LAGO VISTA
TEXAS

AGENDA
CITY COUNCIL REGULAR MEETING
CITY COUNCIL CHAMBERS
5803 THUNDERBIRD
LAGO VISTA, TX
JULY 17, 2025 AT 1:00 PM

AMENDED AGENDA

- To include action item 10d.
- To include action item 10f.
- To remove consent item (approval of minutes).
- To include executive items 2d. & 3d.
- To include bid package & bid plans 7a.
- To include work session item 8d.
- To include public hearing item 9c.
- To include public hearing item 9d.
- To include action item 10e.

JOIN MEETING VIA VIDEO CONFERENCE

Please join my meeting from your computer, tablet or smartphone.
https://meet.goto.com/242387805

You can also dial in using your phone.
United States: +1 (646) 749-3122

Access Code: 242-387-805

1. CALL TO ORDER, CALL OF ROLL

Kevin Sullivan, Mayor
Rob Durbin, Mayor Pro-Tem
Shane Saum, Council Member
Adam Benefield, Council Member
Norma Owen, Council Member
Paul Roberts, Council Member
Paul Prince, Council Member

2. EXECUTIVE SESSION

2a. Consultation with Legal Counsel concerning all regular meeting agenda items requiring confidential, attorney/client advice (as needed) pursuant to Texas Government Code Section 551.071.

2b. Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to

Texas Government Code Section 551.074 - Nichole Navarro, Finance Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

2c. Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - David Scott-Montgomery, Parks and Recreation Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

2d. Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - , City Secretary, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

3. ACTION ON EXECUTIVE SESSION ITEMS (action and/or vote may be taken on the following agenda items):

3a. Consultation with Legal Counsel concerning all regular meeting agenda items requiring confidential, attorney/client advice (as needed) pursuant to Texas Government Code Section 551.071.

3b. Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - David Scott-Montgomery, Parks and Recreation Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

3c. Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - Nichole Navarro, Finance Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

3d. Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - , City Secretary, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

4. INVOCATION

5. PLEDGE OF ALLEGIANCE, PLEDGE TO TEXAS FLAG

6. CITIZEN COMMENTS

In accordance with the Open Meetings Act, Council is prohibited from acting or discussing (other than factual responses to specific questions) any items not on the agenda.

To participate in the citizen comments portion of the meeting, you must submit a completed form. If you are attending the meeting in the City Council Chambers you must

complete the form available at that location and provide it to the Mayor prior to the start of the meeting. If you will be participating using the online videoconferencing tool, you must complete the form and submit it by email in accordance with the instructions included within the form. It is found on the City's website at the link below. The Council will reconvene from executive session at or around 6:30 p.m.

Citizen Participation Registration Form

7. CONSENT AGENDA

All matters listed under Consent Agenda, are to be considered routine by the City Council and will be enacted by one motion. There will not be separate discussion on these items. If discussion is desired, that item will be removed from the consent agenda and will be considered separately.

7a. Discussion, consideration, and possible action awarding Mills Construction's bid for RFP 25-05 in the amount of $500,064.75 for the construction of Sunset Park driveway and authorizing City Manager to sign the contract.

7b. Discussion and possible action regarding the award of RFQ 25-06 for Engineering Design of WTP#3 Upgrade to 6.0 MGD, to Walker Partners; and authorizing the City Manager to negotiate and execute an agreement for such services.

8. WORK SESSION

8a. Discussion regarding possible recommended changes to the City of Lago Vista City Charter as suggested by the Charter Review Committee.

8b. Discussion, consideration, and possible action on concerns regarding water and wastewater master plan.

8c. Discussion and possible action regarding recent flood events, concerning establishing any needed assistant centers, actions taken by the city and future needs.

8d. Discussion regarding adoption of New Section 10.606 – Public Parkland Disclosure and Communication Requirements.

9. PUBLIC HEARING AND POSSIBLE ACTION

9a. **Project # 23-2734-R-REZ** Conduct a public hearing for consideration of a request to rezone a parcel of land from C-1A "Professional Office, Neighborhood Retail" District to C-2 "General Commercial / Retail" District on approximately 1.8681 acres of land addressed as 8039 Bronco Ln, TX 78748 and being Lot 5, Blk A of Lago Vista Retail Subd Addition, Lago Vista, Travis County, Texas. Said property generally described as approximately 685' ESE of the intersection of Bronco Lane and Bar K Ranch Rd. and 242' NW of the Post Office Site.

9b. **Project # 23-2816** Consideration of a Concept Plan for approximately 32.42 acres of land out of the H & O. B. Railroad Survey, Abstract # 2152, Lago Vista, Travis County Texas. Said Concept Plan being for a proposed future 15-lot single family subdivision. Said property currently zoned R1S and being more generally described as being on the south side of Highland Lake Drive approximately 100 feet +/- west of

Santa Monica Ave.

9c. **Project # 23-2777-R-REZ** Conduct a public hearing for consideration of a request to rezone a parcel of land from “TR-1” Temporary Restricted to “C-2” General Commercial Retail. Said rezoning is proposed for an approximately 4.035-acre tract of land identified as Property ID No. 984238 by the Travis Central Appraisal District and situated in the Mary Campbell Survey, Abstract No. 129, in the City of Lago Vista, Travis County, Texas. Said tract was conveyed to Leonard Strickler and is more generally described as being along the west side of Lohman Ford Road, approximately 380 feet south of the intersection of Lohman Ford Road and Travis Drive.

9d. **Project # 23-2778-R-REZ** Conduct a public hearing for consideration of a request to rezone a parcel of land from “TR-1” Temporary Restricted to C-2 “General Commercial Retail”. Said rezoning Proposed for an approximate 3.776-acre tract of land identified as Property ID NO. 999032 by the Travis Central Appraisal District and situated in the Mary Campbell Survey Abstract NO. 129 in the City of Lago Vista, Travis County Texas. Said Tract Having Been conveyed to Leonard Strickler and more generally described as being along the west side of Lohman Ford Road Approximately 954 Feet South of the intersection of Lohman Ford RD. and Travis Dr.

10. ACTION ITEMS

10a. Consideration and possible action on adopting **Resolution No. 25-2141** committing to zero roadway fatalities and serious injuries and adopting the Safe Streets and Roads for All (SS4A) Travis County Safety Action Plan.

10b. Discussion, consideration, and possible action to approve **Ordinance No. 2025-06-05-05** amending Chapter 1, Article 1.500 Purchasing, Section 1.503 Local Preference Program (LLP) of the Code of Ordinances and receive an initial report from staff on how the program has performed since implementation.

10c. Discussion, consideration and possible action to direct staff to review and possibly suggest a potential amendment to the PID Policy relating to maintenance responsibilities for Public Parkland.

10d. Discussion, consideration and possible action on referring an ordinance that amends Chapter 14 of the Zoning Ordinance, Section 2 and Section 16, related to Home Based Business's, to change and ensure that the City of Lago Vista's regulations are in compliance with the recently passed HB 2464 which becomes effective January 1, 2026.

10e. Discussion, consideration, and possible action regarding **Resolution No. 25-2125**; A Resolution by the City Council of the City of Lago Vista, Texas, accepting the Fiscal Year 2024 Audit as prepared by Singleton, Clark & Company, PC.

10f. Discussion, consideration, and possible action directing the Planning and Zoning Commission and staff to review Parkland Dedication requirements, including but not limited to impact fees, fee's in lieu of, amount of land to be dedicated, as related to Chapter 5 of the Subdivision Ordinance.

10g. Discussion and possible action on RFP No. 25-03 Effluent Pond #17 Repairs & Pond #2 Improvements Change Order #1 & #2 and authorizing the City manager to approve the change orders.

10h. Discussion and possible action on Amendment No. 2 to the Effluent Pond Repairs design, which includes plans for a pump house, wet wells, electrical, SCADA, and pumps for Ponds #2, #14, and #17, and to authorize the City Manager to approve the amendment.

11. ITEMS OF COMMUNITY INTEREST

Pursuant to Texas Government Code Section 551.0415, the City Council may report on any of the following items:

11a. Expression of thanks, gratitude, and condolences.
11b. Information regarding holiday schedules.
11c. Recognition of individuals, i.e. Proclamations.
11d. Reminders regarding City Council events.
11e. Reminders regarding community events.
11f. Health and safety announcements.

12. STAFF AND COUNCIL LIAISON REPORTS

12a. Routine Reports from City Staff

12b. Routine Reports from City Council Board/Commission/Committee Liaisons,

- Charter Review Committee, Councilor Prince & Councilor Saum
- Building and Standards Commission, Councilor Benefield
- Keep Lago Vista Beautiful, Councilor Benefield
- Lago Vista Starry Skies, Councilor Benefield
- Airport Advisory Board, Councilor Saum
- Planning & Zoning Commission, Mayor Pro Tem Durbin
- Economic Development Advisory Committee, Councilor Owen
- Lago Vista Independent School District, Councilor Owen
- Lago Vista Property Owner's Association, Councilor Owen
- Turnback Canyon Trail Conservancy, Councilor Owen
- Golf Course Advisory Committee, Councilor Prince
- Library Advisory Board, Councilor Prince
- Parks & Recreation Advisory Committee, Councilor Prince
- Board of Adjustment, Councilor Roberts
- Governmental Affairs, Councilor Saum
- Water Issues; Lower Colorado River Authority Board, Texas Water Development Board, and other entities as appropriate, Councilor Saum
- Youth Advisory Committee, Mayor Sullivan
- Capital Area Council of Governments, Mayor Sullivan
- Texas Department of Transportation, Mayor Sullivan
- Cap Metro, Mayor Sullivan

13. ADJOURNMENT

IT IS HEREBY CERTIFIED that the above Notice was posted on the Bulletin Board in

accordance with Government Code section 551.041 located at all times in City Hall in said City by 12:35 PM on the 14th day of July 2025.

_____
Eric De La Cruz, Assistant City Secretary

THIS MEETING SHALL BE CONDUCTED PURSUANT TO THE TEXAS GOVERNMENT CODE SECTION 551.001 ET SEQ. AT ANY TIME DURING THE MEETING THE COUNCIL RESERVES THE RIGHT TO ADJOURN INTO EXECUTIVE SESSION ON ANY OF THE ABOVE POSTED AGENDA ITEMS IN ACCORDANCE WITH THE SECTIONS 551.071, 551.072, 551.073, 551.074, 551.075 OR 551.076.

THE CITY OF LAGO VISTA IS COMMITTED TO COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT. REASONABLE MODIFICATIONS AND EQUAL ACCESS TO COMMUNICATIONS WILL BE PROVIDED UPON REQUEST.

AT THIS MEETING AT THE STATED LOCATION, A QUORUM OF THE CITY COUNCIL WILL BE PHYSICALLY PRESENT, AND THIS NOTICE SPECIFIES THE INTENT TO HAVE A QUORUM PRESENT THERE, AND THE MEMBER OF THE CITY COUNCIL PRESIDING OVER THE MEETING WILL BE PHYSICALLY PRESENT AT THAT LOCATION. ONE OR MORE MEMBERS OF THE CITY COUNCIL MAY PARTICIPATE IN THIS MEETING REMOTELY, AND IF SO, VIDEOCONFERENCE EQUIPMENT PROVIDING TWO-WAY AUDIO AND VIDEO DISPLAY AND COMMUNICATION WITH EACH MEMBER WHO IS PARTICIPATING BY VIDEOCONFERENCE CALL WILL BE MADE AVAILABLE.

AGENDA ITEM NO. 2a

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Brad Bullock, City Attorney
SUBJECT:	Consultation with Legal Counsel concerning all regular meeting agenda items requiring confidential, attorney/client advice (as needed) pursuant to Texas Government Code Section 551.071.
FINANCIAL IMPACT:	N/A

AGENDA ITEM NO. 2b

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Charles West, City Manager

SUBJECT: Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - Nichole Navarro, Finance Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

FINANCIAL IMPACT: None

RECOMMENDATION: Discussion, consideration and possible action regarding Resolution No. 25- 2143 approving the City Manager's appointment of Nichole Navarro as Finance Director in accordance with the city charter and providing an effective date

ATTACHMENTS:
Navarro_RESOLUTION_NO25_2143.pdf

RESOLUTION NO. 25-2143

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS, APPROVING THE CITY MANAGER'S APPOINTMENT OF NICHOLE NAVARRO AS FINANCE DIRECTOR IN ACCORDANCE WITH THE CITY CHARTER; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Article IV, Section 4.02 of the City of Lago Vista Charter grants the City Manager the authority to appoint and remove department heads, subject to approval by the City Council; and

WHEREAS, the City Manager has selected Nichole Navarro to serve as Finance Director for the City of Lago Vista; and

WHEREAS the City Council finds that Nichole Navarro is qualified to serve in this capacity and that his appointment is in the best interest of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS:

SECTION 1. The City Council hereby approves the City Manager's appointment of Nichole Navarro as Finance Director for the City of Lago Vista.

SECTION 2. This resolution shall become effective immediately upon its passage.

PASSED AND APPROVED this ___ day of _____, 2025.

CITY OF LAGO VISTA, TEXAS

_____
Kevin Sullivan, Mayor

ATTEST:

_____
Susie Quinn, Interim City Secretary

AGENDA ITEM NO. 2c

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Charles West, City Manager
SUBJECT:	Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - David Scott-Montgomery, Parks and Recreation Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.
FINANCIAL IMPACT:	None
RECOMMENDATION:	Discussion, consideration and possible action regarding Resolution No. 25- XXXX approving the City Manager's appointment of David Montgomery-Scott as Parks and Recreation Director in accordance with the city charter and providing an effective date

ATTACHMENTS:
Montgomery-Scott_RESOLUTION_NO 25_2144.pdf

RESOLUTION NO. 25-2144

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS, APPROVING THE CITY MANAGER'S APPOINTMENT OF DAVID MONTGOMERY-SCOTT AS PARKS AND RECREATION DIRECTOR IN ACCORDANCE WITH THE CITY CHARTER; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Article IV, Section 4.02 of the City of Lago Vista Charter grants the City Manager the authority to appoint and remove department heads, subject to approval by the City Council; and

WHEREAS, the City Manager has selected David Montgomery-Scott to serve as Parks and Recreation Director for the City of Lago Vista; and

WHEREAS the City Council finds that David Montgomery-Scott is qualified to serve in this capacity and that his appointment is in the best interest of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS:

SECTION 1. The City Council hereby approves the City Manager's appointment of David Montgomery-Scott as Parks and Recreation Director for the City of Lago Vista.

SECTION 2. This resolution shall become effective immediately upon its passage.

PASSED AND APPROVED this ___ day of _____, 2025.

CITY OF LAGO VISTA, TEXAS

_____
Kevin Sullivan, Mayor

ATTEST:

_____
Susie Quinn, Interim City Secretary

AGENDA ITEM NO. 2d

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Charles West, City Manager
SUBJECT:	Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - , City Secretary, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.
BACKGROUND:	We have an applicant that wishes to remain anonymous until the position can be officially offered.
FINANCIAL IMPACT:	N/A

AGENDA ITEM NO. 2a

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Brad Bullock, City Attorney
SUBJECT:	Consultation with Legal Counsel concerning all regular meeting agenda items requiring confidential, attorney/client advice (as needed) pursuant to Texas Government Code Section 551.071.
FINANCIAL IMPACT:	N/A

AGENDA ITEM NO. 2c

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Charles West, City Manager

SUBJECT: Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - David Scott-Montgomery, Parks and Recreation Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.

FINANCIAL IMPACT: None

RECOMMENDATION: Discussion, consideration and possible action regarding Resolution No. 25- XXXX approving the City Manager's appointment of David Montgomery-Scott as Parks and Recreation Director in accordance with the city charter and providing an effective date

ATTACHMENTS:
Montgomery-Scott_RESOLUTION_NO 25_2144.pdf

RESOLUTION NO. 25-2144

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS, APPROVING THE CITY MANAGER'S APPOINTMENT OF DAVID MONTGOMERY-SCOTT AS PARKS AND RECREATION DIRECTOR IN ACCORDANCE WITH THE CITY CHARTER; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Article IV, Section 4.02 of the City of Lago Vista Charter grants the City Manager the authority to appoint and remove department heads, subject to approval by the City Council; and

WHEREAS, the City Manager has selected David Montgomery-Scott to serve as Parks and Recreation Director for the City of Lago Vista; and

WHEREAS the City Council finds that David Montgomery-Scott is qualified to serve in this capacity and that his appointment is in the best interest of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS:

SECTION 1. The City Council hereby approves the City Manager's appointment of David Montgomery-Scott as Parks and Recreation Director for the City of Lago Vista.

SECTION 2. This resolution shall become effective immediately upon its passage.

PASSED AND APPROVED this ___ day of _____, 2025.

CITY OF LAGO VISTA, TEXAS

_____
Kevin Sullivan, Mayor

ATTEST:

_____
Susie Quinn, Interim City Secretary

AGENDA ITEM NO. 2b

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Charles West, City Manager
SUBJECT:	Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - Nichole Navarro, Finance Director, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.
FINANCIAL IMPACT:	None
RECOMMENDATION:	Discussion, consideration and possible action regarding Resolution No. 25- 2143 approving the City Manager's appointment of Nichole Navarro as Finance Director in accordance with the city charter and providing an effective date

ATTACHMENTS:
Navarro_RESOLUTION_NO25_2143.pdf

RESOLUTION NO. 25-2143

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS, APPROVING THE CITY MANAGER'S APPOINTMENT OF NICHOLE NAVARRO AS FINANCE DIRECTOR IN ACCORDANCE WITH THE CITY CHARTER; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Article IV, Section 4.02 of the City of Lago Vista Charter grants the City Manager the authority to appoint and remove department heads, subject to approval by the City Council; and

WHEREAS, the City Manager has selected Nichole Navarro to serve as Finance Director for the City of Lago Vista; and

WHEREAS the City Council finds that Nichole Navarro is qualified to serve in this capacity and that his appointment is in the best interest of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS:

SECTION 1. The City Council hereby approves the City Manager's appointment of Nichole Navarro as Finance Director for the City of Lago Vista.

SECTION 2. This resolution shall become effective immediately upon its passage.

PASSED AND APPROVED this ___ day of _____, 2025.

CITY OF LAGO VISTA, TEXAS

_____
Kevin Sullivan, Mayor

ATTEST:

_____
Susie Quinn, Interim City Secretary

AGENDA ITEM NO. 2d

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Charles West, City Manager
SUBJECT:	Consultation with Legal Counsel concerning the appointment, employment, evaluation, reassignment, duties, discipline, or dismissal of an employee pursuant to Texas Government Code Section 551.074 - , City Secretary, and legal advice related thereto concerning pending or contemplated litigation pursuant to Texas Government Code 551.071.
BACKGROUND:	We have an applicant that wishes to remain anonymous until the position can be officially offered.
FINANCIAL IMPACT:	N/A

AGENDA ITEM NO. 7a

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Eric DeLaCruz, Finance

SUBJECT: Discussion, consideration, and possible action awarding Mills Construction's bid for RFP 25-05 in the amount of $500,064.75 for the construction of Sunset Park driveway and authorizing City Manager to sign the contract.

BACKGROUND: This project was published on March 20, 2025, with a closing date of May 22, 2025.

A total of five (5) bids were received on May 22nd and read aloud. The bidders were Aaron Concrete, Austin Engineering, Jerdon Enterprise, Mills Construction, and Texas Road. A comparison of all five bids can be found in the Bid Opening Sheet.

FINDINGS: Mills Construction was the lowest responsible bidder in the amount of $500,064.75.

FINANCIAL IMPACT: This project will be in the amount of $500,064.75 which is covered in this FY24-25 Parks & recreation budget in the amount of $375,000 & continuing in the FY25-26 Budget for remaining amount of $125,064.75 utilizing line item code 10-534-9710.

RECOMMENDATION: Approve.

ATTACHMENTS:
Corrected Cobb & Fendley Sunset Park Driveway BID TAB.pdf
RFP 25-05 - Bid Summary Sheet.pdf
Mills Construction Proposal.pdf
RFP 25-05- Bid Package 2025.05.02.pdf
1378-01-053 RM1431 - 03 - LV-SUNSET-PARK_Plans-sealed.pdf

City of Lago Vista
Sunset Park Driveway
Bid Opening May 22, 2025

Summary of All Bid Items

BIDDER	SUNSET PARK DRIVEWAY	RM 1431 LEFT TURN LANE	TOTALS	RANK
AARON CONCRETE	$ 463,349.70	$ 174,559.10	$ 637,908.80	4
AUSTIN ENGINEERING	$ 432,395.90	$ 170,613.80	$ 603,009.70	3
JERDON ENTERPRISE	$ 531,350.25	$ 120,460.20	$ 651,810.45	5
MILLS CONSTRUCTION	$ 368,322.15	$ 131,742.60	$ 500,064.75	1
TEXAS ROAD	$ 433,434.00	$ 143,969.70	$ 577,403.70	2

Yellow highlight indicates a miscalculated total from the proposal was corrected.

City of Lago Vista
Sunset Park Driveway
Bid Opening May 22, 2025

Sunset Driveway Bid Items

					AARON CONCRETE		AUSTIN ENGINEERING		JERDON ENTERPRISE		MILLS CONSTRUCTION		TEXAS ROAD	
BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID
1	100-7002	PREPARING RIGHT-OF-WAY	10.9	STA	$ 1,943.00	$ 21,178.70	$ 4,250.00	$ 46,325.00	$ 4,500.00	$ 49,050.00	$ 3,375.00	$ 36,787.50	$ 1,350.00	$ 14,715.00
2	105-7036	RMV (16") TRT/UNTRT BASE & ASPH PAV	130	SY	$ 23.00	$ 2,990.00	$ 42.00	$ 5,460.00	$ 40.00	$ 5,200.00	$ 50.00	$ 6,500.00	$ 23.00	$ 2,990.00
3	110-7001	EXCAV (ROADWAY)	839	CY	$ 26.00	$ 21,814.00	$ 40.00	$ 33,560.00	$ 65.00	$ 54,535.00	$ 25.00	$ 20,975.00	$ 21.00	$ 17,619.00
4	132-7003	EMBANK (FNL)(OC)(TY B)	403	CY	$ 25.00	$ 10,075.00	$ 3.80	$ 1,531.40	$ 10.00	$ 4,030.00	$ 25.00	$ 10,075.00	$ 13.00	$ 5,239.00
5	160-7002	FURN & PLACE TOPSOIL (4")	3590	SY	$ 8.00	$ 28,720.00	$ 6.00	$ 21,540.00	$ 12.00	$ 43,080.00	$ 15.00	$ 53,850.00	$ 9.00	$ 32,310.00
6	164-7002	BROADCAST SEED (PERM_RURAL_CLAY)	3590	SY	$ 1.00	$ 3,590.00	$ 1.00	$ 3,590.00	$ 0.85	$ 3,051.50	$ 0.55	$ 1,974.50	$ 0.80	$ 2,872.00
7	164-7029	STRAW/HAY MLCH SEED (TEMP_WARM)	1795	SY	$ 15.00	$ 26,925.00	$ 0.10	$ 179.50	$ 1.50	$ 2,692.50	$ 0.55	$ 987.25	$ 1.20	$ 2,154.00
8	164-7030	STRAW/HAY MLCH SEED (TEMP_COOL)	1795	SY	$ 15.00	$ 26,925.00	$ 0.10	$ 179.50	$ 1.50	$ 2,692.50	$ 0.55	$ 987.25	$ 1.20	$ 2,154.00
9	168-7001	VEGETATIVE WATERING	80	MG	$ 63.00	$ 5,040.00	$ 97.00	$ 7,760.00	$ 165.00	$ 13,200.00	$ 7.00	$ 560.00	$ 35.00	$ 2,800.00
10	247-7176	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	555	CY	$ 100.00	$ 55,500.00	$ 95.00	$ 52,725.00	$ 175.00	$ 97,125.00	$ 65.00	$ 36,075.00	$ 180.00	$ 99,900.00
11	310-7013	PRIME COAT(MC-30 OR AE-P)	661	GAL	$ 5.00	$ 3,305.00	$ 4.90	$ 3,238.90	$ 4.75	$ 3,139.75	$ 5.18	$ 3,423.98	$ 9.00	$ 5,949.00
12	341-7003	D-GR HMA TY-B PG64- 22 (EXEMPT)	727	TON	$ 143.00	$ 103,961.00	$ 145.00	$ 105,415.00	$ 140.00	$ 101,780.00	$ 126.47	$ 91,943.69	$ 150.00	$ 109,050.00
13	341-7065	D-GR HMA TY-D PG 76-22 (EXEMPT)	362	TON	$ 173.00	$ 62,626.00	$ 170.00	$ 61,540.00	$ 170.00	$ 61,540.00	$ 161.10	$ 58,318.20	$ 160.00	$ 57,920.00
14	464-7007	RC PIPE (CL III)(30 IN)	46	LF	$ 184.00	$ 8,464.00	$ 415.00	$ 19,090.00	$ 325.00	$ 14,950.00	$ 200.00	$ 9,200.00	$ 160.00	$ 7,360.00
15	467-7343	SET (TY II) (30 IN) (RCP) (6: 1) (P)	2	EA	$ 5,916.00	$ 11,832.00	$ 7,000.00	$ 14,000.00	$ 4,200.00	$ 8,400.00	$ 5,500.00	$ 11,000.00	$ 4,900.00	$ 9,800.00
16	500-7001	MOBILIZATION	1	LS	$ 55,244.00	$ 55,244.00	$ 40,000.00	$ 40,000.00	$ 49,140.00	$ 49,140.00	$ 17,500.00	$ 17,500.00	$ 45,400.00	$ 45,400.00
17	506-7020	CONSTRUCTION EXITS (INSTALL) (TY 1)	106	SY	$ 37.00	$ 3,922.00	$ 37.00	$ 3,922.00	$ 35.00	$ 3,710.00	$ 17.25	$ 1,828.50	$ 36.00	$ 3,816.00
18	506-7024	CONSTRUCTION EXITS (REMOVE)	106	SY	$ 23.00	$ 2,438.00	$ 23.00	$ 2,438.00	$ 22.00	$ 2,332.00	$ 1.00	$ 106.00	$ 23.00	$ 2,438.00
19	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	1220	LF	$ 5.00	$ 6,100.00	$ 6.00	$ 7,320.00	$ 6.00	$ 7,320.00	$ 2.85	$ 3,477.00	$ 4.80	$ 5,856.00
20	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	1220	LF	$ 1.00	$ 1,220.00	$ 1.00	$ 1,220.00	$ 2.50	$ 3,050.00	$ 1.00	$ 1,220.00	$ 1.20	$ 1,464.00
21	3007-7001	BONDING COURSE	296	GAL	$ 5.00	$ 1,480.00	$ 4.60	$ 1,361.60	$ 4.50	$ 1,332.00	$ 5.18	$ 1,533.28	$ 5.50	$ 1,628.00
						$ 463,349.70		**$ 432,395.90**		**$ 531,350.25**		**$ 368,322.15**		**$ 433,434.00**
											Per proposal	$ 368,319.73		
											Delta	$ 2.42		

$ 500,064.75

City of Lago Vista
Sunset Park Driveway
Bid Opening May 22, 2025

RM 1431 Left Turn Lane
TxDOT Bid Items

					AARON CONCRETE		AUSTIN ENGINEERING		JERDON ENTERPRISE		MILLS CONSTGRUCTION		TEXAS ROAD	
BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID	UNIT COST	AMOUNT BID
1	100-7013	TREE PROTECTION (INSTALL)	1	EA	$ 802.00	$ 802.00	$ 800.00	$ 800.00	$ 750.00	$ 750.00	$ 460.00	$ 460.00	$ 790.00	$ 790.00
2	100-7015	TREE PROTECTION (REMOVE)	1	EA	$ 169.00	$ 169.00	$ 170.00	$ 170.00	$ 150.00	$ 150.00	$ 50.00	$ 50.00	$ 167.00	$ 167.00
3	105-7002	RMV (2"-6") TRT/UNTRT BASE & ASPH PAV	72	SY	$ 35.00	$ 2,520.00	$ 42.00	$ 3,024.00	$ 30.00	$ 2,160.00	$ 25.00	$ 1,800.00	$ 50.00	$ 3,600.00
4	160-7002	FURN & PLACE TOPSOIL (4")	196	SY	$ 15.00	$ 2,940.00	$ 6.00	$ 1,176.00	$ 12.00	$ 2,352.00	$ 25.00	$ 4,900.00	$ 15.00	$ 2,940.00
5	164-7002	BROADCAST SEED (PERM_RURAL_CLAY)	196	SY	$ 1.00	$ 196.00	$ 0.90	$ 176.40	$ 0.85	$ 166.60	$ 0.55	$ 107.80	$ 0.80	$ 156.80
6	164-7029	STRAW/HAY MLCH SEED (TEMP_WARM)	196	SY	$ 19.00	$ 3,724.00	$ 0.10	$ 19.60	$ 1.50	$ 294.00	$ 0.55	$ 107.80	$ 1.20	$ 235.20
7	164-7030	STRAW/HAY MLCH SEED (TEMP_COOL)	196	SY	$ 19.00	$ 3,724.00	$ 0.10	$ 19.60	$ 1.50	$ 294.00	$ 0.55	$ 107.80	$ 1.20	$ 235.20
8	464-7005	RC PIPE (CL III)(24 IN)	53	LF	$ 144.00	$ 7,632.00	$ 300.00	$ 15,900.00	$ 290.00	$ 15,370.00	$ 100.00	$ 5,300.00	$ 200.00	$ 10,600.00
9	467-7328	SET (TY II) (24 IN) (RCP) (6: 1) (P)	2	EA	$ 4,649.00	$ 9,298.00	$ 4,200.00	$ 8,400.00	$ 3,500.00	$ 7,000.00	$ 4,500.00	$ 9,000.00	$ 5,000.00	$ 10,000.00
10	496-7004	REMOV STR (SET)	2	EA	$ 498.00	$ 996.00	$ 1,500.00	$ 3,000.00	$ 1,100.00	$ 2,200.00	$ 500.00	$ 1,000.00	$ 330.00	$ 660.00
11	496-7007	REMOV STR (PIPE)	36	LF	$ 52.00	$ 1,872.00	$ 57.00	$ 2,052.00	$ 55.00	$ 1,980.00	$ 50.00	$ 1,800.00	$ 35.00	$ 1,260.00
12	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	1	MO	$ 4,709.00	$ 4,709.00	$ 11,400.00	$ 11,400.00	$ 23,500.00	$ 23,500.00	$ 10,000.00	$ 10,000.00	$ 6,200.00	$ 6,200.00
13	503-7001	PORTABLE CHANGEABLE MESSAGE SIGN	40	DAY	$ 62.00	$ 2,480.00	$ 230.00	$ 9,200.00	$ 205.00	$ 8,200.00	$ 216.00	$ 8,640.00	$ 80.00	$ 3,200.00
14	505-7002	TMA (MOBILE OPERATION)	24	HR	$ 462.00	$ 11,088.00	$ 65.00	$ 1,560.00	$ 32.00	$ 768.00	$ 60.00	$ 1,440.00	$ 240.00	$ 5,760.00
15	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	58	LF	$ 5.00	$ 290.00	$ 6.00	$ 348.00	$ 6.00	$ 348.00	$ 2.85	$ 165.30	$ 4.80	$ 278.40
16	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	58	LF	$ 1.00	$ 58.00	$ 1.00	$ 58.00	$ 2.50	$ 145.00	$ 1.00	$ 58.00	$ 1.20	$ 69.60
17	530-7010	DRIVEWAYS (ACP)	125	SY	$ 223.00	$ 27,875.00	$ 160.00	$ 20,000.00	$ 160.00	$ 20,000.00	$ 39.60	$ 4,950.00	$ 145.00	$ 18,125.00
18	644-7002	IN SM RD SN SUP&AM TY10BWG(1)SA(P- BM)	1	EA	$ 1,100.00	$ 1,100.00	$ 1,000.00	$ 1,000.00	$ 850.00	$ 850.00	$ 2,310.00	$ 2,310.00	$ 2,200.00	$ 2,200.00
19	658-7003	DEL ASSM (D-SW)SZ 1(WFLX)(GND)	2	EA	$ 114.00	$ 228.00	$ 185.00	$ 370.00	$ 120.00	$ 240.00	$ 110.00	$ 220.00	$ 430.00	$ 860.00
20	666-7017	REFL PAV MRK TY I (W) 8" (DOT)	151	LF	$ 6.00	$ 906.00	$ 6.00	$ 906.00	$ 3.50	$ 528.50	$ 5.50	$ 830.50	$ 5.20	$ 785.20
21	666-7023	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	433	LF	$ 6.00	$ 2,598.00	$ 6.00	$ 2,598.00	$ 2.00	$ 866.00	$ 5.50	$ 2,381.50	$ 5.20	$ 2,251.60
22	666-7035	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	21	LF	$ 49.00	$ 1,029.00	$ 49.00	$ 1,029.00	$ 11.75	$ 246.75	$ 44.00	$ 924.00	$ 43.00	$ 903.00
23	666-7041	REFL PAV MRK TY I (W)(ARROW)(090MIL)	2	EA	$ 370.00	$ 740.00	$ 370.00	$ 740.00	$ 203.00	$ 406.00	$ 330.00	$ 660.00	$ 320.00	$ 640.00
24	666-7065	REFL PAV MRK TY I (W)(WORD)(090MIL)	2	EA	$ 463.00	$ 926.00	$ 460.00	$ 920.00	$ 210.00	$ 420.00	$ 412.50	$ 825.00	$ 400.00	$ 800.00
25	666-7175	RE PM TY II (W) 6" (SLD)	2880	LF	$ 3.00	$ 8,640.00	$ 2.80	$ 8,064.00	$ 1.00	$ 2,880.00	$ 2.48	$ 7,142.40	$ 2.40	$ 6,912.00
26	666-7177	RE PM TY II (W) 8" (DOT)	151	LF	$ 3.00	$ 453.00	$ 3.10	$ 468.10	$ 2.00	$ 302.00	$ 2.75	$ 415.25	$ 2.40	$ 362.40
27	666-7179	RE PM TY II (W) 8" (SLD)	433	LF	$ 3.00	$ 1,299.00	$ 3.10	$ 1,342.30	$ 2.00	$ 866.00	$ 2.75	$ 1,190.75	$ 2.40	$ 1,039.20
28	666-7184	RE PM TY II (W) 24" (SLD)	21	LF	$ 25.00	$ 525.00	$ 25.00	$ 525.00	$ 7.00	$ 147.00	$ 22.00	$ 462.00	$ 21.00	$ 441.00
29	666-7186	RE PM TY II (W) (ARROW)	2	EA	$ 216.00	$ 432.00	$ 214.00	$ 428.00	$ 100.00	$ 200.00	$ 192.50	$ 385.00	$ 185.00	$ 370.00
30	666-7194	RE PM TY II (W) (WORD)	2	EA	$ 247.00	$ 494.00	$ 245.00	$ 490.00	$ 105.00	$ 210.00	$ 220.00	$ 440.00	$ 215.00	$ 430.00
31	666-7213	RE PM TY II (Y) 6" (SLD)	4830	LF	$ 3.00	$ 14,490.00	$ 3.00	$ 14,490.00	$ 1.00	$ 4,830.00	$ 2.48	$ 11,978.40	$ 2.40	$ 11,592.00
32	666-7265	REFL PAV MRK TY I (W) 6" (SLD) (090MIL)	2880	LF	$ 6.00	$ 17,280.00	$ 5.50	$ 15,840.00	$ 2.00	$ 5,760.00	$ 4.95	$ 14,256.00	$ 4.50	$ 12,960.00
33	666-7269	REFL PAV MRK TY I (Y) 6" (SLD) (090MIL)	4830	LF	$ 6.00	$ 28,980.00	$ 5.65	$ 27,289.50	$ 2.00	$ 9,660.00	$ 4.95	$ 23,908.50	$ 4.50	$ 21,735.00
34	666-7348	PAVEMENT SLER 6”	575	LF	$ 3.00	$ 1,725.00	$ 3.00	$ 1,725.00	$ 0.75	$ 431.25	$ 2.48	$ 1,426.00	$ 7.50	$ 4,312.50
35	672-7002	REFL PAV MRKR TY I-C	22	EA	$ 10.00	$ 220.00	$ 10.00	$ 220.00	$ 7.00	$ 154.00	$ 8.53	$ 187.66	$ 8.00	$ 176.00
36	672-7004	REFL PAV MRKR TY II-A-A	216	EA	$ 10.00	$ 2,160.00	$ 9.50	$ 2,052.00	$ 7.00	$ 1,512.00	$ 8.53	$ 1,842.48	$ 8.00	$ 1,728.00
37	677-7001	ELIM EXT PAV MRK & MRKS (4")	6083	LF	$ 1.00	$ 6,083.00	$ 1.50	$ 9,124.50	$ 0.50	$ 3,041.50	$ 1.10	$ 6,691.30	$ 1.00	$ 6,083.00
38	677-7008	ELIM EXT PAV MRK & MRKS (24")	135	LF	$ 4.00	$ 540.00	$ 3.70	$ 499.50	$ 3.50	$ 472.50	$ 3.30	$ 445.50	$ 3.20	$ 432.00
39	678-7002	PAV SURF PREP FOR MRK (6")	7710	LF	$ 0.31	$ 2,390.10	$ 0.30	$ 2,313.00	$ 0.08	$ 616.80	$ 0.28	$ 2,158.80	$ 0.25	$ 1,927.50
40	678-7004	PAV SURF PREP FOR MRK (8")	433	LF	$ 1.00	$ 433.00	$ 0.85	$ 368.05	$ 0.10	$ 43.30	$ 0.72	$ 311.76	$ 0.70	$ 303.10
41	678-7008	PAV SURF PREP FOR MRK (24")	21	LF	$ 1.00	$ 21.00	$ 1.25	$ 26.25	$ 3.00	$ 63.00	$ 1.10	$ 23.10	$ 1.00	$ 21.00
42	678-7009	PAV SURF PREP FOR MRK (ARROW)	2	EA	$ 93.00	$ 186.00	$ 91.00	$ 182.00	$ 9.00	$ 18.00	$ 82.50	$ 165.00	$ 80.00	$ 160.00
43	678-7015	PAV SURF PREP FOR MRK (WORD)	2	EA	$ 154.00	$ 308.00	$ 150.00	$ 300.00	$ 9.00	$ 18.00	$ 137.50	$ 275.00	$ 134.00	$ 268.00
						$ 174,559.10		**$ 170,613.80**		**$ 120,460.20**		**$ 131,742.60**		**$ 143,969.70**
											Per proposal	$ 131,659.27		
											Delta	$ 83.33		

LAGO VISTA
TEXAS

CITY OF LAGO VISTA, TEXAS
5803 Thunderbird St Lago Vista, Texas 78645

Bid Date: Thursday, May 22, 2025 @ 1:00 PM
Calendar Days:

BID SUMMARY
RFP No. 25-05 Sunset Park Driveway Thursday, May 22, 2025 @ 1:00 PM

#	Name of Bidder / Company	Bid Bond Enclosed	Acknowledge Addenda	Base Bid Amount	Alt. 1 Amount	Alt. 2 Amount	Total Bid (Alt Incl.)
1	Jerdon Enterprise	Y	Y	$ -	$ -	$ -	$651,810.45
2	Texas Road	Y	Y	$ -	$ -	$ -	$577,403.70
3	Austin Engineering	Y	Y	$ -	$ -	$ -	$603,009.07
4	Aaron Concrete	Y	Y	$ -	$ -	$ -	$637,908.80
5	Mills Construction	Y	Y	$ -	$ -	$ -	$499,979.00

CONTRACTOR'S BID

FOR

SUNSET PARK DRIVEWAY

RFP No. 25-05

BIDDER'S NAME

Mills Construction LLC

(PLEASE PRINT CLEARLY)

CHECKLIST OF ITEMS TO BE RETURNED

The following items shall be returned in order for the bid submittal to be considered acceptable:

- ☐ Completed Bid Summary Sheet
- ☐ Completed Unit Price Schedule
- ☐ Completed Bid Form
- ☐ Bid Security
- ☐ Acknowledgment of Addenda
- ☐ Completed Bidder's Qualification Form

PREPARED FOR:

LAGO VISTA
TEXAS

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED PROFESSIONAL ENGINEER
5/2/2025

5803 Thunderbird Street
Lago Vista, Texas 78645

ADVERTISEMENT FOR SEALED PROPOSALS

Sealed competitive bids, in envelopes addressed to the City of Lago Vista, 5803 Thunderbird Street, Lago Vista, Texas 78645, for **RFP No. 25-05 Sunset Park Driveway,** in the City of Lago Vista, Texas, will be received at the above-mentioned address until 1:00 P.M., May 22nd, 2025 and then publicly opened and read aloud.

Submittals can be submitted in sealed envelopes and marked "RFP No. 25-05 Sunset Park Driveway".

The Contract Documents and Specifications are available at the City of Lago Vista. Questions and requests for additional information shall be sent by email to: Victor.manzano@lagovistatexas.gov. For this project, all bidders will be **required** to accept Addenda and other pertinent information by email, as well as provide written acknowledgement of Addenda as prescribed in the Instructions to Bidders. **No questions or requests for additional information will be accepted later than 12:00 p.m., May 14th, 2025.**

Bid packages will be available on the City's website at www.lagovistatexas.gov/Bids.aspx. as well as online via BidNetDirect at http://www.bidnetdirect.com/texas/lagovista. Project general conditions and standard specifications manual can be found on the City's website at www.lagovistatexas.gov.

An optional pre-bid conference will be held on **May 8th, 2025**, at 1:00 P.M. at 5803 Thunderbird Street, Lago Vista, Texas 78645 in the City Council Conference Room.

A bid security of 5% of the bid amount must accompany each bid or proposal. A certified check or bank draft payable to the City of Lago Vista may be submitted in lieu of the Bid Bond.

After contract is awarded, the contractor will be required to furnish insurance, performance, and payment bonds.

The City of Lago Vista reserves the right to waive any informality that is not detrimental to any other bidder or potential bidder or to reject all bids or to accept the lowest responsible bidder that in the judgment of the City Council will be in the best interest of the City of Lago Vista.

No bidder may withdraw his bid within sixty (60) days after the actual date of opening thereof.

City of Lago Vista, Texas
Kevin Sullivan, Mayor

Newspaper ad published twice:

Thursday, March 20th, 2025
Thursday, March 27th, 2025

CITY HAS COPY OF AFFIDAVIT OF PUBLICATION.

If you have any questions, please e-mail Victor Manzano at:
Victor.manzano@lagovistatexas.gov.

Form TGC 2270
VERIFICATION REQUIRED BY TEXAS GOVERNMENT CODE CHAPTER 2270

Contract identifier: N/A
Department: N/A

By signing below, Company herby verifies the following:

1. Company does not boycott Israel; and
2. Company will not boycott Israel during the term of the contract.

SIGNED BY: [signature]

Print Name of Person Signing, Title, and Company: Zachary Hughes, VP, Mills Construction

Date signed: 5/20/2025

STATE OF TEXAS §
COUNTY OF Williamson §

BEFORE ME, the undersigned Notary Public on this day personally appeared Zachary Hughes (Name), on behalf of Mills Construction (Company) who being duly sworn, stated under oath that he/she has read the foregoing verification required by Texas Government Code Section 2270.002 and said statements contained therein are true and correct..

SWORN AND SUBSCRIBED TO before me, this 20th day of May, 2025.

Elizabeth Renee Parrish
NOTARY OF PUBLIC,
FOR THE STATE OF TEXAS

My Commission Expires:
06-11-2028

ELIZABETH RENEE PARRISH
My Notary ID # 125553177
Expires June 11, 2028

Government Code § 2270.002. Provision Required in Contract
Effective: September 1, 2017
A governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it:
(1) does not boycott Israel; and
(2) will not boycott Israel during the term of the contract.

The following definitions apply:

(1) "Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

(2) "Company" means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations that exists to make a profit.

(3) "Governmental entity" means a state agency or political subdivision of this state.

State law requires verification from a Company for contracts involving goods or services (regardless of the amount) before the City can enter into the contract.

005 BID FORM

AFFIDAVIT OF AUTHENTICITY

Must be included with Bidder's Qualifications

STATE OF TEXAS :

COUNTY OF :

ON THIS, the 20th day of May, 2025, before me, a Notary Public, the undersigned officer, personally appeared ZACHARY HUGHES, who acknowledged her/himself to be the VP *[title]* of Mills Construction LLC *[Contractor's full name]* being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the said contractor by her/himself as such VP *[title]*, executed the foregoing instrument for the purposes therein contained by signing her/his name.

STATE OF TEXAS :

COUNTY OF WILLIAMSON

Sworn to and subscribed before me on the 20th day of May, 2025 (year), by ZACHARY HUGHES *(name of signer)*.

Elizabeth Renee Parrish
Notary Public's Signature

ELIZABETH RENEE PARRISH
My Notary ID # 125553177
Expires June 11, 2028

List on a sheet attached hereto all judgments, claims, arbitration proceedings, or suits pending or outstanding against bidder over the last five (5) years with amount of claim and brief description.

List on a sheet attached hereto all lawsuits or requested arbitration with regard to construction contracts which bidder has initiated within the last five (5) years and brief explanation of claim and outcome.

Attach to this form Bidder's current Financial Statement (assets/Liabilities), preferably audited.

Signature: _____

Name (Officer or Partner): Zachary Hughes

Title: VP

Date: 5/20/2025

SECTION 003

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ADDITIONAL SECTIONS:

- Wage Rates
- City of Lago Vista Standard Specifications (for work outside the ROW)
- TxDOT General Notes
- TXDOT 2024 Standard Specifications (for work within TxDOT ROW)

003 ACKNOWLEDGMENT OF ADDENDA

Acknowledgement of Addenda:

All Addenda must be acknowledged below in the space provided. Alternatively, Addenda may be acknowledged on the outside of the sealed envelope submitted for bid next to the project name. Inclusion of the full text of any Addendum in this bid packet will also constitute the bidder's acknowledgement of that Addendum.

Bidder's Name: Mills Construction LLC

(Fill in Bidder's Name exactly as it appears on pages 2 and 3 of the Bid Form)

I have received, acknowledge, and accept all of the following Addenda:

ADDENDUM NO.	SIGNATURE
1	3/24
2	3/27
3	5/06

Total Bid Amount in numbers:

Total bid in numbers (as tabulated on the Unit Price Schedule): $ 499,979.00

The total bid in numbers above will be used to determine the apparent low bidder. The contract award will be based on bid amounts tabulated and verified by the Engineer.

12. Owner- Osborn Plumbing

Project- Coffee Dog Waterline Replacement

Contact: Mike Osborne 512-321-6098

Contract Amount: $55,000

Project finish: 5/9/2025

Description of work: 2" waterline replacement for 380 LF, asphalt patch, and striping.

Engineer: N/A

Thank you for your time and I hope this list of past, current, or future projects helps with your decision in using us for your future project.

Thanks,

Zachary Hughes

Mills Construction, LLC

512-237-0580

10. Owner- Steven Mazur

Project- San Antonio Old Baseball fields

Contact: Steven Mazur 512-680-2134

Contract Amount: $155,000.00

Projected Finish: 5/24/2025

Description of work: Grading fields, limestone block setting, asphalt lay down, gravel laydown, and tree clearing

Engineer: N/A

11. Owner- GH Old San Antonio Dale, LLC

Project- Terra Acres Subdivision

Contact: Trevor Dallas 512-825-6140

Contract Amount: $ 386,000

Projected Start: 5/12/2025

Description of work: Tree clearing, site grading, waterline install, and curb and gutter

Engineer: Dodson Civil Group

Project- Old 71 Persimmon LLC Culvert Project

Contact: Trevor Dallas 512-825-6140

Contract amount: $36,000

Project Start: 5/28/2025

Description of work: Culvert install, site grading, tree clearing, and asphalt millings install

7. **Owner- Spawglass/MD Anderson**

   Project- MD Anderson Roadway Project

   Contact: Papa Faye 512-550-2128

   Contract amount: $494,442.00

   Projected start date: 5/5/2025

   Description of work: Roadway install and concrete slab remove and replace.

   Engineer: Dally Associates

8. **Owner- Hydroexpress Seeding**

   Project- Travis Club Austin Topsoil

   Contact: Bryden Coghlan 512-332-6318

   Contract amount: $14,475.00

   Projected start date: 5/5/2025

   Description of work: Topsoil spreading of new yard.

9. **Owner- Hope Outdoor Gallery**

   Project- 701 Dalton Lane Rain Gardens

   Contact: Ryan Bruce 737-230-9032

   Contract amount: $68,662.50

   Projected start date: 5/5/2025

   Description of work: Asphalt millings install on existing roadway in South Austin.

   Engineer: Perales Land Development

4. **Owner- Franklin Street**

   Project- Compassionate cultivation

   Contact: Alex Ostendorf 404-918-0518

   Contract amount: $137,106.80

   Projected completion date: 4/25/2025

   Description of work: 8" fire waterline install and tie into AQUA 24" line.

   Engineer: Trine Engineering

5. **Owner- G&C Excavators**

   Project- Misc. projects throughout 2025 and 2025

   Contact: Renee Parrish 512-610-6642

   Contract amount: $632,524.46

   Projected completion date: 5/9/2025

   Description of work: Building pads, subgrade prep, asphalt turn lane, pond excavation, tree clearing, base roadway, and etc.

6. **Owner- Bryan Lastrapes**

   Project- 408 Lakeshore Circle

   Contact: Bryan Lastrapes 832-312-5555

   Contract amount: $29,825.00

   Projected completion date: 4/11/2025

   Description of work: Asphalt millings install down to lake dock

   Engineer: N/A

Project- Urbana at Cottonwood

Contact: Michael Woeste 512-276-0500

Contract amount: $157,989.73

Projected completion date: 5/9/2025

Description of work: Site grading, sidewalk prep, and other misc. things needed.

Engineer: HR Green

Project- Hero Way West

Michael Woeste 512-726-0500

Contract amount: $53,697.89

Projected completion date: 4/7/2025

Description of work: Grading of V channel, sod, and barricade install.

Engineer: HR Green

3. **Owner- ATX Turf Kings**

Project- Old Zorn Road Millings Driveway and Road

Contact: Steven Mazur 512-680-2134

Contract amount: $93,890

Projected completion date: 4/4/2025

Description of work: Asphalt millings install for driveway and roadway.

Engineer: N/A

Mills Construction, LLC
143 Swift Water Loop
Bastrop, Tx 78602
Mobile: 512-237-0580

Here is a list of active/completed projects we are currently working on/finished/or plan to start in the future.

1. **Owner- David Beseda**

   Project- Grove Retail Center (Austin, Tx)

   Contact: David Beseda 512-971-1616

   Contract amount: $278,855

   Project completion date: 12/1/2025

   Description of work: Site grading for pond, storm install, water and WW install, and dry utilities install.

   Engineer: Professional Strucivil engineers

2. **Owner- Legacy MCS**

   Project- Village at Hutto Station

   Contact: Ben Spencer 979-716-9173

   Contract amount: $112,438.50

   Projected completion date: 5/23/2025

   Description of work: Site grading, sidewalk prep, and other misc. things needed.

   Engineer: BGE, Inc

Company: Express Hydroseeding, LLC

Contact: Bryden Coghlan

Number: 512-332-6318

Email: bcoghlan@expresshydroseeding.com

Address: 145 W. Oak Loop, Cedar Creek, Tx 8612

Thank you for your time and I hope this helps you for all future bid opportunities with Mills Construction LLC.

Thanks,

Zachary Hughes

VP

Mills Construction, LLC

512-237-0580

Company: Osborn Plumbing, Inc

Contact: Mike Osborne

Number: 512-321-6098

Email: osbornplumbinginc@gmail.com

Address: 1812 Wilson St, Bastrop, TX 78602

Company: Vista WD

Contact: Steven Mazur

Number: 512-680-2134

Email: steven@vistawd.com

Address: 100 Melanie Cove, Georgetown, Tx 78633

Company: G&C Excavators

Contact: Curtis Griffin/Renee Parrish

Number: 512-610-6642

Email: renee@gandcexcavators.com

Address: 6207 Bee Caves Rd Ste 265, Austin, Tx 78746

Company: GH Old San Antonio Dale, LLC

Contact: Trevor Dallas

Number: 512-825-6140

Email: tdallas@grehinvest.com

Address: 3005 Stratford Dr, Austin, Tx 78746

Company: Sabre Commercial, Inc

Contact: Ryan Bruce

Number: 512-767-7400

Email: rbruce@sabrecommercial.com

Address: 2001 Chicon St, Austin, Tx 78722

Mills Construction, LLC
143 Swift Water Loop
Bastrop, Tx 78602
Mobile: 512-237-0580

Here is our owner references information for Mills Construction LLC.

Company: Legacy MCS

Contact: Michael Woeste

Number: 512-726-0500

Email: mike@legacymcs.com

Address: 7800 Shoal Creek Blvd. Ste 100N, Austin, Tx 78757

Company: David Beseda LLC

Contact: David Beseda

Number: 512-971-1616

Email: dbeseda@prodigy.net

Address: 2310 Portofino Drive, Austin, Tx 78746

Company: Franklin Street

Contact: Alex Ostendorf

Number: 404-918-0518

Email: alex.ostendorf@franklinst.com

Address: 3384 Peachtree Road Northeast, Suite 650, Atlanta, GA 30326

Thank you for your time and I hope this helps you for all future bid opportunities with Mills Construction LLC.

Thanks,

Zachary Hughes

VP

Mills Construction, LLC

512-237-0580

Company: Statewide Materials

Contact: Xavier Alaniz

Number: 512-279-7625

Email: xalaniz@statewidematerials.com

Address: P.O. Box 1080, Manor, Tx 78653

Company: Ferguson Waterworks

Contact: Brad Ellis

Number: 512-930-2262

Email: brad.ellis@ferguson.com

Address: 200 Park Central Rd, Georgetown, Tx 78626

Company: Rambo Materials

Contact: David Ramming

Number: 512-468-9450

Email: David@rambo-materials.com

Address: 267 Wilbarger Bend Rd, Bastrop, Tx 78602

Company: Lonestar Paving

Contact: Peyton Kurio

Number: 512-461-0270

Email: pkurio@lspaving.com

Address: 11675 Jollyville Road, Suite 150, Austin, TX 78759

Company: Alpha Paving

Contact: Abel Vasquez

Number: 512-538-5640

Email: abel@alphapaving.com

Address: 15 Roundville Ln, Round Rock, Tx 78664

Mills Construction, LLC
143 Swift Water Loop
Bastrop, Tx 78602
Mobile: 512-237-0580

Here is our credit references information for Mills Construction LLC.

Company: ROMCO Equipment

Contact: Justin Pogue

Number: 512-688-0382

Email: jpogue@romco.com

Address: 1150 W. Old Settlers Rd, Round Rock, Tx 78681

Company: Holt CAT

Contact: Reese Atkinson

Number: 737-245-5100

Email: reese.atkinson@holtcat.com

Address: 9601 S. I-35 Frontage Rd, Austin, Tx 78744

Company: Tiki Trucking

Contact: Shane Young

Number: 512-422-8851

Email: shane@tikitrucking.com

Address: 2785 N. Bagdad Road, Leander, Tx 78641

Mills Construction, LLC - Equipment List - 5/1/2025

						Warranty Info			
Operator	ID	S/N	Make/Model	Date	Hours	Start Date	Hours	Coverage	Status
			LOADERS						
	L-1	632333	2022 Volvo L110H Loader	4/17/2025	3,815				
	L-2	628026	2024 Volvo L90H Loader	4/17/2025	1,251				
	L-3	628491	Volvo L90H Loader	4/17/2025		Rental			
	L-4	628733	Volvo L90H Loader	4/17/2025		RPO			
			EXCAVATORS						
	TH-1	314202	2021 Volvo EC250E Excavator	4/17/2025	4,218				
	TH-2	317292	2024 Volvo EC250EL Excavator	4/17/2025	534				
	TH-3	NXY01929	CAT 303CR Mini Excavator	4/17/2025	782				
	TH-4	12836	Volvo ERC 58F	4/17/2025	382				
	TH-5	317301	Volvo EC250EL			RPO			
			SCREENERS						
	SP-1	55954	2024 Colt 1000 Screener	4/17/2025	603				
			STACKERS						
	S-1	836X208	2021 MGL 836X Conveyor	4/17/2025	1,926				
	S-2	836X336	2024 MGL 836X Conveyor	4/17/2025					
			BLADES						
	B-1	401373	CAT 150 Blade	4/17/2025	57				
			ROLLERS						
	R-1	273616	2024 Volvo DD35B Roller	4/17/2025	267				
			SCRAPERS						
	SC-1	P00306	2004 CAT 621G Motor Scraper	4/17/2025					
			SKID STEERS						
	SS-1	B6203126	CAT 299D3 XE Skid Steer	4/17/2025	2,149				
	SS-2	0FD201394	CAT 299D CAB Skid Steer	4/17/2025					
	SS-3	FL703453	CAT 255 Skid Steer	4/17/2025	1,217				
			HAUL TRUCKS						
	HT-1	675964	2024 Peterbilt 389	4/17/2025					
	HT-1.5	2024	Trail King 110 Lowboy	4/17/2025					
			COMPANY VEHICLES						
	CV-1		2024 Ford F350	4/17/2025					
	CV-2	1GCHK33245F882967	Chevy Pick Up	4/17/2025					
	CV-3	1FD0W4HT3KEG10514	2019 Ford F450	4/17/2025					
	CV-4	3C6UR5HL7SG511813	2025 Dodge Ram 2500	4/17/2025					
	CV-5	2GC4YMEY5R1207338	2025 Chevy 2500	4/17/2025					
	FT-1	56ZL1UF28PP001484	2023 EV990 Fuel Trailer	4/17/2025					
	TR-1	LT3226	Trailer	4/17/2025					

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

***

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

Mills Construction LLC

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

City of Lago Vista

Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☒ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☒ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

N/A

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

Signature of vendor doing business with the governmental entity

4/28/2025

Date

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 04/22/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Noe Moreno
Whorton Insurance Services OL 11200 Jollyville Rd. Austin TX 78759-4813	PHONE (A/C, No, Ext): (512) 338-1191 FAX (A/C, No): (512) 338-1196 E-MAIL ADDRESS: NoeM@whortonins.com

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
Mills Construction LLC 143 Swift Water Loop Bastrop TX 78602-3042	INSURER A : National American Insurance Company (NAICO)	
	INSURER B : Texas Mutual Insurance Company	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** CL2473140406 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC [ ] OTHER:			MP46830042	07/30/2024	07/30/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ 1,000,000 $ 100,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $
A	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY			MP46830042	07/30/2024	07/30/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Underinsured motorist	$ 1,000,000 $ $ $ $ 1,000,000
A	[X] UMBRELLA LIAB [X] OCCUR [ ] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			MB71970042	07/30/2024	07/30/2025	EACH OCCURRENCE AGGREGATE $	$ 2,000,000 $ 2,000,000 $
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N [ ] (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		0002053368	06/03/2024	06/03/2025	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
A	Cargo Pollution Liability			MP46830042	07/30/2024	07/30/2025	Limit Limit	5,000 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

For Information Purposes Only

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Jim Whorton

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Corporations Section
P.O.Box 13697
Austin, Texas 78711-3697

Jane Nelson
Secretary of State

Office of the Secretary of State

Certificate of Fact

The undersigned, as Secretary of State of Texas, does hereby certify that the document, Certificate of Formation for Mills Construction, LLC (file number 803635517), a Domestic Limited Liability Company (LLC), was filed in this office on May 28, 2020.

It is further certified that the entity status in Texas is in existence.

It is further certified that our records indicate MICHAEL JONATHAN MILLS as the designated registered agent for the above named entity and the designated registered office for said entity is as follows:

1302 JEFFERSON STREET

BASTROP, TX - 78602 USA

In testimony whereof, I have hereunto signed my name officially and caused to be impressed hereon the Seal of State at my office in Austin, Texas on January 22, 2024.

Jane Nelson
Secretary of State

must obtain your correct taxpayer identification number (TIN), which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid).
- Form 1099-DIV (dividends, including those from stocks or mutual funds).
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds).
- Form 1099-NEC (nonemployee compensation).
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers).
- Form 1099-S (proceeds from real estate transactions).
- Form 1099-K (merchant card and third-party network transactions).
- Form 1098 (home mortgage interest), 1098-E (student loan interest), and 1098-T (tuition).
- Form 1099-C (canceled debt).
- Form 1099-A (acquisition or abandonment of secured property).

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

Caution: If you don't return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued);

2. Certify that you are not subject to backup withholding; or

3. Claim exemption from backup withholding if you are a U.S. exempt payee; and

4. Certify to your non-foreign status for purposes of withholding under chapter 3 or 4 of the Code (if applicable); and

5. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting is correct. See *What Is FATCA Reporting*, later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding. Payments made to foreign persons, including certain distributions, allocations of income, or transfers of sales proceeds, may be subject to withholding under chapter 3 or chapter 4 of the Code (sections 1441–1474). Under those rules, if a Form W-9 or other certification of non-foreign status has not been received, a withholding agent, transferee, or partnership (payor) generally applies presumption rules that may require the payor to withhold applicable tax from the recipient, owner, transferor, or partner (payee). See Pub. 515, Withholding of Tax on Nonresident Aliens and Foreign Entities.

The following persons must provide Form W-9 to the payor for purposes of establishing its non-foreign status.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the disregarded entity.
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the grantor trust.
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust and not the beneficiaries of the trust.

See Pub. 515 for more information on providing a Form W-9 or a certification of non-foreign status to avoid withholding.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person (under Regulations section 1.1441-1(b)(2)(iv) or other applicable section for chapter 3 or 4 purposes), do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515). If you are a qualified foreign pension fund under Regulations section 1.897(l)-1(d), or a partnership that is wholly owned by qualified foreign pension funds, that is treated as a non-foreign person for purposes of section 1445 withholding, do not use Form W-9. Instead, use Form W-8EXP (or other certification of non-foreign status).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a saving clause. Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if their stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first Protocol) and is relying on this exception to claim an exemption from tax on their scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include, but are not limited to, interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third-party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester;

2. You do not certify your TIN when required (see the instructions for Part II for details);

3. The IRS tells the requester that you furnished an incorrect TIN;

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only); or

5. You do not certify to the requester that you are not subject to backup withholding, as described in item 4 under *"By signing the filled-out form"* above (for reportable interest and dividend accounts opened after 1983 only).

Form **W-9**
(Rev. March 2024)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give form to the requester. Do not send to the IRS.

Before you begin. For guidance related to the purpose of Form W-9, see *Purpose of Form*, below.

Print or type. See *Specific Instructions* on page 3.

1 Name of entity/individual. An entry is required. (For a sole proprietor or disregarded entity, enter the owner's name on line 1, and enter the business/disregarded entity's name on line 2.)

Michael Mills

2 Business name/disregarded entity name, if different from above.

Mills Construction, LLC

3a Check the appropriate box for federal tax classification of the entity/individual whose name is entered on line 1. Check only one of the following seven boxes.

☑ Individual/sole proprietor ☐ C corporation ☐ S corporation ☐ Partnership ☐ Trust/estate

☐ LLC. Enter the tax classification (C = C corporation, S = S corporation, P = Partnership) . . . . .

Note: Check the "LLC" box above and, in the entry space, enter the appropriate code (C, S, or P) for the tax classification of the LLC, unless it is a disregarded entity. A disregarded entity should instead check the appropriate box for the tax classification of its owner.

☐ Other (see instructions)

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any)

Exemption from Foreign Account Tax Compliance Act (FATCA) reporting code (if any)

(Applies to accounts maintained outside the United States.)

3b If on line 3a you checked "Partnership" or "Trust/estate," or checked "LLC" and entered "P" as its tax classification, and you are providing this form to a partnership, trust, or estate in which you have an ownership interest, check this box if you have any foreign partners, owners, or beneficiaries. See instructions . . . . . ☐

5 Address (number, street, and apt. or suite no.). See instructions.

143 Swift Water Loop

Requester's name and address (optional)

6 City, state, and ZIP code

Bastrop, Tx 78602

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. See also *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

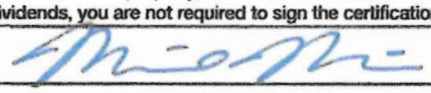
8	5	–	1	2	6	5	8	4	8

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and, generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person**  **Date** 3/12/2025

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

What's New

Line 3a has been modified to clarify how a disregarded entity completes this line. An LLC that is a disregarded entity should check the appropriate box for the tax classification of its owner. Otherwise, it should check the "LLC" box and enter its appropriate tax classification.

New line 3b has been added to this form. A flow-through entity is required to complete this line to indicate that it has direct or indirect foreign partners, owners, or beneficiaries when it provides the Form W-9 to another flow-through entity in which it has an ownership interest. This change is intended to provide a flow-through entity with information regarding the status of its indirect foreign partners, owners, or beneficiaries, so that it can satisfy any applicable reporting requirements. For example, a partnership that has any indirect foreign partners may be required to complete Schedules K-2 and K-3. See the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS is giving you this form because they

MILLS CONSTRUCTION LLC
Active Projects

Updated as of: 5/7/2025

Job Number	Owner	Job Name	Contract Amount
2401	Mills Construction LLC	Asphalt Millings Plant	By Ton or Load
2402	Mills Construction LLC	Gonzales Gravel Quarry	By Ton or Load
2501	David Beseda	Grove Retail Center	N/A
2502	Legacy MCS	Village at Hutto Station	Hourly
2503	Legacy MCS	Urbana at Cottonwood	Hourly
2505	TOCC Land LLC	Compassionaite Cultivation Waterline	$12,517.20
2506	Legacy MCS	Hero Way Pond V Channel	$19,782.89
2507	Spawglass	MD Anderson Roadway Project	$494,442.00
2508	Steven Mazur	Baseball Fields San Antonio	Hourly
2509	GH Old San Antonio	Terra Acres Subdivision	$386,413.36
2510	Old 71 Persimmon LLC	Culvert Project	$26,500.00
2511	Todd Bowers	169 Kona Drive Millings Driveway	$5,000.00
2512	Osborn Plumbing	Coffee Dog Water Line Replacement	$55,000.00

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

SUMMARY OF TOTAL AMOUNTS BID

TOTAL AMOUNT OF BID - Sunset Park Driveway

Three hundred sixty eight thousand three hundred nineteen Dollars and Seventy three Cents $ 368,319.73

TOTAL AMOUNT OF BID - Sunset Park Driveway - FM 1431 LEFT TURN LANE

One hundred thirty one thousand six hundred fifty nine Dollars and twenty seven Cents $ 131,659.27

TOTAL AMOUNT OF BID – All work in contract

Four hundred ninety nine thousand nine hundred seventy nine Dollars and zero Cents $ 499,979.00

NOTE: THE COURT MAY EITHER REJECT ALL BIDS OR AWARD A CONTRACT TO THE LOWEST AND/OR BEST BID.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway – FM 1431 LEFT TURN LANE CSJ: 1378-01-053

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
37	677-7001	ELIM EXT PAV MRK & MRKS (4")	6083	LF	1.10	$ 6,691.30
38	677-7008	ELIM EXT PAV MRK & MRKS (24")	135	LF	3.30	$ 445.50
39	678-7002	PAV SURF PREP FOR MRK (6")	7710	LF	.28	$ 2,120.25
40	678-7004	PAV SURF PREP FOR MRK (8")	433	LF	.72	$ 309.60
41	678-7008	PAV SURF PREP FOR MRK (24")	21	LF	1.10	$ 23.10
42	678-7009	PAV SURF PREP FOR MRK (ARROW)	2	EA	82.50	$ 165.00
43	678-7015	PAV SURF PREP FOR MRK (WORD)	2	EA	137.50	$ 275.00

TOTAL AMOUNT OF BID- Sunset Park Driveway - FM 1431 LEFT TURN LANE

One hundred thirty one thousand six hundred fifty nine Dollars and twenty seven cents $ 131,659.27

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway - FM 1431 LEFT TURN LANE CSJ: 1378-01-053

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
25	666-7175	RE PM TY II (W) 6" (SLD)	2880	LF	2.48	$ 7,128
26	666-7177	RE PM TY II (W) 8" (DOT)	151	LF	2.75	$ 415.25
27	666-7179	RE PM TY II (W) 8" (SLD)	433	LF	2.75	$ 1,190.75
28	666-7184	RE PM TY II (W) 24" (SLD)	21	LF	22	$ 462
29	666-7186	RE PM TY II (W) (ARROW)	2	EA	192.50	$ 385
30	666-7194	RE PM TY II (W) (WORD)	2	EA	220	$ 440
31	666-7213	RE PM TY II (Y) 6" (SLD)	4830	LF	2.48	$ 11,954.25
32	666-7265	REFL PAV MRK TY I (W) 6" (SLD) (090MIL)	2880	LF	4.95	$ 14,256
33	666-7269	REFL PAV MRK TY I (Y) 6" (SLD) (090MIL)	4830	LF	4.95	$ 23,908.50
34	666-7348	PAVEMENT SLER 6"	575	LF	2.48	$ 1,423.13
35	672-7002	REFL PAV MRKR TY I-C	22	EA	8.53	$ 187.55
36	672-7004	REFL PAV MRKR TY II-A-A	216	EA	8.53	$ 1,841.40

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway - FM 1431 LEFT TURN LANE CSJ: 1378-01-053

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BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
13	503-7001	PORTABLE CHANGEABLE MESSAGE SIGN	40	DAY	216	$ 8,640
14	505-7002	TMA (MOBILE OPERATION)	24	HR	60	$ 1,440
15	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	58	LF	2.85	$ 165.30
16	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	58	LF	1	$ 58
17	530-7010	DRIVEWAYS (ACP)	125	SY	39.60	$ 4,950
18	644-7002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	1	EA	2,310	$ 2,310
19	658-7003	DEL ASSM (D-SW)SZ 1(WFLX)(GND)	2	EA	110	$ 220
20	666-7017	REFL PAV MRK TY I (W) 8" (DOT)	151	LF	5.50	$ 830.50
21	666-7023	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	433	LF	5.50	$ 2,381.50
22	666-7035	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	21	LF	44	$ 924
23	666-7041	REFL PAV MRK TY I (W)(ARROW)(090MIL)	2	EA	330	$ 660
24	666-7065	REFL PAV MRK TY I (W)(WORD)(090MIL)	2	EA	412.50	$ 825

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway – FM 1431 LEFT TURN LANE CSJ: 1378-01-053

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
1	100-7013	TREE PROTECTION (INSTALL)	1	EA	460	$ 460
2	100-7015	TREE PROTECTION (REMOVE)	1	EA	50	$ 50
3	105-7002	RMV (2"-6") TRT/UNTRT BASE & ASPH PAV	72	SY	25	$ 1,800
4	160-7002	FURN & PLACE TOPSOIL (4")	196	SY	25	$ 4,900
5	164-7002	BROADCAST SEED (PERM_RURAL_CLAY)	196	SY	.55	$ 107.80
6	164-7029	STRAW/HAY MLCH SEED (TEMP_WARM)	196	SY	.55	$ 107.80
7	164-7030	STRAW/HAY MLCH SEED (TEMP_COOL)	196	SY	.55	$ 107.80
8	464-7005	RC PIPE (CL III)(24 IN)	53	LF	100	$ 5,300
9	467-7328	SET (TY II) (24 IN) (RCP) (6: 1) (P)	2	EA	4,500	$ 9,000
10	496-7004	REMOV STR (SET)	2	EA	500	$ 1,000
11	496-7007	REMOV STR (PIPE)	36	LF	50	$ 1,800
12	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	1	MO	10,000	$ 10,000

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
13	341-7065	D-GR HMA TY-D PG 76-22 (EXEMPT)	362	TON	161.10	$ 58,318.74
14	464-7007	RC PIPE (CL III)(30 IN)	46	LF	200	$ 9,200.00
15	467-7343	SET (TY II) (30 IN) (RCP) (6: 1) (P)	2	EA	5,500	$ 11,000.00
16	500-7001	MOBILIZATION	1	LS	17,500	$ 17,500.00
17	506-7020	CONSTRUCTION EXITS (INSTALL) (TY 1)	106	SY	17.25	$ 1,828.50
18	506-7024	CONSTRUCTION EXITS (REMOVE)	106	SY	1.00	$ 106.00
19	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	1220	LF	2.85	$ 3,477
20	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	1220	LF	1.00	$ 1,220
21	3007-7001	BONDING COURSE	296	GAL	5.18	$ 1,531.80

TOTAL AMOUNT OF BID- Sunset Park Driveway

Three hundred sixty eight thousand three hundred nineteen Dollars and seventy three cents $ 368,319.73

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
1	100-7002	PREPARING RIGHT-OF-WAY	10.9	STA	3,375	$ 36,787.50
2	105-7036	RMV (16") TRT/UNTRT BASE & ASPH PAV	130	SY	50	$ 6,500
3	110-7001	EXCAV (ROADWAY)	839	CY	25	$ 20,975
4	132-7003	EMBANK (FNL)(OC)(TY B)	403	CY	25	$ 10,075
5	160-7002	FURN & PLACE TOPSOIL (4")	3590	SY	15	$ 53,850
6	164-7002	BROADCAST SEED (PERM_RURAL_CLAY)	3590	SY	.55	$ 1,974.50
7	164-7029	STRAW/HAY MLCH SEED (TEMP_WARM)	1795	SY	.55	$ 987.25
8	164-7030	STRAW/HAY MLCH SEED (TEMP_COOL)	1795	SY	.55	$ 987.25
9	168-7001	VEGETATIVE WATERING	80	MG	7	$ 560
10	247-7176	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	555	CY	65	$ 36,075
11	310-7013	PRIME COAT(MC-30 OR AE-P)	661	GAL	5.18	$ 3,420.68
12	341-7003	D-GR HMA TY-B PG64- 22 (EXEMPT)	727	TON	126.47	$ 91,945.51

Refer to the Technical Specifications section for a description of the specific reference number.

Total Staff Employed by Firm *(Break down by Managers and Trades on separate sheet)*: 20 people

Contracting Specialty *(Indicate trades in which bidder performs)*: Civil ; Site grading, utilities, concrete

Union Affiliations: [X] Local [ ] National

Years Performing Work Specialty: 5 Percentage of Work Performed by Firm's Own Forces: 5

Is the Bidder in compliance with all applicable EEO requirements? [X] Yes [ ] No
(If the answer is no, please attach summary of details on a separate sheet)

Bank References

Address: 489 State HWY 71 Contact Name: Jose Gonzales

City: Bastrop State: TX Zip Code: 78602 Phone Number: 331-335-1858

Has the firm or predecessor firm been involved in a bankruptcy or reorganization? [ ] Yes [X] No
(If the answer is yes, please attach summary of details on a separate sheet)

Relevant Experience

Bidder should have successfully completed (substantially on-schedule, on-budget) at least three projects of similar size and nature for which they are submitting qualifications. List projects on a separate sheet with the following information on each and attach hereto:

Project *(Name, Location and Contact)*
Architect *(N/A if not applicable)*
Engineer
Contract Amount
Date Completed *(Month/Year)*
Scope of Work

See attached

List below any/all Contract(s) awarded to Bidder which it has failed to complete *(If applicable, attach a separate sheet)*:

Project *(Name and Location)*: _____

Contract with: _____

Brief Explanation of Cause and Resolution: _____

_____

_____

_____

Bidder Qualification Form - Construction

(Firm must prepare this statement in the form shown)

The undersigned bidder certifies that the information herein is true, correct, complete and accurate. Elaboration on the following information or additional information deemed to be useful for evaluation of bidder's capabilities or to prevent misleading representations may be attached to this form. With exception to material and equipment suppliers, any subcontractor completing 25% or more of the project in terms of cost, is required to fill out this form.

Date: 5/10/2025 Texas License Number: N/A Federal ID No.: 85-1265848

Bidder (Legal Name of Firm): Mills Construction LLC

Address: 143 Swift Water Loop Phone Number: 512-237-0550

Fax Number: N/A

City: Bastrop State: TX Zip Code: 78602 Email: estimating@millsconstructionllc.com

President (or Managing Partner, etc.): Michael Mills

Dun and Bradstreet Number (if any): N/A

Years in Business Under Present Name: 5 years

List all other names under which your business has operated in the last 10 years:

N/A

Work Presently Under Contract ($): 1,500,000

Work in place last year ($): 1,500,000

Total Bonding Capacity ($): $1,500,000

(Attach a letter from Bonding Co. evidencing bonding capacity)

Value of Work Presently Bonded ($): $430,000

Bonding Company: Insurors Indemnity Company

Bonding Agent: Noe Moreno

Insurance Company: Whorton Insurance

Insurance Agent: Noe Moreno Phone: 512-372-2239

A Corporation

By Mills Construction LLC (SEAL)
(Corporation Name)

TX
(State of Incorporation)

By [illegible] (SEAL)
(name of person authorized to sign)

N/A
(Corporate Seal) *(Title)*

Attest Renee Ramirez
(Secretary)

Business address: 143 Swift Water Loop
Bastrop, TX 78602

Phone No.: 512-237-0580

Email Address: estimating@millsconstructiontx.com

Date of Qualification to do business is 05/2020

A Joint Venture

By _____ (SEAL)
(Name)

_____
(Address)

By _____ (SEAL)
(Name)

_____
(Address)

Phone No.: _____

Email Address: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above).

If BIDDER is:

An Individual

By _____(SEAL)
(Individual's Name)

doing business as_____

Business address:_____

_____

Phone No.: _____

Email Address: _____

A Partnership

By _____(SEAL)
(Firm Name)

_____
(General Partner)

Business address:_____

_____

Phone No.:_____

Email Address:_____

performing and furnishing the Work for which this Bid is submitted.

(h) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. Measurement shall be based solely on Plan Quantities as listed in the Unit Price Schedule; no quantities shall be measured in the field for payment purposes. BIDDER will complete the Work in accordance with the Contract Documents for the Unit Prices and Quantities listed on the Unit Price Schedule for the total bid in numbers as entered on the Bid Summary Sheet.

5. BIDDER agrees that the Work will be substantially complete, and completed and ready for final payment in accordance with the lines specified in Article 3 of the Standard Form of Agreement. BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the lines specified in the Agreement.

6. The following documents are required to be attached to be made a condition of this Bid:
(a) Required Bid Security in the form of certified check, cashier's check or corporate surety bond.

7. Communications concerning this Bid shall be addressed to:

Mr. Victor Manzano
CIP Manager
City of Lago Vista
5803 Thunderbird Street
Lago Vista, Texas 78645
Victor.manzano@lagovistatexas.gov

The address of BIDDER indicated below:

8. Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings indicated in the General Conditions or Instructions.

9. SUBMITTED on May 22, 20 25.

State Contractor License No. N/A

BID FORM

PROJECT IDENTIFICATION: RFP No. 25-05 Sunset Park Driveway

PROJECT IDENTIFICATION NUMBER (PID): RFP No. 25-05

THIS BID IS SUBMITIED TO: Mr. Victor Manzano, CIP Manager, City of Lago Vista, Texas

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement of Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for thirty-five days after the day of Bid opening. BIDDER will sign and deliver the required number of counterparts of the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of OWNER'S Notice of Award.

3. In submitting this bid, BIDDER represents, as more fully set forth in the Agreement, that:

   (a) BIDDER has examined and carefully studied the Bidding Documents; including (but not limited to) the following:

   BID PACKET – *All portions of the Contractor's Bid Packet including the Instructions to Bidders, General Conditions, and any Special and /or Supplementary Conditions*

   DRAWINGS – *Most current set of drawings*

   SPECIFICATIONS – *Most current City of Lago Vista Technical Construction Standards, Specifications Manual, and any other as stated in the construction drawings.*

   ADDENDA - *Acknowledged on the Bid Summary Sheet or on the sealed bid envelope*

   (b) BIDDER has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost. progress, performance and furnishing of the Work;

   (c) BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.

   (d) BIDDER has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in the General Conditions. BIDDER accepts the determination set forth in the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which BIDDER is entitled to rely as provided in the General Conditions. BIDDER acknowledges that such reports and drawings are not Contract Documents and may not be complete for BIDDER'S purposes. BIDDER acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost. progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereof. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the limes, price and other terms and conditions of the Contract Documents.

   (e) BIDDER is aware of the general nature of Work to be performed by OWNER and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.

   (f) BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawing identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

   (g) BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for

004.2 CIQ FORM SAMPLE

004 CONFLICT OF INTEREST QUESTIONAIRE

004.1 INSTRUCTIONS

CONFLICT OF INTEREST
DISCLOSURE

IMPORTANT NOTICE TO VENDORS AND BIDDERS- NEW STATE LAW

Beginning January 1, 2006 a new state law (Chapter 176 of the Local Government Code) requires the filing of Conflict of Interest Questionnaires (CIQ) by certain individuals and businesses.

The questionnaires require disclosures describing certain business and gift giving relationships, if any, the filers may have with Local Government Officers or a member of a governing body of a local government entity.

The new law applies to:

- Businesses and individuals who contract with the city,
- Businesses and individuals who seek to contract with the City (regardless of whether a bidder is awarded the contract), and
- Agents who represent such businesses in their business dealing with the City

A copy of the required reporting form is attached. Form CIQ

As part of the contracting process with governmental entities, Section 2252.908 of the Texas Government Code requires that for certain types of contracts, you must fill out a conflict of interest form ("Disclosure of Interested Parties") at the time you submit your signed contract to the District. For further information please go to the Texas Ethics Commission website via the following link.
https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

If you have any questions about compliance, please consult your own legal counsel. Compliance is the individual responsibility of each individual, business and agent who is subject to the law's filing requirement.

If you are required to file a Conflict of Interest Questionnaire, you should file it with the City's Secretary at 5803 Thunderbird Street, Lago Vista, Tx 78645.

any work over 25%, then the evaluations criteria for the Contractor will be utilized to complete this portion of the evaluation.

4. Other Factors: Owner will consider other factors when evaluating Bids, including, but not limited to, the following:
    a. The bidder's past relationship with the municipality.
    b. Any relevant criteria specifically listed in the request for bids as noted herein.
    c. Ability to Meet Proposed Time for Construction: Provide information to demonstrate ability of Organization to complete Projects within budget and on time.
    d. Quality of Work: Demonstrated quality of Work on completed Projects as determined by site visits or discussions with references for Projects. Quality considerations may include appearance of completed Work, amount of warranty or rework required, durability and maintainability of completed Project, and quality of documentation provided.
    e. Safety: Demonstrated success in implementation of an on-site safety program.
    f. Claims Experience and Litigation History: Provide a list of all claims or litigation involving construction Projects that have been filed by Bidder or Owner within the last five (5) years, or that are currently outstanding.
    g. Other factors submitted such as Financial Standing, Superintendent Experience, proposals for changes to reduce cost, or any other factors the Contractor submits for consideration.
    h. For projects over $1.5MM the municipality will attempt to award project to lowest responsible bidder.

In order to determine the Contractors ability to perform the work, the Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of Work as to which identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in General Conditions. Owner may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in Work when such data is required to be submitted prior to recommendation of award.

Owner may consider qualifications (Statement of Qualifications) of Bidders and Bidder's subcontractors and consultants, in addition to proposed cost(s) (Proposal Form) when evaluating Proposals to determine which Proposal offers best value to Owner. Owner will rank each of Bidder's Proposal based on criteria and criteria weighting described herein.

Evaluation and ranking of Proposals will be completed no later than 45th calendar day from date of Proposal opening. Bidders are requested not to withdraw their Proposals within 60 calendar days from date on which Proposals are opened. Proposal Security of highest-ranking firms will be held by Owner until contract negotiations are finalized.

4. OTHER PROCEDURES

Owner may conduct such investigations as Owner deems necessary to assist in evaluation of any Proposal and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish Work in accordance with Contract Documents to Owner's satisfaction within prescribed time.

Owner reserves right to adopt most advantageous interpretation of Proposals submitted in case of ambiguity or lack of clearness in stating Proposal Prices, to reject any or all Proposals, and/or waive informalities.

PROPOSAL INSTRUCTIONS

Project general conditions and standard specifications manual can be found on the City's website at www.lagovistatexas.gov. For work within the right of way refer to Texas Department of Transportation standard specification for construction and maintenance of highways, streets, and bridges. https://www.txdot.gov/content/dam/docs/specifications/2024/spec-book-0924.pdf

1. PROJECT

Objective of Request for the Competitive Sealed Bids process is to competitively procure services with a qualified contractor whose Proposal provides best value for Owner for the project description below:

RFP No. 25-05 Sunset Park Driveway in the City of Lago Vista, Texas
Base Bid: Installing Lago Vista Sunset Park driveway which consists of approximately 1,100 linear feel of new driveway, driveway culvert, restriping, traffic control, erosion control and sedimentation, and related construction.

2. PROPOSAL EVALUATION

Proposals will be received, publicly opened, and names and monetary Proposals of each Bidder read aloud. Subsequently, Proposals will be ranked according to criteria described in this Document. Both cost and non-cost factors will be evaluated according to section 252 of the local government code.

Complete sets of Bid Documents must be used in preparing Proposals; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from use of incomplete sets of Bid Documents. Dates, locations, and times of the proposal submittal are outlined in the Advertisement for Proposal.

Owner and Engineer, in making copies of Bid Documents available on above noted terms, do so only for purpose of obtaining Proposals for Work and do not confer a license or grant for any other use.

3. SELECTION CRITERIA

Owner will consider several factors in selecting a winning bidder as noted in the section 252.043 of the of State of Texas Government Code, and other applicable state codes which allow and will provide best value to Owner. Bids will be evaluated using the following criteria and weighting:

1. Proposed Project Cost: Offeror's Proposed Cost of Performing Work shall be indicated in the Bid or Proposal Form.
2. The reputation of the bidder and of the bidder's goods or services: Provide general information about Bidder's organization and a Statement of Qualifications. Include information on similar Projects in which Bidder has had significant involvement in the last five (5) years, or that demonstrate experience with similar Projects. This list is to include name and a current telephone number of references for each of these Project assignments. Bidders are to include a list of current Project assignments for each of individuals proposed, anticipated completion date for this assignment and percentage of time they will have available to devote to this Project.
3. Experience/Qualifications of Sub-Contractor(s): Provide information on Sub-Contractor(s) who are to complete 25% or more of the project in terms of cost, qualifications, which includes information on similar Projects where Sub-Contractor(s) has been in charge of in the last five (5) years, or that demonstrate experience with similar Projects. This list is to include name and a current telephone number of references for each of these assignments. Subcontractor shall name a Superintendent who must be dedicated to this Project full time for duration of Project and may not be changed without written approval by the Director of Public Works. In the event that Contractor does not intend to outsource

CONTRACTOR'S BID

FOR

SUNSET PARK DRIVEWAY

RFP No. 25-05

BIDDER'S NAME

_____

(PLEASE PRINT CLEARLY)

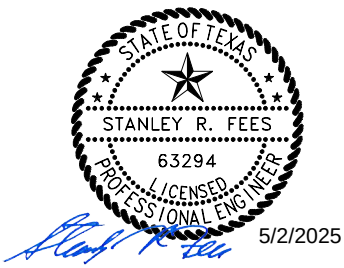
CHECKLIST OF ITEMS TO BE RETURNED

The following items shall be returned in order for the bid submittal to be considered acceptable:

- ☐ Completed Bid Summary Sheet
- ☐ Completed Unit Price Schedule
- ☐ Completed Bid Form
- ☐ Bid Security
- ☐ Acknowledgment of Addenda
- ☐ Completed Bidder's Qualification Form

PREPARED FOR:

LAGO VISTA
TEXAS



5803 Thunderbird Street
Lago Vista, Texas 78645

ADVERTISEMENT FOR SEALED PROPOSALS

Sealed competitive bids, in envelopes addressed to the City of Lago Vista, 5803 Thunderbird Street, Lago Vista, Texas 78645, for **RFP No. 25-05 Sunset Park Driveway,** in the City of Lago Vista, Texas, will be received at the above-mentioned address until 1:00 P.M., May 22nd, 2025 and then publicly opened and read aloud.

Submittals can be submitted in sealed envelopes and marked "RFP No. 25-05 Sunset Park Driveway".

The Contract Documents and Specifications are available at the City of Lago Vista. Questions and requests for additional information shall be sent by email to: Victor.manzano@lagovistatexas.gov. For this project, all bidders will be **required** to accept Addenda and other pertinent information by email, as well as provide written acknowledgement of Addenda as prescribed in the Instructions to Bidders. **No questions or requests for additional information will be accepted later than 12:00 p.m., May 14th, 2025.**

Bid packages will be available on the City's website at www.lagovistatexas.gov/Bids.aspx. as well as online via BidNetDirect at http://www.bidnetdirect.com/texas/lagovista. Project general conditions and standard specifications manual can be found on the City's website at www.lagovistatexas.gov.

An optional pre-bid conference will be held on **May 8th, 2025**, at 1:00 P.M. at 5803 Thunderbird Street, Lago Vista, Texas 78645 in the City Council Conference Room.

A bid security of 5% of the bid amount must accompany each bid or proposal. A certified check or bank draft payable to the City of Lago Vista may be submitted in lieu of the Bid Bond.

After contract is awarded, the contractor will be required to furnish insurance, performance, and payment bonds.

The City of Lago Vista reserves the right to waive any informality that is not detrimental to any other bidder or potential bidder or to reject all bids or to accept the lowest responsible bidder that in the judgment of the City Council will be in the best interest of the City of Lago Vista.

No bidder may withdraw his bid within sixty (60) days after the actual date of opening thereof.

City of Lago Vista, Texas
Kevin Sullivan, Mayor

Newspaper ad published twice:

Thursday, March 20th, 2025
Thursday, March 27th, 2025

CITY HAS COPY OF AFFIDAVIT OF PUBLICATION.

If you have any questions, please e-mail Victor Manzano at:
Victor.manzano@lagovistatexas.gov.

SECTION 003

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ADDITIONAL SECTIONS:

- Wage Rates
- City of Lago Vista Standard Specifications (for work outside the ROW)
- TxDOT General Notes
- TXDOT 2024 Standard Specifications (for work within TxDOT ROW)

003 ACKNOWLEDGMENT OF ADDENDA

Acknowledgement of Addenda:

All Addenda must be acknowledged below in the space provided. Alternatively, Addenda may be acknowledged on the outside of the sealed envelope submitted for bid next to the project name. Inclusion of the full text of any Addendum in this bid packet will also constitute the bidder's acknowledgement of that Addendum.

Bidder's Name: _____

(Fill in Bidder's Name exactly as it appears on pages 2 and 3 of the Bid Form)

I have received, acknowledge, and accept all of the following Addenda:

ADDENDUM NO.	SIGNATURE

Total Bid Amount in numbers:

Total bid in numbers (as tabulated on the Unit Price Schedule): $ _____

The total bid in numbers above will be used to determine the apparent low bidder. The contract award will be based on bid amounts tabulated and verified by the Engineer.

PROPOSAL INSTRUCTIONS

Project general conditions and standard specifications manual can be found on the City's website at www.lagovistatexas.gov. For work within the right of way refer to Texas Department of Transportation standard specification for construction and maintenance of highways, streets, and bridges. https://www.txdot.gov/content/dam/docs/specifications/2024/spec-book-0924.pdf

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Complete sets of Bid Documents must be used in preparing Proposals; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from use of incomplete sets of Bid Documents. Dates, locations, and times of the proposal submittal are outlined in the Advertisement for Proposal.

Owner and Engineer, in making copies of Bid Documents available on above noted terms, do so only for purpose of obtaining Proposals for Work and do not confer a license or grant for any other use.

3. SELECTION CRITERIA

Owner will consider several factors in selecting a winning bidder as noted in the section 252.043 of the of State of Texas Government Code, and other applicable state codes which allow and will provide best value to Owner. Bids will be evaluated using the following criteria and weighting:

1. Proposed Project Cost: Offeror's Proposed Cost of Performing Work shall be indicated in the Bid or Proposal Form.
2. The reputation of the bidder and of the bidder's goods or services: Provide general information about Bidder's organization and a Statement of Qualifications. Include information on similar Projects in which Bidder has had significant involvement in the last five (5) years, or that demonstrate experience with similar Projects. This list is to include name and a current telephone number of references for each of these Project assignments. Bidders are to include a list of current Project assignments for each of individuals proposed, anticipated completion date for this assignment and percentage of time they will have available to devote to this Project.
3. Experience/Qualifications of Sub-Contractor(s): Provide information on Sub-Contractor(s) who are to complete 25% or more of the project in terms of cost, qualifications, which includes information on similar Projects where Sub-Contractor(s) has been in charge of in the last five (5) years, or that demonstrate experience with similar Projects. This list is to include name and a current telephone number of references for each of these assignments. Subcontractor shall name a Superintendent who must be dedicated to this Project full time for duration of Project and may not be changed without written approval by the Director of Public Works. In the event that Contractor does not intend to outsource

any work over 25%, then the evaluations criteria for the Contractor will be utilized to complete this portion of the evaluation.

4. Other Factors: Owner will consider other factors when evaluating Bids, including, but not limited to, the following:
    a. The bidder's past relationship with the municipality.
    b. Any relevant criteria specifically listed in the request for bids as noted herein.
    c. Ability to Meet Proposed Time for Construction: Provide information to demonstrate ability of Organization to complete Projects within budget and on time.
    d. Quality of Work: Demonstrated quality of Work on completed Projects as determined by site visits or discussions with references for Projects. Quality considerations may include appearance of completed Work, amount of warranty or rework required, durability and maintainability of completed Project, and quality of documentation provided.
    e. Safety: Demonstrated success in implementation of an on-site safety program.
    f. Claims Experience and Litigation History: Provide a list of all claims or litigation involving construction Projects that have been filed by Bidder or Owner within the last five (5) years, or that are currently outstanding.
    g. Other factors submitted such as Financial Standing, Superintendent Experience, proposals for changes to reduce cost, or any other factors the Contractor submits for consideration.
    h. For projects over $1.5MM the municipality will attempt to award project to lowest responsible bidder.

In order to determine the Contractors ability to perform the work, the Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of Work as to which identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in General Conditions. Owner may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in Work when such data is required to be submitted prior to recommendation of award.

Owner may consider qualifications (Statement of Qualifications) of Bidders and Bidder’s subcontractors and consultants, in addition to proposed cost(s) (Proposal Form) when evaluating Proposals to determine which Proposal offers best value to Owner. Owner will rank each of Bidder’s Proposal based on criteria and criteria weighting described herein.

Evaluation and ranking of Proposals will be completed no later than 45th calendar day from date of Proposal opening. Bidders are requested not to withdraw their Proposals within 60 calendar days from date on which Proposals are opened. Proposal Security of highest-ranking firms will be held by Owner until contract negotiations are finalized.

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Owner may conduct such investigations as Owner deems necessary to assist in evaluation of any Proposal and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish Work in accordance with Contract Documents to Owner's satisfaction within prescribed time.

Owner reserves right to adopt most advantageous interpretation of Proposals submitted in case of ambiguity or lack of clearness in stating Proposal Prices, to reject any or all Proposals, and/or waive informalities.

004 CONFLICT OF INTEREST QUESTIONAIRE

004.1 INSTRUCTIONS

CONFLICT OF INTEREST
DISCLOSURE

IMPORTANT NOTICE TO VENDORS AND BIDDERS- NEW STATE LAW

Beginning January 1, 2006 a new state law (Chapter 176 of the Local Government Code) requires the filing of Conflict of Interest Questionnaires (CIQ) by certain individuals and businesses.

The questionnaires require disclosures describing certain business and gift giving relationships, if any, the filers may have with Local Government Officers or a member of a governing body of a local government entity.

The new law applies to:

- Businesses and individuals who contract with the city,
- Businesses and individuals who seek to contract with the City (regardless of whether a bidder is awarded the contract), and
- Agents who represent such businesses in their business dealing with the City

A copy of the required reporting form is attached. Form CIQ

As part of the contracting process with governmental entities, Section 2252.908 of the Texas Government Code requires that for certain types of contracts, you must fill out a conflict of interest form ("Disclosure of Interested Parties") at the time you submit your signed contract to the District. For further information please go to the Texas Ethics Commission website via the following link.
https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

If you have any questions about compliance, please consult your own legal counsel. Compliance is the individual responsibility of each individual, business and agent who is subject to the law's filing requirement.

If you are required to file a Conflict of Interest Questionnaire, you should file it with the City's Secretary at 5803 Thunderbird Street, Lago Vista, Tx 78645.

004.2 CIQ FORM SAMPLE

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. *See* Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of person who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 **Name of local government officer with whom filer has employment or business relationship.**

_____

Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4

Signature of person doing business with the governmental entity _____ Date _____

Adopted 06/29/2007

SAMPLE

004.3 FORM TGC 2270

Form TGC 2270
VERIFICATION REQUIRED BY TEXAS GOVERNMENT CODE CHAPTER 2270

Contract identifier: _____
Department: _____

By signing below, Company herby verifies the following:

1. Company does not boycott Israel; and
2. Company will not boycott Israel during the term of the contract.

SIGNED BY: _____

Print Name of Person: _____
Signing, Title, and Company _____

Date signed: _____

STATE OF TEXAS §
COUNTY OF _____ §

BEFORE ME, the undersigned Notary Public on this day personally appeared _____(Name), on behalf of _____ (Company) who being duly sworn, stated under oath that he/she has read the foregoing verification required by Texas Government Code Section 2270.002 and said statements contained therein are true and correct..

SWORN AND SUBSCRIBED TO before me, this _____ day of _____, 20____.

_____
NOTARY OF PUBLIC,
FOR THE STATE OF TEXAS

My Commission Expires:
_____

Government Code § 2270.002. Provision Required in Contract
Effective: September 1, 2017
A governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it:
(1) does not boycott Israel; and
(2) will not boycott Israel during the term of the contract.

The following definitions apply:

(1) “Boycott Israel” means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

(2) “Company” means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations that exists to make a profit.

(3) “Governmental entity” means a state agency or political subdivision of this state.

State law requires verification from a Company for contracts involving goods or services (regardless of the amount) before the City can enter into the contract.

005 BID FORM

BID FORM

PROJECT IDENTIFICATION: RFP No. 25-05 Sunset Park Driveway

PROJECT IDENTIFICATION NUMBER (PID): RFP No. 25-05

THIS BID IS SUBMITIED TO: Mr. Victor Manzano, CIP Manager, City of Lago Vista, Texas

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement of Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for thirty-five days after the day of Bid opening. BIDDER will sign and deliver the required number of counterparts of the Agreement with the Bonds and other documents required by the Bidding Requirements within fifteen days after the date of OWNER'S Notice of Award.

3. In submitting this bid, BIDDER represents, as more fully set forth in the Agreement, that:

   (a) BIDDER has examined and carefully studied the Bidding Documents; including (but not limited to) the following:

   BID PACKET – *All portions of the Contractor's Bid Packet including the Instructions to Bidders, General Conditions, and any Special and /or Supplementary Conditions*

   DRAWINGS – *Most current set of drawings*

   SPECIFICATIONS – *Most current City of Lago Vista Technical Construction Standards, Specifications Manual, and any other as stated in the construction drawings.*

   ADDENDA - *Acknowledged on the Bid Summary Sheet or on the sealed bid envelope*

   (b) BIDDER has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost. progress, performance and furnishing of the Work;

   (c) BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.

   (d) BIDDER has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in the General Conditions. BIDDER accepts the determination set forth in the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which BIDDER is entitled to rely as provided in the General Conditions. BIDDER acknowledges that such reports and drawings are not Contract Documents and may not be complete for BIDDER'S purposes. BIDDER acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost. progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereof. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the limes, price and other terms and conditions of the Contract Documents.

   (e) BIDDER is aware of the general nature of Work to be performed by OWNER and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.

   (f) BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawing identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

   (g) BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for

performing and furnishing the Work for which this Bid is submitted.

(h) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. Measurement shall be based solely on Plan Quantities as listed in the Unit Price Schedule; no quantities shall be measured in the field for payment purposes. BIDDER will complete the Work in accordance with the Contract Documents for the Unit Prices and Quantities listed on the Unit Price Schedule for the total bid in numbers as entered on the Bid Summary Sheet.

5. BIDDER agrees that the Work will be substantially complete, and completed and ready for final payment in accordance with the lines specified in Article 3 of the Standard Form of Agreement. BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the lines specified in the Agreement.

6. The following documents are required to be attached to be made a condition of this Bid:
(a) Required Bid Security in the form of certified check, cashier's check or corporate surety bond.
7. Communications concerning this Bid shall be addressed to:

Mr. Victor Manzano
CIP Manager
City of Lago Vista
5803 Thunderbird Street
Lago Vista, Texas 78645
Victor.manzano@lagovistatexas.gov

The address of BIDDER indicated below:

8. Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings indicated in the General Conditions or Instructions.

9. SUBMITTED on _____, 20_____.

State Contractor License No. _____

If BIDDER is:

An Individual

By _____(SEAL)

(Individual's Name)

doing business as_____

Business address:_____

_____

Phone No.: _____

Email Address: _____

A Partnership

By _____(SEAL)

(Firm Name)

_____

(General Partner)

Business address:_____

_____

Phone No.:_____

Email Address:_____

A Corporation

By _____(SEAL)
(Corporation Name)

_____
(State of Incorporation)

By _____(SEAL)
(name of person authorized to sign)

_____
(Corporate Seal) *(Title)*

Attest _____
(Secretary)

Business address:_____

_____

Phone No.:_____

Email Address:_____

Date of Qualification to do business is_____

A Joint Venture

By _____(SEAL)
(Name)

_____
(Address)

By _____(SEAL)
(Name)

_____
(Address)

Phone No.: _____

Email Address:_____

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above).

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
1	100-7002	PREPARING RIGHT-OF-WAY	10.9	STA		$
2	105-7036	RMV (16") TRT/UNTRT BASE & ASPH PAV	130	SY		$
3	110-7001	EXCAV (ROADWAY)	839	CY		$
4	132-7003	EMBANK (FNL)(OC)(TY B)	403	CY		$
5	160-7002	FURN & PLACE TOPSOIL (4")	3590	SY		$
6	164-7002	BROADCAST SEED (PERM_RURAL_CLAY)	3590	SY		$
7	164-7029	STRAW/HAY MLCH SEED (TEMP_WARM)	1795	SY		$
8	164-7030	STRAW/HAY MLCH SEED (TEMP_COOL)	1795	SY		$
9	168-7001	VEGETATIVE WATERING	80	MG		$
10	247-7176	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	555	CY		$
11	310-7013	PRIME COAT(MC-30 OR AE-P)	661	GAL		$
12	341-7003	D-GR HMA TY-B PG64- 22 (EXEMPT)	727	TON		$

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
13	341-7065	D-GR HMA TY-D PG 76-22 (EXEMPT)	362	TON		$
14	464-7007	RC PIPE (CL III)(30 IN)	46	LF		$
15	467-7343	SET (TY II) (30 IN) (RCP) (6: 1) (P)	2	EA		$
16	500-7001	MOBILIZATION	1	LS		$
17	506-7020	CONSTRUCTION EXITS (INSTALL) (TY 1)	106	SY		$
18	506-7024	CONSTRUCTION EXITS (REMOVE)	106	SY		$
19	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	1220	LF		$
20	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	1220	LF		$
21	3007-7001	BONDING COURSE	296	GAL		$

TOTAL AMOUNT OF BID- Sunset Park Driveway

_____Dollars and_____Cents $_____

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway – FM 1431 LEFT TURN LANE CSJ: 1378-01-053

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
1	100-7013	TREE PROTECTION (INSTALL)	1	EA		$
2	100-7015	TREE PROTECTION (REMOVE)	1	EA		$
3	105-7002	RMV (2"-6") TRT/UNTRT BASE & ASPH PAV	72	SY		$
4	160-7002	FURN & PLACE TOPSOIL (4")	196	SY		$
5	164-7002	BROADCAST SEED (PERM_RURAL_CLAY)	196	SY		$
6	164-7029	STRAW/HAY MLCH SEED (TEMP_WARM)	196	SY		$
7	164-7030	STRAW/HAY MLCH SEED (TEMP_COOL)	196	SY		$
8	464-7005	RC PIPE (CL III)(24 IN)	53	LF		$
9	467-7328	SET (TY II) (24 IN) (RCP) (6: 1) (P)	2	EA		$
10	496-7004	REMOV STR (SET)	2	EA		$
11	496-7007	REMOV STR (PIPE)	36	LF		$
12	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	1	MO		$

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway – FM 1431 LEFT TURN LANE CSJ: 1378-01-053

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
13	503-7001	PORTABLE CHANGEABLE MESSAGE SIGN	40	DAY		$
14	505-7002	TMA (MOBILE OPERATION)	24	HR		$
15	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	58	LF		$
16	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	58	LF		$
17	530-7010	DRIVEWAYS (ACP)	125	SY		$
18	644-7002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	1	EA		$
19	658-7003	DEL ASSM (D-SW)SZ 1(WFLX)(GND)	2	EA		$
20	666-7017	REFL PAV MRK TY I (W) 8" (DOT)	151	LF		$
21	666-7023	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	433	LF		$
22	666-7035	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	21	LF		$
23	666-7041	REFL PAV MRK TY I (W)(ARROW)(090MIL)	2	EA		$
24	666-7065	REFL PAV MRK TY I (W)(WORD)(090MIL)	2	EA		$

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway – FM 1431 LEFT TURN LANE CSJ: 1378-01-053

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
25	666-7175	RE PM TY II (W) 6" (SLD)	2880	LF		$
26	666-7177	RE PM TY II (W) 8" (DOT)	151	LF		$
27	666-7179	RE PM TY II (W) 8" (SLD)	433	LF		$
28	666-7184	RE PM TY II (W) 24" (SLD)	21	LF		$
29	666-7186	RE PM TY II (W) (ARROW)	2	EA		$
30	666-7194	RE PM TY II (W) (WORD)	2	EA		$
31	666-7213	RE PM TY II (Y) 6" (SLD)	4830	LF		$
32	666-7265	REFL PAV MRK TY I (W) 6" (SLD) (090MIL)	2880	LF		$
33	666-7269	REFL PAV MRK TY I (Y) 6" (SLD) (090MIL)	4830	LF		$
34	666-7348	PAVEMENT SLER 6”	575	LF		$
35	672-7002	REFL PAV MRKR TY I-C	22	EA		$
36	672-7004	REFL PAV MRKR TY II-A-A	216	EA		$

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

PROJECT: Sunset Park Driveway – FM 1431 LEFT TURN LANE CSJ: 1378-01-053

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC	DESCRIPTION	BID QUANTITY	UNIT	UNIT COST	AMOUNT BID
37	677-7001	ELIM EXT PAV MRK & MRKS (4")	6083	LF		$
38	677-7008	ELIM EXT PAV MRK & MRKS (24")	135	LF		$
39	678-7002	PAV SURF PREP FOR MRK (6")	7710	LF		$
40	678-7004	PAV SURF PREP FOR MRK (8")	433	LF		$
41	678-7008	PAV SURF PREP FOR MRK (24")	21	LF		$
42	678-7009	PAV SURF PREP FOR MRK (ARROW)	2	EA		$
43	678-7015	PAV SURF PREP FOR MRK (WORD)	2	EA		$

TOTAL AMOUNT OF BID- Sunset Park Driveway - FM 1431 LEFT TURN LANE

_____Dollars and_____Cents $_____

Refer to the Technical Specifications section for a description of the specific reference number.

BID FORM
SCHEDULE OF RATES AND PRICES
LAGO VISTA, TEXAS

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

SUMMARY OF TOTAL AMOUNTS BID

TOTAL AMOUNT OF BID - Sunset Park Driveway

_____ Dollars and _____ Cents $ _____

TOTAL AMOUNT OF BID - Sunset Park Driveway - FM 1431 LEFT TURN LANE

_____ Dollars and _____ Cents $ _____

TOTAL AMOUNT OF BID – All work in contract

_____ Dollars and _____ Cents $ _____

NOTE: THE COURT MAY EITHER REJECT ALL BIDS OR AWARD A CONTRACT TO THE LOWEST AND/OR BEST BID.

BID BOND

KNOW ALL BY THESE PRESENTS: that the undersigned Principal and Surety are firmly bound to the City of Lago Vista ("Lago Vista") in the penal sum of _____Dollars ($_____).

Now the condition of this bond is this: that, whereas the undersigned principal has submitted to Lago Vista a bid to enter into a certain contract whereupon principal undertakes to perform the following-described work of construction, alteration or repair:

City of Lago Vista RFP No. 25-05 Sunset Park Driveway

NOW, THEREFORE, if the principal shall, within _____ (__) days following acceptance by the City Council of the City of Lago Vista of such bid and award by said Council to said principal of said contract, execute and return such further contract documents, together with such bonds and insurance documents as may be required by the terms of the bids accepted, then this obligation shall be null and void, otherwise it shall remain in full force and the amount hereof shall be paid to and retained by the City of Lago Vista as liquidated damages for principal's failure to do so.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their several seals this the ___ day of _____, 20__, the name and corporate seal of each corporate party being hereto affixed and by these presents duly signed by its undersigned representative, pursuant to the authority of its governing body.

Principal: _____

By: _____

Title: _____ Date: _____

Surety: _____

By: _____

Title: _____ Date: _____

(*Attach Power of Attorney*)

007 BIDDER QUALIFICATION FORM

Bidder Qualification Form - Construction

(Firm must prepare this statement in the form shown)

The undersigned bidder certifies that the information herein is true, correct, complete and accurate. Elaboration on the following information or additional information deemed to be useful for evaluation of bidder's capabilities or to prevent misleading representations may be attached to this form. With exception to material and equipment suppliers, any subcontractor completing 25% or more of the project in terms of cost, is required to fill out this form.

Date: _____ Texas License Number:_____ Federal ID No.:_____

Bidder (Legal Name of Firm): _____

Address: _____ Phone Number: _____

_____ Fax Number: _____

City: _____ State:____ Zip Code:_____ Email:_____

President (or Managing Partner, etc.):_____

Dun and Bradstreet Number (if any):_____

Years in Business Under Present Name:_____

List all other names under which your business has operated in the last 10 years:

_____

_____

_____

_____

Work Presently Under Contract ($):_____

Work in place last year ($):_____

Total Bonding Capacity ($):_____
(Attach a letter from Bonding Co. evidencing bonding capacity)

Value of Work Presently Bonded ($):_____

Bonding Company:_____

Bonding Agent:_____

Insurance Company:_____

Insurance Agent:_____ Phone:_____

Total Staff Employed by Firm *(Break down by Managers and Trades on separate sheet)*:_____

Contracting Specialty *(Indicate trades in which bidder performs)*:_____

Union Affiliations: ☐ Local ☐ National

Years Performing Work Specialty:_____ Percentage of Work Performed by Firm's Own Forces:_____

Is the Bidder in compliance with all applicable EEO requirements? ☐ Yes ☐ No
(If the answer is no, please attach summary of details on a separate sheet)

Bank References

Address: _____ Contact Name:_____

City: _____ State:_____ Zip Code:_____ Phone Number: _____

Has the firm or predecessor firm been involved in a bankruptcy or reorganization? ☐ Yes ☐ No
(If the answer is yes, please attach summary of details on a separate sheet)

Relevant Experience

Bidder should have successfully completed (substantially on-schedule, on-budget) at least three projects of similar size and nature for which they are submitting qualifications. List projects on a separate sheet with the following information on each and attach hereto:

Project *(Name, Location and Contact)*
Architect *(N/A if not applicable)*
Engineer
Contract Amount
Date Completed *(Month/Year)*
Scope of Work

List below any/all Contract(s) awarded to Bidder which it has failed to complete *(If applicable, attach a separate sheet)*:

Project *(Name and Location)*:_____

Contract with:_____

Brief Explanation of Cause and Resolution:_____

_____

_____

_____

List on a sheet attached hereto all judgments, claims, arbitration proceedings, or suits pending or outstanding against bidder over the last five (5) years with amount of claim and brief description.

List on a sheet attached hereto all lawsuits or requested arbitration with regard to construction contracts which bidder has initiated within the last five (5) years and brief explanation of claim and outcome.

Attach to this form Bidder's current Financial Statement (assets/Liabilities), preferably audited.

Signature:_____

Name (Officer or Partner):_____

Title:_____

Date:_____

AFFIDAVIT OF AUTHENTICITY

Must be included with Bidder's Qualifications

STATE OF TEXAS :

COUNTY OF :

ON THIS, the _____ day of _____, _____, before me, a Notary Public, the undersigned officer, personally appeared _____ , who acknowledged her/himself to be the _____ of _____
[title] *[Contractor's full name]*

being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the said contractor by her/himself as such _____ , executed the foregoing instrument for the purposes therein contained by signing her/his name.
[title]

STATE OF TEXAS :

COUNTY OF :

Sworn to and subscribed before me on the_____ day of _____, _____ (year), by _____.
(name of signer)

_____
Notary Public's Signature

008 CONTRACT

STANDARD CONSTRUCTION CONTRACT

STATE OF TEXAS §
§ **KNOW ALL MEN BY THESE PRESENTS:**
COUNTIES OF TRAVIS §

THIS CONTRACT is made and entered into on this the _____ day of _____, 20__ by and between the CITY OF LAGO VISTA (hereinafter referred to as "**OWNER**") and _____ (hereinafter referred to as "**CONTRACTOR**"). In consideration of the mutual covenants set forth, the OWNER and CONTRACTOR agree as follows:

Article I. Work

The CONTRACTOR shall perform all of the work as specified in the Contract Documents pertaining to this project. The work is generally described as follows:
RFP No. 25-05 Sunset Park Driveway

ATTACHED ADDENDUM

Addenda numbers____ to _____ , inclusive.
Plans and Specification prepared by: The City of Lago Vista

CITY OF LAGO VISTA

All extra work shall be performed as specified or indicated in the Contract Documents; and, at the CONTRACTOR's own cost and expense, the CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services as may be necessary in order to complete the construction, as described above and in accordance with the Contract Documents unless otherwise agreed to by the OWNER.

Article II. Contract Documents

The Contract Documents may only be altered, amended or modified as provided in the General Conditions. The Contract Documents consist of: this written agreement setting forth the work to be performed; advertisement, if any; instructions to bidders, if any; proposal; addendum; specifications, including the general, special, and technical conditions, provisions, plans, or working drawings; any supplemental changes or agreements pertaining to the work or materials therefore (Change Orders); maintenance, performance and payment bonds; insurance certificate the Construction Standard Specifications as provided for in the contract documents, or if not, then as published by the City of Lago Vista, as amended, and, any additional documents incorporated by reference. These form the Contract Documents and all are as fully a part of the Contract as if attached to this agreement or repeated herein.

Article III. Contract Time

The CONTRACTOR shall perform and complete all the items or work listed and referred to in the Contract Documents within ____120_____ calendar days after the Notice to Proceed. All limitations of time set forth herein are material and are of the essence of this Contract.

Article IV. Contract Price

The OWNER shall pay the CONTRACTOR for completion of the work in accordance with the Contract Documents using current funds. Such payments shall be subject to the General and Special Conditions to the Contract, as contained in the Contract Documents. The Contract is a Unit Price Contract. Should CONTRACTOR need to exceed the price stated herein, CONTRACTOR shall submit a Change Order with proper documentation for written approval by the OWNER. Undertaking any work prior to receiving the approval on a Change Order shall be at CONTRACTOR'S risk and OWNER shall not be required to pay for any work undertaken unless and until such Change Order is approved by the OWNER.

Article V. Debts

The OWNER may, at its option, offset any amounts due and payable under this Contract against and debt (including taxes) lawfully due to OWNER from CONTRACTOR, regardless of whether the amount due arises pursuant to the terms of this Contract or otherwise and regardless of whether or not the debt due to OWNER has been reduced to judgment by a court.

Article VI. Miscellaneous Provisions

The terms used in this Contract shall have the same meaning as designated in the General Provisions of the Standard Specifications aforementioned, as amended. The Contract Documents, which constitute the entire agreement between the OWNER and CONTRACTOR, are listed in Article II. No assignment by either party hereto of any rights under or interests in the Contract Documents will be binding on the other party hereto without the written consent of the party sought to be bound. The OWNER reserves the right to select to build the project herein in whole or in part as needed to meet budget constraints, coordination with other project, or to better align with the needs of the OWNER. The OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives hereto to the covenants, agreements, and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, the OWNER and CONTRACTOR have executed this Contract in duplicate and on the date aforementioned. All portions of the Contract Documents have been signed or identified by the OWNER and CONTRACTOR.

CONTRACTOR: NAME

Signature By:_____

Name: _____

ATTEST:

_____
Name:

Address for giving notices:

_____
_____

CITY OF LAGO VISTA

_____
Taylor M. Whichard

ATTEST:

_____
City Secretary, Maria Franco

Address for giving notices:

5803 Thunderbird Street
Lago Vista, TX 78645

009 REQUEST FOR INFORMATION

Communications concerning this Bid shall be addressed to:

Mr. Victor Manzano
CIP Manager
CITY OF LAGO VISTA
5803 Thunderbird Street
Lago Vista, Texas 78645
Victor.manzano@lagovistatexas.gov

010 PERFORMANCE BOND & PAYMENT BOND

Performance Bond

STATE OF TEXAS

COUNTY OF _____

Bond No. _____

Project No. _____

Project Name _____

Know All Men By These Presents: That _____

of the City of _____, County of _____, and

State of _____, as Principal, and _____,
a solvent company authorized under laws of the State of Texas to act as Surety on bonds for principals, are held and

firmly bound unto _____ (Owner), in the penal sum of

_____

_____ U.S. Dollars ($ _____ U.S.) for payment whereof, well and truly to be made, said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

Conditions of this Bond are such that, whereas, Principal has entered into a certain written contract with OWNER, dated

the _____ day of _____, _____, which Agreement is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

Now, therefore, the condition of this obligation is such, that if said Principal shall faithfully perform said Agreement and shall in all respects duly and faithfully observe and perform all and singular covenants, conditions and agreements in and by said contract agreed and covenanted by Principal to be observed and performed, and according to true intent and meaning of said Agreement hereto annexed, then this obligation shall be void; otherwise to remain in full force and effect.

Provided, however, that this bond is executed pursuant to provisions of Chapter 2253, Texas Government Code as amended and all liabilities on this bond shall be determined in accordance with provisions of said Article to same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that any change in Contract Time or Contract Sum shall not in anywise affect its obligation on this bond, and it does hereby waive notice of any such change in Contract Time or Contract Sum.

In witness whereof, said Principal and Surety have signed and sealed this instrument this _____

day of _____ , _____.

_____	_____
Principal	Surety
By_____	By _____
Title_____	Title _____
Address_____	Address _____
_____	_____
_____	_____
	Telephone _____ Fax _____
	E-Mail Address _____

Name and address of Resident Agent of Surety:

_____

_____

Note: Bond shall be issued by a solvent Surety company authorized to do business in Texas, and shall meet any other requirements established by law or by Owner pursuant to applicable law. A copy of surety agent's "Power of Attorney" must be attached hereto.

Payment Bond

STATE OF TEXAS
COUNTY OF _____

Bond No.
Project No.
Project Name

Know All Men By These Presents: That _____ of the City of _____, County of_____ and State of Texas, as Principal, and _____a solvent corporation authorized under laws of the State of Texas to act as Surety on bonds for principals, are held and firmly bound unto _____(Owner), and all Subcontractors, workers, laborers, mechanics and suppliers as their interests may appear, all of whom shall have right to sue upon this bond in the penal sum of_____U.S. Dollars ($_____U.S.), for payment whereof, well and truly to be made, said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

Conditions of this Bond are such that, whereas, Principal has entered into a certain written contract with Owner; dated the _____ day of _____, _____ to which Agreement is hereby referred to and made a part hereof as fully and to the same extent as if copied in length herein.

Now, therefore, condition of this obligation is such, that if the said Principal shall well and truly pay all Subcontractors, workers, laborers, mechanics, and suppliers, all monies to them owing by said Principals for subcontracts, work, labor, equipment, supplies and materials done and furnished for the construction of improvement of said Agreement, then this obligation shall be and become null and void; otherwise to remain in full force and effect.

Provided, however, that this bond is executed pursuant to provisions of Chapter 2253, Texas Government Code as amended and all liabilities on bond shall be determined in accordance with provisions of said Article to same extent as if it were copied at length herein.

Surety, for value received, stipulates and agrees that any change in Contract Time or Contract Sum shall not in anywise affect its obligation on this bond, and it does hereby waive notice of any such change in Contract Time or Contract Sum.

In witness whereof, said Principal and Surety have signed and sealed this instrument this _____ day of _____, _____.

Principal
By_____
Title_____
Address_____
Telephone _____
Fax _____
E-Mail Address _____

Surety
By_____
Title _____
Address _____
Telephone _____
Fax _____
E-Mail Address _____

Name and address of the Resident Agent of Surety:
_____
_____

Texas Department of Transportation

The wage rates listed herein are those predetermined by the Secretary of Labor and State Statue and listed in the United States Department of Labor's (USDOL) General Decisions dated 01-03-2025 and are the minimum wages to be paid accordingly for each specified classification. To determine the applicable wage rate zone, a list entitled "TEXAS COUNTIES IDENTIFIED BY WAGE RATE ZONES" is provided in the contract. Any wage rate that is not listed in the USDOL's general decision, must be requested by the contractor through the completion of an Additional Classification and Wage Rate Request and be submitted for approval. A blank cell indicates that the classification and wage rate are not listed on the USDOL's general decision and therefore must be requested by the contractor through the completion of an Additional Classification and Wage Rate Request. IMPORTANT NOTICE FOR STATE PROJECTS: only the controlling wage rate zone applies to the contract. Effective 01-03-2025.

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX02 *(TX20250002)	ZONE TX03 *(TX20250003)	ZONE TX04 *(TX20250004)	ZONE TX05 *(TX20250005)	ZONE TX06 *(TX20250006)	ZONE TX07 *(TX20250007)	ZONE TX08 *(TX20255008)	ZONE TX24 *(TX20250024)	ZONE TX25 *(TX20250025)	ZONE TX27 *(TX20250027)	ZONE TX28 *(TX20250028)	ZONE TX29 *(TX20250029)	ZONE TX30 *(TX20250030)	ZONE TX37 *(TX20250037)	ZONE TX38 *(TX20250038)	ZONE TX42 *(TX20250042)
1428	Agricultural Tractor Operator						$12.69					$12.35			$11.75		
1300	Asphalt Distributor Operator	$14.87	$13.48	$13.88	$15.72	$15.58	$15.55	$15.72	$13.28	$15.32	$15.62	$14.36	$14.25	$14.03	$13.75	$14.06	$14.40
1303	Asphalt Paving Machine Operator	$13.40	$12.25	$12.35	$13.87	$14.05	$14.36	$14.20	$13.26	$13.99	$14.68	$12.92	$13.44	$12.53	$14.00	$14.32	$12.99
1106	Asphalt Raker	$12.28	$10.61	$12.02	$14.21	$11.65	$12.12	$11.64	$11.44	$12.69	$12.05	$11.34	$11.67	$11.40	$12.59	$12.36	$11.78
1112	Batching Plant Operator, Asphalt																
1115	Batching Plant Operator, Concrete																
1214	Blaster																
1615	Boom Truck Operator						$18.36										
1444	Boring Machine Operator																
1305	Broom or Sweeper Operator	$11.21	$10.33	$10.08	$11.99		$11.04	$11.62		$11.74	$11.41	$10.30		$10.23	$10.60	$12.68	$11.05
1144	Communications Cable Installer																
1124	Concrete Finisher, Paving and Structures	$13.55	$12.46	$13.16	$12.85	$12.64	$12.56	$12.77	$12.44	$14.12	$13.04	$13.38	$12.64	$12.80	$12.79	$12.98	$13.32
1318	Concrete Pavement Finishing Machine Operator				$16.05		$15.48			$16.05		$19.31				$13.07	
1315	Concrete Paving, Curing, Float, Texturing Machine Operator											$16.34				$11.71	
1333	Concrete Saw Operator				$14.67					$14.48	$17.33					$13.99	
1399	Concrete/Gunite Pump Operator																
1344	Crane Operator, Hydraulic 80 tons or less				$18.22		$18.36			$18.12	$18.04	$20.21			$18.63	$13.86	
1345	Crane Operator, Hydraulic Over 80 Tons																
1342	Crane Operator, Lattice Boom 80 Tons or Less	$16.82	$14.39	$13.85	$17.27		$15.87			$17.27		$14.67			$16.42	$14.97	$13.87
1343	Crane Operator, Lattice Boom Over 80 Tons				$20.52		$19.38			$20.52		$17.49			$25.13	$15.80	
1306	Crawler Tractor Operator	$13.96	$16.63	$13.62	$14.26		$15.67			$14.07	$13.15	$13.38			$14.60	$13.68	$13.50
1351	Crusher or Screen Plant Operator																
1446	Directional Drilling Locator						$11.67										
1445	Directional Drilling Operator				$20.32		$17.24										
1139	Electrician	$20.96		$19.87	$19.80		$26.35		$20.27	$19.80		$20.92				$27.11	$19.87
1347	Excavator Operator, 50,000 pounds or less	$13.46	$12.56	$13.67	$17.19		$12.88	$14.38	$13.49	$17.19		$13.88			$14.09	$12.71	$14.42
1348	Excavator Operator, Over 50,000 pounds		$15.23	$13.52	$17.04		$17.71			$16.99	$18.80	$16.22				$14.53	$13.52
1150	Flagger	$9.30	$9.10	$8.50	$10.28	$8.81	$9.45	$8.70		$10.06	$9.71	$9.03	$8.81	$9.08	$9.90	$10.33	$8.10
1151	Form Builder/Setter, Structures	$13.52	$12.30	$13.38	$12.91	$12.71	$12.87	$12.38	$12.26	$13.84	$12.98	$13.07	$13.61	$12.82	$14.73	$12.23	$12.25
1160	Form Setter, Paving & Curb	$12.36	$12.16	$13.93	$11.83	$10.71	$12.94			$13.16	$12.54	$11.33	$10.69		$13.33	$12.34	$13.93
1360	Foundation Drill Operator, Crawler Mounted				$17.99					$17.99						$17.43	
1363	Foundation Drill Operator, Truck Mounted		$16.86	$22.05	$21.51		$16.93			$21.07	$20.20	$20.76		$17.54	$21.39	$15.89	$22.05
1369	Front End Loader Operator, 3 CY or Less	$12.28	$13.49	$13.40	$13.85		$13.04	$13.15	$13.29	$13.69	$12.64	$12.89			$13.51	$13.32	$12.17
1372	Front End Loader Operator, Over 3 CY	$12.77	$13.69	$12.33	$14.96		$13.21	$12.86	$13.57	$14.72	$13.75	$12.32			$13.19	$13.17	$13.02
1329	Joint Sealer																
1172	Laborer, Common	$10.30	$9.86	$10.08	$10.51	$10.71	$10.50	$10.24	$10.58	$10.72	$10.45	$10.30	$10.25	$10.03	$10.54	$11.02	$10.15
1175	Laborer, Utility	$11.80	$11.53	$12.70	$12.17	$11.81	$12.27	$12.11	$11.33	$12.32	$11.80	$11.53	$11.23	$11.50	$11.95	$11.73	$12.37
1346	Loader/Backhoe Operator	$14.18	$12.77	$12.97	$15.68		$14.12			$15.18	$13.58	$12.87		$13.21	$14.13	$14.29	$12.90
1187	Mechanic	$20.14	$15.47	$17.47	$17.74	$17.00	$17.10			$17.68	$18.94	$18.58	$17.00	$16.61	$18.46	$16.96	$17.47

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX02 *(TX20250002)	ZONE TX03 *(TX20250003)	ZONE TX04 *(TX20250004)	ZONE TX05 *(TX20250005)	ZONE TX06 *(TX20250006)	ZONE TX07 *(TX20250007)	ZONE TX08 *(TX20250008)	ZONE TX24 *(TX20250024)	ZONE TX25 *(TX20240025)	ZONE TX27 *(TX20250027)	ZONE TX28 *(TX20250028)	ZONE TX29 *(TX20250029)	ZONE TX30 *(TX20250030)	ZONE TX37 *(TX20250037)	ZONE TX38 *(TX20250038)	ZONE TX42 *(TX20250042)
1380	Milling Machine Operator	$15.54	$14.64	$12.22	$14.29		$14.18			$14.32	$14.35	$12.86			$14.75	$13.53	$12.80
1390	Motor Grader Operator, Fine Grade	$17.49	$16.52	$16.88	$17.12	$18.37	$18.51	$16.69	$16.13	$17.19	$18.35	$17.07	$17.74	$17.47	$17.08	$15.69	$20.01
1393	Motor Grader Operator, Rough	$16.15	$14.62	$15.83	$16.20	$17.07	$14.63	$18.50		$16.02	$16.44	$15.12	$16.85	$14.47	$17.39	$14.23	$15.53
1413	Off Road Hauler			$10.08	$12.26		$11.88			$12.25		$12.23			$13.00	$14.60	
1196	Painter, Structures					$21.29	$18.34						$21.29			$18.62	
1396	Pavement Marking Machine Operator	$16.42		$13.10	$13.55		$19.17	$12.01		$13.63	$14.60	$13.17		$16.65	$10.54	$11.18	$13.10
1443	Percussion or Rotary Drill Operator																
1202	Piledriver															$14.95	
1205	Pipelayer		$11.87	$14.64	$13.17	$11.17	$12.79		$11.37	$13.24	$12.66	$13.24	$11.17	$11.67		$12.12	$14.64
1384	Reclaimer/Pulverizer Operator	$12.85			$11.90		$12.88			$11.01		$10.46					
1500	Reinforcing Steel Worker	$13.50	$14.07	$17.53	$16.17		$14.00			$16.18	$12.74	$15.83		$17.10		$15.15	$17.72
1402	Roller Operator, Asphalt	$10.95		$11.96	$13.29		$12.78	$11.61		$13.08	$12.36	$11.68			$11.71	$11.95	$11.50
1405	Roller Operator, Other	$10.36		$10.44	$11.82		$10.50	$11.64		$11.51	$10.59	$10.30		$12.04	$12.85	$11.57	$10.66
1411	Scraper Operator	$10.61	$11.07	$10.85	$12.88		$12.27		$11.12	$12.96	$11.88	$12.43		$11.22	$13.95	$13.47	$10.89
1417	Self-Propelled Hammer Operator																
1194	Servicer	$13.98	$12.34	$14.11	$14.74		$14.51	$15.56	$13.44	$14.58	$14.31	$13.83		$12.43	$13.72	$13.97	$14.11
1513	Sign Erector																
1708	Slurry Seal or Micro-Surfacing Machine Operator																
1341	Small Slipform Machine Operator									$15.96							
1515	Spreader Box Operator	$12.60		$13.12	$14.71		$14.04			$14.73	$13.84	$13.68		$13.45	$11.83	$13.58	$14.05
1705	Structural Steel Welder															$12.85	
1509	Structural Steel Worker						$19.29									$14.39	
1339	Subgrade Trimmer																
1143	Telecommunication Technician																
1145	Traffic Signal/Light Pole Worker						$16.00										
1440	Trenching Machine Operator, Heavy						$18.48										
1437	Trenching Machine Operator, Light																
1609	Truck Driver Lowboy-Float	$14.46	$13.63	$13.41	$15.00	$15.93	$15.66			$16.24	$16.39	$14.30	$16.62	$15.63	$14.28	$16.03	$13.41
1612	Truck Driver Transit-Mix				$14.14					$14.14							
1600	Truck Driver, Single Axle	$12.74	$10.82	$10.75	$13.04	$11.61	$11.79	$13.53	$13.16	$12.31	$13.40	$10.30	$11.61		$11.97	$11.46	$10.75
1606	Truck Driver, Single or Tandem Axle Dump Truck	$11.33	$14.53	$11.95	$12.95		$11.68		$14.06	$12.62	$11.45	$12.28		$13.08	$11.68	$11.48	$11.10
1607	Truck Driver, Tandem Axle Tractor withSemi Trailer	$12.49	$12.12	$12.50	$13.42		$12.81	$13.16		$12.86	$16.22	$12.50			$13.80	$12.27	$12.50
1441	Tunneling Machine Operator, Heavy																
1442	Tunneling Machine Operator, Light																
1706	Welder		$14.02		$14.86		$15.97		$13.74	$14.84					$13.78		
1520	Work Zone Barricade Servicer	$10.30	$12.88	$11.46	$11.70	$11.57	$11.85	$10.77		$11.68	$12.20	$11.22	$11.51	$12.96	$10.54	$11.67	$11.76

Notes:

*Represents the USDOL wage decision.

Any worker employed on this project shall be paid at the rate of one and one half (1-1/2) times the regular rate for every hour worked in excess of forty (40) hours per week.

For reference, the titles and descriptions for the classifications listed here are detailed further in the AGC of Texas' *Standard Job Classifications and Descriptions for Highway, Heavy, Utilities, and Industrial Construction in Texas* posted on the AGC's Web site for any contractor.

TEXAS COUNTIES IDENTIFIED BY
WAGE RATE ZONES: 2, 3, 4, 5, 6, 7, 8, 24, 25, 27, 28, 29, 30, 37, 38, 42

County Name	Zone	County Name	Zone	County Name	Zone	County Name	Zone
Anderson	28	Donley	37	Karnes	27	Reagan	37
Andrews	37	Duval	30	Kaufman	25	Real	37
Angelina	28	Eastland	37	Kendall	7	Red River	28
Aransas	29	Ector	2	Kenedy	30	Reeves	8
Archer	25	Edwards	8	Kent	37	Refugio	27
Armstrong	2	El Paso	24	Kerr	27	Roberts	37
Atascosa	7	Ellis	25	Kimble	37	Robertson	7
Austin	38	Erath	28	King	37	Rockwall	25
Bailey	37	Falls	28	Kinney	8	Runnels	37
Bandera	7	Fannin	28	Kleberg	27	Rusk	4
Bastrop	7	Fayette	27	Knox	37	Sabine	28
Baylor	37	Fisher	37	Lamar	28	San Augustine	28
Bee	27	Floyd	37	Lamb	37	San Jacinto	38
Bell	7	Foard	37	Lampasas	7	San Patricio	29
Bexar	7	Fort Bend	38	LaSalle	30	San Saba	37
Blanco	27	Franklin	28	Lavaca	27	Schleicher	37
Borden	37	Freestone	28	Lee	27	Scurry	37
Bosque	28	Frio	27	Leon	28	Shackelford	37
Bowie	4	Gaines	37	Liberty	38	Shelby	28
Brazoria	38	Galveston	38	Limestone	28	Sherman	37
Brazos	7	Garza	37	Lipscomb	37	Smith	4
Brewster	8	Gillespie	27	Live Oak	27	Somervell	28
Briscoe	37	Glasscock	37	Llano	27	Starr	30
Brooks	30	Goliad	29	Loving	37	Stephens	37
Brown	37	Gonzales	27	Lubbock	2	Sterling	37
Burleson	7	Gray	37	Lynn	37	Stonewall	37
Burnet	27	Grayson	25	Madison	28	Sutton	8
Caldwell	7	Gregg	4	Marion	28	Swisher	37
Calhoun	29	Grimes	28	Martin	37	Tarrant	25
Callahan	25	Guadalupe	7	Mason	27	Taylor	2
Cameron	3	Hale	37	Matagorda	27	Terrell	8
Camp	28	Hall	37	Maverick	30	Terry	37
Carson	2	Hamilton	28	McCulloch	37	Throckmorton	37
Cass	28	Hansford	37	McLennan	7	Titus	28
Castro	37	Hardeman	37	McMullen	30	Tom Green	2
Chambers	38	Hardin	38	Medina	7	Travis	7
Cherokee	28	Harris	38	Menard	37	Trinity	28
Childress	37	Harrison	42	Midland	2	Tyler	28
Clay	25	Hartley	37	Milam	28	Upshur	4
Cochran	37	Haskell	37	Mills	37	Upton	37
Coke	37	Hays	7	Mitchell	37	Uvalde	30
Coleman	37	Hemphill	37	Montague	37	Val Verde	8
Collin	25	Henderson	28	Montgomery	38	Van Zandt	28
Collingsworth	37	Hidalgo	3	Moore	37	Victoria	6
Colorado	27	Hill	28	Morris	28	Walker	28
Comal	7	Hockley	37	Motley	37	Waller	38
Comanche	37	Hood	28	Nacogdoches	28	Ward	37
Concho	37	Hopkins	28	Navarro	28	Washington	28
Cooke	37	Houston	28	Newton	28	Webb	3
Coryell	7	Howard	37	Nolan	37	Wharton	27
Cottle	37	Hudspeth	8	Nueces	29	Wheeler	37
Crane	37	Hunt	25	Ochiltree	37	Wichita	5
Crockett	8	Hutchinson	37	Oldham	37	Wilbarger	37
Crosby	2	Irion	2	Orange	38	Willacy	30
Culberson	8	Jack	28	Palo Pinto	28	Williamson	7
Dallam	37	Jackson	27	Panola	28	Wilson	7
Dallas	25	Jasper	28	Parker	25	Winkler	37
Dawson	37	Jeff Davis	8	Parmer	37	Wise	25
Deaf Smith	37	Jefferson	38	Pecos	8	Wood	28
Delta	25	Jim Hogg	30	Polk	28	Yoakum	37
Denton	25	Jim Wells	27	Potter	2	Young	37
DeWitt	27	Johnson	25	Presidio	8	Zapata	30
Dickens	37	Jones	25	Rains	28	Zavala	30
Dimmit	30			Randall	2		

City of Lago Vista Standard Specifications (for work outside the ROW)

CITY OF LAGO VISTA
STANDARD SPECIFICATIONS
(1ST EDITION)

NOTICE TO BIDDERS

The CITY OF LAGO VISTA STANDARD SPECIFICATIONS are general in nature and may not include all requirements for any specific project.

Special Specifications, Special Provisions to Standard Specifications, and General Requirements may be included in the Project Manual for each specific project. Such Special Specifications, Special Provisions, and General Requirements that are included in the Project Manual for a specific project are hereby included as part of the construction specifications for that specific project.

It is the Bidder's sole responsibility to read, understand, and apply all other such Special Specifications, Special Provisions, and General Requirements included in the Project Manual.

PREPARED BY:
CITY ENGINEER, DPW

The City of Lago Vista, Texas

JANUARY 2019

5803 Thunderbird Street, Lago Vista, Texas 78645 Phone: 512-527-3526 Fax: 512-267-5265
www.lagovistatexas.gov

FOREWORD

Outline of Specifications
Each specification is outlined by Articles and Sections. The basic Articles required for a specification are:
XXX.1. Description.
XXX.2. Materials.
XXX.3. Equipment.
XXX.4. Construction or Work Methods.
XXX.5. Measurement.
XXX.6. Payment.

Here "XXX" represents the Item number. Some Articles are not used in every Item. Measurement and Payment Articles are combined when the work described is subsidiary to bid items of the Contract.

Hierarchy of Organizational Elements
The hierarchy of organizational elements available below the Item level is as follows:
XXX.X. Article.
A. Section.
1. Section.
a. Section.
(1) Section.
(a) Section.

The term Section is used for all breaks below the Article.

SECTION 000

GENERAL PROVISIONS

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103 DEFINITIONS AND ABBREVIATIONS

103.1 SUMMARY

This section includes definitions and resolves potential conflicts between associated documents and notes included in the Contract Documents. Conformance to the terms of this section is a requirement that is subsidiary to all other items in this Contract, and no direct payment shall be allowed for any item referenced under this section.

103.2 DEFINITIONS

The following words and expressions, or pronouns used in their place, shall whenever they appear in this Contract be construed as follows, unless a different meaning is clear from the context:

Abbreviations: Wherever the abbreviation defined herein occur on the plans, in the specifications, contract, bonds, advertisement, bid or in any other document or instrument herein contemplated or to which the specifications apply or may apply, the intent and meaning shall be as shown in Abbreviations and Acronyms sections.

Addendum, Bulletin, or Letter of Clarification: Written changes, revisions, or any additional contract provisions issued by the owner or its representative, to the prospective bidders, to be acknowledged by the bidders prior to bid opening.

Advertisement: Legal publications pertaining to the work contemplated or under contract.

Approved, Directed, Required, and Words of like Import: Whenever they apply to the work being performed as directed by the contract, specifications, drawings, or written direction given by the owner or representative, shall imply the direction, requirements, permission or designation of the owner.

Air Temperature: The temperature measured in degrees Fahrenheit (°F) in the shade, not in the direct rays of the sun, and away from artificial heat.

Apparent Low Bidder: The Bidder determined to have the numerically lowest total bid as a result of the tabulation of bids by the Department.

Architect or Engineer of Record: A person registered as an architect/engineer or licensed as a landscape architect, in accordance with State law, exercising overall responsibility for the design or a significant portion of the design and performs certain Contract administration responsibilities as described in the Contract; or a firm employed by the City to provide professional architectural/engineering services.

Award: The City's acceptance of a Contractor's bid for a proposed Contract that authorizes the Department to enter into a Contract.

Backfill: Embedment and final backfill as indicated in specifications of standard drawings.

Base: a layer of specified material of plan thickness placed immediately below the pavement course surfacing.

Bid: The written statement or statements duly filed with the City office specified in the advertisement for bids of these specifications by the person, persona, partnership, company, firm, association, or corporation proposing to do the work contemplated, including the approved form on which the formal bids for the work are to be prepared.

Bid Bond: The security designated in the advertisement and bid, to be furnished by each BIDDER on all bids in excess of $50,000, as a guaranty of good faith to enter into a contract with the OWNER and execute the required bonds for the work contemplated after the work is awarded to the BIDDER and payment of damages upon the BIDDER'S failure to enter into the contract.

Bidder: Any person, persons, partnership, company, firm, association, or corporation acting directly or through a duly authorized representative submitting a bid for the work contemplated.

Bidders Questionnaire: A prequalification form completed by a prospective Bidder reflecting a Bidder's financial data and experience.

Blast Cleaning: Using one of the blasting methods including, but not limited to, water blasting, low-pressure water blasting, high-pressure water blasting, abrasive blasting, water-abrasive blasting, shot blasting, slurry blasting, water injected abrasive blasting, and brush blasting.

Brush Blasting: Sweeping lightly with an abrasive blast to remove loose material.

Business Day: A Business Day for non-construction activities is defined as the time period in which the Lago Vista City Hall is open for public business between the days of Monday through Friday (inclusive) from 8 A.M. to 5 P.M. In general discussions, a "Business Day" should differ from a "Calendar Day" and should be properly and intentionally written as such.

Calendar Day: Any successive day of the week, month, or year, without regard to holidays, or any other day in particular.

City: The City of Lago Vista, Texas. At times this definition may include a representative authorized to act on behalf of the City. Responsibility for final enforcement of contracts involving the City is by Charter vested in the City Manager.

City Attorney: The City Attorney of the City of Lago Vista, Texas, or the City Attorney's duly authorized assistants or agents.

City Engineer: The OWNER'S Project Manager overseeing the administration of the CONTRACT and the CONTRACTOR'S performance thereunder. Unless otherwise specifically provided in the CONTRACT Documents, the OWNER'S Project Manager is an employee of City, and is not the Consulting Engineer.

Certificate of Insurance: A form approved by the City covering insurance requirements stated in the Contract.

Change Order: A written order to the contractor from the City of Lago Vista authorizing and directing an addition, deletion, or revision to the work within the scope of the contract documents, or authorizing an adjustment to the contract price or time.

Contract (Documents): Contract documents are all of the written, printed, or typed and drawn language that comprise and govern the performance of the contract (or agreement) between the Owner and the contractor or consultant. The Contract Documents include but are not limited to Bid Advertisement, Instruction to Bidders, Proposal, Addendums, Specifications, General and Special Conditions, Drawings, Bid Bond, Performance Bond, Insurance, and any supplemental changes pertaining to the work or materials constructed.

Contract Intent: The intent of the Contract is to describe the complete work to be performed. The Contractor shall furnish materials, supplies, tools, equipment, labor, and other incidentals necessary for the proper prosecution and completion of the work in accordance with the Contract Documents.

Contract Price: The total amount payable to the contractor as directed under the terms and conditions of the contract documents. At times the term may be used in the context of describing the unit price of an item.

Contract Time: The number of working days specified for completion of the work including authorized additional working days.

Contract Work: Everything required furnishing and completing by the contractor, as directed by any, or all, parts of the contract documents.

Contractor: The person(s), partnership, firm, or any combination thereof, as an independent contractor entering into the contract for the execution of the work, acting directly or through a duly authorized representative.

Control of Access: The condition in which the right to access of owners or occupants of abutting land or other persons in connection with a highway, roadway, or construction site, is fully or partially controlled by public authority.

Control Point: An established point shown on the plans to provide vertical and horizontal references for geometric control for construction.

Commencement of Construction: The initial disturbance of soils associated with clearing and grubbing, grading, or excavation activities, as well as other construction-related activities (e.g., stockpiling of fill material, demolition).

Consulting Engineer: The person, firm, or entity hired as an independent consultant by the OWNER to design the Project and represent the OWNER in the administration of the CONTRACT in whatever capacity the OWNER designates; the OWNER may, at its sole option, designate the Consulting Engineer to be the Engineer for purposes of administration of the CONTRACT. The Consulting Engineer shall be understood to be the Consulting Engineer of the OWNER, and nothing contained in the CONTRACT Documents shall be construed to make the Consulting Engineer an employee of the OWNER, nor shall they be construed to create any contractual or agency relationship between the Consulting Engineer and the CONTRACTOR. The term includes the officers, employees, associates, agents, and sub-consultants of Consulting Engineer, if any.

Date of Written Authorization: Date of the written work order authorizing the Contractor to begin work.

Drawing(s): Only those drawings specifically entitled as such and as specified in the contract, or in any bulletin, or any detailed drawing furnished by the OWNER, pertaining or supplemental thereto.

Easement: A real property right acquired by 1 party to use land belonging to another party for a specified purpose.

Embedment: Bedding and initial backfill.

Equal: Materials, articles or methods which are of equal or higher quality than those specified or shown on the drawings and as further defined in Substitution of Materials Section, as determined by the Engineer in his or her sole discretion.

Extra Work: Work other than that which is expressly or impliedly required by the Contract documents at the time of the execution of the Contract.

Final backfill: Material required filling the trench from the top of the initial backfill to ground elevation or subgrade of a street.

Hazardous Materials or Waste: Hazardous materials or waste include but are not limited to explosives, compressed gas, flammable liquids, flammable solids, combustible liquids, oxidizers, poisons, radioactive materials, corrosives, etiologic agents, and other material classified as hazardous by 40 CFR 261, or applicable City of Lago Vista, State of Texas, and federal regulations.

High-Pressure Water Blasting: Water blasting with pressures between 5,000 and 10,000 psi.

HS: Horseshoe shaped conduit, generally constructed of brick and mortar, usually older drainage systems. Newer systems are constructed of reinforced concrete.

Incentive/Disincentive Provisions: An adjustment to the Contract price of a predetermined amount for each day the work is completed ahead of or behind the specified milestone, phase, or Contract completion dates. The amount of the incentive/disincentive is determined based on estimated costs for engineering, traffic control, delays to the motorists, and other items involved in the Contract.

Initial backfill: Material that covers the utility line (usually 6-inches on all sides of the pipe or as directed by specs and drawings).

Inspector: Any representative of the OWNER or as specified in the contract documents designated to inspect the work.

Interpretation of Specifications: Throughout the Contract Documents, all declarative, imperative statements and phrases shall be interpreted as constituting specific instructions to the Contractor, unless specifically stated otherwise.

Joint venture: Any combination of individuals, partnerships, limited liability companies, or corporations submitting a single bid proposal.

Letter of Clarification: See Addendum.

Limits of Construction: An area with established boundaries, identified within the road right of way and easements, where the Contractor is permitted to perform the work.

Letting: The receipt, opening, tabulation, and determination of the apparent low Bidder.

Low-Pressure Water Blasting: Water blasting with pressures between 3,000 and 5,000 psi.

Maintenance Bond: A bond executed by a corporate surety in accordance with the contract documents and Article 7.19-1, Vernon's Texas Insurance Code, in the amount of the contract guaranteeing the prompt, full and faithful performance of the general guaranty and warranty contained in the Contract Documents.

Major Item: A major item is any line item of the work to be performed of the total contract amount, which amounts to 5 percent or more, or $100,000, whichever is less.

Milestone Date: The date that a specific portion of the work is to be completed, before the completion date for all work under the Contract.

National Holiday: January 1, the last Monday in May, July 4, the first Monday in September, the fourth Thursday in November, December 24, or December 25.

Non-Site-Specific Contracts: Contracts in which a geographic region is specified for the work and for which work orders, with or without plans, further detail the limits and work to be performed.

Owner: The City of Lago Vista. The City may be represented by any of the Department Directors clearly identified in the contract documents as the principal contact person for each project.

Owner's Representative: The Engineer or other duly authorized assistant, agent, inspector or superintendent acting within the scope of the particular duties instructed to him or her by the City of Lago Vista.

Payment Bond: A bond executed by a corporate surety in accordance with Article 7.19-1, Texas Insurance Code and Chapter 2253, Texas Government Code, in the amount of the contract, solely for the

protection and use of payment bond beneficiaries who have a direct contractual relationship with the general CONTRACTOR or a subcontractor to supply public work labor or material.

Performance Bond: The approved form of security furnished by the CONTRACTOR and the CONTRACTOR'S Surety as a guarantee of good faith on the part of the CONTRACTOR to execute the work in strict accordance with the plans, specifications and terms of the contract, and that the CONTRACTOR will maintain the work constructed by him/her in good condition for the period of time required; said security shall be in accordance with the City of Lago Vista Specifications and individual contract documents.

Plan or Plans: The plans are the drawings, or reproductions therefrom, made by or approved by the OWNER showing in detail the location, dimension and position of the various elements of the project, including such profiles, typical cross-sections, layout diagrams, working drawings, preliminary drawings and such supplemental drawings as the OWNER may issue to clarify other drawings or for the purpose of showing changes in the work hereinafter authorized by the OWNER. The plans are usually bound separately from the other parts of the Contract Documents, but they are part of the Contract Documents just as though they were bound therein.

Prequalification Statement: The forms on which required information is furnished concerning the Contractor's ability to perform and finance the work.

Project Midpoint: For the purposes of this addendum, the Mid-point of a project is that point at which one-half of the CONTRACT amount, less retainage and extra work, has been paid to the CONTRACTOR for services rendered.

Proposal: The written and signed offer of the bidder, when submitted on approved proposal forms, to perform the contemplated work and furnish the necessary material and labor in accordance with the provisions of the plans and specifications, special and general provisions, and all contract documents.

Proposal Guaranty: The security designated in the proposal and furnished by the Bidder as a guarantee that the Bidder will enter into a Contract if awarded the work.

Quality Assurance (QA): Sampling, testing, inspection, and other activities conducted by the Engineer to determine payment and make acceptance decisions.

Quality Control (QC): Sampling, testing, and other process control activities conducted by the Contractor to monitor production and placement operations.

Sandblasting, Dry: Spraying blasts of pressurized air combined with sand.

Sandblasting, Wet: Spraying blasts of pressurized water combined with sand.

Saturated Surface Dry (SSD): Saturated Surface Dry (SSD) describes the condition of the aggregate in which the pores in each particle of the aggregate particle are filled with water and no excess water is on the particle surface. This allows the absorption and the specific gravity of the aggregate to be measured.

Shot Blasting: Spraying blasts of pressurized air combined with metal shot.

Site: The area upon or in which the CONTRACTOR'S operations are carried on, and such other areas adjacent thereto as may be designated as such by the OWNER.

Special Provisions: The special clauses of the contract, setting forth conditions or requirements peculiar to the specific project involved, supplementing the standard or general specifications and taking precedence over any conditions or requirements of the standard or general specifications with which they are in conflict. The term includes any and all addendums that expressly supplement and take precedence over the general or standard specifications, regardless of whether they are peculiar to a specific project or apply to all projects.

Specifications (Specs): The directions, provisions, and requirements contained herein, together with the special provisions supplemental hereto pertaining to the method and manner of performing the work or to the qualities or quantities of the materials to be furnished under the contract Specifications include all of the general, special and technical conditions or provisions, and all addendum or supplements thereto.

Standard Drawings: Drawings and sketches approved by the City Engineer to be used in conjunction with project drawings, special provisions, and general specifications.

Standard Details: Standard Details are drawings set up for use in multiple projects, and are set as a minimum requirement. They may be included as a separate bound set of drawings, or may be included in whole or in part in the Construction Drawings, or both. Standard Details will be referenced in the construction drawings with a callout corresponding to the number of the Standard Detail as shown on the Standard Detail drawing itself.

Storm Water Pollution Prevention Plan (SWPPP or SW3P): A document consisting of the following: evaluation of how and where pollutants may be mobilized by stormwater onsite, site plan for managing stormwater run-off, identification of appropriate erosion and sediment controls, maintenance and inspection schedule, record keeping process, and identification of stormwater discharge points from site.

Subcontract: The agreement between the Contractor and subcontractor establishing the obligations of the parties for furnishing of materials and performance of the work prescribed in the Contract documents.

Sub-Contractor: The person(s), partnership, firm, or any combination thereof, as an independent contractor entering into the contract with the principal contractor for the execution of the work, acting directly or through a duly authorized representative, as directed by the contractor under contractual obligations with the owner.

Subbase: Layer of specified material of plan thickness between a base and a subgrade.

Subgrade: That portion of the roadbed upon which the subbase, base or the pavement is to be placed. It includes 12-inches beyond the back of the curb for concrete paved streets.

Subsidiary: Materials, labor, or other elements that because of their nature or quantity have not been identified as a separate item and are included within the items on which they necessarily depend.

Superintendent: The representative of the Contractor who is available at all times and able to receive instructions from the Engineer or authorized representatives and to act for the Contractor.

Supplier: Any subcontractor contracting with the CONTRACTOR, or any of its subcontractors, to fabricate or deliver or who actually fabricates or delivers materials, supplies or equipment to be consumed or incorporated into the work.

Sureties: The corporate bodies which are bound by such bonds as are required with and for the CONTRACTOR. The sureties engaged to be responsible for the entire and satisfactory fulfillment of the Contract and for any and all requirements as set out in the specifications, Contract or plans. In order for a surety to be acceptable, the surety shall conform to the requirements of Article 7.19-1, Texas Insurance Code.

Unit Price: Where in the bid form a "Unit Price" is set forth, the "Unit Price" shall include the furnishing by the CONTRACTOR of all labor, tools, materials, machinery, appliances, water, heat, utilities, transportation, plant and equipment appurtenant to and necessary for the construction in every detail and the completion in a workmanlike manner of all the work to be done under these specifications. The "Unit Price" shall also include all permanent protection of overhead, surface and underground structures, cleaning up, finish, overhead expense, bond, insurance, patent fees, royalties, risk due to the elements, delay, profit, injuries, damages, claims and all other items not specifically mentioned that may be required to construct fully each item of the work, complete in place.

Water-Abrasive Blasting: Spraying blasts of pressurized water combined with abrasive media.

Water Blasting: Spraying blasts of pressurized water of at least 3,000 psi.

Water-Injected Abrasive Blasting: Abrasive blasting with water injected into the abrasive/air stream at the nozzle.

Work: All work including the furnishing of all labor, materials, tools, equipment, required submittals and incidentals to be performed by the CONTRACTOR under the terms of the contract.

Work Order, or Notice to Proceed: Written notice to the Contractor to begin the work. The work order may include the date on which work or time charges are to begin, the number of working days for specified work (for multiple work order Contracts), and plan sheets providing additional details specific to a location or to an item of work for non-site-specific work.

Work Day: A work (or working) day is defined as a calendar day not including Saturdays, Sundays, or legal holidays authorized in the list prepared by the City for contract purposes, in which weather or other conditions not under the control of the CONTRACTOR shall permit the performance of the principal units of work underway for a continuous period of not less than 7 hours between 7 A.M. and 6 PM. A principle unit of work shall be that unit which controls completion time of the contract. Nothing in this definition shall be construed as prohibiting the CONTRACTOR from working on Saturdays, if the CONTRACTOR so desires and permission of the OWNER has been granted. Work on Sundays shall not be permitted except in cases with the written permission of the owner. If Saturday or Sunday work is permitted, working time shall be charged on the same basis as weekdays. Where the working time is expressed as calendar days or a specific date, the concept of working days shall no longer be relevant to the contract. Work at nighttime or outside the 7 A.M. and 6 P.M. shall not be permitted except in cases of extreme emergency and then only with the written permission of the owner.

Working Time, Completion Time or Contract Time: The time set forth in the contract for the performance and completion of the work contracted for. The time may be expressed as calendar days, working days or a specific date.

103.3 RESOLUTION OF CONFLICTS

Inclusion of specifications from multiple sources may lead to minor conflicts in terminology, dimensions, quantities, specifications, and requirements. Conflicts between any of the Contract Documents shall be resolved as follows:

1. Special Provisions in the Construction Contract shall take precedence over all other Contract Documents.

2. Requirements, quantities, and other information contained in the Specifications and Construction Drawings (including notes on the plans) shall take precedence over requirements contained in the Construction Contract. Conflicts between Specifications and Construction Drawings shall be resolved as detailed below.

3. Actual quantities measured in the field, installed and accepted, shall take precedence over quantities listed in any of the Contract Documents; however, payment for quantities may be by lump sum, unit price, plan quantity, or otherwise as described elsewhere in the Contract Documents.

4. In all cases where there are conflicts within the Contract Documents, the first Specification referenced on each line item on the Unit Price Schedule shall control for that line item, and shall determine the method of measurement for that line item.

5. Dimensions, quantities, specifications, and all other requirements that are included in a Project Manual (including requirements in the Unit Price Schedule) that has been prepared for a specific project, shall take precedence over dimensions, quantities, specifications, and all other requirements that are included in the Construction Drawings. Measurement units and item descriptions used in the Unit Price Schedule shall take precedence over measurement units and item descriptions included in the plans or specifications.

6. Dimensions, quantities, specifications (including notes) and all other requirements that are included in the Construction Drawings shall take precedence over conflicting data that is included in Standard Details, Standard Specifications, and Special Specifications.

7. Dimensions and quantities written in words or numbers shall take precedence over scaled measurements or quantities calculated from drawings, both in the Construction Drawings and Standard Details.

8. In all instances, written communications take precedence over any verbal understandings between any parties involved. Verbal instructions, submittals, and communications shall be for convenience only and shall not be binding on any party involved.

9. Any third-party reports, exhibits, documents, and / or recommendations that have been prepared by third parties, such as geotechnical reports and traffic studies that have been submitted to the design engineer for his use, may be made available or included in the Contract Documents for use as supporting data and for informational purposes only. The recommendations contained in such documents were made to the design engineer, and the design engineer may or may not have agreed with and followed those recommendations during final design. Therefore, all other Contract Documents shall take precedence over recommendations and requirements contained in such third-party reports.

10. All other conflicts shall be resolved by the Owner, and shall be resolved in a manner that is consistent with the Owner's best interest.

103.4 ABBREVIATIONS

Wherever the abbreviations defined herein occur on the plans, in the specifications, contract, bonds, advertisement, proposal, or in any other document or instrument herein contemplated, or to which the specifications apply or may apply, the intent and meaning shall be as follows:

%	Percent
‘	Foot or Feet
"	Inch or Inches
#	Pound or pounds
AASHTO	American Association of State Highway and Transportation Officials
ABA	American Bankers Association
ACI	American Concrete Institute
am, a.m.	Before noon
ANSI	American National Standards Institute
Asph.	Asphalt
Assn.	Association
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
APWA	American Public Works Association
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
Be	Outside diameter of Pipe
Bd	Trench width
Blvd	Boulevard
c	Centigrade
cc	Cubic Centimeter
CFR	Code of Federal Regulations
cfs	Cubic feet per second
C.I.	Cast Iron
CL, C.L.	Center Line
cm	Centimeter
co	Cleanout
c.o.c.	Cleveland Open Cup
Conc.	Concrete
Cond.	Conduit
Corr.	Corrugated
cSt	Centistokes (Viscosity)
Cu.	Cubic
Culv.	Culvert
CY,C.Y.	Cubic Yard
D	Inside Diameter
D.I.	Ductile Iron
Dia.	Diameter
Dr.	Drive, or Driveway
Elev.	Elevation
F	Fahrenheit
FM	Factory Mutual
fps	Feet per second
Ft.	Foot or Feet

Gal.	Gallon
g, gm	Gram
HDPE	High Density Polyethylene
HP	Horsepower
Hr.	Hour
ID	Inside Diameter
in.	Inch or Inches
ISSA	International Slurry Surfacing Association
Kg or kg	Kilogram
kPa	Kilopascals
L	Liter
Lb.	Pound or Pounds
LDPE	Low Density Polyethylene
L.F.	Linear foot or feet
Lin.	Linear
LL	Liquid Limit
LLDPE	Linear Low Density Polyethylene
LMDPE	Linear Medium Density Polyethylene
LOI	Loss on Ignition
M	Meter
Max.	Maximum
MH	Manhole
Min.	Minimum or Minute
M.J.	Mechanical Joint
mm	Millimeter
Mod.	Modified
Mono.	Monolithic
mph	Miles per hour
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
MPa	Megapascal
MUTCD	(Texas) Manual on Uniform Traffic Control Devices
NACE	National Association of Corrosion Engineers
Nat' I	National
NEMA	National Electrical Manufacturers Association
No.	Number
N.P.T.	National Pipe Thread
NRMCA	National Ready-mixed Concrete
NSF	National Sanitation Foundation
o.d.,OD	Outside Diameter
OSHA	Occupational Safety and Health Administration
oz.	Ounce
Pa	Pascal
PI, P.I.	Plasticity Index
pm,p.m.	After noon
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
PVCO	Molecularly Oriented PVC
R	Radius
RAP	Recycled/Reclaimed Asphalt Pavement
RCP	Reinforced Concrete Pipe
RCRA	Resource Conservation and Recovery Act
Reinf.	Reinforced or reinforcing
Rem.	Remove

Rep.	Replace
R/W, ROW,	Right-of-Way
Sani., San.	Sanitary
Sec.	Second
S.F.	Square Feet
Sq.	Square
SSPC	The Society for Protective Coatings [formerly Steel Structures Painting Council]
St.	Street
Strm	Storm
Std.	Standard
Str.	Strength
SWPPP	Storm Water Pollution Prevention Plan
SY, S.Y.	Square Yard
TAC	Texas Administrative Code
Tex-###-X	Refer to TxDOT Manual of Testing Procedures
TCEQ	Texas Commission on Environmental Quality
TMUTCD	Texas Manual on Uniform Traffic Control Devices
TxDOT	Texas Department of Transportation
TxDOT	Refer to TxDOT Standard Specifications for Construction of Highways, Streets and Bridges
Item#	Underwriter's Laboratory
UL	Micrometers
Um, nm	United States
US, U.S.	United States Code
U.S.C.	United States Environmental Protection Agency
USEPA	Vertical
Vert.	Volume
Vol.	Weight
Wt.	Water
WT	Wastewater
WW	Yard
Yd.	

104 INSTRUCTIONS TO BIDDERS

104.1 INTRODUCTION

Instructions to the Contractor in these specifications are generally written in active voice, imperative mood. The subject of imperative sentences is understood to be "the Contractor." The City's responsibilities are generally written in passive voice, indicative mood. Phrases such as "as approved," "unless approved," "upon approval," "as directed," "as verified," "as ordered," and "as determined" refer to actions of the Engineer unless otherwise stated, and it is understood that the directions, orders, or instructions to which they relate are within the limitations of and authorized by the Contract.

104.2 PROPOSAL PREPARATION

The bidder shall submit its proposal on the forms furnished or approved by the OWNER. All blank spaces in the form shall be correctly filled in, the bidder shall state the prices, in both words, and numerals, for which it proposes to do the work, contemplated or furnish the material required. Such prices shall be written in ink distinctly and legibly. If an individual submits the proposal, that individual or duly authorized agent must sign the proposal. If an association or partnership submits the proposal, the name and address must be given and the proposal signed by a duly authorized member of the association or partnership. If a corporation submits the proposal, the corporate name and business address must be given and the proposal signed by a duly authorized corporate officer or agent. Powers of attorney authorizing agents to sign the proposal must be properly certified and must be in writing and submitted with the proposal. The proposal shall be executed in ink. The CONTRACTOR accepts all risks associated with bidding in this manner. It is understood and agreed that the proposal may not be withdrawn once the bid-opening process has begun.

104.2.A. Plan, Specs, and Site Examination

Bidders are advised that the plans, specifications and other documents on file as stated in the advertisement shall constitute all the information, which the OWNER shall furnish. Bidders are required, prior to submitting any proposal, to review the plans and read the specifications, proposal, Contract and bond forms carefully; to obtain and read the most current versions of all referenced State, Federal, and National standards; to visit the site of the work; to examine carefully local conditions; to inform themselves by their independent research, tests and investigations of the difficulties to be encountered and judge for themselves the accessibility of the work and all attending circumstances affecting the cost of doing the work or time required for its completion; and to obtain all information required to make a proposal. No information given by the OWNER or any official thereof, other than that shown on the plans and contained in the specifications, proposals and other Contract documents, shall be binding upon the OWNER. Bidders shall rely exclusively upon their own estimates, investigations, tests and other data, which are necessary for full and complete information upon which the proposal may be based. Any bidder, by submitting a bid, represents and warrants: that it has prepared the bid in accordance with the specifications, with full knowledge and understanding of the terms and provisions thereof; that it has done any inspection or test it deems appropriate; that it has reviewed, studied and examined its bid prior to the signing and submission of same; and that it was cognizant of the terms of its proposal, verified its calculations and found them to be correct and agrees to be bound thereby.

1. **Availability of Lands for Work:** The lands upon which the work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment or storage of materials and equipment to be incorporated in the work are to be obtained and paid for by Contractor. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.
2. **Copies of Bidding Documents:** Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents. Owner and Engineer, in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bid for the Work and do not confer a license or grant for any other use.

3. **Bid Form:** The Bid Form is included with the Bidding Documents; additional copies may be obtained from Engineer (or the Issuing Officer). All blanks on the Bid Form must be completed by printing in black ink or by typewriter. Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature. Bids by partnerships must be executed in the partnership name and signed by a partner. whose title must appear under the signature and the official address of the partnership must be shown below the signature.

104.2.B. Quantities in Proposal

The quantities of the work and materials set forth in the proposal form or on the plans approximately represent the work to be performed and materials to be furnished, and are for the purpose of comparing the bids on a uniform basis. Payment shall be made to the CONTRACTOR only for the actual quantities of work performed or materials furnished as measured in the field or otherwise determined by the Engineer in accordance with the plans and specifications; and it is understood that the quantities may be increased or decreased as hereinafter provided, without in any way invalidating the bid prices. If greater or lesser quantities are required than those quantities indicated in the Unit Price Schedule, the Contractor shall provide the required quantities. The method and amount of payment adjustments for quantities and changes, if any, will depend on whether the contract is Lump Sum, Plans Quantity, or Unit Price, and will be calculated accordingly.

104.2.C. Addenda

Bidders desiring further information, or interpretation of the Specifications, must make request for such information in writing to the City or Engineer, a minimum of 48-hours before the bid opening. Answers to all such requests will be given in writing to all bidders, in Addendum form, and all Addenda will be bound with, and made a part of, the Contract Documents. No other explanation or interpretation will be considered official or binding. Should a bidder find discrepancies in, or omissions from, the Specifications or other Contract Documents, or should he be in doubt as to their meaning, he should at once notify the Engineer in order that a written Addendum may be sent to all bidders. Any Addenda issued twenty-four (24) hours before the opening of bids will be mailed or delivered to each Contractor contemplating the submission of a proposal on this work. The proposal as submitted by the Contractor will be so constructed as to include any Addenda if such are issued by the City/Engineer twenty-four (24) hours before the opening of bids. The quantities of the work and materials set forth in the proposal form or on the plans approximately represent the work to be performed and materials to be furnished, and are for the purpose of comparing the bids on a uniform basis.

104.2.D. Statement of Qualification

No proposal shall be considered unless it has included a Bidders Statement of Qualifications (SOQ). A statement of Bidders Qualification form is to be filled and included in the proposal from all bidders. The City will award to contract to a qualified bidder; therefore an SOQ is required prior to award of contract. To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days after Bid opening detailed written evidence such as financial data, previous experience, present commitments and other such data as may be called for in the contract documents. Each bid must contain evidence of Bidder's qualification to do business in the state where the project is located or covenant to obtain such qualification prior to award of the contract.

104.2.E. Nonresponsive Proposal

No proposal shall be considered unless it is filed at the place and within the time limit for receiving proposals as stated in the advertisement and/or Notice to Bidders or any addendum. Each proposal shall be in a sealed envelope, plainly marked with the word "Proposal" and the name or description of the project as designated in the advertisement. A proposal that has one or more of the deficiencies listed below is nonresponsive and will not be considered.

1. Failure to sign the proposal.

2. The proposal is in a form other than the official proposal form issued to the Bidder or Bidders.
3. The proposal was not in the hands of the letting official at the time and location specified in the advertisement.
4. Proposal writing is illegible.
5. The Bidder fails to acknowledge or improperly acknowledges receipt of all addenda issued.
6. The Bidder modifies the proposal in a manner that alters the conditions or requirements for work as stated in the proposal form.
7. Any other items inconsistent with the requirements set for by the City.

104.2.F. Withdrawing the Proposal

Proposals filed with the OWNER can be withdrawn or modified and redeposit prior to the time set for opening proposals. Request for non-consideration of proposals must be made in writing addressed to the OWNER prior to the time set for opening proposals. After other proposals are opened and publicly read, the proposal for which non-consideration is properly requested will be returned unopened. The proposal may not be withdrawn after bid opening has commenced. The bidder, in submitting the same, warrants and represents that its bid has been carefully reviewed and checked and that it is in all things true and accurate and free of mistakes and that such bid shall not and cannot be withdrawn after opening because of any mistake committed by the bidder; provided, however, that any bidder may withdraw its bid 90 days after the actual date of opening thereof, should no award have been made to such bidder.

104.2.G. Bid Submission

Bids shall be submitted at the time and place indicated in the Advertisement of Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title and name and address of Bidder and accompanied by the Bid Security. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.
Each prospective Bidder is furnished one copy of the Bidding Documents with one separate unbound copy each of the Project Manual including the text "To be filled out and returned by bidder." The Bidding Documents may be retained by Bidder. The unbound copy of the Project Manual is to be completed and submitted in a sealed envelope labeled in the center of envelope with the project name. The bidder's full name and contact information shall be listed on the upper left hand corner of the envelope.

104.2.H. Opening and Consideration of Proposals

The proposals filed with the OWNER shall be opened at the time stated in the advertisement and/or in the Notice to Bidders, or any subsequently issued addendum, and publicly read aloud, and shall thereafter remain on file with the OWNER. No Contract shall be awarded based on such proposals until after at least two days have elapsed. Contract shall only be awarded after the City Council has made a decision to do so.
After proposals are opened, the proposals shall be tabulated for comparison on the basis of the bid prices and quantities shown in the proposal. Until final award of the Contract, the OWNER reserves the right to reject any or all proposals, to waive technicalities or irregularities at its option, to advertise for new proposals or proceed to do the work otherwise in the best interests of the OWNER. Each bidder shall be furnished a copy of the bid tabulation upon request.

104.2.I. Rejection of Proposals

Proposals shall be considered irregular if they show any omissions, alterations of form, additions, unbalanced values or conditions not called for, unauthorized alternate bids or other irregularities of any kind. The OWNER may reject any proposal containing any such irregularity. The OWNER, however, reserves the right to waive any irregularities and to make the award in the best interest of the OWNER.
The BIDDER or CONTRACTOR shall not take advantage of any error in the bidding or contract documents. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown in or mentioned in both. In the case of any apparent difference between the drawings and specifications, or any other apparent error which the BIDDER or

the CONTRACTOR may discover, the BIDDER or CONTRACTOR shall refer the matter to the OWNER, to which the decision of the OWNER shall govern and made known via the issuance of addenda. The OWNER shall have the right to correct any error discovered. Proposals may be rejected if they are found to be non-responsive or disqualified for other specific reasons.

104.2.J. Disqualification

Bidders may be disqualified and their proposals not considered for any, and not limited to, the following reasons:

1. Reasonable belief that collusion exists among the bidders.
2. Reasonable belief that any BIDDER is interested in more than one proposal for the work contemplated.
3. The BIDDER having a history of filing frequent, excessive and meritless claims, or fraudulent claims, against the OWNER, or against other contractors on a project of the OWNER.
4. The BIDDER or its Surety having defaulted on a previous Contract, or the BIDDER performing poorly on a previous Contract.
5. Lack of competency, skill, judgment, financial capability, integrity, reputation, reliability or responsibility to perform the work as revealed by the bid proposal, bid questionnaires, financial statement, performance history or other relevant information obtained by the OWNER.
6. Uncompleted work, which in the judgment of the OWNER shall prevent or hinder the prompt completion of additional work if awarded.
7. Failure of BIDDER to use OWNER‘S form of bid bond in submitting its bid, or submission of a cashier‘s check drawn on a state or national bank not located in the OWNER‘S jurisdictional area.
8. Unbalanced value of any bid items.
9. The BIDDER is currently a party to any litigation against the OWNER.

Other reasons not shown in these specifications shall be presented to City’s Council. The last reserves the right to make final decision in disqualification situations not covered by these specifications.

104.2.K. Return of Proposal Guarantee

The OWNER shall normally return the proposal guaranties accompanying all proposals within 30 calendar days after bid opening except for the three apparent low proposals. The three apparent low proposal guaranties shall be retained by the OWNER until the required Contract and surety bonds have been executed, after which they shall be returned. The City may retain the remaining guaranties for up to 30 days after opening of bids if the one or more of the said are found to be within 3% of the lowest bid, or irregularities and other situations are found within the bids.

104.3 PROPOSAL GUARANTEE

No proposal shall be considered unless it is accompanied by a cashier's check on any state or national bank or acceptable bidder's surety bond, payable unconditionally to the OWNER. The cashier's check or bidder's surety bond shall be in the amount of not less than five (5) percent of the total amount of the bid. The type of check or money order must be indicated on the face of the instrument and the instrument must be no more than 90 days old. The proposal guaranty is required by the OWNER as evidence of good faith and as a guarantee that if awarded the Contract, the bidder shall execute the Contract and furnish the required bonds and evidence of insurance within 10 days after receipt of the awarded Contract or pay the damages as set forth below. The bidder's surety bond shall be conditioned that, if the proposal is withdrawn after the bids have been opened or the CONTRACTOR refuses to execute the Contract in accordance with its proposal and provide the required surety bonds, the CONTRACTOR and the surety shall become liable to the OWNER for the amount of the bidder's surety bond. In the event a cashier's check is submitted along with the proposal of the bidder, and the CONTRACTOR does not execute the Contract and provide the required surety bonds and evidence of insurance within 10 days after receipt of the awarded Contract, or withdraws its bid after bids have been opened, the OWNER shall be entitled to the proceeds of such check. Provided however, if the Contract price is less than $100,000.00, the Bidder shall have the option of providing a Letter of Credit in lieu of a Performance Bond, said Letter of Credit to be in a form acceptable to City of Lago Vista.

104.4 CONFLICT OF INTEREST DISCLOSURE

The contractor shall fill out and submit a Conflict of Interest Disclosure form with bid documents. The questionnaires require disclosures describing certain business and gift giving relationships, if any, the filers may have with Local Government Officers or a member of a governing body of a local government entity.
This applies to:

- Businesses and individuals who contract with the City,
- Businesses and individuals who seek to contract with the City (regardless of whether a bidder is awarded the contract), and
- Agents who represent such businesses in their business dealing with the City

A copy of the required reporting form shall be included in the bid documents. Compliance is the individual responsibility of each individual, business and agent who is subject to the law's filing requirement.
If you are required to file a Conflict of Interest Questionnaire, you should file it with the Lago Vista City Secretary at 5803 Thunderbird Dr, Lago Vista, TX 78645.

105 CONTRACT AWARD AND EXCECUTION

105.1 INTRODUCTION

The OWNER will attempt to award the Contract within 90 days after the opening of proposals. The award, if made, shall be to the lowest responsible bidder; but in no case shall the award be made until after investigations are made as to the responsibility of the bidder to whom it is proposed to award the Contract. The City will make decision based on physical location of the CONTRACTOR's business, whether bid amount falls within 3% of lowest bid, and including but not limited to contractors experience and financial accountability. If awarded the Contract, the bidder shall execute the Contract and furnish the required bonds and evidence of insurance within 10 calendar days after receipt of the awarded Contract.

105.2 CONTRACT AWARD

Owner reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, unresponsive, unbalanced or conditional Bids, and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive, or the Bidder is unqualified, or of doubtful financial ability, or fails to meet any other pertinent standard or criteria established by Owner. Owner also reserves the right to waive all informalities not involving price, time or changes in the Work and to negotiate contract terms other than price with the Successful Bidder.

In evaluating Bids, Owner will consider the qualifications of Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

Owner also may consider the operating costs, maintenance requirements, performance date and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

By submitting a bid for the project described in these Instructions to Bidders, each bidder agrees to the determination of the low bidder and payment procedures described in the contract documents and each bidder further agrees that he is not, and will not be disadvantaged in any way by these bid evaluation procedures and/or subsequent bid award and/or payment procedures.

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within fifteen days thereafter, Contractor will sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds. If Owner does not request a specific number of counterparts, the Contractor will sign and deliver tree (3) copies. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Contractor. Each counterpart is to be accompanied by a complete set of the Drawings with appropriate identification.

105.3 CONTRACTOR'S WARRANTIES AND UNDERSTANDING

In consideration of, and to induce the award of this Contract to it, the CONTRACTOR represents and warrants:

1. That it is financially solvent, and sufficiently experienced and competent to perform the work.
2. That the facts stated in the proposal and the information given by it pursuant to the bidding documents is true and correct in all respects.
3. That has read, understood and complied with all the requirements set forth in the bidding documents.
4. That it is familiar with and understands all laws and regulations applicable to the work.
5. Unless otherwise specifically provided for in the Contract documents, the CONTRACTOR shall do all the work and shall furnish all the tools, equipment, machinery, materials, labor and appliances, except as herein otherwise specified, necessary or proper for performing and completing the work required by this Contract, in the manner and within the time herein prescribed.

105.3.A. Contractor Site Visit

By executing the Contract, the CONTRACTOR represents that it has visited the site of work, has fully familiarized itself with the local and on-site conditions under which the work is to be performed and has correlated its observation with the requirements of the Contract documents. In addition, the CONTRACTOR represents that it has satisfied itself as to subsurface conditions at the site of the work. Information, data and representations contained in the Contract documents pertaining to the conditions at the site, including subsurface conditions, are for information only and are not warranted or represented in any manner to accurately show the conditions at the site of the work. The CONTRACTOR agrees that it shall make no claims for damages; additional compensation or extension of time against the OWNER because of encountering actual conditions in the course of the work, which vary or differ from conditions or information, contained in the Contract documents. Except as provided in *Site Preparation* section, Existing Structures, Facilities and Appurtenances, all risks of differing subsurface conditions shall be borne solely by the CONTRACTOR.

105.3.B. Contractor Employee Wages

Contractor hereby acknowledges and agrees that Contractor and each subcontractor are responsible for complying with the applicable provisions of Chapter 2258 of the Texas Government Code regarding the payment of prevailing wage rates. Contractor and each subcontractor shall pay wages to persons performing labor in connection with this Contract in an amount that is not less than the applicable prevailing wage rates for such workers. The Contractor shall forfeit as a penalty to Owner sixty dollars ($60.00) for each laborer, workman or mechanic employed for each calendar day, or portion thereof, such laborer, workman or mechanic is paid less than said stipulated rate for any work done under this Contract by the Contractor or by any subcontractor under Contractor. Owner may withhold additional funds as appropriate when confronted with wage rate violations.

105.4 BONDS

All Proposals shall be accompanied by a certified cashier's check (or BID BOND) upon a national or state bank in the amount of five percent (5%) of the Total Maximum Bid Price payable without recourse to City of Lago Vista, or a Bid Bond in the same amount from a reliable Surety company as a guarantee that Bidder will enter into a contract and execute Performance Bond within ten (10) days after Notice of Award of Contract to him.

If the Contract amount is greater than $25,000 but less than or equal to $100,000, only a Payment Bond in 100% of the Contract amount is mandatory; provided, however, that the bidder receiving the award may elect to furnish a Performance Bond in the same amount if the bidder so chooses. Provided however, if the Contract price is less than $50,000.00, the Bidder shall have the option of providing a Letter of Credit in lieu of a Payment Bond, said Letter of Credit to be in a form acceptable to City of Lago Vista.

If the amount of the Contract, including OWNER-accepted alternates and allowances, if any, is greater than $100,000, Performance and Payment Bonds in amount of 100% of the Contract amount are mandatory and shall be provided by the bidder receiving the award.

If the Contract amount is less than $50,000, the bidder receiving the award may elect not to provide Performance and Payment Bonds, or a Letter of Credit; provided that in such event, no money will be paid to the CONTRACTOR until final completion and acceptance of all work by OWNER. If the bidder receiving the award elects to provide Performance and Payment Bonds in 100% of the Contract amount, progress payments will be disbursed in accordance with the applicable contract provisions. CONTRACTOR shall not begin any Work on this Project until all bonds and required insurance have been furnished by Contractor and approved by Owner. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents.

All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as

published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

105.4.A. Surety Bonds

With the execution and delivery of the Contract, the CONTRACTOR shall furnish and file with the OWNER in the amounts herein required, the surety bonds specified hereunder. Without exception, the OWNER'S bond forms must be used, and exclusive venue for any lawsuit in connection with such bonds shall be specified as the county in which the OWNER's principal office is located. Such surety bonds shall be in accordance with the provisions of Texas Government Code, Chapter 2253, as amended, and Article 7.19-1 of the Insurance Code, as amended. These bonds shall automatically be increased by the amount of any change order or supplemental agreement which increases the Contract price with or without notice to the surety, but in no event shall a change which reduces the Contract amount reduce the penal amount of such bonds. If performance and payment bond forms are included in the bid documents, these forms shall be used with this Contract.

All sureties must be listed as approved sureties by the U.S. Department of Treasury. In the event any surety on the bonds becomes insolvent or is otherwise unable to perform its obligations under the bonds, the CONTRACTOR shall provide substitute bonds or equivalent security satisfactory to the OWNER to protect the interests of OWNER and of persons furnishing labor and materials in the prosecution of the Work.

105.4.B. Performance Bond

A good and sufficient bond in an amount not less than 100-percent of the approximate total amount of the Contract, as evidenced by the proposal tabulation, or, conditioned on the faithful performance of the work in accordance with the plans, specifications and Contract documents, including performance of any guarantees or warranties required by OWNER, and including any extensions thereof, for the protection of the OWNER. This bond shall provide for the repair and/or replacement of all defects due to faulty materials and workmanship that appear within a period of one year from the date of completion and acceptance of the improvement by the OWNER or such lesser or greater period as may be designated in the Contract documents.

105.4.C. Payment Bond

Bond shall be in an amount not less than 100-percent of the approximate total amount of the Contract, as evidenced by the proposal tabulation, or otherwise solely for the protection and use of payment bond beneficiaries who have a direct contractual relationship with the prime CONTRACTOR, or a subcontractor to supply public work labor or material.

105.4.D. Maintenance Bonds

If required, Contractor shall provide a Maintenance Bond in the amount of 100 percent of the Contract Price. This Bond shall become effective on the date of Substantial Completion for all or any part of the project, and shall remain in effect for a period of two (2) years after the date of Substantial Completion for any roadway work, or any other work as indicated in the contractual documents, except as provided otherwise by Laws or Regulations. Surety for the Maintenance Bond shall meet the same requirements as for Performance and Payment Bonds set forth in this section. Specific requirements for this Maintenance Bond shall be as established in the Agreement.

105.4.E. Additional Bonds

If at any time the OWNER is, or becomes, dissatisfied with any surety on a performance, or payment bond, the CONTRACTOR shall, within five days after notice from the OWNER, substitute an acceptable bond (or bonds}, or provide an additional bond, in such form and sum as requested, and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such bonds shall be paid by the CONTRACTOR without recourse to the OWNER. No further payments under the Contract shall be deemed due or payable until the substitute or additional bonds have been furnished to and accepted by the OWNER.

105.4.F. Developer Bonds

In order to insure that it might not incur liabilities, the City may require, before it gives approval of the plans for development, that the owner of said development shall provide sufficient surety bond(s) to guarantee that claims against such development, in the event of default, shall be satisfied. Such bonds shall be no less than 100-percent of the Developer-CONTRACTOR contract amount.

105.4.G. Sureties

No sureties shall be accepted by the OWNER who are now in default or delinquent on any bonds or who are interested in any litigation against the OWNER. All bonds shall meet the applicable requirements of Article 7.19-1, Texas Insurance Code and Chapter 2253, Texas Government Code, shall be made on forms furnished by the OWNER, and shall be executed by not less than one corporate surety authorized to do business in the State of Texas and acceptable to the OWNER. Each bond shall be executed by the CONTRACTOR and surety. Each surety shall designate on the bond the name, address and phone number of a representative for the surety located in a county of the State of Texas acceptable to the OWNER to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such surety. The OWNER reserves the right to reject any and all sureties.

105.5 INSURANCE

Any insurance policies required under this Item may be written in combination with any of the others, where legally permitted, but none of the specified limits may be lowered or otherwise negatively impacted by doing so, nor may any of the requirements or special provisions of this Item be limited or circumvented by doing so.

105.5.A. Contractor's Insurance

Without limiting any of the other obligations or liabilities of the CONTRACTOR, during the term of the Contract the CONTRACTOR and each subcontractor at its own expense shall purchase and maintain the herein stipulated minimum insurance with companies duly approved to do business in the State of Texas and satisfactory to the OWNER. Certificates of each policy shall be delivered to the OWNER before any work is started, along with a written statement from the issuing company stating that said policy shall not be canceled, non-renewed or materially changed without 30 days advance written notice being given to the OWNER, except when the policy is being canceled for nonpayment of premium, in which case 10 days advance written notice is required. Prior to the effective date of cancellation, the CONTRACTOR must deliver to the OWNER a replacement certificate of insurance or proof of reinstatement. The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor which entitles the Owner to declare the Contract void if the Contractor does not remedy the breach within ten days after receipt of notice of breach from the Owner. Coverage shall be of the following types and not less than the specified amounts:

1. **Workers' Compensation** as required by Texas law, with the policy endorsed to provide a waiver of subrogation as to the OWNER; employer's liability insurance of not less than $500,000 for each accident, $100,000 disease - each employee, $500,000 disease - policy limit.
   Contractor hereby represents to the Owner that all employees of the Contractor who will provide services on the Project will be covered by worker's compensation coverage for the duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the Texas Worker's Compensation Commission, Division of Self-Insurance Regulation. Providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

   The policy shall contain the following endorsements in favor of Owner:
   a. Waiver of Subrogation, form WC 420304; and
   b. 30-day Notice of Cancellation, form WC 420601.

The following is the form of notice of worker's compensation coverage prescribed by the Texas Worker's Compensation Commission. Pursuant to Section 110.110(d)(7), this notice must be printed with a title in at least 30-point bold type, and text in at least 19-point normal type, and shall be in both English and Spanish and any other language common to the worker population.

The Contractor shall contractually require each person with whom it contracts to provide services on the Project to Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of the Texas Labor Code, Section 401.011(44) for all of its employees providing services on the Project, for the duration of the Project. That person or entity shall provide prior to beginning work a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the Project, for the duration of the Project. This section's intent is to apply all requirements set forth for Contractor to all subcontractors, whether entities or persons with whom the CONTRACTOR has entered into a contract.

REQUIRED WORKER'S COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by worker's compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee." "Call the Texas Worker's Compensation Commission at (512) 440-3789 to receive further information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

2. **General liability insurance**, including independent CONTRACTOR'S liability, completed operations and contractual liability, covering, but not limited to, the liability assumed under the indemnification provisions of this Contract, fully insuring CONTRACTOR'S (or subcontractor's) liability for injury to or death of OWNER'S employees and third parties, extended to include personal injury liability coverage with damage to property of third parties, with minimum limits as set forth in the Contract Documents.
   Contractor's Liability Insurance shall also include completed operations and product liability coverage and eliminate the exclusion with respect to property under the care, custody and control of Contractor:
   a. General Aggregate (Except Products -Completed Operations) of $100,000;
   b. Each Occurrence Bodily Injury of $300,000;
   c. Property Damage Each Occurrence of $25,000. Property Damage liability insurance will provide Explosion, Collapse and Underground coverage where applicable.
   d. OWNER listed as an additional insured, endorsement CG 2010.
   e. 30-day notice of cancellation in favor of Owner, endorsement CG 0205.
   f. Aggregate limits of insurance per project, endorsement CG 2503.
   g. Waiver of Transfer of Recovery against Others in favor of Owner, endorsement CG 2404.
   h. Independent Contractors coverage.
3. **Business Automobile Liability Insurance**, covering owned, hired, and non-owned vehicles, with a bodily injury (including death) minimum combined single limit of $500,000 per occurrence for bodily injury and property damage. Alternate acceptable limits are $250,000 bodily injury per person, $500,000 bodily injury per occurrence and at least $100,000 property damage liability each accident.
   Such insurance shall include coverage for loading and unloading hazards.
   The policy shall contain the following endorsements in favor of Owner:
   a. Waiver of Subrogation endorsement TE 2046A;
   b. 30-day Notice of Cancellation endorsement TE 0202A; and
   c. Additional Insured endorsement TE 9901 B, naming City of Lago Vista, its Aldermen, officers, officials and employees as additional insured.
4. **Owner's Liability Insurance**: CONTRACTOR shall obtain, pay for and maintain at all times during the prosecution of the work under this Contract an OWNER's protective liability insurance policy naming the OWNER and the Design Engineer as insures for property damage and bodily injury, which may arise in the prosecution of the work or CONTRACTOR'S operations under this Contract. Coverage shall be on an "occurrence" basis, and the policy shall be issued by the same insurance company that carries the

CONTRACTOR's liability insurance with a combined bodily injury and property damage minimum limit of $600,000 per occurrence and $1,000,000 aggregate.

5. **"Umbrella" Liability Insurance:** If required by OWNER, CONTRACTOR shall obtain, pay for and maintain umbrella liability insurance during the Contract term, insuring CONTRACTOR for an amount of not less than $1,000,000 per occurrence combined limit for bodily injury and property damage that follows form and applies in excess of the primary liability coverage required hereinabove. The policy shall provide "drop down" coverage where underlying primary insurance coverage limits are insufficient or exhausted. OWNER and Engineer shall be named as additional insurers.
6. **Railroad Protective Insurance:** When required in the Special Provisions, CONTRACTOR shall obtain, maintain and present evidence of railroad protective insurance (RPI). The policy shall be in the name of the railroad company having jurisdiction over the right-of-way involved. The minimum limit of coverage shall meet the specifications provided by the railroad company. The OWNER shall specify the amount of RPI necessary.

105.5.B. Insurance Requirements

Insurance to provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance and furnishing of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed or furnished by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable. Insurance furnished by the CONTRACTOR shall be in accordance with the following requirements:

1. Any policy submitted shall not be subject to limitations, conditions or restrictions deemed inconsistent with the intent of the insurance requirements to be fulfilled by the CONTRACTOR. The OWNER'S decision thereon shall be final.
2. Policies are to be written through companies duly licensed to transact that class of insurance in the State of Texas.
3. All liability policies required herein shall be written with an "occurrence" basis coverage trigger.
4. Companies issuing the insurance policies and CONTRACTOR shall have no recourse against the OWNER for payment of any premiums or assessments for any deductibles, as all such premiums and deductibles are the sole responsibility and risk of the CONTRACTOR.
5. Approval, disapproval or failure to act by the OWNER regarding any insurance supplied by the CONTRACTOR (or any subcontractors) shall not relieve the CONTRACTOR of full responsibility or liability for damages and accidents as set forth in the Contract documents. Neither shall the bankruptcy, insolvency or denial of liability by the insurance company exonerate the CONTRACTOR from liability.
6. No special payments shall be made for any insurance that the CONTRACTOR and subcontractors are required to carry; all are included in the Contract price and the Contract unit prices.
7. The CONTRACTOR shall retain all required certificates of insurance for the duration of the project and for one year thereafter and shall have the responsibility of enforcing insurance requirements among its SUBCONTRACTORS. The CITY shall be entitled, upon request and without expense, to receive copies of these certificates.

105.5.C. Owner's Property Insurance

OWNER shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR, Subcontractors or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount, will be borne by CONTRACTOR, Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the site, OWNER shall in writing, advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

105.6 CONTRACT EXCECUTION

The CONTRACTOR shall within 10 business days after receipt of the Contract sign the necessary agreements entering into the required Contract with the OWNER. The failure of the CONTRACTOR to execute the Contract or provide the required statutory surety bonds within 10 business days after the Contract is received shall constitute a breach of its proposal and the OWNER may annul the award and retain the proceeds of the bid security. In the event the OWNER should re-advertise for bids, the defaulting CONTRACTOR may not be eligible to bid.

105.6.A. Intent of Contract Documents

The intent of the documents, unless otherwise specifically provided, is to produce complete and finished work, which the CONTRACTOR undertakes to do in full compliance with the Contract documents. It is not intended to mention every item of work in the specifications that can be adequately shown on the drawings, nor is it to show on the drawings all items of work described or required by the specifications. All materials or labor for work shown on the drawings or reasonably inferable therefrom as being necessary to produce a finished job shall be provided by the CONTRACTOR whether or not same is expressly covered in the specifications. No verbal conversation, understanding or agreement with any officer or employee or agent of the OWNER, either before or after the execution of the Contract, shall affect or modify any of the terms, conditions or obligations contained in the Contract documents.

105.6.B. Notice to Proceed

Upon OWNER receipt of the executed Contract and the required insurance and surety bonds, a notice to proceed shall be issued by the OWNER indicating the date upon which the Contract time shall start and the projected date of completion. The OWNER will attempt to provide the work order within the time specified in the plans. The CONTRACTOR shall commence work within 10 days from the date specified in the written work order. No work shall commence before the notice to proceed has been issued. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity or discrepancy in the Contract Documents, unless CONTRACTOR knew or reasonably should have known thereof.

105.6.C. Delay of Contract

The CONTRACTOR shall not be entitled to any claim for damages due to delay in the award or work order. If the CONTRACTOR encounters any delay occasioned by the OWNER's failure or inability to obtain right-of-way or is delayed by the relocation or removal of any of the utilities or other installations of similar kind, the CONTRACTOR shall not be entitled to any claim for damages by virtue of any delay. Should the OWNER unreasonably delay the issuance of the work order through no fault of the CONTRACTOR, the CONTRACTOR shall be entitled only to an equitable extension of Contract time, the Contract amount to remain unchanged.

1. **Force Majeure:** A delay in the completion of the Work that arises from one or more of the following events shall be considered an excused delay provided notice is given as provided herein: unforeseeable causes beyond the control and without the fault or negligence of the Contractor or its subcontractors or suppliers, including but not restricted to, acts of God, acts of the public enemy, acts of terrorism, acts of federal, state or local government in its sovereign capacity, acts of Owner, fires, floods, epidemics, quarantines, freight embargoes, unusually severe weather (excluding delays caused by above-average but not excessive rainfall), or delays of Owner as described in subsections below, delays of subcontractors or suppliers at any time arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or subcontractors or suppliers performing Work under this Contract (provided, however, that failure to order supplies, materials or equipment when shortages are known or expected, in time to perform the Work in accordance with the Contract Documents, is not excused.)

The Contractor, within a reasonable period of time, but in no event more than 14 days from the beginning of any such delay (unless Contracting Officer grants a further period of time), notifies Contracting Officer or OWNER in writing of the causes of delay to enable Owner to investigate and document the cause and duration of the delay. The Contractor shall submit with each application for payment a "Time Extension Request" form (provided by the Project Manager) documenting any requests for Contract time extension. The form shall be submitted even if no time extension is requested.

2. **Delay for Weather Conditions:** The Contract Time set out in the Contract Documents, including Substantial Completion Date and Final Completion Date, are deemed to include normal weather conditions at the Project site. The Contractor may be entitled to an excused delay due to unusual and severe weather conditions if the weather conditions are (a) excessive and severe for the period of time, (b) could not have been reasonably anticipated, (c) had an adverse effect on the scheduled construction, and (d) Contractor reasonably performed other Work on the Project in place of the scheduled work and still incurred a delay in the construction schedule. In order to be entitled to a delay on this basis, Contractor must provide OWNER with notice of the delay (as provided herein) and data substantiating the claim, including weather information issued by the National Oceanic and Atmospheric Administration ("NOAA") for the City in which the Project is located (or if such information is not available for the Project location, then for the closest City) which shows that the weather conditions were in excess of those that are normal for the site, and job logs that indicate impacted work and estimated effect of the weather. Unless the parties agree to a different method of determining weather conditions, weather information produced by NOAA will be used to determine normal and abnormal weather conditions at the Project site.
   In order to be entitled to a Time extension due to weather conditions, Contractor must provide OWNER with notice of the adverse condition and its impact on the construction schedule as soon as Contractor becomes aware that a delay will or is likely to occur, to enable Owner to investigate and document the conditions. Such notice will be provided in writing as soon as reasonably possible but in no event later than 14 days after the date of the commencement of the weather condition giving rise to the claim for the delay.

3. Delay Caused by Owner: If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or by Engineers (other than an excused delay), or of a separate contractor employed by the Owner, then the Contractor shall promptly notify the OWNER, in writing, of such delay, to enable Owner and/or the Engineers to take action to reduce or eliminate the delay. Contractor must notify Owner and Project Manager as soon as possible after it becomes aware of the condition that it believes has caused or will be likely to cause a delay, but in no event less than 7 days after it becomes aware of such condition. Contractor's failure to do so will constitute a failure to mitigate damages and a waiver of Contractor's claim as provided under the terms of the Contract Documents. Owner's proper exercise of any of its remedies under the Contract Documents, including, but not limited to, remedies of suspension of the Work or requirement for correction or re-execution of any defective Work, shall not under any circumstances be construed as constituting a delay to Contractor's performance of the Work.

In the event of an excused delay under this Section, the Contractor shall submit with each application for payment a "Time Extension Request" form (provided by the OWNER) documenting any requests for Contract Time extension. The form shall be submitted even if no time extension is requested. Project Manager will provide Contractor with a reasonable period of extension of the Contract Time as may be equitable, provided that all conditions for obtaining an extension are met. The time extension will be set out in a Change Order. Any such extension of the Contract Time shall be net of any unexcused delays caused by or due to the fault of Contractor or anyone performing Work under the Contract.

Any provision of the Contract Documents to the contrary notwithstanding, it is expressly agreed that the extension of the Contract Time shall be Contractor's sole remedy for any delay unless the same shall have been

caused by acts constituting interference by the Owner which interfered with Contractor's performance of the work, and then only to the extent that such acts continue after Contractor's written notice to Owner of such interference. Owner's exercise of any of its rights or remedies under the contract documents, including the right to suspend the Work or to require correction or re-execution of any defective Work shall not under any circumstances be construed as interference with Contractor's performance of the Work.

105.6.D. Modification of Contract

The OWNER reserves the right to make changes in the quantities of the work, as may be considered necessary or desirable and such changes shall not be considered as waiving or invalidating any conditions or provisions of the Contract or bonds. The CONTRACTOR shall perform the work as altered, whether increased or decreased, and no allowances shall be made for anticipated profits.

1. **Increased or Decreased Quantities of Work:** The OWNER reserves the right to decrease the work under this Contract. Payment to the CONTRACTOR for the Contract items shall be made for the actual quantities of work performed and material furnished at the unit prices set forth in the Contract, except as provided below:
   - **a.** When the quantity of work to be done or of materials to be furnished under any major item of the Contract is more than 125 percent or less than 75 percent of the quantity stated in the Contract, then either party to the Contract, upon demand, shall be entitled to negotiate for revised consideration on the portion of work above 125 percent of the quantity stated in the Contract.
   - **b.** Any revised consideration shall be paid for as is hereinafter provided under Payment for Extra Work Item. The foregoing notwithstanding, the total original Contract amount shall not be increased more than 25 percent; the CONTRACTOR, by submission of a bid and execution of the Contract, is deemed to consent to the OWNER's right to reduce the total original Contract amount by more than 25 percent. This would not be applicable to the Additional Bid Items which are used on a per need basis. The OWNER may increase or decrease these items without reserve.
2. **Alteration of Plans and Specifications:** The OWNER reserves the right to make such changes in the plans and specifications and in the character of the work as may be necessary or desirable to insure completion in the most satisfactory manner, provided such changes do not materially alter the original plans and specifications or change the general nature of the work as a whole. Such changes shall not be considered as waiving or invalidating any condition or provision of the Contract and bonds. Such changes shall be issued by the Engineer.
3. **Extra Work:** When any work is necessary to the proper completion of the project and for which no prices are provided for in the proposal and Contract, the CONTRACTOR shall do such work, but only when and as ordered in writing by the Engineer. Extra Work is further explained in Item for Payment of Extra Work and Item for Disputed Work and Claims for Additional Compensation.
4. **Differing Site Conditions:** During the progress of the work, differing subsurface or latent physical conditions may be encountered at the site. The two types of differing site conditions are defined as: differ materially from those indicated in the Contract and unknown physical conditions of an unusual nature differing materially from those ordinarily encountered or not anticipated and generally recognized as inherent in the work provided for in the Contract. Engineer shall be notified if differing site conditions are encountered. Unless directed otherwise, suspend work on the affected items and leave the site undisturbed. The Engineer shall make a determination whether differing site conditions exist. CONTRACTOR has the right to investigate site, perform any form of exploratory search at own expense prior to bids opening, provided that such investigation does not constitute a nuisance to OWNER or public, interrupt routine operations, or cause adverse impact of any form. The OWNER, or its representative, has the right to reject any differing site conditions claim if such conditions could have been determined with prior investigation by the CONTRACTOR.

   The Project Manager/Engineer will observe the Work for general compliance with the Contract Documents. The Project Manager/Engineer will initiate Change Order Requests and evaluate the Contractor's proposed cost and related time, and develop Construction Change Directives. The Contractor shall provide proposed costs and time for Change Order Requests as soon as possible, but not more than 20 days, after receipt of the Change Order request from the OWNER. The OWNER will conduct inspections to determine the date or dates of Substantial Completion and the date of Final

Completion. The Project Manager in conjunction with the Design Engineer will review, upon receipt from the Contractor, the as-built drawings, written warranties, owner's manuals and related documents required by the Contract.

5. **Finality of Change Orders:** In addition to the OWNER, the CONTRACTOR shall sign the Change Order Documents to verify the terms and conditions established by the Change Order; however, failure or refusal of the CONTRACTOR to sign a Change Order shall not relieve the CONTRACTOR of its obligation to execute the proposed changes in accordance with this Item and the other terms and provisions of this Contract. Each Change Order shall be specific and final as to prices and the extension of time, if any, and no reservations or other provisions allowing for future additional money or time as a result of the particular changes identified and fully compensated in the Change Order.

105.6.E. Change Orders

Owner and Contractor may at any time, without notice to or approval of the Surety, by written Change Order hereto, make changes in the Work, the Contract Amount, the Contract Time, or otherwise modify the Contract. If applicable unit prices are contained in the Agreement, the Owner may require the Contractor to proceed with the desired unit prices specified in the Contract; provided that in case of a unit price contract the net value of all changes does not increase the original total amount of the agreement by more than twenty-five percent (25%) or decrease the original total amount by eighteen percent (18%).

Any provision in the Contract Documents to the contrary notwithstanding, in the event Contractor receives an order, directive, instructions, or other communication regarding the Work from Owner or Engineers that Contractor believes will result in a change in the scope of Work, the Contract Time and/or the Contract Amount, Contractor shall promptly notify the person making the request, and the OWNER that the requested change will result in an increase in the Contract Time and/or Contract Amount before undertaking the Work. Contractor may not perform the Work unless and until it receives a written Change Directive from OWNER. Failure of CONTRACTOR to follow this requirement will constitute a waiver by Contractor of the right to obtain additional time or additional payment for the work. This provision shall not apply to instructions given by Owner or Engineer in an emergency situation to prevent or address an imminent threat of injury to persons or damage to property, or action taken by Contractor in accordance with Section for Emergencies.

105.7 EXTRA WORK CLAIMS

Except where otherwise provided in the Contract Documents, claims by the CONTRACTOR, whether for damages, additional compensation, additional time or other reasons must be made by written notice to the OWNER within fourteen days after occurrence of the event or events giving rise to the particular claim. Every claim, whether for damages, additional compensation, additional time or other reasons shall be signed and sworn to by an authorized corporate officer (if not a corporation, then an official of the company authorized to bind the CONTRACTOR by his or her signature) of the CONTRACTOR, verifying the truth and accuracy of the claim. Such verification shall be a condition precedent to the acceptability of any claim asserted by the CONTRACTOR. The CONTRACTOR shall be deemed to have waived any claim not made strictly in accordance with the procedure and time limits set out in this paragraph.

105.7.A. Disputed Work Compensation Claims

If the CONTRACTOR is of the opinion that:

1. Certain work necessary or required to accomplish the result intended by this Contract or certain work ordered to be done as contract work by the OWNER is actually Extra Work and not CONTRACTOR work, or
2. any determination or order of the OWNER violates the terms and provisions of this Contract.

CONTRACTOR shall promptly, either before proceeding with such work or complying with such order or determination, notify the OWNER in writing of its contentions with respect thereto and request a final determination by the OWNER. Such determination of the OWNER shall be given in writing to the CONTRACTOR. If the OWNER determines that the work in question is Extra Work and not Contract work, or that the order complained of requires performance by the CONTRACTOR beyond that required by the Contract, or violates the

terms and provisions of the Contract, thereupon the OWNER shall cause either (a) the issuance of a written order covering the Extra Work as provided for Change or Modification of Contract hereof, or (b) the determination or order complained of to be rescinded or so modified so as to not require performance beyond that required by the terms and provisions of the Contract.

If written notice is not given, the Contractor waives the right to additional compensation unless the circumstances could have reasonably prevented the Contractor from knowing the cost impact before performing the work. Notice of the request and the documentation of the costs will not be construed as proof or substantiation of the validity of the request. Submittal of the request shall be in sufficient detail to enable the Engineer to determine the basis for entitlement, adjustment in the number of working days specified in the Contract, and compensation.

If the OWNER determines that the work in question is Contract work and not Extra Work, or that the determination or order complained of does not require performance by the CONTRACTOR beyond that required by the Contract or violate the terms and provisions of the Contract, the OWNER shall direct the CONTRACTOR to proceed, and the CONTRACTOR must promptly comply. In order to reserve its right to claim compensation for such work resulting from such compliance, however, the CONTRACTOR must, within fourteen (14) days after receiving the OWNER'S determination and direction, notify the OWNER in writing that the work is being performed, or that the determination and direction is being complied with. The CONTRACTOR must note on notice if the claimed Extra Work is still under protest or if the claim has been dropped by the CONTRACTOR. If the Extra Work claim has been dropped, the CONTRACTOR may not reinstate that same claim. Payment, if any is due, shall be made when the OWNER makes a final determination regarding the merit of the CONTRACTOR's protest.

If the CONTRACTOR fails to so appeal to the OWNER for a determination or, having so appealed, should the CONTRACTOR thus fail to notify the OWNER in writing of its protest, the CONTRACTOR shall be deemed to have waived any claim for extra compensation of damages therefore. No oral appeals or oral protests, no matter to whom made, shall be deemed even substantial compliance with the provisions of this item.

A delay of the CONTRACTOR due to a court order against the OWNER, or due to the OWNER's failure to secure right-of-way at the time required or because of a conflict of a utility with the work, shall not be cause for additional compensation for damages sustained by the CONTRACTOR, but may be a cause for extension of Contract working time only.

Unless the aforesaid requirements and conditions have been complied with by the CONTRACTOR, the OWNER shall be released from all claims arising under, relating to or by reason of this Contract, except for the sums to be due under the payment provisions of this Contract. It is further stipulated and agreed that no conduct on the part of the OWNER or any agent or employee of the OWNER shall ever be construed as a waiver of the requirements of this section, when such requirements constitute an absolute condition precedent to any approval of any claim for extra compensation, notwithstanding any other provisions of the Contract documents; and in any action against the OWNER to recover any sum in excess of the Contract amount, the CONTRACTOR must allege and prove strict compliance with the provisions of this section. The CONTRACTOR shall, upon notice from the OWNER, produce for examination and audit at the CONTRACTOR's office, by the representatives of the OWNER, all its books and records showing all of its acts and transactions in connection with contractual performance as well as relating to or arising by reason of the matter in dispute.

The cost for extra work performed by Contractor or Subcontractor will be determined by either: 1) an agreed lump sum, 2) an agreed unit price, or 3) an actual field cost as agreed to by the Owner.

The Contractor and Subcontractor will be allowed mark-up percentages for overhead and profit for changes in the Work as described below, unless the Agreement sets forth different provisions for determining overhead and profit. In the event of a conflict, the provisions of the Agreement shall control. The maximum allowable mark-up percentage of the actual cost of the Work will be 15% on the first $20,000 and 10% on the balance over $20,000.

If subcontracted work is involved, the Contractor will include with Contractor’s cost proposal a detailed breakdown for the Subcontractor in accordance with the above requirements for the Contractor. The Subcontractor will be allowed the same mark-up percentages as provided above for the Contractor. The Contractor will be allowed the following mark-up on subcontracted work: a maximum of 8% on the first

$30,000, and 5% on the balance over $30,000. Under no circumstances will the OWNER be obligated to accept any change orders requested by the contractor.

If the scope of Work is reduced by the Owner such that the Contractor will not incur costs for deleted Work, the Contractor will credit those costs to the Owner and retain only Contractor's overhead and profit incurred prior to notification of Owner's reduction of the scope of the Work. If extra Work is requested by the Owner, the Contractor will be allowed to add to Contractor's actual costs a percentage as noted above to cover Contractor's overhead and profit. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

105.7.B. Additional or Extra Work Compensation Claims

While the CONTRACTOR or any subcontractor is performing Extra Work or complying with a determination or order under protest in accordance with Disputed Work and Claims for Additional Compensation Item (the cost of which shall also be determined by the method set out as aforementioned), the CONTRACTOR shall daily furnish the Engineer or other representative of the OWNER at the project site with three copies of verified statements showing:

1. The name and number of each worker, foreman, timekeeper, mechanic, or laborer employed on Extra Work or engaged in complying with such determination or order, the character of Extra Work each is doing and the wages paid to him or her, including the rate and amount of payroll taxes, contribution for insurance and federal social security.
2. The nature, cost and quantity of any materials, supplies, tools, plant or construction equipment furnished or used in connection with the performance of the Extra Work or in complying with such determination or order, and from whom purchased or rented.

A copy of such statements shall be signed by the OWNER's representative, noting thereon any items in question, and shall be returned to the CONTRACTOR within two working days after submission. This signature shall not be construed as the OWNER's agreement and acceptance of items not questioned since all items are subject to subsequent review and audit by OWNER representatives. The CONTRACTOR and its subcontractors, when required by the OWNER, must also produce for inspection and audit by designated OWNER representatives, any and all of their books, vouchers, records, daily job diaries and reports, canceled checks, etc. showing the nature and quantity of labor, materials and equipment actually used in the performance of the Extra Work; the amounts expended therefore; and the costs incurred for insurance premiums and other items of expense directly chargeable to such Extra Work. The CONTRACTOR must permit the OWNER'S representatives to make extracts there from or copies thereof as may be desired. Failure of the CONTRACTOR to comply strictly with these requirements shall constitute a waiver of any claim for extra compensation on account of the performance of such Extra Work. OWNER (or representative) may require the CONTRACTOR at that time to sign document that they are not willing to provide all required information.

105.7.C. Cleanup

Upon completion of the work, CONTRACTOR shall remove litter, debris, objectionable material, temporary structures, excess materials, and equipment from the work locations. Clean and restore property damaged by the Contractor's operations during the prosecution of the work. Leave the work locations in a neat and presentable condition. This work will not be paid for directly but will be considered subsidiary to Items of the Contract. Remove from the right of way cofferdams, construction buildings, material and fabrication plants, temporary structures, excess materials, and debris resulting from construction.

Where work is in a stream, remove debris to the ground line of the bed of the stream. Leave stream channels and rights of way in a neat and presentable condition. Clean structures to the flow line or the elevation of the outfall channel, whichever is higher. Dispose of all excess material in accordance with federal, state, and local regulations.

The Contractor shall remove all spillage and tracking arising from the performance of the Work from such areas, and shall establish a regular maintenance program of sweeping and hosing to minimize accumulation of dirt and dust upon such areas. Contractor's construction of the Work shall include removal of spatters and spills from materials and landscaping shall be neat and plants and grass installed as part of the Project shall be healthy and in good condition, and exterior surfaces shall be clean, neat, and free of debris. If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

The aforementioned site cleanup shall be done regardless whether there is a pending claim against the OWNER. The OWNER reserves the right to withhold a minimum payment of 10 (ten) percent of total contract price up to a maximum of 25 (twenty five) percent of total contract price from the contractor if OWNER has deemed the site improperly clean, safe, or fully finished per design drawings, general specifications, and special condition specifications.

106 CONTROL OF WORK

106.1 INTRODUCTION

This section shall be used in reference to coordination between different entities whether implicitly or explicitly involved or named into contractual documents. With exception to litigations and claims, the following nomenclature shall be used as a guide in general coordination with entities and peoples such as but not limited to the OWNER, inspectors, and franchise utility companies.

106.2 CONTRACT DOCUMENTS

106.2.A. Authority of Engineer

The Engineer has the authority to observe, test, inspect, approve, and accept the work. The Engineer decides all questions about the quality and acceptability of materials, work performed, work progress, Contract interpretations, and acceptable Contract fulfillment. The Engineer has the authority to enforce and make effective these decisions. The Engineer acts as a referee in all questions arising under the terms of the Contract. The Engineer's decisions will be final and binding.

The Project Manager does not have the authority to execute Change Orders or agree to changes in the Work which affect the Contract Amount or the Contract Time. These changes must be approved by the City Engineer or City Manager and in some cases the City Council. The City may delegate any part of his respective functions hereunder, but the Contractor will be notified in writing of any such delegation and the extent thereof.

106.2.B. Priority of Contract Documents

The Contract documents are complementary and what is called for by any one shall be as binding as if called for by all. In case of conflict between Contract documents, priority of interpretation shall be in the following order: OWNERS written changes, signed agreement (or Contract), performance and payment bonds, proposal, special provisions (or conditions}, advertisement for bids (or invitation to bidders, or request for proposals), project (or Contract) drawings, Technical Construction Standard Specifications, and Standard Details.

106.2.C. Contract Documents and Specifications

The OWNER shall furnish the CONTRACTOR, without charge, a minimum of one copy of the Contract and any supplemental drawings and specifications reasonably necessary for the proper execution of the work. At least one copy of all drawings and specifications shall be accessible at all times to the OWNER at the job site.

The plans, the specifications, the proposal, special provisions and all supplementary documents are intended to describe a complete work and are essential parts of the Contract. All requirements occurring in any of them are binding. In cases of discrepancies, figured dimensions shall govern over scaled dimensions; plans shall govern over Standard Specifications, special provisions shall govern over both plans and Standard Specifications. All other provisions of the Standard Specifications shall remain in force.

106.2.D. Supplemental Drawings and Specifications

In order to carry out the intent of the Contract documents and to assist the CONTRACTOR in performing its work, the OWNER, after the execution of the Contract, may, by supplemental drawings, specifications or otherwise, furnish additional information or instructions as may be necessary for construction purposes.

All such supplemental drawings, specifications or instructions are intended to be consistent with the Contract documents and reasonably inferable therefrom. The OWNER, or design Engineer, may charge the CONTRACTOR for submittal of additional copies deemed not necessary to complete the work per the contractual documents. no The OWNER shall not charge extra costs on a claim that particular supplemental drawings, specifications or instructions differ from the requirements of the Contract documents, incurring extra costs, unless the CONTRACTOR has first brought the matter, in writing, to the OWNER'S attention for adjustment before proceeding with the work covered by such.

If the OWNER shall decide that there is no departure from the requirements of the Contract documents, the CONTRACTOR shall then proceed with the work as shown, specified or directed. If the OWNER shall decide that extra work is involved, OWNER shall so modify the supplemental drawings, specifications or instructions to

eliminate the extra work, or cause a written change order to be issued in accordance with Item for Change or Modification of Contract herein.

106.2.E. Referenced Standards

All referenced State, Federal, and National standards, their most current version in effect, unless specifically noted otherwise shall be followed unless they fall in direct contradiction to the standards written herein. In case of conflict the CONTRACTOR shall notify the OWNER and obtain guidance prior to proceeding with work. Referenced standards may include, but are not limited to, publications such as TxDOT Standard Specifications for Construction of Highways, Streets and Bridges, TxDOT Manual of Testing Procedures, Federal Specifications, ASTM designations, AWWA standards, and standards of other professional societies and associations.

106.2.F. Contract Document Errors and Corrections

The Engineer shall be permitted to make such corrections or interpretations as may be necessary for the fulfillment of the intent of the Contract documents. The CONTRACTOR shall not take advantage of any apparent errors, omissions or discrepancies in the drawings or specifications. In case of any errors, omissions or discrepancies in the drawings or specifications, the CONTRACTOR shall promptly submit the matter to the OWNER who, in turn, shall promptly make a determination and issue the necessary instructions in writing. Any adjustment by the CONTRACTOR without this determination and instructions shall be at the CONTRACTOR's own risk and expense. The work is to be made complete as intended by the Contract Documents.

106.2.G. Plans and Shop Drawings

The Engineer may provide working drawings to supplement the plans with all necessary details not included on the Contract plans. The CONTRACTOR shall be permitted also to provide working drawings (sometimes referred to as shop drawings) as directed in the Contract Documents to supplement the plans with all necessary details not included on the Contract plans. Working drawings shall be prepared and furnished in a timely manner and obtain approval, if required, before the beginning of the associated work. For all working drawing submittal requirements, the Engineer may allow electronic and other alternative submission procedures.

“Shop Drawings” or “working drawings” means drawings, diagrams, schedules, and other data, which are prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work. “Samples” means physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to assist in the establishment of standards by which the Work will be judged.

Working drawings shall be submitted using United States standard measures and in the English language. The routing of submittals for review and approval will be established at the preconstruction conference. The Contractor is responsible for the accuracy, coordination, and conformity of the various components and details of the working drawings. Department approval of the Contractor’s working drawings will not relieve the Contractor of any responsibility under the Contract. The work performed under this Article will not be measured or paid for directly, but will be subsidiary to pertinent Items.

1. **Purpose:** The purpose of submittals by the CONTRACTOR is to demonstrate that the CONTRACTOR understands the design concept, and that it demonstrates its understanding by indicating which equipment and materials it intends to furnish and install, and by detailing the fabrication and installation methods it intends to use. The CONTRACTOR shall be responsible for dimensions that are to be confirmed and correlated at the job site, fabrication processes and techniques of construction, coordination of its work with that of other trades and satisfactory performance its work. The CONTRACTOR shall check and verify all measurements and review submittals prior to being submitted, and sign or initial a statement included with the submittal, which signifies compliance with plans, specifications, and dimensions suitable for the application. No portion of the work requiring submission of a shop drawing, product data or sample shall be commenced until the submittal has been approved by the Engineer. All such portions of the work shall be in accordance with approved submittals.

2. **Procedure:** With reasonable promptness and in such sequence as to cause no delay in the work or in the work of the OWNER or any separate contractor, CONTRACTOR shall submit two (2) copies of shop drawings, layouts, manufacturer's data and material schedules as may be required by the Engineer for his/her review. Submittals may be checked by and stamped with the approval of the CONTRACTOR and identified as the Engineer may require. Such review by the Engineer shall include checking for general conformance with the design concept of the project and general compliance with information given in the General Contract Documents. Indicated actions by the Engineer, which may result from his/her review, shall not constitute concurrence with any deviation from the plans and specifications unless such deviations are specifically identified by the method described below, and further shall not relieve the CONTRACTOR of responsibility for errors or omissions in the submitted data. Processed shop drawing submittals are not change orders.
3. **Shop Drawing Conflicts:** If deviations, discrepancies or conflicts between submittals and the design drawings and/or specifications are discovered, either prior to or after submittals are processed, the design drawings and specifications shall govern. Any deviation from the specified criteria shall be expressly stated in writing in the submittal. The CONTRACTOR shall not be relieved of responsibility for any deviation from the requirements of the Contract documents by the Engineer's approval of shop drawings, product data or samples unless the CONTRACTOR has specifically informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation.
4. **Shop Drawing Approval:** ENGINEER will review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals accepted by ENGINEER. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER's review and approval will not extend to means, methods, techniques, sequences or procedures of construction (except where a particular means, method, technique, sequence or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by ENGINEER, and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.
5. **Shop Drawing Rejection and Delays:** The CONTRACTOR shall be responsible for delays caused by rejection of the submittal of inadequate or incorrect shop drawings, product data or samples. The CONTRACTOR shall be responsible for providing all copies of approved shop drawings necessary for the construction operations. One (1) copy of the approved submittals shall be retained by the CONTRACTOR at the job site until completion of the project and shall be available per the request of the OWNER or representative.
6. **Continuation of Work:** Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submissions accepted by ENGINEER, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by section under Claims, or as OWNER and CONTRACTOR may otherwise agree in writing.

106.3 WORKMANSHIP, WARRANTIES AND GUARANTEES

Unless otherwise expressly provided in the Contract drawings or specifications, the work shall be performed in accordance with the best modern practice with materials and workmanship of the highest quality and suitable for their purpose. The OWNER shall judge and determine the CONTRACTOR's compliance with these requirements.

106.3.A. Cooperation of Contractor

The CONTRACTOR shall cooperate with the Engineer, other Contractors, and utility and railroad companies. All work associated with fulfilling this requirement is subsidiary to the various Items of the Contract and no direct compensation will be made. Provide all information necessary to administer the Contract. Maintain at least one copy of the Contract at the work locations at all times.

Designate in writing a competent, English-speaking Superintendent employed by the Contractor. The Superintendent must be experienced with the work being performed and capable of reading and understanding the Contract. Ensure the Superintendent is available at all times and able to receive instructions from the Engineer or authorized representative and to act for the Contractor. The Engineer may suspend work if a Superintendent is not available or does not meet the above criteria.

1. **Cooperating with Utility Providers:** Use established safety practices when working near utilities. Consult with the appropriate utilities before beginning work. Notify the Engineer immediately of utility conflicts. The Engineer will decide whether to adjust utilities or adjust the work to eliminate or lessen the conflict. Unless otherwise shown on the plans, the Engineer will make necessary arrangements with the utility owner when utility adjustments are required. Use work procedures that protect utilities or appurtenances that remain in place during construction. Cooperate with utilities to remove and rearrange utilities to avoid service interruption or duplicate work by the utilities. Allow utilities access to the right of way. Immediately notify the appropriate utility of service interruptions resulting from damage due to construction activities. Cooperate with utilities until service is restored. Maintain access to fire hydrants when necessary.
2. **Cooperation between Contractors:** CONTRACTOR shall cooperate and coordinate with other Contractors working within the limits or adjacent to the limits. Cooperation shall be extended to sub-contractors, inspectors, or any other person(s) whether directly or indirectly related to the construction.
3. **Cooperating with Inspectors:** Inspectors are authorized representatives of the OWNER. Inspectors are authorized to examine all work performed and materials furnished, including preparation, fabrication, and material manufacture. Inspectors shall inform the Contractor of failures to meet Contract requirements. Inspectors may reject work or materials and may suspend work until any issues can be referred to and decided by the Engineer. Inspectors cannot alter, add, or waive Contract provisions, issue instructions contrary to the Contract, act as foremen for the Contractor, or interfere with the management of the work. Inspection or lack of inspection will not relieve the Contractor from obligation to provide materials or perform the work in accordance with the Contract. Contractor shall:
   - **a.** Provide safe access to all parts of the work and provide information and assistance to the Engineer to allow a complete and detailed inspection.
   - **b.** Give the Engineer sufficient notice to inspect the work. Work performed without suitable inspection, as determined by the Engineer, may be ordered removed and replaced at Contractor's expense.
   - **c.** Remove or uncover portions of finished but not inspected work as directed. Once inspected, restore work to Contract requirements. If the uncovered work is acceptable, the costs to uncover, remove, and replace or make good the parts removed will be paid for by the CONTRACTOR. If the work is unacceptable, assume all costs associated with repair or replacement, including the costs to uncover, remove, and replace or make good the parts removed. If the previously inspected and approved construction is modified or uncovered, the costs to uncover, remove, and replace or make good the parts removed will be paid for in accordance with Item for Changes in the Work.

106.3.B. Workmanship

If the OWNER notifies the CONTRACTOR in writing of defective work, the CONTRACTOR shall correct the deficiencies within fourteen (14) calendar days of the Notice at no additional cost to the OWNER. If the defective work is not corrected within fourteen (14) calendar days, or the CONTRACTOR is not making satisfactory progress (in the opinion of the OWNER) to correct the deficiencies, the OWNER may withhold future payments for All Work until the defective work has been corrected to the satisfaction of the OWNER.

106.3.C. General Warranty

CONTRACTOR warrants and guarantees to OWNER, ENGINEER and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by abuse, modification or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors or Suppliers; or normal wear and tear under normal usage.

CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents:

1. observations by ENGINEER;
2. recommendations of any progress or final payment by ENGINEER;
3. the issuance of a certificate of Substantial Completion or any payment by OWNER to CONTRACTOR under the Contract Documents;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any acceptance by OWNER or any failure to do so;
6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;
7. any inspection, test or approval by others; or
8. any correction of defective Work by OWNER.

Nothing written in these documents is intended to release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents. The warranty described herein binds the Contractor to repair or replace (at the option of Engineers or Owner) without cost to Owner, any Work discovered during the two year period to be out of compliance with the Contract Documents and any Work which during the two year period described herein exhibits defects in workmanship or materials or which malfunctions or fails to work correctly or in the manner intended.

The warranty provided herein will be extended by any work performed by the Contractor (or performed by the Owner or Surety in the event Contractor fails to perform its warranty obligations) in repairing or replacing non-complying or defective work or materials, so that all repaired or replaced work shall have a one year warranty from the date repairs or replacements are completed. In the event Contractor fails to comply with these provisions, Owner shall have, in addition to any other rights and remedies provided by law or the Contract Documents, the right to (1) perform the repair or replacement by its own employees or other contractor and demand reimbursement from Contractor for all amounts incurred by Owner, in which event Contractor shall pay said amounts to Owner within 30 days after demand, and/or (2) make demand on Surety to perform Contractor’s obligations.

All warranties required by the Contract Documents shall include labor and materials and shall be signed by the manufacturer and/or Subcontractor as the case may be and countersigned by the Contractor. All warranties shall be delivered to the OWNER upon completion of the Work and before the submission of request for Final Payment. At the time of final completion of the Work, the Contractor agrees to assign to the Owner any and all manufacturers' warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturers' warranties.

106.3.D. Special Warranty

If within one year after final acceptance of the work by the OWNER, as evidenced by the final certificate of acceptance or within such longer or shorter period of time as may be prescribed by law or by the terms of any other applicable special warranty on designated equipment or portions of work as required by the Contract documents, any of the work is found to be defective or not in accordance with the Contract documents, the CONTRACTOR shall correct it promptly after receipt of a written notice from the OWNER to do so. This obligation shall survive termination of the Contract. The OWNER shall give such notice promptly after discovery of the condition.

The CONTRACTOR shall remove from the site all portions of the work which are defective or nonconforming and which have not been corrected unless removal is waived in writing by the OWNER.
All subcontractors', manufacturers' and suppliers' warranties and guarantees, express or implied, respecting any part of the work and any materials used therein, shall be obtained and enforced by the CONTRACTOR for the benefit of the OWNER without the necessity of separate transfer or assignment thereof, provided that if directed by the Engineer, the CONTRACTOR shall assign such warranties and guarantees in writing to the OWNER.
Any work repaired or replaced, pursuant to this section, shall be subject to the provisions of this section to the same extent as work originally performed.

106.3.E. Owner's Rights

The rights and remedies of the OWNER provided in this section are in addition to, and do not limit, any rights or remedies afforded to the OWNER by law or any other provision of the Contract documents, or in any way limit the OWNER's right to recovery of damage due to default under the Contract.

106.4 CONSTRUCTION STAKES

Unless otherwise expressly provided in the Contract drawings or specifications, the CONTRACTOR shall be responsible for all required Construction Staking associated with the project. When applicable, Costs for Construction Staking are paid under the appropriate bid item number included in the CONTRACT DOCUMENTS. In all other cases, Construction Staking is contingent to the rest of the project.
Copies of survey notes demonstrating third order level of accuracy shall be furnished to the OWNER within two weeks after the survey completion for final stakeout of the major project components. The furnished survey notes shall include the final vertical and horizontal stakeout notes for all drainage, street paving, structural, water, or sanitary sewer improvements. Alignments shall be tied to horizontal control with sufficient calls provided to delineate centerline or alignment. The location or monumentation of any real property boundaries or easements required for construction be performed by or under the direct supervision of a Registered Professional Land Surveyor in Texas as required by article 5282c of the Vernon's Texas Civil Statutes.
The CONTRACTOR is responsible for maintaining all survey control points and monuments in the construction area at all times and any costs for re-staking or re-establishing controls required shall be borne by the CONTRACTOR.
The OWNER will perform or confirm the initial and final measurement for payment and reserves the right to field verify any stakes placed, measurements for payment made and any work performed by the CONTRACTOR.

106.5 MEANS AND METHODS OF CONSTRUCTION

The OWNER'S approval of the CONTRACTOR'S means or methods of construction, or the OWNER's failure to exercise OWNER's right to prohibit such means or methods, shall not relieve the CONTRACTOR of its responsibility for the work or of its obligation to accomplish the result intended by the Contract documents; nor shall the exercise or non-exercise of such rights to prohibit create a cause of action for damages or provide a basis for any claim by the CONTRACTOR against the OWNER.

106.5.A. Drawings Conformity

All work shall conform to the lines, grades, cross-sections, and dimensions shown on the plans. Any deviation from the plans which may be required by the emergency needs of construction will be determined and authorized in writing by the OWNER.

106.5.B. Means and Methods

Unless otherwise expressly provided in the Contract drawings, specifications or bulletins, the means and methods of construction shall be such as the CONTRACTOR may choose; subject, however, to the OWNER's right to prohibit means and methods proposed by the CONTRACTOR which in the OWNER's judgment shall:

1. constitute a hazard to the work, or to persons or property, or shall violate express requirements of applicable laws or ordinances,

2. cause unnecessary or unreasonable inconvenience to the public,
3. not produce finished work in accordance with the requirements of the Contract documents,
4. not assure the work to be completed within the time allowed by the Contract.

Where the Contract drawings, specifications or bulletins do not require the use of specific means or methods of construction, sequencing of construction or a specific traffic control plan, the CONTRACTOR shall submit its proposed plan of procedure, sequencing or traffic control plan to the OWNER sufficiently in advance of the work affected to permit a reasonable time for review and comments. The sequence of construction and traffic control plan must be approved in advance by the OWNER before construction begins. Failure to submit the proposed plan within a reasonable time shall not create a claim for damages for resulting delay in the work or for damages, nor shall it be a cause for extension of working time to complete the work. CONTRACTOR further agrees to indemnify OWNER for any cause of action brought by any third party against the OWNER.

106.5.C. Construction Zone

CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any adjacent land or areas, resulting from the performance of the Work. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

1. During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as tools, appliances, construction equipment and machinery and surplus materials. CONTRACTOR shall leave the site clean and ready for occupancy by OWNER at Substantial Completion of the Work. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.
2. CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

106.5.D. Construction Safety

CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. All persons on the Work site or who may be affected by the Work.
2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site.
3. All other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.

All damage, injury or loss to any property, caused directly or indirectly, in whole or in part, by CONTRACT, Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant or anyone employed by any of them or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier or other person or organization directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with section of Acceptance of Work that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion). OWNER may issue a stop work order if it has been observed that unsafe working conditions, methods, materials, etc. are occurring at the construction site.

106.5.E. Construction Emergencies

CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with laws or Regulations.

In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from OWNER or ENGINEER, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued to document the consequences of such action.

106.5.F. Construction Safety Plan

CONTRACTOR shall provide a Safety Plan for the Project which complies with, but is not limited to, the following guidelines. The Contractor is responsible for reviewing the specific requirements of the Contract, analyzing the planned methods of operation, and incorporating any additional specific or unique safety requirements in the written plan. The Contractor is responsible for ensuring that all applicable safety regulations are addressed as part of the Safety Plan. No Work shall commence on the Project site until the Safety Plan has been reviewed by Owner.

1. General Provisions: The Safety Plan shall include:
    a. An acknowledgement that the Contractor is totally responsible for compliance with OSHA requirements and relevant federal, state and local laws, rules and other regulations, which require a place of employment that is free of unsanitary or hazardous conditions that would harm an employee's health or safety or which establishes procedures or requirements for workplace safety.
    b. An emergency evacuation plan, and site evacuation plan as may be appropriate for the Scope of Work.
    c. The Contractor's proposal for compliance with the specific safety requirements, including the procedures for completing and forwarding to the Owner all on site accident and incident reports.
    d. A layout drawing of the site indicating access roads, fire and ambulance lanes, location of first aid stations, location or required danger alarm systems, location of offices, parking for private vehicles and equipment, and storage of all flammable and/or combustible liquids, gases or other hazardous materials, and the evacuation assembly area, as may be appropriate for the Scope of Work.
    e. Plans for providing medical service. A copy is to be posted at the work site first aid station and the following emergency numbers shall be included for the given work area: Lago Vista City Manager: 512-527-3526.

f. The name of the Contractor's Safety Manager, Superintendent or (Contractor's Safety Supervisor), his/her qualifications and delineate his/her authority to direct work stoppage and expend funds to eliminate imminent hazardous conditions.
g. A description of the following issues:
    (1) The frequency at which safety inspections will be conducted by the Contractor's Safety Engineer, Contractor's Safety Supervisor or other assigned inspector.
    (2) Construction areas that will be designated « Hard Hat Areas» and where warning signs will be posted at all entry points.
    (3) The greatest number of employees to be working at any one time during peak construction periods.
    (4) Contractor's policies for initial safety indoctrination of all employees.
    (5) Contractor's plans for continued safety education for all employees, including weekly safety meetings.
    (6) Contractor's housekeeping rules or regulations.
    (7) Plans for providing adequate lighting, ventilation, noise control, and personal protective equipment.
    (8) Plans for controlling access to prevent unauthorized persons from entering the construction area.
    (9) Site Safety equipment provided by Contractor, with locations.
    (10) Persons who are trained to administer First Aid.
    (11) Procedures to be followed in case of emergency.

2. Special Provisions: Depending on the type of construction, additional items must be incorporated into the Contractor's Safety Plan. When applicable, these include the following:
    a. Where the illustration of crane operation signals shall be posted on the Project site.
    b. Traffic control and marking of hazards (i.e. haul roads, highways or other traffic intersections, utilities, prohibited areas).
    c. Fire protection and security systems interruption which include automatic detection devices and alarms, automatic sprinkler systems, fire pumps, fire hydrants, applicable water supplies and reservoirs. Plans shall include measures and/or procedures to provide interim fire and security protection to facilities or areas affected by interruptions.
    d. Excavations including slope protection, shoring, guarding, barricades, excavation access, and excavated material storage. Scaffolding, including planking size, cleats, guardrails, toe boards, anchor points, put-logs, section pins, and scaffold access.
    e. Ladders, including types for specific uses and types of anchors to be utilized.
    f. Use of cranes or derricks and the testing and inspection thereof, including hook latches, cables, boom stops, load tables, warning devices and fire extinguishers.
    g. Testing and inspecting equipment, and the provision of backup alarms for tractors, backhoes, dozers, motor graders, etc.
    h. Requirements for storage of flammable/combustible liquids for gases, including paints.
    i. Submittal of false work (multi-story structures) and formwork drawings for review and approval. This item should also be indicated on the Contractor's progress schedule to prevent submittal delay which could hold up project.
    j. Provision of toilets, including frequency at which toilets will be cleaned with soap and water, and sterilized.
    k. Complete Blasting Plan, if applicable, which includes procedures for blasting, permits, explosives handling, explosive storage, explosive transportation, hole loading, blast signals, and blaster qualifications.
    l. Checking and testing electrical tools and appliances for the required ground and installation of electrical circuits in accordance with the National Electric Code.
    m. Use of safety nets in areas where the use of safety harnesses and life lines or scaffolds is not practical. Use of safety harnesses, lifelines and lanyards when necessary.
    n. Providing welding protection, including shields, fire extinguishers, ventilation, hot work permits and fire watches.

106.5.G. Record Drawings

During the performance of Work under the Contract, the Contractor shall record and delineate accurately on one set of prints of the Drawings, which will be furnished to Contractor by the OWNER, all changes in such Work which constitute significant departures from the original Drawings. The set of Drawings thus corrected and changed shall show the Work as actually constructed ("As-Built Drawings" or "Record Drawings"). Such As-Built Drawings shall be delivered to the OWNER for review and approval at the earliest practicable date prior to completion of all Work under the Contract, in any event not later than the date of acceptance of the completed Work.

The Contractor shall review said As-Built Drawings on site with the Engineers at monthly intervals to verify proper recording of data and shall incorporate such revised Drawings as may be furnished by the Design Engineer as the job progresses. The As-Built Drawings shall show sufficient detail to convey, among other pertinent information, the following: 1. Physical dimensions, relation to existing conditions, and horizontal and vertical location of all underground or hidden installations; and 2. All modifications to the Work as recorded in Change Orders and Construction Change Directives.

106.6 COORDINATION

The OWNER and the CONTRACTOR shall designate an address and, if available, a facsimile number where all notices, directions or other communications may be delivered. If the OWNER and the CONTRACTOR agree, service of notice under this section may be accomplished by e-mail under the same provisions as notice by facsimile.

106.6.A. Local Access

The CONTRACTOR shall provide a telephone number, which will be answered by a representative during normal business hours and answered either live or electronically, outside normal business hours with said calls returned within one hour. The phone shall be accessible by direct dial without long distance charges for all citizens in the construction area and the City of Dallas personnel.

106.6.B. Service of Notices

Notices to the surety or sureties on Contract bonds shall be directed or delivered to the surety's home office or to the surety's designated agent for delivery of notices. Service by mail shall be presumed complete upon deposit of the paper, enclosed in a postpaid, properly addressed envelope, in a post office or official depository under the care and custody of the United States Postal Service. Service, by facsimile after 5:00 p.m. local time of the recipient, shall be deemed delivered on the following business day.
A party may change its designated address, facsimile number or e-mail address by delivering written notice of the new address, facsimile number or email address, properly signed, to all interested parties. Nothing herein contained shall be deemed to preclude hand delivery of any notice, direction or communication to a party mentioned above.

106.7 INSPECTION

It is the intent of the OWNER to inspect all work on this project. Some work may not require the presence of an inspector, and the CONTRACTOR should obtain written verification from the Engineer if an inspector is not needed before proceeding with that particular item of work. The CONTRACTOR must pay for all testing needed to determine acceptability for any work done without proper inspection, as directed by the Engineer.
The CONTRACTOR shall furnish the OWNER with every reasonable facility for ascertaining whether or not the work performed was in accordance with the requirements and intent of the plans and specifications. Any work done (except excavation) or materials used without suitable inspection by the OWNER may be ordered removed and replaced at the CONTRACTOR's expense.

106.7.A. Removal of Defective or Unauthorized Work

All work which has been rejected or condemned shall be repaired, or if it cannot be repaired satisfactorily, it shall be removed and replaced at the CONTRACTOR's expense. Defective materials shall be immediately removed from the site of the work. Work done without line and grade having been given, work done beyond the lines or not in conformity with the grades shown on the plans or as given, save as herein provided, work done without written authority and prior agreement in writing as to process, shall be done at the CONTRACTOR's risk and shall be considered unauthorized and at the option of the owner may not be measured and paid for and may be ordered removed at the CONTRACTOR's expense. Upon failure of the CONTRACTOR to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized or condemned work or materials immediately after receiving notice from the owner, the owner shall, after giving written notice to the CONTRACTOR, have the authority to cause defective work to be remedied or removed and replaced, or to cause unauthorized work to be removed and to deduct the cost thereof from any monies due or to become due the CONTRACTOR. Alternatively, the owner may, at its option, declare the CONTRACTOR in default, in which event the performance bond surety shall complete the Contract.

106.7.B. Final Inspection

Whenever the improvements provided for by the Contract shall have been completely performed on the part of the CONTRACTOR, the CONTRACTOR shall notify the OWNER that the improvement is ready for final inspection. If the work is not acceptable to the OWNER at the time of such inspection, OWNER shall inform CONTRACTOR as to the particular defects to be remedied before final acceptance shall be made. The OWNER shall make final inspection of all work included in the Contract as soon as practicable after remedies have been made and the work is ready for acceptance.

106.7.C. Notice for Inspection

The scheduled start of construction for each location shall be coordinated with the Department of Public Works a minimum of ten (10) days prior to the requested start date. Inspection of work associated with Department of Public Works projects will be done by the OWNER’s appointed engineer, construction manager, or inspector. Inspections shall be requested through the appropriate appointed contract, a minimum of 24 hours prior to the need for inspection. The CONTRACTOR shall assure that the OWNER is aware of any work being performed on the project prior to the work taking place, and the CONTRACTOR should obtain written verification from the OWNER if an inspection is not needed before proceeding with any particular item of work.

106.7.D. Owner Site Visits

OWNER, ENGINEER, or its representative, will make visits to the site at intervals appropriate to the various stages of construction as OWNER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER will endeavor for the benefit of OWNER to determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and on-site observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work. ENGINEER's visits and on-site observations are subject to all the limitations on ENGINEER's authority, responsibility, and particularly but without limitation, during or as a result of ENGINEER's on-site visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work.

106.7.E. Overtime Inspection

Project inspectors must be paid at one and one-half their regular salary rates for all time spent on project inspection which exceeds 40 hours per week Monday through Friday and for time during legal Holidays declared by the OWNER. The OWNER will provide one inspector who will be available for this project during an eight-hour period on working days between the hours of 7:30 a.m. and 4:30 p.m., (Monday through Friday, except on legal Holidays,) for the duration of this project at no charge to the CONTRACTOR. All inspection performed on this project in excess of eight hours a day on working days, (Monday through Friday,) or before the hour of 7:30 a.m. or after the hour of 4:30 p.m., or performed on weekends or on legal Holidays may be considered overtime inspection.

The CONTRACTOR will be required to reimburse the OWNER for the cost of all inspection overtime, which may be necessary for the successful and expeditious prosecution of the work included in this CONTRACT. Inspection overtime will not be charged if the OWNER required the CONTRACTOR to work during overtime periods because of restrictions for water main tie-ins, traffic requirements, or other periods that inspection would normally be charged as determined by the OWNER. The OWNER's decision shall be final.

Except in an emergency situation, the CONTRACTOR shall be required to furnish in writing to the OWNER, not less than 36 hours in advance, a request to work overtime on Saturday, Sunday, Holiday, or any day on which the City Offices are closed for normal business. A written request is not required for overtime work on a weekday. Overtime will be scheduled at the discretion of the OWNER. The CONTRACTOR is not guaranteed that overtime will be accommodated.

Unless otherwise specified in the CONTRACT, inspection overtime will be charged to the CONTRACTOR, with the number of Inspectors to be determined by the OWNER under the following overtime conditions:

1. Weekdays between the hours of Midnight to 7:30 a.m. and between 4:30 p.m. to Midnight, at a rate of $50.00 per hour per Inspector.
2. Saturdays, Sundays and Holidays between midnight to midnight with a minimum of four (4) hours, at rate of $50.00 per hour per Inspector and a minimum of $200 per day per Inspector.

Inspection fees will be accumulated during the monthly estimate period. A statement of charges for the estimate period will be provided to the CONTRACTOR. The statement of charges must be paid prior to the OWNER processing the next submitted estimate. PAYMENT IS DUE WITHIN TEN (10) DAYS AFTER THE DATE OF THE INVOICE. If payment is not made as due, the OWNER reserves the right to deduct or withhold amounts due from the monthly progress payment or final payment.

106.8 ACCEPTANCE

Once the work is satisfactory to the OWNER and in accordance with the specifications and CONTRACT documents, the CONTRACTOR shall be issued a certificate of acceptance. The Certificate of Acceptance will not be issued until all work required by contract, including all water and wastewater appurtenances have been adjusted to their final position.

106.8.A. Termination of Contract

The contract will be considered fulfilled, save as provided in any maintenance stipulations, bond, or by law, when all the work has been completed, the final inspection, and final acceptance made by the OWNER, and final payment made by the OWNER.

106.8.B. Guarantee after Completion

Unless otherwise specified in the technical section of these specifications, the CONTRACTOR shall, after test and acceptance, and for a period of one year from date of final written acceptance by the OWNER or within such longer or shorter period of time as may be prescribed by law or by the terms of any other applicable special warranty on designated equipment or portions of work as required by the contract documents, rebuild, repair, or replace any and all items which have proven defective due to unsatisfactory material and / or workmanship. Upon written notice from the OWNER, the CONTRACTOR shall immediately make any repairs that may be ordered, or such repairs will be made by the City of Lago Vista at the expense of the CONTRACTOR or the CONTRACTOR'S Surety. In case of an emergency where delay would cause serious loss or damage, the City of Lago Vista may undertake to have the defects repaired without previous notice. The expense of all repairs,

including all emergency repairs, shall be borne by the CONTRACTOR or the CONTRACTOR'S Surety, at no cost to the OWNER. This obligation shall survive termination of the contract.

106.8.C. Final Payment

Whenever the work provided for by the contract shall have been completely performed on the part of the CONTRACTOR, the CONTRACTOR shall notify the OWNER that the work is ready for final inspection. The OWNER will then make such final inspection and if the work is satisfactory and in accordance with the specifications and contract documents, the OWNER shall issue a certificate of acceptance to the CONTRACTOR and submit a request to accept the work performed by the CONTRACTOR and payment of a final estimate under the terms of which the OWNER will release 100% of the retainage, plus the unpaid portions of the final estimate as the OWNER deems advisable. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment.

The amount of this final estimate, less any sums that have been previously paid, deducted or retained under the provisions of the contract, shall be paid the CONTRACTOR within 30 days after the final acceptance by the OWNER, provided the CONTRACTOR has furnished to the OWNER a consent of Surety and satisfactory evidence that all indebtedness connected with the work and all sums of money due for any labor, materials, apparatus, fixtures, or machinery furnished for and used in the performance of the work have been paid or otherwise satisfied, or that the person or persons to whom the same may respectively be due have consented to such final payment. The acceptance by the CONTRACTOR of the final payment as aforesaid shall operate as and shall be a release to the OWNER from all claims or liabilities under the contract, including all subcontractor claims, for anything done or furnished or relating to the work under the contract or for any act or neglect of said OWNER relating to or connected with the contract.

106.8.D. Audits

By execution of the Contract, CONTRACTOR grants the OWNER the right to audit, at City's election, all of CONTRACTOR'S records and billings relating to the performance of the Work under the Contract. CONTRACTOR agrees to retain such records for a minimum of three (3) years following completion of the Work under this Contract. OWNER agrees that it will exercise the right to audit only at reasonable hours.

107 CONTROL OF MATERIALS

107.1 INTRODUCTION

This section shall be used in reference to material quality, storage, sampling, and source. The specifications for materials set out the minimum standard of quality that the OWNER believes necessary to procure a satisfactory project. Use only materials that meet Contract requirements. Unless otherwise specified or approved, use new materials for the work. Contractor may suggest in writing to the OWNER of less expensive material. In such cases the payment to the contractor shall be reduced accordingly based on the agreed price between the OWNER and CONTRACTOR. Contractor may suggest in writing to the OWNER of higher quality material. In such cases these shall be no additional accrued cost to the OWNER unless the OWNER agrees in writing to the cost and installation of higher quality materials.

107.2 SUBSTITUTION OF MATERIALS

No substitutions will be permitted until the CONTRACTOR has received written permission of the Engineer to make a substitution for the material that has been specified. The Owner reserves the right to refuse to accept substitutions of materials or equipment. Requests for substitution shall be made prior to the date of the preconstruction conference. Where the term "or equal," or "or approved equal" is used, it is understood that if a material, product, or piece of equipment bearing the name so used is furnished it will be approvable, as the particular trade name was used for the purpose of establishing a standard of quality acceptable to the OWNER. If a product of any other name is proposed for use, the Engineer's approval thereof must be obtained before the CONTRACTOR procures the proposed substitute.

Where the term "or equal," or "or approved equal" is not used in the specifications, this does not necessarily exclude alternative items or material or equipment which may accomplish the intended purpose. However, the CONTRACTOR shall have the full responsibility of proving that the proposed substitution is, in fact, equal, and the Engineer, as the representative of the OWNER, shall be the sole judge of the acceptability of substitutions. The provisions of this sub-section as related to "Substitutions" shall be applicable to all sections of these specifications.

Should an authorized substitution require redesign of a portion of the work or alterations to the plans or specifications in order for the materials or articles which are to be substituted to properly fit or in other ways to be satisfactory, the Engineer shall accomplish such redesigns and alterations. The CONTRACTOR shall bear all reasonable costs associated with redesign and alteration efforts performed by the Engineer.

Owner may, in its discretion, agree to accept substitutions of materials or equipment after the Contract has been signed for good cause shown. The Contractor may make substitutions of materials or equipment only with the prior written consent of Owner after evaluation and approval by the applicable Engineer and in accordance with a Change Order. A request for substitution constitutes a representation by Contractor that Contractor:

a) has investigated the proposed product and determined that it is equal or superior in all respects to the specified product;
b) shall provide identical warranties as those required for the specified product or any extended warranties required by Owner as a condition for approval of the substitution;
c) shall coordinate installation and make changes to other Work which may be required at no cost to Owner;
d) waives claims for additional costs or time extension which may subsequently become apparent;
e) certifies that the proposed product will not affect or delay the approved Construction Schedule; and

107.2.A. Salvageable Materials

All salvageable material shall be designated by and remain the property of the OWNER. Any designated salvageable material that is destroyed or damaged due to negligence of the CONTRACTOR shall be replaced with new material by the CONTRACTOR at no expense to the OWNER. Salvage material, unless designated for reuse, shall be returned to a location designated by the OWNER.

107.2.B. Source of Materials

The CONTRACTOR shall be free to obtain the approved materials, equipment and articles from sources of its own selection. However, if the OWNER finds that the work shall be delayed or adversely affected in any way because a selected source of supply cannot furnish a uniform product in sufficient quantity and at the time required and a suitable source does exist, or the product is not suitable for the work, the OWNER shall have the right to require the original source of supply changed by the CONTRACTOR. The CONTRACTOR shall have no claim for extra cost or damage because of this requirement.

107.2.C. Quality of Materials

The CONTRACTOR warrants to the OWNER that all materials and equipment furnished under this Contract shall be new unless otherwise specified in the Contract documents and that same shall be of good quality and workmanship, free from faults and defects and in conformance with the Contract documents. All materials and equipment not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and shall be promptly repaired or replaced by the CONTRACTOR at the CONTRACTOR's sole cost upon demand of the OWNER. If required by the OWNER, the CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

The Contractor shall furnish to the OWNER for its approval the name of the manufacturer, the model number, and other identifying data and information respecting the performance, capacity, nature, and rating of the machinery and mechanical and other equipment that the Contractor contemplates incorporating into the Work. When required by the Contract or when called for by the OWNER, the Contractor shall furnish the OWNER for approval, full information concerning the material or articles the Contractor contemplates incorporating into the Work.

No lead based paint and no materials containing asbestos shall be incorporated into the Project. Coal tar sealants shall not be used on the Project. Contractor, subcontractors, and suppliers may be required to certify that these materials were not provided or installed as part of this Contract.

107.3 OFF-SITE STORAGE

Payment for costs incurred in storage of materials or equipment away from the project site will not be made by the OWNER unless:

1. The OWNER has approved off-site storage in writing; and
2. The materials or equipment are stored in a bonded warehouse located in the County approved by the OWNER and identified with the project for which they are stored as evidenced by warehouse receipts and appropriate documents of title.

Storage in facilities of the manufacturer or CONTRACTOR will not be permitted or paid for, unless such storage is expressly approved in writing by the OWNER.

107.3.A. Surplus Materials

Surplus materials shall be disposed of by the CONTRACTOR at his expense. Surplus excavation materials shall be removed from the site unless specified otherwise under the performance specifications.

107.4 MATERIAL SAMPLING AND TESTING

Unless otherwise stipulated in the Contract documents, initial testing of all materials, construction items or products incorporated in the work shall be performed at the direction and expense of the OWNER, including initial compaction and density tests deemed necessary. In the event materials, construction items or products incorporated in the work fail to satisfy the minimum requirements of the initial test, appropriate prove out test shall be made as directed by the OWNER to determine the extent of the failure and to verify that the corrective measures have brought the item up to specification requirements. The cost of all testing necessary to determine the extent of the failure and the adequacy of the corrective measures shall be the responsibility of the CONTRACTOR.

The failure of the OWNER to make any tests of materials shall in no way relieve the CONTRACTOR of its responsibility of furnishing materials conforming to the Contract documents.

Tests, unless otherwise specified, shall be made in accordance with the latest methods of the American Society for Testing and Materials (ASTM). The CONTRACTOR shall provide such facilities as the OWNER may require for collecting and forwarding samples and shall not use the materials represented by the samples until tests have been made. The CONTRACTOR shall furnish adequate samples without charge. Test materials and samples shall be stored so as to ensure the preservation of their quality and fitness for the Work. If directed by the Engineer, they shall be placed on wooden platforms or other hard, clean surfaces and shall be placed under cover if directed. Stored materials shall be placed and located so as to facilitate prompt inspection.

The CONTRACTOR shall furnish without additional cost to the OWNER such materials for testing as may be reasonably necessary. Retesting after failure to pass tests shall be at the expense of the CONTRACTOR. Should the percentage of rejected material or equipment be unreasonably large, the additional cost of such inspection and tests resulting therefrom shall be borne by the CONTRACTOR. The OWNER shall judge what is extra inspection and shall determine the additional cost incurred thereby and payable by the CONTRACTOR.

108 LEGAL AND CONTRACT RESPONSIBILITIES

108.1 INTRODUCTION

This section shall be used in reference to the legal relations and contract responsibilities between the OWNER and CONTRACTOR. This Contract is between the OWNER and the CONTRACTOR only. No person or entity may claim third-party beneficiary status under this Contract or any of its provisions, nor may any non-party sue for personal injuries or property damage under this Contract.

108.2 CONTRACTOR INDEPENDENCE

While engaged in carrying out and complying with the terms and conditions of this Contract the CONTRACTOR is, and shall be, an independent CONTRACTOR and shall not, with respect to its acts or omissions, be deemed an officer, employee or agent of the OWNER. The CONTRACTOR shall not at any time or in any manner represent that it or any of its agents or employees are in any manner agents or employees of the OWNER.
The fact that the OWNER or the Engineer shall have the right to inspect or observe CONTRACTOR's work during performance and to exercise the other rights and prerogatives expressly reserved to the OWNER or the Engineer under this Contract is not intended to, and shall not any time, change or affect the status of the CONTRACTOR as an independent CONTRACTOR with respect to the OWNER, the CONTRACTOR's own employees or any other person, firm or corporation. Nothing contained in the Contract documents shall create any contractual or agency relationship between the Engineer and the CONTRACTOR.

108.3 INDEMNIFICATION

CONTRACTOR COVENANTS AND AGREES TO AND DOES HEREBY INDEMNIFY, HOLD HARMLESS AND DEFEND, AT ITS OWN EXPENSE, THE OWNER, ITS OFFICERS, AND EMPLOYEES, FROM AND AGAINST ANY AND ALL CLAIMS OR SUITS FOR PROPERTY LOSS OR DAMAGE AND/OR PERSONAL INJURY, INCLUDING DEATH, TO ANY AND ALL PERSONS, OF WHATSOEVER KIND OR CHARACTER, WHETHER REAL OR ASSERTED, ARISING OUT OF THE WORK AND SERVICES TO BE PERFORMED HEREUNDER BY CONTRACTOR, ITS OFFICERS, AGENTS, EMPLOYEES, SUBCONTRACTORS, LICENSEES OR INVITEES, WHETHER OR NOT CAUSED, IN WHOLE OR IN PART, BY THE ALLEGED NEGLIGENCE OF THE OFFICERS, EMPLOYEES, OF THE OWNER. CONTRACTOR LIKEWISE COVENANTS AND AGREES TO, AND DOES HEREBY, INDEMNIFY AND HOLD HARMLESS OWNER FROM AND AGAINST ANY AND ALL INJURIES, DAMAGE, LOSS OR DESTRUCTION TO PROPERTY OF OWNER DURING THE PERFORMANCE OF ANY OF THE TERMS AND CONDITIONS OF THIS CONTRACT, WHETHER ARISING OUT OF IN WHOLE OR IN PART, ANY AND ALL ALLEGED ACTS OR OMISSIONS OF OFFICERS, SERVANTS, OR EMPLOYEES OF OWNER.
THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY.

The provisions of this indemnification and all other Indemnification obligations set out in the Contract Documents, shall survive the termination of this Contract, howsoever caused, as to events occurring prior to such termination, and no payment, partial payment, nor issuance of a certificate of Substantial Completion nor a certificate of final completion nor acceptance or occupancy in whole or in part of the Work shall waive or release any of the provisions of this section or of any other indemnification contained in the Contract Documents.

108.4 CLAIM AGAINST OWNER

No claim whatsoever shall be made by the CONTRACTOR or Sub-CONTRACTOR against any officer, servant, employee or agent of the OWNER for or on account of, anything done or omitted to be done in connection with this Contract.

108.4.A. Financial Interest

CONTRACTOR is hereby advised to comply with the OWNER's financial interest or comparable policy. If OWNER does not implement a financial interest or comparable policy of its own, provisions of this Item shall govern matters of financial interest.

No officer, servant, employee or agent of the OWNER shall have a financial interest, direct or indirect, in any contract with the OWNER or be financially interested, directly or indirectly, in the sale to the OWNER of any land, materials, supplies or services, except on behalf of the OWNER as an officer or employee. Any violation of this article with the knowledge, expressed or implied, of the persons, partnership, company, firm, association or corporation contracting with the OWNER shall render the Contract involved voidable by the OWNER.

108.4.B. Claim Venue

The parties herein agree that this Contract shall be performed in the county in which the OWNER'S principal office is located, and if legal action is necessary in connection therewith, exclusive venue shall lie in this county. The terms and provisions of the Contract documents shall be construed in accordance with the laws and court decisions of the State of Texas. The Contract shall be governed by and interpreted in accordance with the laws of the State of Texas. Venue for any action brought in connection with the Contract Documents shall lie in courts of competent jurisdiction in Burnet County, Texas. If any provision or part of the Contract Documents is held to be void or unenforceable under any Law or Regulation, all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

In the event of any suit or action arising out of or relating to the Contract, the prevailing party in such proceeding shall be entitled to recover reasonable attorney fees and court costs. Reference is made to Section 271.159 of the Texas Local Government Code in connection with the recovery of attorney's fees. The parties agree to mediate any dispute arising in connection with the Contract Documents in good faith prior to filing suit for damages. The parties agree to mediate any dispute in good faith prior to filing suit for relief other than injunctive relief.

108.5 NO WAIVER OF LEGAL RIGHTS

Inspection by the Engineer; any order, measurement, quantity or certificate by the Engineer; any order by the OWNER for payment of money; any payment for or acceptance of any work; or any extension of time or any possession taken by the OWNER shall not operate as a waiver of any provisions of the Contract or any power therein reserved to the OWNER of any rights or damages therein provided. Any waiver of any breach of Contract shall not be held to be a waiver of any other or subsequent breach. The OWNER reserves the right to correct any error that may be discovered in any estimate that may have been paid and to adjust the same to meet the requirements of the Contract documents. The OWNER reserves the right to recover by process of law sums as may be sufficient to correct any error or make good any deficiency in the work resulting from such error, dishonesty or collusion by the CONTRACTOR or its agents and the Engineer or assistants, discovered in the work before or after the final payment has been made.

108.5.A. Faulty or Uncompleted Work

Neither final acceptance of the work, nor final payment, shall relieve the CONTRACTOR of responsibility for faulty materials or workmanship. The CONTRACTOR shall promptly remedy any defects due thereto and pay for any damage to other work resulting therefrom. Likewise, neither final acceptance nor final payment, nor partial or entire use or occupancy of the work by the OWNER shall constitute acceptance of work not done in accordance with the Contract documents or relieve CONTRACTOR of liability with respect to any expressed or implied warranties or responsibility for faulty materials or workmanship, whether same be patently or latently defective.

The OWNER, or any officer or agent thereof, shall not be precluded at any time, either before or after final completion and acceptance of the work and final payment therefrom:

1. Showing the true and correct amount, classifications, quality and character of the work done and materials furnished by the CONTRACTOR or any other person under this Contract.
2. From showing at any time that any determination, return, decision, approval, order, letter, payment or certification is untrue and incorrect or improperly made in any particular, or
3. The work or the materials or any parts thereof do not in fact conform to the Contract requirements.

4. Demanding the recovery from the CONTRACTOR of any overpayments made to it, or such damages as the OWNER may sustain by reason of the CONTRACTOR's failure to perform each and every part of this Contract in strict accordance with its terms; or both.

108.5.B. Compensation of Acknowledged Work

The CONTRACTOR shall receive and accept compensation, as herein provided, as full payment for furnishing all labor, tools, material, equipment and incidentals; for performing all work contemplated and embraced under the contract; for all loss or damage arising out of the nature of the work, or from the action of the elements; for any unforeseen defects or obstruction which may arise or be encountered during the prosecution of the work and before its final acceptance by the OWNER; for all risks of whatever description connected with the prosecution of the work; for all expense incurred by or in consequence of suspension or discontinuance of such prosecution of the work as herein specified; for any infringement of patents, trademarks or copyrights; and for completing the work in an acceptable manner according to the plans and specifications.

Unless otherwise provided in the Contract documents, the CONTRACTOR shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation and other facilities and services necessary for the proper execution and completion of the work, whether temporary or permanent and whether or not incorporated or to be incorporated into the work.

108.5.C. Severability

In the event a term, condition, or provision in this Contract is determined to be void, unenforceable, or unlawful by a court of competent jurisdiction, then that term, condition or provision, shall be deleted and the remainder of the Contract shall remain in full force and effect.

108.5.D. Successors and Assigns

Subject to the limitations upon assignment and transfer herein contained, this Contract shall be binding upon and inure to the benefit of the parties hereto, their respective successors and assigns.

108.6 OBLIGATION AND WORK PERFORMANCE

Any failure or neglect on the part of OWNER, Engineer or inspectors to enforce provisions herein dealing with supervision, control, inspection, testing or acceptance and approval of the work shall never operate to relieve CONTRACTOR from full compliance with the Contract documents nor render owner liable to CONTRACTOR for money damages, extensions of time or increased compensation of any kind.

In addition to those matters elsewhere expressly made the responsibility of the CONTRACTOR, the CONTRACTOR shall have the full and direct responsibility for the performance and completion of the work under this Contract and for any act or neglect of the CONTRACTOR, its agents, employees or subcontractors. CONTRACTOR shall bear all losses, if any, resulting on account of the amount and character of the work, or because the conditions under which the work must be done are different from what CONTRACTOR estimated or anticipated, or because of weather, floods, elements or other causes.

108.7 EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this Contract the CONTRACTOR agrees to nondiscrimination of employment practices.

108.7.A. Nondiscrimination Toward Employees

The CONTRACTOR shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, age or national origin. The CONTRACTOR shall take affirmative action to insure that applicants are employed and that employees are treated equally during employment without regard to their race, color, sex, religion, age or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The CONTRACTOR agrees to post in conspicuous places, available to employees or applicants for employment,

notices to be provided setting forth the provisions of this nondiscrimination clause. The CONTRACTOR shall, in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR; state that all qualified applicants shall receive consideration for employment without regard to race, color, religion, sex, national origin or age. The CONTRACTOR shall include the provisions of this section in all subcontracts pertaining to the work.

108.7.B. Labor Unions

The CONTRACTOR shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice to be provided, advising the said labor union or workers' representatives of the CONTRACTOR'S commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

108.8 STATE AND LOCAL SALES TAXES

The OWNER qualifies for exemption from the state and local sales and use taxes, pursuant to the provisions of the Texas Limited Sales, Excise and Use Tax Act. Therefore, the CONTRACTOR shall not pay such taxes which would otherwise be payable in connection with the performance of this Contract.

The CONTRACTOR shall issue an exemption certificate in lieu of the tax on the purchase of all materials, supplies, equipment and other tangible personal property incorporated into the real property being improved; and all materials, supplies and other tangible personal property, other than machinery, or equipment and its accessories, and repair and replacement parts, necessary and essential for the performance of the Contract with the OWNER which is to be completely consumed at the job site.

Tangible personal property necessary and essential for the performance of the Contract includes only such materials, tools and supplies specifically needed and directly used to incorporate tangible personal property into the real estate being improved under the Contract. Overhead supplies and supplies used indirectly or only incidental to the performance of the Contract with the OWNER are not included in the exemption. Tangible personal property is "completely consumed" if after being used once for its intended purpose it is used up or destroyed. Any exemption certificate issued by the CONTRACTOR is subject to the existing rules and interpretation governing the exemption issued by the Comptroller of Public Accounts of the State of Texas. The OWNER will not make interpretations of the extent or applicability of the exemption in a particular case; if the CONTRACTOR, or any subcontractor or supplier of the CONTRACTOR, has any questions about the extent or applicability of the exemption in specific circumstances, guidance should be sought from the State Comptroller's Office. Under "reasons said purchaser is claiming this exemption" in the exemption certificate, the CONTRACTOR must name the OWNER and the project for which the equipment, material and supplies are being purchased, leased or rented.

The Contract Amount shall be final and be deemed to include all taxes payable (unless exempt as indicated above) in connection with the Work. CONTRACTOR may not issue a separate amount to OWNER indicating this to be the correct amount including all taxes and/or fees.

108.9 PATENTS

The CONTRACTOR shall pay all royalties and license fees and shall provide, by suitable legal agreement with the patentee or OWNER, for the use of any design, device, material or process covered by letters, patent or any copyright. The CONTRACTOR shall indemnify, defend, hold and save the OWNER and its officers, employees and agents harmless from all liability and claims for infringement of any patent or copyright. In the event that any claims, suit or action at law or in equity of any kind whatsoever is brought against the OWNER, or its officers, employees or agents involving any such patents, copyrights or license rights, then the OWNER shall have the right to and may retain from any money due or to become due to the CONTRACTOR such sum deemed necessary by the OWNER for its protection until such claim or suit shall have been settled and satisfactory evidence to that effect shall have been furnished the OWNER.

108.10 COMPLIANCE WITH LAWS

The CONTRACTOR shall fully comply with all local, state and federal laws, including all codes, ordinances and regulations applicable to this Contract and the work to be done thereunder, which exist or which may be enacted later by governmental bodies having jurisdiction or authority for such enactment.

108.10.A. Permits

The CONTRACTOR shall secure and pay for all permits and licenses necessary for the execution of the work and shall fully comply with all their terms and conditions. All work required under this Contract shall comply with all requirements of law, regulation, permit or license. If the CONTRACTOR finds that there is a variance, it shall immediately report this to the OWNER for resolution.

108.10.B. Pleas of Misunderstanding

No pleas of misunderstanding or ignorance thereof will be considered. The CONTRACTOR and the CONTRACTOR's Sureties shall indemnify and save harmless the OWNER against any claims or liability arising from or based on the violation of any such law, ordinance, regulation or order whether by the CONTRACTOR, employees, or Subcontractors. The OWNER shall not be liable for interest on any progress or final payment to be made under this Contract, except as may be provided by the applicable provisions of the Prompt Payment Act, Chapter 2251, Texas Government Code.

108.10.C. Jobsite Notice

Contractor shall post at the Project site, in a conspicuous place, any notices required by law to be posted there, and any notices required by the Owner in writing to be posted there, including the following notices required to be posted by Owner:

1. Workers' Compensation Notice:

NOTICE OF REQUIRED WORKERS' COMPENSATION COVERAGE
(Contractor Must Post at Project Site)

REQUIRED WORKERS' COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

REQUISITOS SOBRE COBERTURA DE COMPENSACIÓN

"La ley requiere que todas las personsas que trabajan en esta localidad o proporcionan servicios relacionados con este proyecto de construción esten cubiertos por seguro de compensación. Esto incluye personas que proporcionan, transportan, o entregan equipo o materiales, o proporcionan trabajo o transportación y otros servicios relacionados a el proyecto, cualquiera que sea la identidad de su patrón o su situación como empleado."

"Llame a la Comisión Tejana de Compensación a Trabajadores (Texas Workers' Compensation Commission), marcando el 512-440-3789 para recibir información de los requisitos legales sobre cobertura de seguros, para verificar si su patrón ha proporcionado la cobertura requerida, o para reportarlo, sin no lo ha hecho."

2. Notice of City of Lago Vista Safety Rules:

CITY OF LAGO VISTA SAFETY RULES

The following City of LAGO VISTA safety rules must be followed at all times:

1. The possession or use of tobacco products, alcoholic beverages, illegal drugs, and firearms or weapons on Owner's property is prohibited at all times, twenty-four hours a day. There shall be zero tolerance for violations of this provision.

2. Contractor, subcontractors and all other persons performing Work at the Project site shall use only such access to the site and facilities as are designated by Owner, and shall comply with all other rules and requirements established by Owner for use or occupancy of the Project site. In addition, Contractor, and subcontractors shall be aware that there are construction and access easements existing on the Owner's property and upon the adjacent properties that govern coordination of construction activities. Contractor and subcontractors shall perform the Work in compliance with these easements at all times.

3. Owner shall have the right to require the immediate removal from the Project site of any person performing Work who violates the provisions of these Safety Rules or who fails to comply with all other rules or requirements established by the City of Lago Vista for use or occupancy or the Project site. Owner may prohibit such person from being allowed to perform Work at the Project site in the future.

108.11 PROTECTION OF WORK AND OF PERSONS AND PROPERTY

The CONTRACTOR shall have the responsibility to provide and maintain all safety measures and take all precautionary measures required by law or otherwise to protect persons and property while said persons or property are approaching, leaving or within the work site or any area adjacent to said work site.

It shall be the duty and responsibility of the Contractor and all of its subcontractors to be familiar with and comply with all requirements of Public Law 91-596, 29 U.S.C. §§ 651 et. seq., the Occupational Safety and Health Act of 1970, (OSHA) and all amendments thereto, and to enforce and comply with all applicable provisions of OSHA.

108.11.A. Sanitary Provisions

The CONTRACTOR shall establish and enforce among its employees such regulations in regard to cleanliness and disposal of garbage and waste as shall tend to prevent the inception and spread of infectious or contagious diseases and to prevent effectively the creation of a nuisance about the work on any property either public or private, and such regulations as are required by the OWNER shall be put into immediate force and effect by the CONTRACTOR. The necessary sanitary conveniences for the use of laborers on the work, properly secluded from public observation, shall be constructed and maintained by the CONTRACTOR in such a manner and at such points as shall be approved by the OWNER, and their use shall be strictly enforced by the CONTRACTOR. All sanitary laws and regulations of the State of Texas and the OWNER's jurisdiction shall be strictly complied with.

108.11.B. Public Convenience

Materials stored about the work site shall be so placed, and the work shall at all times be so conducted, as to cause no greater obstruction to the traveling public than is considered necessary by the OWNER. The CONTRACTOR shall make provisions by bridges or otherwise at all cross streets, highways, sidewalks and private driveways for the free passage of pedestrians and vehicles, provided that where bridging is impracticable or unnecessary, in the opinion of the OWNER, the CONTRACTOR may make arrangements satisfactory to the OWNER for the diversion of traffic and shall, at its own expense, provide all material and perform all work necessary for the construction and maintenance of roadways and bridges for the diversion of traffic. Sidewalks must not be obstructed except by special permission of the OWNER. The materials excavated, and the construction materials or plant used in the construction of the work, shall be placed so as not to

endanger the work or prevent free access to all fire hydrants, water valves, gas valves, manholes for the telephone, telegraph signal or electric conduits, sanitary sewers and fire alarm or police call boxes in the vicinity.

1. **Notice:** The OWNER reserves the right to remedy any neglect on the part of the CONTRACTOR as regards to the public convenience and safety which may come to its attention, after 24 hours' notice in writing to the CONTRACTOR, save in cases of emergency, when it shall have the right to remedy any neglect without notice; and in either case, the cost of such work done by the OWNER shall be deducted from the monies due or to become due the CONTRACTOR. The CONTRACTOR shall notify the OWNER when any street is to be closed or obstructed; such notice shall in the case of major thoroughfares or streets upon which transit lines operate be made 48 hours in advance. The CONTRACTOR shall, when directed by the OWNER, keep any street or streets in condition for unobstructed use by emergency services. Where the CONTRACTOR is required to construct temporary bridges or to make other arrangements for crossing over ditches or streams, its responsibility for accidents shall include the roadway approaches as well as the structures of such crossings.
2. **Right of Way:** Where the work passes over or through private property, the OWNER shall provide such right-of-way. The CONTRACTOR shall notify the proper representatives of any public utility, corporation, any company or individual, not less than 48 hours in advance of any work which might damage or interfere with the operation of property along or adjacent to the work. The CONTRACTOR shall be responsible for all damage or injury to property of any character (except such as may be required by the provisions of the Contract documents or caused by agents or employees of the OWNER) by reason of any negligent act or omission on the part of the CONTRACTOR, its employees, agents or subcontractors, or at any time due to defective work or materials, or due to its failure to reasonably or properly prosecute the work, and said responsibility shall not be released by the fact that the work shall have been completed and accepted.

108.11.C. Protection of Work

During performance and up to date of final acceptance, the CONTRACTOR shall be under the absolute obligation to protect the finished work against any damage, loss or injury. In the event of such damage, loss or injury, the CONTRACTOR shall promptly replace or repair such work, whichever the OWNER shall determine to be preferable. The obligation to deliver finished work in strict accordance with the Contract prior to final acceptance shall be absolute and shall not be affected by the OWNER's approval of or failure to prohibit means and methods of construction used by the CONTRACTOR. All risk of loss or damage to the work shall be borne solely by the CONTRACTOR until final completion and acceptance of all work by the OWNER, as evidenced by the OWNER's issuance of a certificate of acceptance.

108.11.D. Protection of Persons

The CONTRACTOR shall have the responsibility to provide and maintain all warning devices and take all precautionary measures required by law or otherwise to protect persons and property while said persons or property are approaching, leaving or within the work site or any area adjacent to said work site. Compensation shall be paid to the CONTRACTOR for the installation or maintenance of any warning devices, barricades, lights, signs or any other precautionary measures required by law or otherwise for the protection of persons or property according to item for Barriers and Warning and or Detour Signs.

The CONTRACTOR shall assume all duties owed by the OWNER to the general public in connection with the general public's immediate approach to and travel through the work site and the area adjacent to said work site. Where the work is carried on, in or adjacent to any street, alley, sidewalk, public right-of-way or public place, the CONTRACTOR shall at its own cost and expense provide such flagmen and watchmen in addition to its responsibility to furnish, erect and maintain such warning devices, barricades, lights, signs, and other precautionary measures for the protection of persons or property as are required by law.

During periods when schools are in session, the CONTRACTOR will be required during the construction of the Work to maintain a suitable all-weather footpath across the Work at all designated school crosswalks and to move and reinstall pedestrian crossing warning signs as construction and routing of traffic lanes require.

The CONTRACTOR's responsibility for providing and maintaining flagmen, watchmen, warning devices, barricades, signs, and lights, and other precautionary measures shall not cease until directed in

writing by the OWNER or until final payment, whichever occurs first. If the OWNER discovers that the CONTRACTOR has failed to comply with the applicable federal and state Jaw by failing to furnish the necessary flagmen, warning devices, barricades, lights, signs or other precautionary measures for the protection of persons or property, the OWNER may order such additional precautionary measures as required by law to be taken to protect persons and property. The CONTRACTOR shall reimburse the OWNER for any expense incurred by the OWNER in taking any additional precautionary measures as a result of the CONTRACTOR's failure to do so.

108.11.E. Protection of Property

The CONTRACTOR will be held responsible for all damage to the work and other public or private property due to the failure of warning devices, barricades, signs, lights, or other precautionary measures in protecting said property, and whenever evidence is found of such damage, the Engineer may order the damaged portion immediately removed and replaced by and at the cost and expense of the CONTRACTOR. Minimum standards for safeguarding pedestrian and vehicular traffic are contained in the current Texas Manual of Uniform Traffic Control Devices, as amended, Texas Department of Transportation. Signage, barricades and other traffic control devices for detouring and maintenance of traffic on this Contract shall be as provided in above said manual and as directed by the Engineer. Costs associated with the acquisition and removal of required traffic control devices shall be considered incidental to the Work.

108.11.F. Trench Safety Regulations

The CONTRACTOR shall be responsible for complying with state laws and federal regulations relating to trench safety, including those which may be enacted during the performance under this Contract. The CONTRACTOR is advised that Federal Regulations 29 C.F.R. 1926.650-1926.652 have been, in their most recent version as amended, in effect since January 2, 1990. THE CONTRACTOR SHALL FULLY COMPLY WITH THE U. S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS PERTAINING TO EXCAVATIONS, TRENCHING, AND SHORING AND SHALL PROVIDE AND FAMILIARIZE ITS EMPLOYEES INVOLVED IN EXCAVATION AND TRENCHING WITH THE PROVISIONS IN OSHA PAMPHLET NUMBER 2226, EXCAVATING AND TRENCHING OPERATIONS.

1. **Indemnification:** CONTRACTOR AGREES TO DEFEND, INDEMNIFY AND HOLD OWNER, ITS OFFICERS, SERVANTS, AGENTS AND EMPLOYEES, COMPLETELY HARMLESS FROM ANY CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES (INCLUDING ATTORNEY'S FEES, IF ANY) FOR ANY PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT (INCLUDING ANY INJURY, DEATH OR DAMAGE SUFFERED BY THE CONTRACTOR'S OWN EMPLOYEES) ARISING OUT OF OR OCCASIONED BY THE USE OF ANY TRENCH EXCAVATION PLANS, REGARDLESS OF THEIR ORIGIN, OR BY ANY NEGLIGENT, GROSSLY NEGLIGENT, STRICTLY LIABLE OR INTENTIONAL ACT OF THE CONTRACTOR, A SUBCONTRACTOR OR ANY INDIVIDUAL EMPLOYEE OR LABORER (WHETHER OR NOT AN EMPLOYEE OF THE CONTRACTOR OR A SUBCONTRACTOR) IN THE PERFORMANCE OR SUPERVISION OF ACTUAL TRENCH EXCAVATION UNDER THE CONTRACT. THIS INDEMNITY APPLIES REGARDLESS OF WHETHER OWNER'S OR CONSULTING ENGINEER'S NEGLIGENCE OR FAULT IN THE ADMINISTRATION OF THIS CONTRACT OR IN THE PREPARATION. REVIEW OR APPROVAL OF THE OWNER'S OR CONTRACTOR'S TRENCH EXCAVATION PLAN CONTRIBUTED TO THE INJURY, DEATH OR DAMAGE. OWNER ACCEPTS NO LIABILITY WHATSOEVER AS A RESULT OF ITS PREPARATION, REVIEW OR APPROVAL OF ANY TRENCH EXCAVATION PLAN UNDER THIS CONTRACT. OWNER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE ADEQUACY OR CORRECTNESS OF ANY TRENCH EXCAVATION PLAN. (THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES TO THE CONTRACT AND ARE NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY. THIS PARAGRAPH SHALL NOT BE CONSTRUED TO WAIVE ANY GOVERNMENTAL IMMUNITY OF THEOWNER. THIS PARAGRAPH CONTROLS IN THE EVENT OF A CONFLICT WITH ANY OTHER INDEMNITY OR OWNER-WARRANTY PROVISION IN THE SPECIFICATIONS).
2. **Trench Safety Plan:** CONTRACTOR shall be responsible for providing to the OWNER an acceptable trench safety plan signed and sealed by a Professional Engineer qualified to do such work and

licensed/registered in the State of Texas. The CONTRACTOR shall be responsible for selecting an appropriate method of providing trench safety after due consideration of the job conditions, location of utilities, pavement conditions and other relevant factors. Slope-back methods which may result in unnecessary displacement of utilities and/or destruction of pavement shall not be used without permission from the OWNER. Plans for devices used to provide trench safety such as trench shields and shoring systems will be likewise certified by professional engineers licensed/registered in the State of Texas or by a professional engineer licensed/registered in the state of manufacture of the shield or shoring system.

3. **Explosives:** When required by the plans, or as requested, CONTRACTOR shall provide a written blasting plan. The OWNER retains the right to reject the blasting plan. CONTRACTOR shall store all explosives securely and clearly mark all storage places with "DANGER – EXPLOSIVES." Store, handle, and use explosives and highly flammable material in compliance with federal, state, and local laws, ordinances, and regulations. Assume liability for property damage, injury, or death resulting from the use of explosives. Contractor shall give at least a 48-hr. advance notice to the appropriate Roadmaster before doing any blasting work involving the use of electric blasting caps within 200 ft. of any railroad track.

108.11.G. Shoring and Sheeting

The sides of all excavation shall be supported in accordance with the trench safety plan. Where bracing or sheeting and shoring are used, the trench width shall be increased accordingly, shall be considered as incidental work, and shall not be paid for as a separate item. All sheeting, shoring, and bracing shall have sufficient strength and rigidity to withstand the pressure exerted, to maintain the sides of the excavation properly in place, and to protect all persons or property from injury or damage. When excavations are made adjacent to existing buildings or other structures or in paved streets, particular care shall be taken to adequately sheet, shore, and brace the sides of the excavation to prevent undermining of or settlement beneath the structures or pavement. Underpinning of adjacent structures or pavement shall be done at the CONTRACTOR'S own cost and expense and in a manner satisfactory to the OWNER, or, when required by the OWNER, the pavement shall be removed, the void(s) satisfactorily filled, compacted, and the pavement replaced by the CONTRACTOR. The entire expense of such removal and subsequent replacement thereof shall be borne by the CONTRACTOR. Wooden sheeting, shoring, and bracing shall be left in place where it is adjacent to the pipe embedment for the initial lift of backfill, if directed by the OWNER.

The removal of all sheeting, shoring, and bracing shall be done in such manner as not to endanger or damage either new or existing structure, or private or public properties, and so as to avoid cave-ins or sliding of the banks. All holes or voids left by the removal of the sheeting, shoring, or bracing shall be immediately and completely filled and compacted with suitable materials. If, for any reason, the CONTRACTOR, with the approval of the OWNER, elects to leave in place the sheeting, shoring or bracing, no payment shall be allowed for such material left in place.

108.11.H. Trenching Inspection

The CONTRACTOR shall cause all shoring or bracing to be inspected by an OSHA competent person. According to OSHA regulations, a competent person is defined as one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

108.11.I. Payment of Special Trenching

Payment for trench safety shall be by the lineal feet (L.F.) of trench exceeding a depth of 5-ft. unless otherwise specified in the Contract. Excavation for slope-back methods shall be subsidiary to the trench safety pay item including replacement and re-compaction. Excess excavation for other trench safety methods is also subsidiary to the trench safety pay item. Costs relating to the preparation of the trench safety plan including geotechnical investigation, testing and report preparation fees are all subsidiary to the pay item for trench safety. Should trench safety measures be required during Contract performance where no pay item has been provided, then the CONTRACTOR shall immediately notify the OWNER and, if directed to do so, provide trench safety under the

provisions of Item for Extra Work and/or Item for Payment of Extra Work. Should the OWNER fail to authorize the work as provided for in aforementioned items, then the CONTRACTOR shall proceed under the provisions of item for Claims for Additional Compensation, and item for Performance of Extra or Disputed Work. Trench safety requirements are mandatory and shall not be waived. Payment for special shoring, if any, shall be based on the square feet (S.F.) of shoring used.

108.11.J. Soil Borings

Soil Borings are to be used for information only and are not warranted accurate in any way. The OWNER accepts no responsibility for any deviation from or variance in soil types and/or depths shown on the borings.

108.12 WORKING AREA

The CONTRACTOR shall confine its equipment, storage of materials and construction operations to the area shown on the Contract drawings or stated in the specifications, prescribed by ordinance, laws, or permits or as may be directed by the OWNER, and shall not unreasonably encumber the site or public right-of-way with its construction equipment, plant or materials. Such area shall not be deemed for the exclusive use of the CONTRACTOR. Other contractors of the OWNER may enter upon and use such portions of the area and for such items as determined by the OWNER are necessary for all purposes required by its contracts. The CONTRACTOR shall give to such other contractors all reasonable facilities and assistance to the end that the work on this and other contracts shall not be unduly or unreasonably delayed. Any additional areas desired by the CONTRACTOR for its use shall be provided at its own effort, cost and expense.

108.12.A. Project Signs

Project signs shall be furnished, constructed, and erected by the CONTRACTOR as directed by the OWNER. Signs shall be placed in a location selected by the OWNER and maintained in good condition until the completion of the project. Project signs shall be removed by the CONTRACTOR upon the completion and acceptance of the project by the OWNER.

108.12.B. Railway Crossings

Where the work encroaches upon any right-of-way of any railway, the OWNER shall secure the necessary easement for the work. Where railway tracks are to be crossed, the CONTRACTOR shall observe all the regulations and instructions of the railway company as to methods of doing the work or precautions for safety of property and the public. All negotiations with the railway company, except for right-of-way, shall be made by the CONTRACTOR. The railway company shall be notified by the CONTRACTOR not less than five days prior to commencing the work. The CONTRACTOR shall not be paid separate compensation for such railway crossing but shall receive only the compensation as set out in the proposal. Prior to crossing or working on Railroad Right-of-Way, the CONTRACTOR will be required to contact the railroad company, or companies, and to execute CONTRACTOR's Agreements as may be required by each railroad company involved. No work shall be permitted where railroads are involved until the Engineer is furnished sufficient correspondence from the railroad company involved to ascertain that either the agreement has been executed and a certified copy of the insurance policy furnished, or that no such action is required.

108.13 EXISTING STRUCTURES AND APPURTENANCES

This item addresses only matters arising from certain existing, man-made surface and subsurface structures, facilities and appurtenances, not naturally occurring conditions. AS PROVIDED IN ITEM FOR CONTRACTOR'S WARRANTIES AND UNDERSTANDING, THE OWNER SHALL HAVE NO LIABILITY WHATSOEVER FOR ANY CLAIM ARISING FROM A DIFFERING, NATURALLY OCCURRING SURFACE OR SUBSURFACE CONDITION, OR FROM ANY MAN-MADE CONDITION THAT IS NOT A SURFACE OR SUBSURFACE STRUCTURE, FACILITY OR APPURTENANCE. The OWNER'S responsibility for any claim arising from existing, man-made surface and subsurface structures, facilities and appurtenances is governed solely by this item., and any situation involving a differing subsurface condition not included herein shall be governed solely by Item for Contractor's Warranties and Understanding.

108.13.A. Locations

The plans show the general locations of all known, existing man-made surface and subsurface structures, facilities and appurtenances. The locations of many gas mains, water and wastewater mains, storm sewers, drains, culverts, conduits and other man-made utility structures, facilities and appurtenances, however, are unknown. Notwithstanding any other provisions of the Contract, the Contractor shall be solely responsible for location and protection of any and all public lines and utility customer service lines in the Work area. Failure of a utility to be indicated does not relieve the Contractor of responsibility to protect utility lines encountered. The Contractor shall notify "One Call" (1-800-344-8377, or 811), and exercise due care to locate and to mark, uncover or otherwise protect all such lines within the limits of construction and any of the Contractor's work or storage areas.

THE OWNER DOES NOT WARRANT THE PLANS TO SHOW THE EXACT LOCATIONS OF ANY AND ALL KNOWN, EXISTING MAN-MADE SURFACE AND SUBSURFACE STRUCTURES, FACILITIES AND APPURTENANCES, AND DOES NOT WARRANT THAT IT KNOWS OF THE EXISTENCE OF ALL POSSIBLE EXISTING MAN-MADE SURFACE AND SUBSURFACE STRUCTURES, FACILITIES AND APPURTENANCES. The OWNER assumes no responsibility, except as provided below, for any failure to show any or all of these structures on the plans or to show them in their exact locations.

The OWNER may conduct certain test borings to be made on the site and indicated on the plans such information, or any information pertaining to the character or depth of materials is found from observations, records or otherwise. The action of the OWNER in revealing such information shall not in any manner be construed as a warranty on the part of the OWNER of the exact nature of the subsurface conditions that shall be encountered during construction of the work. Although the information is shown as accurately as possible, the OWNER does not guarantee that any materials to be encountered at any point or points are even approximately the same, either in character or elevations, as those shown on the plans. The information thus furnished by the OWNER is intended only as a guide to the CONTRACTOR's own investigations preliminary to submitting a bid for the work.

108.13.B. Conditions for to Work or Payment Increases

The CONTRACTOR and OWNER mutually, expressly agree that the failure of the OWNER to show any existing, man-made surface or subsurface structure, facility or appurtenance on the plans, or the failure to show them on the plans in their exact locations, shall not be considered as a basis of a claim for Extra Work, damages or other compensation of any kind, nor shall it be considered as a basis for increasing the quantities of work or unit prices on any bid item, unless:

1. The CONTRACTOR could not have discovered the existing, man-made surface or subsurface structure, facility or appurtenance by a reasonable review of the plans and specifications and a reasonable, careful inspection of the work site prior to bid opening or award of the Contract.
2. The existing, man-made surface or subsurface structure, facility or appurtenance is in a location that necessitates a substantial change in the alignment, depth or hydraulic gradient of the work to be constructed under the Contract because the CONTRACTOR cannot, by the use of reasonable skill or care, place the work in accordance with the original alignment, depth or hydraulic gradient.
3. The existing surface or subsurface structure, facility or appurtenance requires the construction of a special structure, facility, appurtenance or other special work, provisions for which are not already made in the plans and specifications, to protect the existing man-made surface or subsurface structure, facility or appurtenance, or the work to be constructed under the Contract from damage.

If either of the above elements occurs, the provisions of the specifications regarding claims for Extra Work apply. Otherwise, the condition is considered part of the Contract work and OWNER shall not be liable for extra compensation. Provided, however, that the OWNER will not be liable for payment of Extra Work claims under this subsection that are not timely filed in accordance with other provisions of the specifications, nor shall the OWNER be liable to pay for any additional work or additional costs arising solely from a decision of the CONTRACTOR to change the original means or methods of construction chosen because an existing, man-made surface or subsurface structure, facility or appurtenance is encountered.

108.13.C. Utility Coordination and Protection

It is the intention of the OWNER that all known conflicts between utility-owned facilities and the proposed construction will be cleared prior to the issuance of the work order. Utility information shown on the plans must be confirmed by actual field check in advance of construction. It will be the CONTRACTOR'S responsibility to locate and report all utility conflicts to the Engineer promptly in order to avoid unnecessary delays, and the CONTRACTOR will cooperate with utility owners in making the adjustment(s). Conflicts that are found during construction will be resolved as expeditiously as possible. The CONTRACTOR will be required to protect adequately all utility-owned facilities from damage or displacement by its operations.
The adjustment or location of any utility-owned facility which the CONTRACTOR may desire for its own convenience or ease of construction will be its responsibility to coordinate and will be at its own expense.

108.13.D. Hazardous Materials

OWNER shall be responsible for any Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the site. OWNER shall not be responsible for any such materials brought to the site by CONTRACTOR, Subcontractor, Suppliers or anyone else for whom CONTRACTOR is responsible. Contractor agrees that it shall not transport to, use, generate, dispose of or install at the Project site any hazardous substance (as defined herein), except in accordance with applicable Environmental Laws. Further, in performing the Work, the Contractor shall not cause any release of hazardous substances into, or contamination of, the environment, including the soil, the atmosphere, any water course or ground water, except in accordance with applicable Environmental Laws.

Upon uncovering any such materials the CONTRACTOR shall immediately:

1. Stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by paragraph 6.23),
2. Notify OWNER and ENGINEER (and thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. CONTRACTOR shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR special written notice specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or specifying any special conditions under which such Work may be resumed safely.

If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of such Work stoppage or such special conditions under which Work is agreed by CONTRACTOR to be resumed, either party may make a claim therefore as provided in the Contract Documents. If after receipt of such special written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order such portion of the Work that is in connection with such hazardous condition or in such affected area to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a claim therefor as provided in the Claims Section of these provisions. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others.

108.14 PROJECT CLEAN-UP

The CONTRACTOR shall be aware that keeping the project site in a neat and orderly condition is considered an integral part of the contracted work and as such shall be considered subsidiary to the appropriate bid items.
Clean up work shall be done as directed by the Engineer as the work progresses or as needed. If, in the opinion of the Engineer it is necessary, clean-up shall be done on a daily basis. Clean up work shall include, but not be limited to removing the trash, paper, rubbish and debris resulting from operations, sweeping streets clean of

dirt or debris, alleviating any dust nuisance in the work area, storing excess material in appropriate and organized manner and keeping trash of any kind off of residents' property.

If the Engineer does not feel that the jobsite has been kept in an orderly condition, on the next estimate payment (and all subsequent payments until completed) of the appropriate bid item(s) will be reduced by 25%. Upon completion of the work and before final acceptance and final payment shall be made, the CONTRACTOR shall completely clean and remove from the site of the work all equipment, construction materials, surplus and discarded materials, temporary structures and debris of every kind. CONTRACTOR shall leave the site of the work in a neat and orderly condition equal to that which originally existed, or as called for in the Contract documents. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the Engineer, and at the CONTRACTOR's sole cost.

108.14.A. Disposal of Materials

Surplus excavation and other materials removed as a part of the construction may be deposited at a legal disposal site in accordance with all applicable federal, state and local laws and regulations. In addition, if the materials are disposed of within private property, a release from the property owner must be obtained before final acceptance of the Work. Surplus excavation and other materials must not be deposited in areas designated as flood plain or along natural drainage ways. Material so deposited will be required to be removed at the CONTRACTOR'S expense and the area restored to its natural condition. Failure to comply promptly with the requirements of this special provision will result in withholding of payments due.

108.14.B. Restoration of Property

When and where any damage or injury is done to public or private property on the part of the CONTRACTOR, it shall restore or have restored at its own cost and expense such property to a condition equal (or improved) to that existing before such damage was done by repairing, rebuilding or otherwise restoring as may be directed, or it shall make good such damage or injury in a manner acceptable to the property owner or the Engineer. Replacement of previously constructed items, such as curb, gutter, sidewalks, driveways, paving, etc., shall conform to the specifications for new construction, unless directed otherwise by the OWNER. In case of failure on the part of the CONTRACTOR to restore such property or make good such damage or injury, the OWNER may, upon 48 hours' written notice, under ordinary circumstances, and without notice when a nuisance or hazardous condition results, proceed to repair, rebuild or otherwise restore such property as may be determined necessary, and the cost thereof shall be deducted from any monies due or to become due the CONTRACTOR under its Contract; or where sufficient Contract funds are unavailable for this purpose the CONTRACTOR or its surety shall reimburse the OWNER for all such costs.

109 PROSECUTION AND PROGRESS

109.1 INTRODUCTION

Before starting work, CONTRACTOR shall schedule and attend a preconstruction conference with the Engineer. Failure to schedule and attend a preconstruction conference is not grounds for delaying the beginning of working.

Unless otherwise shown in the Contract, begin work within 30 calendar days (7 calendar days for routine maintenance Contracts) after the authorization date to begin work as shown on the work order. It is the intent of this specification to provide a continuous construction operation without delay except as occasioned by unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, and it shall be the CONTRACTOR'S responsibility to execute the work in the most expeditious manner.

109.2 CONSTRUCTION SCHEDULE

The CONTRACTOR must submit to the OWNER, within ten days after the Effective Date of the Agreement, a detailed Construction Schedule outlining the major items of work on the project. This schedule must be approved as to form by the OWNER prior to CONTRACTOR starting work on the project. The schedule must be updated on a monthly basis. CONTRACOTR shall submit a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

If the schedule submitted is not to the OWNER's satisfaction, the CONTRACTOR shall have an additional five days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until the schedules are submitted to and acceptable to ENGINEER as provided below. The progress schedule will be acceptable to ENGINEER as providing an orderly progression of the Work to completion within any specified Milestones and the Contract Times, but such acceptance will neither impose on ENGINEER responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor. CONTRACTOR's schedule of Shop Drawing and Sample submissions will be made acceptable to ENGINEER as providing a workable arrangement for reviewing and processing the required submittals. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance.

109.2.A. Stop Work

The OWNER has the authority to stop work on the project if the CONTRACTOR fails to provide an updated schedule as requested. The OWNER shall not be responsible for any delay as a result of the CONTRACTOR'S failure to submit the schedule in a timely manner.

109.2.B. Preconstruction Conference

Within twenty days after the Contract Times start to run, but before any Work at the site is started, OWNER shall schedule a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules, procedures for handling Shop Drawings and other submittals, processing Applications for Payment and maintaining required records.

109.3 PROSECUTION OF THE WORK

The CONTRACTOR shall begin the work to be performed under this Contract not later than 10 days from the date specified in the work order and shall conduct the work in such a manner and with sufficient equipment, material, and labor as is necessary to insure its completion within the working time.

Should the prosecution of the work be discontinued by the CONTRACTOR, the CONTRACTOR shall notify the OWNER at least twenty-four hours in advance of resuming operations. Work shall be done only during the hours between 7:00 am and 6:00 pm unless the OWNER approves other hours. Nighttime work is allowed only when shown on the plans or directed or allowed by the Engineer. Nighttime work is defined as work

performed from 30 min. after sunset to 30 min. before sunrise. CONTRACTOR may work on Saturdays if so desires and permission of the OWNER has been granted. Work on Sundays shall be permitted only with the written permission of the OWNER. If Saturday or Sunday work is permitted, working time shall be charged on the same basis as weekdays. Where the working time is expressed as calendar days or a specific date, the concept of working days shall no longer be relevant to the Contract. Work requiring inspection will not be permitted on a legal City holiday except by special written permission of the OWNER. Any work done without proper inspection is subject to removal and replacement at the direction of the OWNER.

109.4 OBLIGATION TO COOPERATE WITH OTHER CONTRACTORS

The OWNER may award other contracts for additional work on this project, and the CONTRACTOR shall fully cooperate with such other contractors and shall coordinate and fit its work to be done hereunder to such additional work as may be contracted by the OWNER. At the time of bidding, prospective bidders shall be advised of other planned contract work, which is expected to affect the work area. The CONTRACTOR shall not commit or permit any act, which shall interfere with the performance of work by any other contractor.
Upon receiving written notice from the CONTRACTOR that another contractor is failing to coordinate its work with the work under this Contract as directed by the OWNER, the OWNER shall promptly investigate the charge and take such necessary action as the situation may require.
However, the OWNER shall not be liable to the CONTRACTOR for damages suffered by the CONTRACTOR due to the fault or negligence of another contractor or through failure of another contractor to carry out the directions of the OWNER. Should any interference occur between contractors, the Engineer may furnish the CONTRACTOR with written instructions designating priority of effort or change in methods, whereupon the CONTRACTOR shall immediately comply with such direction. In such event, the CONTRACTOR shall be entitled to an extension of working time only for unavoidable delays verified by the Engineer; however, no increase in the Contract price shall be due the CONTRACTOR.

109.5 EMPLOYEES

The CONTRACTOR shall employ only competent, efficient workpeople and shall not use on the work any unfit person or one not skilled in the work assigned to him or her and shall at all times maintain good order among its employees. Whenever the OWNER shall inform the CONTRACTOR in writing that, in its opinion, any employee is unfit, unskilled, disobedient, or is disrupting the orderly progress of the work, such employee shall be removed from the work and shall not again be employed on it.
Under urgent circumstances, the OWNER may orally require immediate removal of an employee for cause, to be followed by written confirmation.

109.6 SUBCONTRACTS

The CONTRACTOR shall not make any subcontract for performing any portion of the work included in the CONTRACT without written notice to the OWNER. This CONTRACT having been made pursuant to the bid submitted by the CONTRACTOR and in reliance with the CONTRACTOR'S personal qualifications and responsibility, the OWNER reserves the right to withhold approval of any SUBCONTRACTOR, which the OWNER may deem would not be in the OWNER'S best interest.
The CONTRACTOR shall, as soon as practicable after signing the CONTRACT, submit a separate written notice to the OWNER identifying each proposed SUBCONTRACTOR. Upon request of the OWNER, the CONTRACTOR shall promptly furnish additional information tending to establish that any proposed SUBCONTRACTOR has the necessary facilities, skill, integrity, past experience and financial resources to perform the work in accordance with the terms and conditions of this CONTRACT.

Nothing contained in the Contract Documents shall create any contractual relation between Owner and any Subcontractor or supplier or any party with whom Owner or any of its Subcontractors or suppliers contracts.

Each subcontract agreement for a portion of the Work is hereby assigned by the Contractor to the Owner and the Surety; provided, however, that such assignment shall be effective as to Owner only after Owner's written

termination of the Contract or Contractor's right to proceed under terms of the Contract, and acceptance in writing by Owner of the particular subcontract.

109.5.A. Approval of Subcontractor

The CONTRACTOR must submit, with the request for approval of a SUBCONTRACTOR, the location, within the Highland Lakes area, of at least three contracts where the SUBCONTRACTOR has performed construction similar to the construction outlined in the CONTRACT. If required by the OWNER, the SUBCONTRACTOR'S representative will accompany the OWNER'S representative on examination of the referenced work. The CONTRACTOR must also submit to the OWNER a revised Schedule of Work and SUBCONTRACTOR/SUPPLIER Payment form anytime there is a change in the SUBCONTRACTOR/SUPPLIER participation on the CONTRACT.

109.5.B. Subcontractor Replacement

If the OWNER determines that any proposed SUBCONTRACTOR is unacceptable, it shall so notify the CONTRACTOR, who may thereupon submit another proposed SUBCONTRACTOR unless the CONTRACTOR decides to do the work itself. Disapproval by the OWNER of any proposed SUBCONTRACTOR shall not provide a basis for any time extension claim or additional compensation of any nature, including but not limited to anticipated profit, overhead, or delay, by the CONTRACTOR. If an approved SUBCONTRACTOR fails to perform properly the work undertaken, it shall be removed from the job upon request of the OWNER, following notification to the CONTRACTOR in writing of the request for removal and the reasons therefore. Each subcontract entered into shall provide that the provisions of this CONTRACT shall apply to all SUBCONTRACTORS and their officers and employees in all respects as if they were employees of the CONTRACTOR. The OWNER'S decision not to disapprove of any subcontract shall not relieve the CONTRACTOR of any of its responsibilities, duties, and liabilities hereunder. The CONTRACTOR shall be solely responsible for the acts, omissions, negligence, or defaults of its SUBCONTRACTORS and of such SUBCONTRACTOR'S officers, agents and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the CONTRACTOR to the extent of its subcontract.

The CONTRACTOR agrees to bind each SUBCONTRACTOR and each SUBCONTRACTOR agrees to be bound by the terms of the CONTRACT documents insofar as applicable to its respective work. The CONTRACTOR and each SUBCONTRACTOR jointly and severally agree that nothing in the CONTRACT documents or otherwise shall create or be deemed to create any rights in favor of a SUBCONTRACTOR against the OWNER; nor shall be deemed or construed to impose upon the OWNER any obligation, liability or duty to a SUBCONTRACTOR; or to create any contractual relation whatsoever between a SUBCONTRACTOR and the OWNER.

The provisions contained herein shall likewise apply to any sub-subcontracts.

109.5.C. Sub-Contractual Relations

The CONTRACTOR is solely responsible for making payments properly to his SUBCONTRACTORS and SUPPLIERS on the Project. During construction of the Project, the CONTRACTOR shall submit each month a CONTRACTOR'S Report of SUBCONTRACTOR/SUPPLIER Payment (the "Report"). The Report shall show all payments made to date by the CONTRACTOR (plus existing retainage) to each SUBCONTRACTOR and SUPPLIER involved in the Project. The Report shall be made on a form approved and supplied by the OWNER. As an alternative to the Report, the CONTRACTOR may furnish Affidavits of Payment Received, which affidavits shall be executed by each SUBCONTRACTOR and SUPPLIER owed money and paid during the previous progress payment period for work or materials furnished on the Project. If, for any reason, the CONTRACTOR is withholding payment to a SUBCONTRACTOR or SUPPLIER due to a dispute or other problem with performance, the CONTRACTOR shall note on the Report form the amount withheld and that payment is in dispute. The OWNER may require the CONTRACTOR to document and verify the dispute or other problem in question. Receipt by the OWNER of the Report or Affidavits of Payment Received shall be a condition precedent to payment on any invoice or estimate.

The OWNER reserves the right in its sole discretion to withhold payment to the CONTRACTOR should it appear from the Report or other information furnished to the OWNER that the Report has not been properly completed.

109.5.D. Sub-Contractual Claims

When submitting a bid proposal, the CONTRACTOR thereby assigns to the City any and all claims for overcharges associated with this contract or any subcontracts directly or indirectly related to the work, which overcharges may arise under the Anti-Trust Laws of the United States, 15 U.S.C.A., Section 1, et seq (1973). The CONTRACTOR shall include in all his subcontracts a clause that requires his SUBCONTRACTORS to assign to the City all claims for overcharges on purchases and supplies, which may arise under the Anti-Trust Laws of the United States, 15 U.S.C.A., Section 1 et seq (1973). The CONTRACTOR shall require his SUBCONTRACTORS to execute a notarized assignment on or before the date of the City's approval of the respective SUBCONTRACTORS for the work, which assignment shall become a part of the prime contract and made a part hereof for all purposes.

The CONTRACTOR agrees to thoroughly review and analyze any claim for additional time, additional compensation, or other damages filed by a SUBCONTRACTOR, in good faith, as to its merits and amount. CONTRACTOR also agrees that it will not present or pass the claim through to the OWNER as if it were the CONTRACTOR'S claim, if the claim is subject to any valid legal or equitable defenses available to either OWNER or CONTRACTOR under the CONTRACT documents, the terms of the Subcontract, or applicable statutory or case law, which defenses include, but are not limited to, any and all notice and claim defenses arising under the Subcontract or the CONTRACT documents. If the SUBCONTRACTOR'S claim is subject to any valid legal or equitable defense under the CONTRACT documents, the Subcontract, or applicable statutory or case law, CONTRACTOR shall, as a condition precedent to the filing of any claim against the OWNER by virtue or any derivative liability of the OWNER under the CONTRACT documents or applicable law, defend against the invalid SUBCONTRACTOR claim in a court of competent jurisdiction, at CONTRACTOR'S sole cost and expense. Failure of CONTRACTOR to defend against invalid SUBCONTRACTOR claims as required in this paragraph shall constitute a complete and unequivocal waiver of any right of CONTRACTOR to seek reimbursement from OWNER. Further, if the CONTRACTOR fails to provide the defense required above, CONTRACTOR shall be obligated to indemnify and reimburse OWNER for all expenses and costs, including but not limited to attorney's fees and expert witness costs, incurred by OWNER in defending any lawsuit based upon a SUBCONTRACTOR claim, in which lawsuit a valid legal or equitable defense was available under the CONTRACT documents, the Subcontract or applicable statutory or case law.

109.6 ASSIGNMENTS

The CONTRACTOR shall not assign, transfer, convey, or otherwise dispose of this Contract, or its right to execute it, or its right, title or interest in it or any part thereof without the previous written consent of the Surety Company and the written approval of the OWNER. The CONTRACTOR shall not assign, either legally or equitably, by power of attorney or otherwise, any of the monies due or to become due under this Contract or its claim thereto without the prior written consent of the Surety company and the written approval of the OWNER. Nothing in this paragraph is intended to conflict with Texas Business and Commerce Code.

The approval of the OWNER of a particular assignment, transfer or conveyance shall not dispense with such approval to any further or other assignments. The approval by the OWNER of any assignment, transfer or conveyance shall not operate to release the CONTRACTOR or Surety hereunder from any of the Contract and bond obligations, and the CONTRACTOR shall be and remain fully responsible and liable for the defaults, negligent acts and omissions of its assignees, its agents and employees, as if they were its own. Should the prosecution of the work be discontinued by the CONTRACTOR, the CONTRACTOR shall notify the OWNER at least twenty-four hours in advance of resuming operations.

If the CONTRACTOR does, without the consent of the OWNER, assign, transfer, convey, or otherwise dispose of the contract or of the CONTRACTOR'S right, title or interest therein, or any part thereof to any person or persons, partnership, company, firm or corporation, or by bankruptcy, voluntary or involuntary, or by assignment under the insolvency laws of any state, attempt to dispose of the contract or make default in or abandon said contract, then the contract may, at the option of the OWNER, be revoked and annulled, unless the sureties shall successfully complete said contract, and any monies due or to become due under this contract shall be retained by the OWNER as liquidated damages for the reason that it would be Impracticable and difficult to fix the actual damage.

109.7 TEMPORARY WORK SUSPENSION

The OWNER shall have the right by written order to suspend the work temporarily, in whole or in part, whenever, in the judgment of the OWNER, such temporary suspension is required.

109.7.A. Reasons for Suspension

1. Because it is in the interest of the OWNER generally;
2. Tue to government or judicial controls or orders which make performance of this CONTRACT temporarily impossible or illegal;
3. To coordinate the work of separate contractors at the job site;
4. To expedite the completion of a separate contract even though the completion of this particular CONTRACT may be thereby delayed;
5. Because of weather conditions unsuitable for performance of the work, including of designated ozone alerts as determined by the National Weather Bureau or other authorized agency; or
6. Because the CONTRACTOR is proceeding contrary to CONTRACT provisions or has failed to correct conditions considered unsafe for workers.
7. Because of certain events and activities occurring in proximity to the construction where it would be in the best interest of the public and the CONTRACTOR for such work to be suspended.

The written order of the OWNER to the CONTRACTOR shall state the reasons for suspending the work and the anticipated periods for such suspension. Upon receipt of the OWNER'S written order, the CONTRACTOR shall suspend the work covered by the order and shall take such means and precautions as may be necessary to properly protect the finished and partially finished work, the unused materials and uninstalled equipment, including the provision of suitable drainage about the work and the erection of temporary structures where necessary. The CONTRACTOR shall not suspend the work without written order from the OWNER and shall proceed with the work promptly when notified by the OWNER to resume operations.

109.7.B. No Additional Compensation

No additional compensation shall be paid to the CONTRACTOR for any suspension under Item for Reasons for Suspension, above or otherwise where same is caused by the fault of the CONTRACTOR. Where such temporary suspension is not due to the fault of the CONTRACTOR, or as a result of a designated Ozone Alert Period, it shall be entitled to:

1. an equitable extension of working time for the completion of the work, not to exceed the delay caused by such temporary suspension, as determined by the OWNER; and
2. the actual and necessary costs of properly protecting the finished and partially finished work, unused materials and uninstalled equipment during the period of the ordered suspension as determined by the OWNER as being beyond the CONTRACT requirements, such costs, if any, to be determined on the basis set forth in Item for Payment for Extra Work, herein; and
3. where the CONTRACTOR elects to move equipment from the job site and then return it to the site when the work is ordered resumed, the actual and necessary costs of these moves, in an amount determined by the OWNER under the provisions of Item of Payment for Extra Work; provided, however, no compensation shall be allowed if the equipment is moved to another construction project for the OWNER.
4. Where such temporary suspension is not due to the fault of the CONTRACTOR and is the result of a designated Ozone Alert Period, the CONTRACTOR shall be entitled to additional time as provided above, but is not entitled to additional compensation.

Other than the additional time and compensation stated above, CONTRACTOR shall not be entitled to any other time extension related to the suspension, nor any additional compensation in any way related to such suspension.

109.7.C. Emergency Contract Termination Clause

Whenever, because of a national emergency, so declared by the President of the United States, or other lawful authority, it shall be impossible for the CONTRACTOR to obtain all labor, materials, and equipment necessary for the prosecution of the work with reasonable continuity, the CONTRACTOR shall notify the OWNER. If the

OWNER cannot, after a reasonable time, help obtain priorities for the materials and equipment within a reasonable effort, then the Contract shall be considered as terminated, and the CONTRACTOR shall be entitled to payment for work performed that is acceptable to OWNER based upon unit prices contained in the bid or, if the Contract is lump sum, then based upon the schedule of values submitted by the CONTRACTOR. CONTRACTOR shall not be entitled to any compensation for anticipated profit, overhead, delay damages or any other compensation for work that has not been performed.

109.8 DELAYS AND LIQUIDATED DAMAGES

The CONTRACTOR may be entitled to an extension of working time under this CONTRACT only when all details supporting the claims for such extension are submitted to the OWNER in writing by the CONTRACTOR within fourteen (14) days from and after the time when any alleged cause of delay shall occur, and then only when such time is approved by the OWNER. The CONTRACTOR shall notify the OWNER immediately upon encountering any condition that the CONTRACTOR believes may cause a claim for a time extension. In adjusting the CONTRACT time for the completion of the project, unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to inability to obtain supplies and materials when orders for such supplies and materials were timely made and materials are not available from other sources, acts of God or the public enemy, acts of the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather conditions, ozone alerts as determined by the National Weather Bureau or other authorized agency, or delays of SUBCONTRACTORS due to such causes beyond their control shall be taken into consideration.

If the satisfactory execution and completion of the CONTRACT should require work and materials in greater amounts or quantities than those set forth in the CONTRACT, requiring more time for completion than the anticipated time, then the CONTRACT time may be equitably increased, but not more than in the same proportion as the cost of the additional work bears to the cost of the original work contracted for. No allowances shall be made for delays or suspension of the performance of the work due to the fault of the CONTRACTOR.

109.8.A. Delays

No adjustment of the CONTRACT time shall be made if, concurrently with the equitable cause for delay, hindrance, disruption, force majeure, impact, or interference, there existed a cause for delay due to the fault or negligence of the CONTRACTOR or CONTRACTOR'S agents, employees or SUBCONTRACTORS. Notwithstanding any other provisions of the CONTRACT Documents, including the General and Special Provisions, no adjustment shall be made to the CONTRACT price and the CONTRACTOR may not be entitled to claim or receive any additional compensation as a result of or arising out of any delay, hindrance, disruption, force majeure, impact or interference, foreseen or unforeseen, resulting in adjustment of the CONTRACT time, including but not limited to those caused in whole or in part by the acts, omissions, failures, negligence or fault of the OWNER, its officers, servants or employees. Delays; Extension of Time; Liquidated Damages, and no act of the OWNER shall be deemed a waiver or entitlement of such extension.

109.8.B. Liquidated Damages

For each day that any work shall remain uncompleted after the time specified in the proposal and the Contract, or the increased time granted by the OWNER, or as equitably increased by additional work or materials ordered after the Contract is signed, the sum per day given in the Schedule 009.8.B.1 **Liquidated Damages**, unless otherwise specified in the special provisions, shall be deducted from the monies due the CONTRACTOR.

Schedule 109.8.B.1 Liquidated Damages

Amount of Contract ($)	Amount of Liquidated Damages ($)
Less than 25,000	100 Per Day
25,000 to 99,999.99	160 Per Day
100,000 to 999,999.99	240 Per Day
1,000,000 or More	500 Per Day

The sum of money thus deducted for such delay, failure or non-completion is not to be considered as a penalty, but shall be deemed, taken and treated as reasonable liquidated damages, per day that the CONTRACTOR shall be in default after the time stipulated in the Contract for completing the work. The said amounts are fixed and agreed upon by and between OWNER and CONTRACTOR because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER in such event would sustain; and said amounts are agreed to be the amount of damages which the OWNER would sustain and which shall be retained from the monies due, or that may become due, the CONTRACTOR under this Contract; and if said monies be insufficient to cover the amount owing, then the CONTRACTOR or its surety shall pay any additional amounts due. In the event that the actual damages incurred by the OWNER exceed the amount of liquidated damages, OWNER shall be entitled to recover its actual damages.

109.9 CONTRACTOR DEFAULT

The work or any portion of the work under this Contract shall be suspended immediately on written order of the OWNER declaring the CONTRACTOR to be in default. A copy of such notice shall be served on the CONTRACTOR's surety. The Contract may be terminated by the OWNER for any good cause or causes, among others of which special reference is made to either the following:

1. Failure of the CONTRACTOR to start the work within 10 days from date specified in the written work order issued by the OWNER to begin the work.
2. Substantial evidence that the progress of the work being made by the CONTRACTOR is insufficient to complete the work within the specified working time.
3. Failure of the CONTRACTOR to provide sufficient and proper equipment, materials or construction forces for properly executing the work.
4. Substantial evidence that the CONTRACTOR has abandoned the work or discontinued the performance of the work or any part thereof and failure to resume performance within a reasonable time after notice to do so.
5. Substantial evidence that the CONTRACTOR has become insolvent or bankrupt, or otherwise financially unable to carry on the work.
6. Deliberate failure on the part of the CONTRACTOR to observe any requirements of the Contract Documents or to comply with any orders given by the Engineer as provided for in the Contract Documents.
7. Failure of the CONTRACTOR to promptly make good any defects in materials or workmanship, or any defects of any nature, the correction of which has been directed in writing by the OWNER.
8. Substantial evidence of collusion for the purpose of illegally procuring a contract or perpetrating fraud on the OWNER in the construction of work under Contract.
9. Repeated and flagrant violations of safe working procedures.
10. The filing by the CONTRACTOR of litigation against the OWNER prior to final completion of the work.

When the work is suspended for any of the causes itemized above, or for any other cause or causes, the CONTRACTOR shall discontinue the work or such part thereof as the OWNER shall designate, whereupon the surety may either at its option assume the Contract or that portion thereof which the OWNER has ordered the CONTRACTOR to discontinue and perform the same or, with the written consent of the OWNER, sublet the same, provided, however, that the surety shall exercise its option within two weeks after the written notice to discontinue the work has been served upon the CONTRACTOR and upon the surety or its authorized agents. The surety in such event shall assume the CONTRACTOR's place in all respects and shall be paid by the OWNER for all work performed by it in accordance with the terms of the Contract, but in no event shall such payments exceed the Contract amount, regardless of the cost to the surety to complete the work.

109.9.A. Surety Compensation

All monies remaining due the CONTRACTOR at the time of its default shall thereupon become due and payable to the surety as the work progresses, subject to all terms of the Contract. In case the surety does not, within the hereinabove specified time, exercise its obligation to assume the Contract or that portion thereof which the OWNER has ordered the CONTRACTOR to discontinue, then the OWNER shall have the power to complete by contract or otherwise, as it may determine, the work herein described or such part thereof as it may deem necessary; and the CONTRACTOR hereto agrees that the OWNER shall have the right to take possession of or use

any or all of the materials, plant, tools, equipment, supplies and property of every kind provided by the CONTRACTOR for the purpose of its work and to procure other tools, equipment and materials for the completion of the same and to charge to the account of the CONTRACTOR the expense of said contract for labor, materials, tools, equipment and expenses incident thereto. The expense so charged shall be deducted by the OWNER out of such monies as may be due or may at any time thereafter become due the CONTRACTOR under and by virtue of the Contract or any part thereof.

109.9.B. New Contractor Selection

The OWNER shall not be required to obtain the lowest bid for the work of completing the contract, but the expenses to be deducted shall be the actual cost of such work. In case such expense is less than the sum which would have been payable under the Contract if the same had been completed by the CONTRACTOR, then in such case the OWNER may pay the CONTRACTOR the difference in the cost, provided that the CONTRACTOR shall not be entitled to any claim for damages or for loss of anticipated profits.

In case such expense shall exceed the amount which would have been payable under the Contract if the same had been completed by the CONTRACTOR, the CONTRACTOR and its surety shall pay the amount of the excess to the OWNER on notice from the OWNER for excess due including any costs incurred by the OWNER, such as inspection, legal fees and liquidated damages. When any particular part of the work is being carried on by the OWNER by contract or otherwise under the provisions of this section, the CONTRACTOR shall continue the remainder of the work in conformity with the terms of the Contract and in such manner as not to hinder or interfere with the performance of workmen employed as above provided by the OWNER or surety.

109.10 TERMINATION AND SUSPENSION

The performance of the work under this Contract may be terminated by the OWNER in whole or from time to time in part, in accordance with this section, whenever the OWNER shall determine that such termination is in the best interest of the OWNER.

109.10.A. Court Ordered Suspension

The CONTRACTOR shall suspend such part or parts of the work pursuant to a court order issued against the OWNER and shall not be entitled to additional compensation for anticipated profits, overhead, delay damage or any other form of compensation by virtue of such court order; neither shall the CONTRACTOR be liable to the OWNER in the event the work is suspended by such court order, unless such suspension is due to the fault or negligence of the CONTRACTOR.

109.10.B. Notice of Termination for Convenience

Any such termination shall be effected by serving a notice of termination to the CONTRACTOR specifying the extent to which performance of work under the Contract is terminated, and the date upon which such termination becomes effective. Further, it shall be deemed conclusively presumed and established that such termination is made with just cause as therein stated; and no proof in any claim, demand or suit shall be required of the OWNER regarding such discretionary action.

After receipt of a Notice of Termination, the Contractor shall cooperate fully with Owner in minimizing the cost to Owner of such termination and shall, as directed by the Contracting Officer, protect the Work accomplished and properties acquired for performance of the Work, terminate or cancel incomplete subcontracts and purchase orders, and dispose of surplus materials and other properties.

In the event of such a termination, the Contract Amount shall be equitably adjusted to a sum which shall fairly compensate the Contractor for all Work completed and for all costs incurred (net of salvage) in part performance of the incomplete portions of the Work and for all costs incurred in connection with the termination, but exclusive of profit on the incomplete portions of the Work. In no event shall such sum be less than the portion of the Contract Amount allotted to the completed portion of the Work.

109.10.C. Contractor Action

After receipt of a notice of termination, and except as otherwise directed by the OWNER, the CONTRACTOR shall:

1. **Stop Work:** Stop work under the CONTRACT on the date and to the extent specified in the notice of termination.
2. **No Further Orders:** Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion the work under the CONTRACT as is not terminated.
3. **Deliver and Assign to OWNER**: At the OWNER'S written request, deliver and assign to OWNER, or any person or entity acting on the OWNER'S behalf, any or all subcontracts, purchase orders and options made by CONTRACTOR in the performance of the work, and deliver to the OWNER true and correct originals and copies of such CONTRACT Documents.
4. **Transfer Title to OWNER:** Transfer title to the OWNER and deliver in the manner, at the times, and to the extent, if any, directed by the OWNER:
   a. **Deliver Fabricated or Un-fabricated Parts:** The fabricated or un-fabricated parts, work in process, completed work, supplies and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the notice of termination; and
   b. **Deliver Completed or Partially Completed Plans:** The completed or partially completed plans, drawings, information, and other property which, if the CONTRACT had been completed, would have been required to be furnished to the OWNER.
5. **Complete Performance:** Complete performance of such part of the work as shall not have been terminated by the notice of termination.
6. **Protect and Preserve Property:** Take such action as may be necessary, or as the OWNER may direct, for the protection and preservation of the property related to its CONTRACT which is in the possession of the CONTRACTOR and in which the OWNER has or may acquire an interest.

At a time not later than thirty (30) Calendar Days after the termination date specified in the notice of termination, the CONTRACTOR may submit to the OWNER a list, certified as to the quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the OWNER. Not later than fifteen (15) Calendar Days thereafter, the OWNER shall accept title to such items and remove them or enter into a storage agreement covering the same, provided that the list submitted shall be subject to verification by the OWNER upon removal of the items, or, if the items are stored, within forty-five (45) Calendar Days from the date of submission of the list, and provided that any necessary adjustments to correct the list as submitted shall be made prior to final settlement.

109.10.D. Termination Claim

Within 60 days after notice of termination, the CONTRACTOR shall submit its termination claim to the Engineer in the form and with the certification prescribed by the Engineer. Unless one or more extensions in writing are granted by the Engineer upon request of the CONTRACTOR, made in writing within such 60-day period or authorized extension thereof, any and all such claims shall be conclusively deemed waived.

109.10.E. Claim and Action Against Owner

No claim against the OWNER under the Contract or for breach of the Contract or additional compensation for extra or disputed work shall be made or asserted against the OWNER under the Contract or in any court action except pursuant to the provisions of Item for Payment of Extra Work, Item for Disputed Work and Claims for Additional Compensation, and Item for Performance of Extra or Disputed Work, and unless the CONTRACTOR shall have strictly complied with all requirements relating to the giving of notice and information with respect to such claim as required under said sections.

109.10.F. Termination Compensation

Subject to the provisions of Item for Termination Claim, the CONTRACTOR and OWNER may agree upon the whole or any part of the amount or amounts to be paid to the CONTRACTOR by reason of the total or partial termination of work pursuant hereto, provided that such agreed amount or amounts shall never exceed the total

Contract price as reduced by the amount of payments otherwise made and as further reduced by the Contract price of work not terminated. The Contract shall be amended accordingly, and the CONTRACTOR shall be paid the agreed amount. No amount shall be due for lost or anticipated profits. Nothing in Item for Failure to Agree hereunder, prescribing the amount to be paid to the CONTRACTOR in the event of failure of the CONTRACTOR and the OWNER to agree upon the whole amount to be paid to the CONTRACTOR by reason of the termination of work pursuant to this section, shall be deemed to limit, restrict or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the CONTRACTOR pursuant to this paragraph.

109.10.G. Failure to Agree

In the event of the failure of the CONTRACTOR and the OWNER to agree, as provided in Item for Termination Compensation, upon the whole amount to be paid to the CONTRACTOR by reason of the termination of work pursuant to this section, the OWNER shall determine, on the basis of information available to it, the amount, if any, due to the CONTRACTOR by reason of the termination and shall pay to the CONTRACTOR the amounts determined. No amount shall be due for lost or anticipated profits.

109.10.H. Deductions

In arriving at the amount due the CONTRACTOR under this section, there shall be deducted:

1. All unliquidated advance or other payments on account theretofore made to the CONTRACTOR, applicable to the terminated portion of this Contract.
2. Any claim which the OWNER may have against the CONTRACTOR in connection with this Contract
3. The agreed price for or the proceeds of sale of any materials, supplies or other things kept by the CONTRACTOR or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the OWNER.

109.10.I. Adjustment

If the termination hereunder be partial prior to the settlement of the terminated portion of this Contract, the CONTRACTOR may file with the Engineer a request in writing for an equitable adjustment of the price or prices specified in the Contract relating to the continued portion of the Contract (the portion not terminated by the notice of termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices; nothing contained herein, however, shall limit the right of the OWNER and the CONTRACTOR to agree upon the amount or amounts to be paid to the CONTRACTOR for the completion of the continued portion of the Contract when said Contract does not contain an established Contract price for such continued portion.

109.10.J. No Limitation of Rights

Nothing contained in this section shall limit or alter the rights, which the OWNER may have for termination of this Contract or any other right which OWNER may have for default or breach of Contract by CONTRACTOR.

109.11 USE OF COMPLETED PORTIONS OF WORK

The OWNER may, after written notice to the CONTRACTOR, and without incurring any liability for increased compensation to the CONTRACTOR, take over and use any completed portion of the work prior to the final completion and acceptance of the entire work included in the Contract, and notwithstanding that the time allowed for final completion has not expired. The CONTRACTOR shall not object to, nor interfere in any way with, such occupancy or use after receipt of the OWNER'S written notice. Immediately prior to such occupancy and use, the OWNER shall inspect such portion of the work to be taken over and shall furnish the CONTRACTOR a written statement of the work, if any, still to be done on such part. The CONTRACTOR shall promptly thereafter complete such unfinished work to permit occupancy and use on the date specified in the OWNER'S written order, unless the OWNER shall permit specific items of work to be finished after the occupancy and use by the OWNER.

The provisions in the paragraph above shall not apply to portions of roads, streets, bridges or detours upon which traffic is diverted to enable the continuation of the Contract work. Neither such usage, as performed under this section, nor the written statement of work still to be done shall be held in any way an acceptance of

said work or structure or any part thereof, nor as a waiver of any of the provisions of these specifications or other Contract Documents pending final completion and acceptance of the work; all necessary repairs and removals of any section of the work so put into use, due to the defective materials or workmanship or to operations of the CONTRACTOR, shall be performed by the CONTRACTOR at its own expense. In the event the CONTRACTOR is unreasonably delayed by the OWNER exercising its rights under this section, the CONTRACTOR may submit a request for an extension of time under Item for Delays; Extension of Time; Liquidated Damages; no additional compensation or delay damages will be paid.

110 MEASUREMENT AND PAYMENT

110.1 INTRODUCTION

The Engineer will measure all completed work using United States standard measures, unless otherwise specified.

110.2 PAYMENT FOR LABOR AND MATERIAL

The CONTRACTOR shall furnish payrolls and personnel records, which pertain to current construction contracts with the OWNER for the purpose of ascertaining compliance with minimum wage rates published by the OWNER. Monthly and final estimates for payment will not be processed unless the CONTRACTOR complies with this requirement in a timely manner.

The CONTRACTOR for itself or any of its SUBCONTRACTORS shall pay all indebtedness, which may become due to any person, firm, or corporation having furnished labor, material or both in the performance of this CONTRACT. It shall be the responsibility of each person, firm or corporation claiming to have furnished labor, materials or both, in connection with this CONTRACT, to protect its interest in the manner prescribed by applicable laws of the State of Texas, provided, however, that as this Contract provides for a public works project, no lien of any kind shall ever exist or be placed against the work or any portion thereof, or any public funds or retainage held by the OWNER; and any SUBCONTRACTOR shall look solely to the CONTRACTOR and the payment bond surety, and not the OWNER, for payment of any outstanding amounts due for labor, materials or any other indebtedness in connection with the work. However, the OWNER may, at any time prior to making final payment, require the CONTRACTOR to furnish a Consent of Surety to any payment due the CONTRACTOR for completed work and may, at the discretion of the OWNER or the request of the Surety, make the check jointly payable to the CONTRACTOR and the Surety.

110.2.A. Payment for Materials

1. **Materials On-Hand:** Materials purchased and stored more than 30 days before use shall be considered materials on-hand. Payment for such materials shall be made as materials are consumed.
2. **Materials Stored Off-Site:** Off-site storage of such materials and payment for off-site storage shall be accomplished according to Item for Off-Site Storage.

110.2.B. Payment for Extra Work

Extra Work done by the CONTRACTOR, as authorized and approved by the OWNER, shall be compensated for in the manner described in this Item. The compensation provided for Extra Work done constitutes full and final payment for the cost of the Extra Work, which cost is limited to: all reasonable costs of labor, materials, supplies, tools, equipment or machinery rental, power, fuel, lubricants, water and other similar operation expenses (but only for the time that such of the above things are employed or used on such Extra Work) incurred in the performance of the Extra Work, and a ratable proportion of premium expenses for all bonds and insurance required under the Contract, to the extent that the Extra Work would cause an increase in such bond or insurance premiums; and a markup amount of not-to-exceed 15-percent of the above mentioned costs to cover and compensate the CONTRACTOR for profit, overhead, profit-and-overhead markups charged to CONTRACTOR by other subcontractors and suppliers, general supervision, field office expense and all other elements of cost and expense not embraced within the cost of the Extra Work. No cost of off-site storage shall be included in the above description of cost unless off-site storage has been approved and directed by the OWNER in writing. No other claims or reservations of right as to additional costs, prices, markups, costs not permitted to be included under this paragraph, disallowed costs or other future additional money or time shall be accepted; each change order shall be specific and final.

1. **Distinguishing Extra Work:** For purposes of this Item or any other provision of the Contract documents that allows a claim for Extra Work, the term "Extra Work" means work that is not reasonably within the scope of the Contract Documents and not otherwise incidental or necessary to performance of the Contract. The term does not include any change by the CONTRACTOR in the means and methods of performing the Work from that anticipated or bid (even if such change in means or methods is requested or directed by the OWNER), whether or not the change is due to foreseeable or

unforeseeable events or conditions, if the intended result or scope of the Work is not expanded or increased. The OWNER shall not be liable for any claim due to a change in the means or methods of construction by the CONTRACTOR, resulting in additional costs, if the OWNER has not changed the plans or specifications and if the intended result and scope of the work required by and reasonably inferred from the Contract Documents remains the same. The OWNER shall also not be liable for any claim for work required in performance of the Contract, without which the Contract could not be completed, notwithstanding that the CONTRACTOR did not contemplate or foresee the degree or amount of work that would be necessary or required to complete the Contract and notwithstanding that it cost the CONTRACTOR more to complete the Contract work than the original Contract price.

2. **Method of Determination:** The method of determination and payment of cost, or credit to the OWNER, for any Extra Work shall be one of the following:
   - **a.** Unit prices agreed on in writing by the Engineer and approved by the OWNER and executed by the OWNER and CONTRACTOR before the Extra Work is commenced or unit prices already included in the Contract documents, subject to all other conditions of the Contract. Mutual acceptance of a not-to-exceed lump sum properly itemized and supported by sufficient substantiating data to permit evaluation before the Extra Work is commenced, subject to all other conditions of the Contract.
   - **b.** A not-to-exceed cost to be determined in a manner agreed upon by the parties plus a mutually acceptable fixed or percentage fee, agreed upon before the Extra Work is commenced and subject to all other conditions of the Contract.
   - **c.** The force account method provided in Item for Force Account Work.
3. **Force Account Work:** If the CONTRACTOR and the OWNER cannot agree to one of the methods of calculating cost provided in Item for Method of Determination above, or if the parties agree to a method but cannot agree to a final dollar figure, or if the CONTRACTOR for whatever reason fails or refuses to sign the Change Order in question, the CONTRACTOR, provided it receives a written order signed by the OWNER, shall promptly proceed with the work involved. Nothing in this paragraph shall be construed to relieve the CONTRACTOR of any obligations it has under the disputed work provisions of Item for Disputed Work and Claims for Additional Compensation, and Item for Performance of Extra or Disputed Work, and where applicable the CONTRACTOR is still obligated to abide with those Items as well as this Item for Force Account Work. The cost of the work involved shall then be calculated on a force account basis, on the basis of the actual, reasonable field cost of the work attributable to the changes, plus a reasonable allowance for overhead, profit, markups of other subcontractors and suppliers, general supervision, field office expense and other elements of cost not embraced within the actual field cost as specified herein, such allowance in any case never to exceed 15%. In such case, the CONTRACTOR shall keep a detailed itemized account of the work involved and the actual field cost incurred, in a format acceptable to the Engineer and with such appropriate supporting data as the Engineer or the OWNER may prescribe. Sworn copies of the itemized accounting shall be directed to the Engineer each day during the performance of the force account work. Failure of the CONTRACTOR to submit the sworn-to itemized accounting daily as required herein shall constitute a waiver by the CONTRACTOR of any right to dispute the OWNER'S determination of the amount due the CONTRACTOR for force account work. Actual, reasonable field cost of the work to be charged under this Item of Force Account Work for force account work is limited to the following:
   - **a.** The reasonable wages of all workmen, foremen, timekeepers, mechanics and laborers, plus costs of social security, old age and unemployment insurance, fringe benefits required by agreement or custom (excluding employee or executive bonuses), and worker's compensation insurance, for the time such labor is actually employed or used on force account work.
   - **b.** Reasonable costs of materials, tools, supplies and equipment (but not to include off-site storage unless so approved and directed in writing by the OWNER), whether incorporated or consumed into the force account work.
   - **c.** Reasonable rental costs of machinery and equipment, exclusive of hand tools, only for the time actually employed or used on force account work, whether rented from the CONTRACTOR or others.

d. A pro rata portion of premium expenses for all bonds and insurance to the extent force account work would cause an increase in such bond or insurance premiums.

Pending final determination of the cost to the OWNER, payment of undisputed amounts on force account shall be included on the monthly estimate as work is completed unless otherwise expressly provided in the written order signed by the OWNER to perform the work. Nothing in this Item for Force Account Work shall be construed as directing the CONTRACTOR's means and methods of performing the work in question.

110.3 PAYMENT WITHHELD

In addition to express provisions elsewhere contained in the Contract, the OWNER may withhold or nullify from any payment otherwise due the CONTRACTOR such amount as determined necessary to protect the OWNER'S interest, or, if it so elects, may withhold or retain all or a portion of any payment or refund payment on account of either of the following:

1. Unsatisfactory progress of the work not caused by conditions beyond the CONTRACTOR'S control.
2. Defective work or not corrected defective work.
3. CONTRACTOR'S failure to carry out instructions or orders of the OWNER or its representative.
4. Reasonable doubt that the Contract can be completed for the balance then unpaid.
5. Work or execution thereof not in accordance with the Contract documents.
6. Claim filed by or against the CONTRACTOR or reasonable evidence indicating probable filing of claims.
7. Failure of the CONTRACTOR to make payments to any subcontractor or suppliers for material or labor used in the performance of the Work.
8. Damage to another CONTRACTOR.
9. Unsafe working conditions allowed persisting by the CONTRACTOR.
10. Failure of the CONTRACTOR to provide work schedules as required by the OWNER.
11. Use of subcontractors without the Engineer's approval.
12. Failure of the CONTRACTOR to keep current as-built record drawings at the job site or to turn same over in completed form to the OWNER.

When the grounds for withholding payment are removed, payment shall be made for amounts withheld because of them, and OWNER shall never be liable for interest on any delayed or late payment. To the greatest extent permitted by applicable law, Owner shall not be deemed to be in breach of the Contract Documents by reason of the withholding of any payment which Owner is entitled to withhold pursuant to, or which it withholds in good faith in reliance on, any provision of the Contract Documents, and no interest shall accrue in connection with the withheld payment(s) determined to have been properly withheld. In determining whether amounts claimed for payment by Contractor, or any subcontractor, are in dispute, Owner shall have the right to consider amounts withheld under this provision, due to Contractor fault or in an attempt to protect the public from loss or overpayment of public funds, to be amounts in dispute. Nothing in this Section or in the Contract Documents shall limit or reduce any right of the Owner to offset amounts owed to Contractor by amounts owed to Owner by Contractor, or to exercise any other rights or remedies provided by law or equity.

110.4 MONTHLY ESTIMATES AND PAYMENTS

This Item is not intended to contradict previous sections pertaining to MONTHLY ESTIMATE, PARTIAL PAYMENTS, RETAINAGE, FINAL INSPECTION, ACCEPTANCE AND FINAL PAYMENTS.

110.4.A. Monthly Estimates

Between the 25th day and the last day of each month, the OWNER shall make an approximate estimate of the value of the work done during the month under the specifications. Whenever the said estimate or estimates of work done since the last previous estimate exceeds $100 in amount, a percentage of such estimated sum shall be paid the CONTRACTOR on the next following month. Payment of the monthly estimate is determined at the Contract Item prices less any withholdings or deductions in accordance with the Contract. The monthly estimate may include acceptable nonperishable materials delivered to the work; such payment shall be allowed on the

same percentage basis of the net invoice value as provided hereinafter. The percent retained by the owner shall normally be up to the amount noted under the Item for Retainage, unless otherwise stated elsewhere in the contract documents. At the midpoint, or at any subsequent time, if the owner determines that the progress on the Contract is satisfactory in all respects, it may at its discretion cease to retain additional funds until the completion of the project, or until progress ceases to be satisfactory. The owner shall make the sole determination in this matter.

Except as otherwise provided by the Contract, between the 25th day and the last day of each month the CONTRACTOR shall make an estimate of the value of work done during this month under the specifications. The CONTRACTOR shall prepare the estimate on a form approved by the Engineer. The CONTRACTOR shall forward the estimate required above to the OWNER by not later than the last day of the month. The monthly estimate may include acceptable nonperishable materials delivered to and stored at the work site or a storage facility accessible to the OWNER; payment for such stored materials shall be allowed on the same percentage basis of the value as provided hereinafter. The monthly estimate shall also provide such supporting documentation as the Engineer or the other applicable provisions of the specifications may require. The OWNER shall verify that the CONTRACTOR's estimate matches the total value of work done and acceptable non-perishable materials delivered to the work site or storage facility, based upon the bid proposal prices and quantities measured or verified by OWNER. In the event of a discrepancy between quantities of work as shown in the CONTRACTOR'S estimate and measured quantities as shown in the OWNER'S verification, the OWNER's determination or measurement shall be final, and the CONTRACTOR's estimate shall be adjusted to reflect the quantities of work as shown by the OWNER'S verification. Payment shall be made by OWNER about thirty (30) days after receipt of the estimate from CONTRACTOR. OWNER shall not be liable for interest on any late or delayed payment caused by any claim or dispute, any discrepancy in quantities as described above, any failure to provide supporting documentation or other information required with the estimate or as a precondition to payment under the Contract, or due to any payment the OWNER has a right to withhold under the Contract. Measurement and payment shall be done per the design documents as designed by the Engineer.

The CONTRACTOR shall complete installation proposed improvements as shown on the drawings. Payment each month shall be done for a percentage complete of such items as measured in Square Yards, Cubic Yards, and Linear Feet of the total amount installed. All items paid per EACH will be paid per each individual item installed. Any approved deviation from the design documents will be paid per individual unit price shown. The OWNER provided unit measurements take into account small discrepancies up to 10% for all volume and weight measurements, 7% for all area measurements, and 5% for all linear measurements, compared to what may be found in the field. If CONTRACTOR notices considerable change then a change proposal request may be submitted for approval as noted herein.

The CONTRACTOR shall submit to the Engineer a Schedule of Values for each Lump Sum item of work for review and approval 20 days before the work is scheduled to be performed. The CONTRACTOR shall itemize in the Schedule of Values the actual costs to the CONTRACTOR to perform the various parts of the Lump Sum item work which shall include a reasonable overhead and profit cost item. Partial payment for Lump Sum items shall be made based on the value and percentage of the work in the bid item completed, as approved by the OWNER and as reflected in the Schedule of Values. The CONTRACTOR shall furnish to the OWNER such detailed information as OWNER may request to assist in the preparation of monthly estimates. It is understood that the monthly estimates shall be approximate only, and all monthly estimates and partial payments shall be subject to correction in the estimate rendered following the discovery of an error in any previous estimate, and such estimate shall not in any respect be taken as an admission of the OWNER of the amount of work done or of its quality or sufficiency nor as an acceptance of the work or the release of the CONTRACTOR of any of its responsibility under the Contract.

Owner shall not be obligated to make any progress payment or the final payment if the Surety objects to such payment or refuses to consent to such payment, or withdraws its consent to such payment. If requested by the Surety, or if Owner determines that it is advisable to do so, Owner shall have the right to make payments jointly to Contractor and Surety, or to Contractor and any subcontractor, supplier, or other person claiming payment for labor or materials. In the event of a dispute between Contractor and/or the Surety or persons

performing labor or supplying materials, as to whom payment of amounts held by Owner should be made, Owner shall have the right to interplead the funds held by it in the registry of a court having appropriate jurisdiction, and to withhold from the amounts held by it all attorney's fees and other costs incurred by Owner in connection with such dispute.

110.4.B. Retainage

As security for the faithful completion of the work by the CONTRACTOR, the OWNER shall retain 15-percent of the total dollar amount of work done on all contracts $25,000 and less; 10 a-percent of the total dollar amount of work done on all contracts in excess of $25,000 and less than $400,000; five-percent of the total dollar amount of work done on all contracts of $400,000 or more. On all contracts in excess of $400,000, either of the following shall apply:

1. On all contracts in excess when work progress is 80-percent complete, retainage may, at the OWNER'S option, be reduced to two percent of the dollar value of all work satisfactorily completed to date (not to include material on hand), provided that the CONTRACTOR is making satisfactory progress and there is no cause of greater retainage as determined by the Engineer.
2. When work progress is substantially complete, the retainage may be further reduced to only that amount necessary to assure completion as determined by the Engineer.
3. If the OWNER determines that the CONTRACTOR is not making satisfactory progress or if there is other specific cause, the OWNER may, at its discretion, reinstate up to the five percent retainage.

110.4.C. Final Contractor's Report

The final CONTRACTOR'S Report of SUBCONTRACTOR / SUPPLIER Payment, evidencing that all indebtness connected with the work and all sums of money due for any labor, materials, apparatus, fixtures or machinery furnished for or used in the performance of the work have been paid or otherwise satisfied, or that the person or persons to whom the same may be respectively due have consented to final payment. The OWNER may reasonably require other documentation, including but not limited to, additional affidavits, lien waivers, and other such documentation needed to protect the OWNER'S interest. In addition, the CONTRACTOR shall be required to execute the OWNER'S standard Affidavit of Final Payment and Release as a precondition to receipt of final payment. The acceptance by the CONTRACTOR of the final payment as aforesaid shall operate as and shall be a release to the OWNER from all claims or liabilities under the CONTRACT, including all SUBCONTRACTOR claims, for anything done or furnished or relating to the work under the CONTRACT or for any act or neglect of said OWNER relating to or connected with the CONTRACT. All warranties and guarantees shall commence from the date of the certificate of acceptance. No interest shall be due the CONTRACTOR on any partial or final payment or on the retainage.

110.4.D. Acceptance

The Contractor shall notify the ENGINEER when the list of outstanding items and Work are complete, and the Project Manager will arrange a final inspection with the Contractor and the Owner. If work completed is to the OWNER's satisfaction, then OWNER shall issue a letter or certificate of acceptance to the CONTRACTOR.
Upon completion of the Work in full and strict conformity to the Contract Documents and within 30 days after final acceptance of the Work by a Contracting Officer and Contractor's satisfaction of its obligations for final payment, Owner shall pay the unpaid balance of the Contract Amount less any sum that may be necessary to settle any claim Owner may have against the Contractor or that may be necessary to settle any outstanding obligations of the Contractor or of its Subcontractors arising out of or incident to the performance of the Contract or which is otherwise withheld pursuant to the terms of the Contract Documents.

Neither the Certificate of Substantial Completion, nor final acceptance payment, nor any other provisions in the Contract Documents, shall relieve the Contractor of its obligations under the Contract Documents or under any warranty.

110.4.E. Final Payment

Whenever the improvements provided for by the Contract shall have been completely performed on the part of the CONTRACTOR, as evidenced in the certificate of acceptance obtained according to Item of Acceptance, and all required submissions provided to the OWNER, a final estimate showing the value of the work shall be prepared by the Engineer as soon as the necessary measurements and computations can be made. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment. The amount of the final estimate, less any sums that have been previously paid, deducted or retained under the provisions of this Contract, shall be paid to the CONTRACTOR within a reasonable period of time after final acceptance, provided that the CONTRACTOR has first furnished the OWNER:

1. Consent of surety to final payment.
2. The final CONTRACTOR's notarized Report of Subcontractor/Supplier Payment, evidencing that all indebtness connected with the work and all sums of money due for any labor, materials, apparatus, fixtures or machinery furnished for or used in the performance of the work have been paid or otherwise satisfied, or that the person or persons to whom the same may be respectively due have consented to final payment.
3. Other affidavits, lien waivers and other documentation as the OWNER may reasonably require protecting its interests.
4. All warranties, instructions, documents and other submittals required by the Contract Documents, or otherwise required by Owner.
5. Furnish a release of all claims against Owner, in form satisfactory to Owner, whether of Contractor, Subcontractors or of others, arising under and by virtue of the Contract.
6. Deliver to Owner all As-Built Drawings and three Owner's Manuals containing all Contractor and Subcontractor names, addresses and phone numbers; all plumbing, electrical, and communication equipment/fixture product data; all special equipment product data; and all parts lists and operating, maintenance, and service manuals.
7. The Contractor shall arrange for a reasonable amount of instruction for the Owner’s employees and representatives to insure proper operation of all equipment furnished. The Contractor shall not assume that the Owner’s employees possess special expertise or have had any previous experience whatsoever in the operation and maintenance of equipment installed as part of the Project.

In addition, the CONTRACTOR shall be required to execute the OWNER's standard Affidavit of Final Payment and Release as a precondition to receipt of final payment. The acceptance by the CONTRACTOR of the final payment as aforesaid shall operate as and shall be a release to the OWNER from all claims or liabilities under the Contract, including all subcontractor claims, for anything done or furnished or relating to the work under the Contract or for any act or neglect of said OWNER relating to or connected with the Contract.

All warranties and guarantees shall commence from the date of the certificate of acceptance. No interest shall be due the CONTRACTOR on any partial or final payment or on the retainage.

110.4.F. Wire Transfer Payments

Payments to the CONTRACTOR may, at the discretion of the OWNER, be made by wire transfer to a bank of the CONTRACTOR'S choice. The CONTRACTOR must furnish the following information:

1. The ABA number of the bank.
2. The CONTRACTOR'S account number.

The request must be on the CONTRACTOR'S letterhead and signed by an authorized representative of the CONTRACTOR (cannot be a copy).

SECTION 400

PAVING

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401 INTRODUCTION

This Section shall govern the replacement, rehabilitation, or new construction of roadways, including items such as structures, signage, and other items not applicable to other sections.

402 SUBGRADE PREPARATION

402.1 DESCRIPTION

Subgrade is that portion of the roadbed upon which the subbase, base or the pavement is to be placed. It includes 12-in. beyond the back of the curb for streets, which are to be paved with concrete.
This item shall consist of scarifying, blading and rolling the subgrade to obtain a uniform texture and provide as nearly as practicable a uniform density for the top 6-in of the subgrade, or other depths as may be called out in the plans or the bid form. These specifications shall govern for the preparation of the subgrade except as otherwise provided or specified.

402.2 EQUIPMENT

All equipment necessary for the construction of this item shall be on the project and shall be approved by the OWNER as to condition before the CONTRACTOR shall be permitted to begin construction operations on which the equipment is to be used. Any equipment that achieves the desired results in the time frame allowed is acceptable. Compaction equipment shall conform to the requirements of Item for Proof Rolling.

In lieu of the subgrade equipment specified, the CONTRACTOR may, upon written permission from the OWNER, operate other subgrade equipment that will produce equivalent results in the same period of time as the specified equipment. If the substituted subgrade equipment fails to produce the desired results within the same period of time as would be expected of the specified equipment, as determined by the OWNER, its use shall be discontinued.

402.3 CONSTRUCTION METHODS

After the excavation of embankment has been substantially completed, the subgrade shall be shaped so that after rolling as specified in Item for Proof Rolling and subsequent finishing operations, it shall conform to the correct alignment, cross section and elevation. Rolling and sprinkling, as needed, shall be performed when and to the extent directed and the roadbed shall be completed to or above the plane of the typical section shown on the plans and the lines and grades established by the OWNER. All preparing of the right of way and/or clearing and grubbing and removal of concrete curbs, all organics (i.e., roots, trees, grass, and other humus materials) and any other deleterious materials, shall be complete before starting the subgrade preparation. All unsuitable material shall be removed and replaced with approved material. All foundations, walls or other objectionable material shall be removed to a minimum depth of 18 inches under all structures and 12 inches under areas to be vegetated. Subgrade shall be scarified at least 6 inches of the cut soil subgrade, and re-compacted to standard as shown below.

In the event that fill material is required to be placed over the subgrade to achieve required grades, approved material shall be placed in 8-inch loose lifts and compacted and tested in accordance with Section for Embankment requirements.

After completion of the compaction and immediately before the application of subbase, base or pavement, the subgrade preparation equipment shall be operated using approved methods in a manner to finish the subgrade to the required section. The subgrade shall then be tested with the approved template, operated and maintained by the CONTRACTOR. All irregularities which develop in excess of ½-in. in a length of 10-ft. measured longitudinally shall be corrected by loosening, adding or removing material; reshaping; and re-compacting by sprinkling and rolling. The completed subgrade shall have a uniform density of not less than 95-percent Standard Proctor density (ASTM D 698). Density tests shall also be performed on any utility trench backfill

beneath the proposed roadway to verify that adequate compaction levels have been achieved. Moisture content shall be within -2 to +4 of optimum.
The Contractor will be required to set blue tops for the subgrade and any required fill material on centerline, at quarter points and curb lines or crown lines at intervals not exceeding 50 feet. Subgrade shall be prepared and tested at a rate of one test per 500 feet per lane prior to placement of embankment or select fill material.

The subgrade shall be maintained in a smooth, compacted condition, in conformity with the required section and established grade, until the subbase, base or pavement is placed, and shall be kept wetted down sufficiently in advance of placing any subbase, base or pavement to insure its being in a firm and moist condition for at least 2-in. below surface of the prepared subgrade. Only such subgrade as is necessary for the satisfactory execution of the work shall be completed ahead of the placement of base or pavement. Hauling or operating of unnecessary equipment on the completed subgrade shall be kept to a minimum. If equipment is operated on recent work, the OWNER may inspect and require subgrade replacement for such defects as fractures, rutting, or any other failure. Complete drainage of the subgrade shall be provided at all times. Finishing of the subgrade by other methods shall be permitted on pavement widening projects, on sections where the pavement width is not uniform, at intersections and elsewhere where the operation of certain equipment would not be practical. Subgrade finished by hand or other methods shall conform to the requirements above specified.

402.4 MEASUREMENT AND PAYMENT

Unless otherwise noted in the contract documents the preparation of subgrade shall not be measured for payment as a separate contract pay item. This item shall be considered subsidiary to other paving items. Item shall furnishing of all labor, tools, materials, equipment and incidentals necessary to complete the work, including disposal or surplus material, all in accordance with the plans and these specifications.

If required the preparation of subgrade shall be measured by the square yard (SY) regardless of the required depth of preparation; and cost thereof shall be included in such contract items as are provided, which pay items shall be the total compensation for the furnishing of all labor, tools, materials, equipment and incidentals necessary to complete the work, including disposal or surplus material, all in accordance with the plans and these specifications.

403 FLEXIBLE BASE OR SUBBASE PREPARATION

403.1 DESCRIPTION

Subbase is that layer of specified material of plan thickness between a base and a subgrade. Base is that layer of specified material of plan thickness placed immediately below the pavement course surfacing, flexible base or subbase includes 12-in. beyond the back of the curb for streets, which are to be paved with concrete.
This item shall consist of scarifying, blading and rolling the subgrade to obtain a uniform texture and provide as nearly as practicable a uniform density for a minimum of 6-inches, or other depths as may be called out in the plans or the bid form. The base layer shall be constructed as herein specified in one course for depths less than 6” and two courses for depths greater than 6”, in conformity with the typical sections and to the lines and grades as indicated or as established by the OWNER.
These specifications shall govern for the preparation of the subbase except as otherwise provided or specified. This item shall consist of a foundation course for a surface course or for other subbase or base courses; shall be constructed as herein specified in one or more courses in conformity with the typical section shown on the plans and to the lines and grades as established by the OWNER.

403.2 EQUIPMENT

All equipment necessary for the construction of this item shall be on the project and shall be approved by the OWNER as to condition before the CONTRACTOR shall be permitted to begin construction operations on which the equipment is to be used. Any equipment that achieves the desired results in the time frame allowed is acceptable.

In lieu of the subgrade equipment specified, the CONTRACTOR may, upon written permission from the OWNER, operate other subgrade equipment that will produce equivalent results in the same period of time as the specified equipment. If the substituted subgrade equipment fails to produce the desired results within the same period of time as would be expected of the specified equipment, as determined by the OWNER, its use shall be discontinued.

403.3 MATERIALS

The flexible base delivered shall be free of all foreign material or debris (i.e. reinforcement steel, dirt, plastic, trash). Material shall consist of durable particles of crushed limestone or crushed concrete and shall be free of thin, laminated, or elongated pieces, or an excess of shale, dirt, organic matter or other materials that would be harmful to the production of a homogenous base coarse. Should the CONTRACTOR elect to produce the material from local pits, the material shall be secured from sources approved by the OWNER. The pits as utilized shall be opened up in such a manner as to immediately expose the vertical faces of all the strata of acceptable material in the depth mined. Unless otherwise directed, the material shall be secured in successive vertical cuts extending through all of the exposed strata, in order that a uniform mixed material shall be secured.

Aggregate that fails to meet the requirements of these specifications may be rejected by the OWNER. Such rejection shall incur no cost to the OWNER. Aggregate sources from which materials are delivered with properties not meeting these specifications may be rejected as further supply sources to the project by the OWNER.

403.3.A. Testing

Tests base materials shall be in accordance with the following TxDOT standard laboratory test procedures:

1. Preparation for Soil Constants and Sieve Analysis	Tex-101-E
2. Liquid Limit	Tex-104-E
3. Plastic Limit	Tex-105-E
4. Plasticity Index	Tex-106-E
5. Sieve Analysis	Tex-110-E
6. Wet Ball Mill	Tex-116-E
7. Triaxial Test	Tex-117-E (Part II)

When a magnesium soundness value is shown on the plans the material shall be tested in accordance with Test Method Tex-411-A Soundness of Aggregate Using Sodium Sulfate or Magnesium Sulfate.

Base material will be stockpiled after crushing, tested by the testing agency designated by the Owner and reviewed by the Owner prior to being hauled to the project site.

403.3.B. Gradation

Gradation shall meet the requirements in Table 403.3.B.1 Flexible Base or Subbase Gradation, according to specified grade and properties according to Table 403.3.B.2.

Table 403.3.B.1 Flexible Base or Subbase Gradation

Sieve Size	Percent Retained
2 ½ inch	0
1¾ inch	0-10
No. 4	45-75
No. 40	60-85

Table 403.3.B.2 Physical Properties

Physical Property	Max. Percentage
Liquid Limit (LL)	35
Plasticity Index (PI)	4 - 12
Wet Ball Mill	50
Increase in passing No. 40 sieve	20

* Tests shall be made in accordance with A.S.T.M. latest methods and Texas State Highway Department testing. Minimum compressive strength when subjected to the triaxial test: 35 psi at 0 psi lateral pressure and 175 psi at 15 psi lateral pressure, unless otherwise indicated.

403.3.C. Material Storage

Prior to stockpiling of aggregates, the area shall be cleaned of trash, weeds and grass and be relatively smooth. Stockpiles should be constructed to between 20,000 and 40,000 cubic yards in size. The size should be limited to the ability of the available equipment to construct, mix and test the pile. The stockpile shall be constructed utilizing equipment such as a scraper, a bottom dump or other acceptable equipment that allows spreading when dumped without re-handling. The stockpile shall be constructed to allow dump spreading in 1 direction only. Height of stockpile shall not exceed the capabilities of available machinery to make a full cut (bottom to top) on any of the 4 sides.

The Contractor will furnish tests on a completed stockpile. Tests shall be performed by a qualified provider of material testing services. The stockpile shall not be added to after it has been tested.

403.4 CONSTRUCTION METHODS

After the excavation of embankment has been substantially completed and the subgrade operations have been competed per specifications set forth herein, the subbase and/or base layer shall be shaped and shall conform to the correct alignment, cross section and elevation.

403.4.A. Placing

Immediately before placing the subbase or base course material, the subgrade shall be checked as to conformity with grade and section. A minimum of 2 inches of depth of the existing base material shall be uniformly scarified and mixed with the first course of base prior to compaction.

The material shall be delivered in vehicles of a uniform capacity. It shall be the charge of the CONTRACTOR that the required amount of specified material shall be delivered to secure the proper thickness of the completed subbase or base course.

Material deposited on the subgrade shall be spread and shaped the same day. All material shall be moved at least once from the original position in which it is deposited. In the event of inclement weather or other unforeseen circumstances which render impracticable the spreading of the material during the first 24-hour period, the material shall be scarified and spread as directed by the OWNER. The material shall be sprinkled, if directed, and shall then be bladed, dragged and shaped to conform to the typical section as shown on the plans.

All areas and "nests" of segregated coarse or fine material shall be corrected or removed and replaced with well-graded material as directed by the OWNER. If additional binder is considered desirable or necessary after the material is spread and shaped, it shall be furnished and fully incorporated with the material in place by

scarifying, harrowing, brooming or by other approved methods. The course shall be sprinkled as required and compacted to the extent necessary to provide not less than the percent density as specified in Item for Density. In addition to the requirements specified for density, the full depth of flexible subbase or base shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each course is completed, tests as necessary shall be made by the OWNER unless otherwise specified in the special provisions or in the plans. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements.

Throughout the entire operation, the shape of the course shall be maintained by blading. The surface, upon completion, shall be smooth and in conformity with the typical sections shown on the plans to the established lines and grades. On the surface on which pavement is to be placed, any deviation in excess of ¼-in. in cross section in a length of 16-ft. measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling. All fractures, settlement, or segregation that develops shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and re-compacting by sprinkling and rolling. Should the subbase or base course, due to any reason or cause, lose the required stability, density and finish before the surfacing is complete, it shall be re-compacted and refinished at the sole expense of the CONTRACTOR.

403.4.B. Courses

Non full depth asphalt pavements, paving types with flexible base under the curb and gutter shall be placed and compacted at the same time and in the same operation as the flexible base under the pavement. Where the subbase or base course exceeds 6-in. in thickness, it shall be constructed in two or more courses of equal thickness as indicated on the typical section. Course depth shall be a minimum of 3-in. and maximum of 6-in. The first course shall be placed and compacted under the curb and gutter and under the pavement. The curb and gutter shall then be built upon the first course. The final course of the flexible base shall be placed following the curing time as specified in Item for Concrete Curb and Gutter.

In addition to the requirements specified for density, the full depth of flexible base shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each section of flexible base is completed, tests as necessary will be made by the Contractor. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements. Should the base course, due to any reason or cause, lose the required stability, density and finish before the surfacing is complete, it shall be re-compacted and refinished at the sole expense of the Contractor.

403.4.C. Density

Each course of flexible base shall be compacted to not less than 95 percent of optimum density, as determined by TxDOT test method Tex-114, in accordance with ASTM D2167 Nuclear Test Method. In no case shall the base be worked at more than 2 percent above or below optimum moisture. Field density determinations shall be made in accordance with approved methods. Tests shall be performed at intervals not exceeding 500 feet at random points on the roadway cross section.

403.5 MEASUREMENT AND PAYMENT

Preparation of base and subbase shall be measured by the square yard (SY) regardless of the required depth of preparation.

1. For flexible base paid as measured in place, the quantity shall be computed by the average end area method based on cross sections taken before beginning of any construction operations, and equivalent cross sections taken after completion and acceptance of the flexible base. The contractor shall be required to provide cross sections of the existing topography before beginning of any construction operations, and shall be required to provide cross sections immediately following completion and acceptance of the flexible base. The manner, location, and level of detail of the cross sections shall be as approved by the OWNER. The contractor shall calculate the total flexible base volume and submit both sets of cross sections and the calculations to the OWNER for review and approval.

2. For flexible base paid as a plans quantity item, no field measurement shall be made, and payment shall be at the unit price bid for the quantity shown on the plans. No adjustment of quantities shall be made except in the instance of design changes by the OWNER.
3. Where no curb and gutter is in place or is to be constructed in connection with the base, measurement shall be made to the lines shown on the plans or established as the edge of the base to be constructed.
4. Where curb and gutter is in place or is proposed to be constructed in connection with the placing of the base material, measurement shall be made to 12-in beyond the back of curb. Material placed under the curb and gutter or behind the curb shall not be measured separately but in conjunction with the rest of the roadway base material.

Preparation of the base and/or subbase shall be paid for as a separate contract pay item; and cost thereof shall be included in such contract items as are provided, which pay items shall be the total compensation for the furnishing of all labor, tools, materials, equipment and incidentals necessary to complete the work, including disposal or surplus material, all in accordance with the plans and these specifications. Price shall be full compensation for preparation of subgrade, furnishing of material, hauling, blading, sprinkling, compacting and furnishing all of labor and equipment necessary to complete the work.

404 ROLLING OF EMBANKMENT, SUBGRADE OR FLEXIBLE BASE

404.1 DESCRIPTION

Rolling shall consist of the compaction of embankment, subgrade, subbase, or flexible base by the operation of approved power rollers, as herein specified and as directed by the OWNER. The embankment, subgrade or base course shall be sprinkled as directed by the OWNER. Rolling patterns and speeds shall be established per project and indicated on the plans. Any soft or compressible areas detected during the proof rolling process shall be undercut to firm soil and backfilled as required by the OWNER with acceptable soil to make the final grade.

404.2 EQUIPMENT

All equipment necessary for the construction of this item shall be on the project and shall be approved by the OWNER as to condition before the CONTRACTOR shall be permitted to begin construction operations on which the equipment is to be used. Any equipment that achieves the desired results in the time frame allowed is acceptable. Sufficient rollers shall be provided to compact the material in a manner satisfactory to the OWNER. When operations are so isolated from one another that one roller unit cannot perform the required compaction satisfactorily, the CONTRACTOR shall provide additional roller units.

If equipment fails to produce the desired result within the required time frame, its use shall be discontinued and the CONTRACTOR will be required to furnish equipment, as determined by the OWNER, at no additional cost to the OWNER.

In lieu of the equipment specified, the CONTRACTOR may, upon written permission from the OWNER, operate other compaction equipment that will produce equivalent results in the same period of time as the specified equipment. If the substituted equipment fails to produce the desired results within the same period of time as would be expected of the specified equipment, as determined by the OWNER, its use shall be discontinued.

404.3 MEASUREMENT AND PAYMENT

This item shall be considered subsidiary to other paving items; and shall be the total compensation for all labor, materials, tools, machinery, equipment and incidentals necessary to complete the work in accordance with the plans and this specification.

If included in the contract documents as a separate contract pay item, rolling shall be measured for payment by the actual hours the roller is in operation (Hrs), as ordered by the OWNER. Rolling provided in the proposal and the contract, as a separate pay item, shall be paid for in accordance with the contract unit price.

405 PAVEMENT SECTION TREATMENT

This item shall consist of treating embankment, subgrade, subbase, and base courses by addition of lime, cement, or asphalt; mixing and compacting the material to the required density.

405.1 LIME TREATMENT

This item shall consist of treating subgrade, subbase, and base courses by the pulverization, addition of lime, mixing and compacting the mixed material to the required density. This item applies to natural ground, embankment, or pulverized recycled asphalt pavement base or subbase courses placed under this contract, which shall be constructed as specified herein and in conformity with the typical section, lines and grades as shown on the plans.

405.1.A. Materials

Materials for Lime Treatment shall consist of Hydrated Lime (Slurry) and Quicklime.

405.1.A.1. Hydrated Lime (Slurry): Hydrated lime slurry shall be a pumpable suspension of solids in water. The solids portion of the mixture, when considered on the basis of "solids content," shall consist principally of hydrated lime of a quality and fineness sufficient to meet the following requirements as to chemical composition and residue.

405.1.A.1.a. Gradation: The "solids content'' of the lime slurry shall have a hydrate alkalinity Ca(OH)2 of not less than 90-percent by weight. The percent by weight of residue retained in the "solid content" of lime slurry shall conform to the requirements in Table 405.1.A.1.a.(1) Hydrated Lime Residue.

Table 405.1.A.1.a.(1) Hydrated Lime Residue

Sieve Size	Residue Retained by Weight
No. 6	None
No. 10	Max.1.0%
No. 30	Max. 2.5%

Slurry shall be Type B, commercial lime slurry, shall conform to one of the following three grades:

Grade 1: The "dry solids contents" shall be at least 31-percent by weight of the slurry.

Grade 2: The "dry solids contents" shall be at least 35-percent by weight of the slurry.

Grade 3: The "dry solids contents" shall be at least 46-percent by weight of the slurry.

When Type B, commercial lime slurry, is specified, the CONTRACTOR shall select, prior to construction, the grade to be used and shall notify the OWNER in writing before changing from one grade to another.

405.1.A.2. Quicklime: Quicklime is a dry material consisting essentially of calcium oxide. It shall be furnished either in "pebble" gradation suitable for dry placing and slurry placing, or as a dry powder suitable only for slurry placing. Powdered quicklime is restricted to slurry placing, as the possibility of appreciable amounts of finely divided powdered quicklime makes it unsuitable for dry placing.

CAUTION: HANDLING AND USE OF QUICKLIME CAN BE DANGEROUS. QUICKLIME SHOULD BE PRESCRIBED BY A REGISTERED PROFESSIONAL OWNER FAMILIAR WITH ITS USE.

Quicklime shall conform to the chemical requirements of ASTM C977 Quicklime and Hydrated Lime for Soil Stabilization. Water shall conform to the requirements of section for Water under Item for Portland Cement Concrete Pavement.

405.1.A.3. Testing: If the minimum design strength or percent lime to be used is specified, it shall be determined by preliminary laboratory tests at the OWNER's expense. Optimum lime addition percentage shall

be determined by Tex-112-E Admixing Lime to Reduce Plasticity Index of Soils (Atterberg Limits Soil-Lime Series) and/or by ASTM 06276 Test Method for using pH to Estimate the Soil-Lime Proportion Requirement for Soil Stabilization (pH Soil-Lime Series).

405.1.A.4. Delivery and Storage: If hydrated lime is furnished in bags, each bag shall bear the manufacturer's certified weight. Bags varying more than 5-percent by weight may be rejected; the average weight of the bags in any shipment, as shown by weighing 50 bags taken at random, shall not be less than the manufacturer's certified weight. If lime is furnished in trucks, each truck shall bear the weight of lime measured on certified scales, or the CONTRACTOR shall place a set of standard platform truck scales or hopper scales at a location approved by the OWNER.
Hydrated lime and quicklime shall be stored and handled in closed, weatherproof containers until immediately before distribution on the road. If storage bins are used, they shall be completely enclosed. Hydrated lime bags shall be stored in weatherproof buildings with adequate protection from ground dampness. Quicklime, when permitted, shall be shipped only in bulk; bagged material shall not be acceptable.

Any materials that do not conform to the requirements of this specification shall be rejected.

405.1.B. Equipment

Machinery, tools and equipment necessary for proper performance of the work shall be on the project and approved by the OWNER prior to the beginning of construction operations. When permitted, quicklime shall be slurred in agitated slurry tanks. The distributor truck used for slurry placing need not necessarily be equipped with an agitator. However, the slurry at the time of distribution must meet the consistency requirements specified.
All machinery, tools and equipment used shall be maintained in a satisfactory and workmanlike manner.

405.1.C. Construction Methods

It is a primary requirement of this specification to secure a completed course of treated material containing a uniform lime mixture, free from loose or segregated areas, or uniform density and moisture content, well bound for its full depth, and with a smooth surface and suitable for placing subsequent courses. It shall be the responsibility of the CONTRACTOR to regulate the sequence of work, to use the proper amount of lime, maintain the work and rework the courses as necessary to meet the above requirements.
Prior to beginning any lime treatment, the roadbed shall be constructed and shaped to conform to the typical sections, lines and grades as shown on the plans or as established by the OWNER.

In cases where groundwater is present, application of lime for stabilization shall be evaluated by the OWNER.

Mixing procedure shall be the same for "dry placing" or "slurry placing" as hereinafter described.

405.1.C.1. Treatment for Materials in Place: Materials to be treated shall be excavated to the secondary grade (proposed bottom of lime treatment) and removed or windrowed to expose the secondary grade. Any wet or unstable material below the secondary grade shall be corrected by scarifying, adding lime and compacting until it is of uniform stability. The excavated material shall then be spread to the desired cross section.

If the CONTRACTOR elects to use a cutting or pulverizing machine that shall remove the subgrade material accurately to the secondary grade and to pulverize the material at the same time, CONTRACTOR shall not be required to expose the secondary grade or windrow the material. However, the CONTRACTOR shall be required to roll the subgrade before using the pulverizing machine and correct any soft areas that this rolling may reveal. This method shall be permitted only where a machine is provided which shall insure that the material is cut uniformly to the proper depth and which has cutters that shall place the secondary grade to a smooth surface over the entire width of the cut. The machine shall be of such design that a visible indication is given at all times that the machine is cutting to the proper depth.

405.1.C.1.a. Mixing: Mixing procedure shall be the same for "dry placing" or "slurry placing" as hereinafter described.

Material and lime shall be thoroughly mixed by approved road mixers or other approved equipment and the mixing continued until a homogeneous, friable mixture of material and lime is obtained, free from all clods or lumps. Materials containing plastic clay or other materials which shall not readily mix with lime shall be mixed as thoroughly as possible at the time of the lime application, brought to the proper moisture content, sealed with a pneumatic roller, and left to cure 1- to 4-days as directed by the OWNER. During the curing period, the material shall be kept moist. After the required curing time, the material shall be uniformly mixed by approved methods. If the soil binder lime mixture contains clods, they shall be reduced in size by raking, blading, discing, harrowing, scarifying or the use of other approved pulverization methods so that when all non-slaking aggregates obtained on the No. 4 sieve are removed, the remainder of the material shall meet the requirements of Table 405.1.C.4.a.(1) Mixing Lime Treated Materials-In-Place when tested dry by laboratory sieves.

Table 405.1.C.4.a.(1) Mixing Lime Treated Materials In Place

Sieve Size	Minimum Passing
1¾-in	100%
No. 4	60%

1. Recycled asphalt pavement shall be pulverized so that 100% shall pass a 2-in. sieve.

During the interval of time between application and mixing, hydrated lime that has been exposed to the open air for a period of 6-hours or more, or to excessive loss due to washing or blowing, shall not be accepted for payment.

In addition to the above, when pebble quicklime is used, the material and lime shall be mixed as thoroughly as possible at the time of application. Sufficient moisture shall be added during the mixing to hydrate the quicklime. After mixing, and prior to compaction, the mixture of material, quicklime and water shall be moist cured for 2- to 7-days, as approved by the OWNER. After curing, mixing shall continue until the pulverization requirements are met.

405.1.C.2. Treatment for New Materials: The base and subbase materials, as provided in the governing specifications, shall be delivered, placed and spread in the required amount per station. The material shall be manipulated as specified and thoroughly mixed prior to the addition of the lime.

405.1.C.2.a. Mixing: Mixing procedure shall be the same for "dry placing" or "slurry placing" as hereinafter described. The base or subbase material, lime and required water shall be thoroughly mixed and blended by approved road mixers or other approved equipment and the mixing continued until a homogeneous, friable mixture is obtained. When lime is placed as a slurry and mixed by the use of blades, the material shall be bladed as the lime water mixture is applied; after the total amount has been placed, the mixture shall be thoroughly blended to the satisfaction of the OWNER.

During the interval of time between application and mixing, hydrated lime that has been exposed to the open air for a period of 6-hours or more, or to excessive loss due to washing or blowing, shall not be accepted for payment.

405.1.C.3. Lime Application: Lime shall be spread only on that area where the first mixing operation can be completed in the same working day, except that quicklime shall be mixed at the time of application. The application and mixing of lime with the materials shall be accomplished by the methods hereinafter described unless otherwise approved by the OWNER.

405.1.C.3.a. Dry Placing: Quicklime may be placed dry if it is in pebble form. A spreader or motor grader shall be used to spread pebble Quicklime.

405.1.C.3.b. Hydrated Lime: Lime shall be mixed with water and applied as a thin water suspension or slurry. Type B, commercial lime slurry shall be applied with a lime percentage not less than that applicable for the grade used. The distribution of lime at the rate shown on the plans shall be attained by

successive passes over a measured surface of roadway until the proper moisture and lime content have been achieved.

405.1.C.3.c. Quicklime: When Quicklime is applied as a slurry, the amount of dry quicklime shall be 80% of the amount shown on the plans. The residue from the Quicklime slurring procedure shall be spread uniformly over the length of the roadway currently being processed unless otherwise approved by the OWNER. This residue is primarily inert material with little stabilizing value, but may contain a small amount of Quicklime particles that slake slowly. A concentration of these particles could cause the compacted stabilized material to swell during slaking.

405.1.C.4. Compaction: Compaction of the mixture shall begin immediately after final mixing and in no case later than three (3) days after final mixing. The material shall be aerated or sprinkled as necessary to provide optimum moisture. Compaction shall begin at the bottom and shall continue until the entire depth of the mixture is uniformly compacted as shown on the plans or specified by the OWNER. The compacted mixture shall have a uniform density of not less than 98-percent of the maximum density as determined by ASTM D 698. Moisture content shall be within minus 2 to plus 4 percent of optimum. After each section is completed, such tests as are necessary shall be made by the OWNER. If any portion fails to meet the density specified, it shall be reworked as necessary to obtain the specified density. After the mixture has been compacted, the surface shall be shaped to the required line, grades, and cross sections and then thoroughly rolled sufficiently lightly to prevent hairline cracking.

405.1.C.5. Maintenance: The CONTRACTOR shall be required to maintain the completed soil lime base within the limits of its contract in good condition, satisfactory to the OWNER as to grade, crown, and cross section until such time as the surface course is constructed. Only lime treated soil shall be used for fine grading proposed street pavement subgrade where lime treatment has been specified. The subgrade of low areas shall be lightly scarified to a depth of from two to 3 inches before fine grading is performed to insure the resulting subgrade is a homogeneous, monolithic layer throughout. Use of sand or sandy soil for fine grading beneath proposed street pavement areas is strictly prohibited.

The surface of the compacted layer shall be kept moist until covered by other base or paving material or application of a curing seal of emulsified asphalt conforming to requirements of Item for Emulsions. If a curing seal is used, it should be applied as soon as possible after completion of final rolling, at a rate of between 0.10- and 0.20-gallons-per-square-yard, the exact rate to be determined by the OWNER. No equipment or traffic shall be permitted on lime treated material for 72-hours after curing seal is applied, unless otherwise permitted by the OWNER. In cases where subgrade treatment or subbase sets up sufficiently to prevent objectionable damage from traffic, such layers may be opened to traffic 2-days after compaction. The CONTRACTOR shall immediately repair all irregularities or other defects that may occur at the CONTRACTOR'S expense. Repairs are to be made as directed by the OWNER and in a manner to insure restoration of a uniform surface and durability of the portion repaired.

405.1.D. Measurement and Payment

Lime treatment shall be measured for payment in square-yards (SY) for the thickness shown in the plans for the surface area of completed and accepted work.

The measurement for lime shall be by the ton (2000-pounds) of dry weight. The measured tonnage of (dry) quicklime shall be multiplied by the conversation factor 1.25 to give the equivalent quantity of hydrated lime (dry) which shall be the basis of payment.

Lime treatment shall be paid for at the contract unit price per square-yard (SY), as provided in the proposal and contract.

The contract unit price shall be the total compensation for preparing the roadbed; for loosening, pulverizing, application of lime, water content in the slurry mixture and the mixing water; mixing, shaping, sprinkling, compacting, finishing, curing and maintaining; for manipulations required; and for all labor, equipment, fuels, tools and incidentals necessary to complete the work, all in accordance with the plans and specifications.

Lime material measured as provided in the this item shall be paid for at the unit price bid for "lime material" which price shall be full compensation for furnishing the material; for all freight involved; for all unloading, storing and handling; and for all labor, equipment, fuels, tools and incidentals necessary to complete the work.

405.2 PORTLAND CEMENT TREATMENT

This item shall consist of the treatment of the subgrade, subbase or base course which is to be composed of a compacted mixture of soil, and/or pulverized recycled asphalt pavement, Portland cement and water and shall be constructed as herein specified and in conformity to the cross sections, lines and grades as established by the OWNER. In the event new materials are placed, rather than using in-situ soils, the subbase or base shall be constructed as herein specified and in conformity with the items governing the base or subbase courses.

405.2.A. Materials

Materials for Portland Cement Treatment involve Portland Cement, Water, and Soil or Base Material. All cement shall be sampled and tested in accordance with the current Standard Methods of Sampling and Testing Portland Cement of the ASTM Designation C-183, C-184, C-188, C-190 and C-191.

1. Cement shall be ASTM C150 Type I, II, III, or IP and conform to the requirements of Item for Portland Cement Pavement.
2. Water shall conform to the requirements of Item for Portland Cement Pavement.
3. The soil shall consist of the in-situ soil or approved soil, free from vegetation, roots, or other objectionable matter. It may be either the material encountered in the existing section, material secured from approved sources shown on the plans or as designated by the OWNER, or a combination of existing and additional soil from approved sources, as shown on the plans, or as directed by the OWNER.
4. Base Material shall conform to the requirements of Item for Flexible Base or Subbase Preparation.

Portland Cement shall meet the requirements of the current Standard Specifications for Portland Cement of the ASTM Designation C-150, Type I, for Normal Portland Cement, Type III for High Early Strength Portland Cement and Type II will have a maximum of five (5) percent tricalcium aluminate for exposure to sewage.

405.2.B. Equipment

All equipment necessary to properly prosecute, perform and complete the work within the contract time shall be on the project and shall be approved by the OWNER as to type and condition before the CONTRACTOR shall be permitted to begin construction operations on which the equipment is to be used. The cement-modified soil layer may be constructed with any machine or combination of machines and auxiliary equipment that shall produce the results meeting the requirements for soil pulverization, cement application, water application, mixing, incorporating of materials, compaction, finishing and curing as specified herein. The CONTRACTOR shall at all times provide sufficient equipment to enable continuous performance of the work and its completion in the required number of working days.

405.2.C. Construction Methods

The primary requirement of this specification is to secure a complete course of treated material containing a uniform Portland cement mixture, free from loose or segregated areas, of uniform density and moisture content, well bound and compacted for its full depth with a smooth surface suitable for placing additional subbase, base or surface courses. It shall be the responsibility of the CONTRACTOR to regulate the sequence of work, to process a sufficient quantity of material so as to provide full depth as shown on plans, to use the proper amount of Portland cement, maintain the work and to rework the courses as necessary to meet the foregoing requirements.

Cement stabilized base shall not be mixed or placed when the air temperature is below 40°F and falling, but may be mixed or placed with the air temperature is above 35°F and rising, the temperature being taken in the shade and away from artificial heat, and with the further provisions that cement stabilized base shall be mixed or placed only when weather conditions, in the opinion of the OWNER, are suitable.

405.2.C.1. Treatment for Materials in Place: Before other construction operations are begun, the roadbed shall be graded and shaped as required to construct the Portland cement treatment for material in place in conformance with the lines, grades, thickness and typical cross sections shown on the plans. Unsuitable soil or material shall be removed and replaced with acceptable soil. The subgrade shall be firm and able to support without displacement the construction equipment and achieve the compaction herein specified. Soft or yielding subgrade shall be corrected and made stable before construction proceeds. The soil and/or recycled asphalt pavement shall be so pulverized that at the completion of moist-mixing, it meets the gradation in Table 405.2.C.1.a. Cement Treated Materials in Place.

Table 405.2.C.1.a. Cement Treated Materials in Place

Sieve Size	Minimum Passing
1-in	100%
No. 4	80%

1. Recycled asphalt pavement shall be pulverized so that 100% shall pass a 2-in. sieve.
2. Exclusive of gravel or stone retained on these sieves.

405.2.C.1.b. Application: Portland cement shall be spread by an approved dry or slurry method uniformly on the soil at the rate specified on the plans or as determined by preliminary laboratory tests. If a bulk cement spreader is used, it shall be positioned by string lines or other approved method during spreading to insure a uniform distribution of cement. Cement shall be applied only to such an area that all the operations can be continuous and completed in daylight within 6-hours of such application.
The percentage of moisture in the soil at the time of cement application shall not exceed the quantity that shall permit uniform and intimate mixture of soil and cement during dry-mixing operations, and it shall not exceed the specified optimum moisture content for the soil and cement mixture. In the event of high soil-moisture contents, cement may be applied at one-half the specified rate when approved by the OWNER. The remainder of the application rate of cement shall be applied the following day(s), not to exceed 48-hours. The usual construction sequence shall then be resumed.
No equipment, except that used in the spreading and mixing, shall be allowed to pass over the freshly spread cement until it is mixed with the soil or base material.

Any mixing method used to achieve the specified results is acceptable. Mixing shall continue until a homogeneous, friable mixture of the material and cement is obtained, free from all clods or lumps. The mixture shall be kept within moisture tolerances throughout the operation.

405.2.C.1.c. Compaction: Compaction shall begin after mixing and after gradation and moisture requirements have been met. The material shall be compacted to at least 95-percent of the maximum density as determined by ASTM D698. At the start of compaction, the percentage of moisture in the mixture and in un-pulverized soil lumps, based on oven-dry weights, shall be within 2-percentage points of the specified optimum moisture content and shall be less than the quantity which shall cause the soil-cement mixture to become unstable during compaction and finishing. When the un-compacted soil-cement mixture is wetted by rain so that the average moisture content exceeds the tolerance given at the time of final compaction, the entire section shall be reconstructed in accordance with this specification at the sole expense of the CONTRACTOR. The specified optimum moisture content and density shall be determined in the field on the representative samples of soil-cement mixture obtained from the area being processed. Final moisture content shall be within -2 to +4 of optimum.

Prior to the beginning of compaction, the mixture shall be in a loose condition for its full depth. Compaction shall begin at the bottom and shall continue until the entire depth of the mixture is uniformly compacted. The loose mixture shall then be uniformly compacted to the specified density within 2-hours. After the soil and cement mixture, except the top mulch, is compacted, water shall be uniformly applied as needed and thoroughly mixed in. The surface shall then be reshaped to the required lines, grades and cross section and then lightly scarified to loosen any imprint left by the compacting or shaping equipment.

The resulting surface shall be thoroughly rolled with a pneumatic tire roller and "clipped," "skinned," and ''tight-bladed" by a power grader to a depth of approximately ¼-in., moving all loosened soil and cement from the section. The surface shall then be thoroughly compacted with the pneumatic roller, adding small increments of moisture as needed during rolling. When directed by the OWNER, surface finishing methods may be varied from this procedure, provided a dense, uniform surface, free of surface material, is maintained at its specified optimum during all finishing operations. Surface compaction and finishing shall proceed in such a manner as to produce, in not more than 2-hours, a smooth, closely knit surface, free of cracks, ridges or loose material, conforming to the drawn grade and line shown on the plans.

OWNER shall conduct In-place density tests shall as outlined in ASTM D2922 in Place by Nuclear Methods (Shallow Depth). In-place density tests shall be performed at the rate of one-per-300-linear-ft. of paving for two lanes. The suitability of the modification shall be confirmed by Atterberg Limit testing at the rate of one-test-per-2,500-cubic-yards of processed material.

In addition to the requirements specified for density, the full depth of the material shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each section is completed, tests as necessary will be made by the OWNER. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements. Throughout this entire operation the shape of the course shall be maintained by blading, and the surface upon completion shall be smooth and in conformity with the typical section shown on the plans and to the established lines and grades. Should the material, due to any reason or cause, lose the stability, density and finish before the next course is placed or the work is accepted, it shall be re-compacted and refinished at the sole expense of the CONTRACTOR.

405.2.C.2. Plant Mixed Material: Cement Treated Base (CTB) shall consist of aggregate, cement and water uniformly mixed in a central plant, transported to the project, spread, compacted, shaped, finished, and cured in accordance with these specifications. It shall conform to the lines, grades, thicknesses, and typical cross-section shown on the plans.

Unsuitable subgrade soil or material shall be removed and replaced with acceptable soil. The subgrade shall be firm and able to support without displacement of the construction equipment and compaction. Soft or yielding subgrade shall be corrected and made stable before construction proceeds.

405.2.C.2.a. Mixing: The aggregate, cement and water shall be mixed in a pug mill as approved by the OWNER. The plant shall be equipped with feeding and metering devices that add the aggregate, cement and water into the mixer in the specified quantities to produce a mixture that meets or exceeds the mix design criteria. Aggregate and cement shall be mixed sufficiently to prevent cement balls from forming when the mix water is added. Mixing time shall be sufficient to assure an intimate, uniform mixture of aggregate, cement and water. The percentage of moisture in the aggregate, at the time of cement application shall be the amount that assures a uniform and intimate mixture of aggregate and cement during mixing operations. It shall not exceed the specified moisture content required for adequate compaction.

Free access to the plant shall be provided to the OWNER for construction quality control. The mixture shall be hauled to the paving area in trucks having beds cleaned of deleterious material.

405.2.C.2.a.(1) Aggregate: The aggregate may be any granular material or combinations of aggregates that will, when mixed with adequate amounts of cement and water, produce laboratory mix design Unconfined Compression Test strengths as specified in the paragraph below in accordance with ASTM D1632. The preceding tests will utilize the Moisture-Density Relation as determined by ASTM D558: AASHTO T134. The maximum size of aggregate shall pass a 2-inch sieve.

405.2.C.2.a.(2) Mix Design: The CONTRACTOR shall submit a mix design for the proposed CTB to the OWNER for approval in advance of the proposed work. Unconfined compression strength test results shall be submitted with the mix design by the SUPPLIER of the Cement Treated Base (CTB) material. Work shall not begin until the mix design is approved by the OWNER.

405.2.C.2.b. Placement: The mixture shall be placed on a moistened subgrade in a uniform layer by any approved method of spreading that will deposit the required quantity per lineal foot, without segregation, to produce a uniformly compacted base conforming to the grade and cross-section. Not more than 30-minutes shall elapse between placement of cement treated base in adjacent lanes at any location except at longitudinal and transverse construction joints.

Compaction shall start as soon as possible after spreading. Elapsed time between the addition of water to the cement treated base mixture and the start of compaction shall not exceed 60-minutes under normal conditions. The OWNER may alter this time if environmental conditions, such as temperature, humidity or wind conditions would justify such a change. Laboratory tests may be required to verify changes in compaction time limits.

405.2.C.2.c. Compaction: At the start of compaction, the percentage of moisture in the mixture shall not be more than 1% below or 2% above the specified optimum moisture content, and shall be less than that quantity which will cause the cement treated base mixture to become unstable during compaction and finishing. The specified optimum moisture content and density shall be determined in the field by a Moisture-Density Test AASHTO T134 or ASTM D558, on representative samples of cement treated base mixture obtained from the area prior to compaction. Prior to compaction, the mixture shall be in a loose condition for its full depth. The loose mixture shall then be compacted uniformly to the specified density.

During compaction operations, initial shaping may be required to obtain uniform compaction and required grade and cross-section. When initial compaction is completed, the surface of the cement treated base shall be shaped to the required lines, grades and cross-section. The moisture content of the surface material shall be maintained at not less than its specified optimum moisture content during finishing operations. If any reshaping of the surface is necessary, it shall be lightly scarified to remove any compaction planes, scales or smooth surfaces left by equipment. Final compaction shall then be continued until uniform and adequate density is obtained. Cement treated base shall be uniformly compacted to a minimum of 95-percent of maximum density. Compaction and finishing shall be done in such a manner as to produce, in not longer than two-hours, a smooth, dense surface free of compaction planes, cracks, ridges, or loose material.

405.2.C.3. Finishing: After the final layer or course of the cement modified soil has been compacted, it shall be brought to the required lines and grades in accordance with the typical sections. The completed section shall then be finished by rolling as directed with a pneumatic tire or other suitable roller sufficiently light to prevent hair cracking. Preparation for final surfacing may begin immediately.

405.2.C.3.a. Protection and Cover: After the roadway has been finished as specified herein, it shall be immediately protected against rapid drying by applying a curing seal of emulsified asphalt at the rate of 0.2-gallon per square yard. The curing seal shall consist of emulsified asphalt conforming to requirements of Item for Emulsions (PCE). Immediately prior to application of the curing seal, the section shall be wetted by the use of pressure water distributors so that all voids in the soil-cement surface are filled with water, but without free water standing on the surface. The curing seal shall be applied while this moisture condition exists so that undue asphalt penetration of the soil-cement surface shall be prevented; and at the same time aided in complete coverage by the curing seal.

Should it be necessary for construction equipment or other traffic vehicles to pass over the section before the curing seal has dried sufficiently to prevent pickup, if shall be the responsibility of the CONTRACTOR to dust or sand the surface before such use. The CONTRACTOR shall also maintain the curing cover for 7-days so that all of the soil-cement base course shall be covered effectively with curing seal during this period. The curing seal shall remain in place for the additional asphalt-wearing surface.

405.2.C.3.b. Usage: The CONTRACTOR shall not be permitted to drive heavy equipment over completed portions. Pneumatic-tired equipment required for hauling cement and water may be permitted to drive over after the surface has hardened sufficiently to prevent the equipment from marring the surface, provided that protection and cover are not impaired. The soil-cement course may be opened to local traffic as soon as the curing seal has been applied and dusted or sanded as necessary to prevent it from being picked up by traffic. Completed portions may be opened to all traffic after 7-days.

405.2.C.3.b. Maintenance: The CONTRACTOR shall be required within the limits of its contract to maintain the soil-cement treatment in good condition from the time it first starts work until all work shall have been completed. Maintenance shall include immediate repairs of any defect that may occur after the cement is applied. Such maintenance work shall be done by the CONTRACTOR at the CONTRACTOR'S expense and repeated as often as necessary to keep the area continuously intact. Repairs are to be made in such a manner as to insure restoration of a uniform surface for the full depth of treatment. Any low area of treated subgrade shall be remedied by scarifying the surface to a depth of at least 2-in., filling the area with· treated material and compacting. Any low area of subbase or base shall be remedied by replacing the material for the full depth of subbase or base treatment rather than adding a thin layer of stabilized material to the completed work.

405.2.D. Measurement and Payment

Portland cement treatment shall be measured by the square-yard (SY) of completed and accepted cement treated course. Measurement for cement shall be by the ton (2000-pounds) of dry weight, as determined by certified weight tickets. No allowance shall be made for any materials used or work done outside the limits as established by the OWNER.

The work performed and material furnished as prescribed by this item and measured as provided in this item shall be paid for at the unit price bid for soil-cement treated subgrade, subbase, or base course, which price shall be full compensation for pulverizing or providing the soil material; handling, hauling and spreading dry or slurry cement, mixing the cement with the soil either in-place or in a mixing plant; furnishing, hauling and mixing water with the soil-cement mixture; spreading and shaping the mixture; compacting the mixture, including all rolling required for this compaction; surface finishing; curing; and for all manipulation, labor, equipment, appliances, tools and incidentals necessary to complete the work and carry out the maintenance provisions in this specification.

Cement material measured as provided in this item shall be paid for at the unit price bid for cement material, which price shall be compensation for furnishing the material, for all freight involved, for all unloading and storing, and for all labor, equipment, fuels, tools and incidentals necessary to complete the work, all in accordance with the plans and these specifications.

406 ASPHALT PAVEMENT

This Item establishes the requirements for asphalt construction. This item shall consist of a surface course to be composed of a compacted mixture of mineral aggregate and asphaltic material. The pavement shall be constructed on the previously completed and approved base in accordance with the detail indicated.

406.1 HOT MIX ASPHALT (HMAC)

This item shall consist of a surface course to be composed of a compacted mixture of mineral aggregate and asphaltic material. The pavement shall be constructed on the previously completed and approved base in accordance with the detail indicated.

406.1.A. Materials

The Contractor shall furnish materials to the project meeting the following requirements and such that the final mixture, prior to being placed, shall be as specified herein. The Contractor shall be solely responsible for the quality and control of his materials.

406.1.A. Aggregates: Aggregates for Surface Treatments shall be provided in accordance with TxDOT Item 302 in conformance to the type, grade, and surface aggregate classification (SAC) shown on the plans.

406.1.B.1. Asphalts, Oils, and Emulsions: Asphaltic Material shall be provided in accordance with TxDOT Item 300 and as shown on the plans.

406.1.B.1.a Prime Coat: If a prime coat is indicated use cutback (MC-30 or MC-70) or emulsion asphalt. Cutback asphalt shall be applied at a rate of 0.35 gal/sy, and emulsified asphalts shall be applied at a rate of 0.2 gal/sy conforming to materials and methods of TxDOT Item 310 "Prime Coat".

406.1.C.1. Mixtures: Mixture Design shall be performed in accordance with TxDOT Item 340 to satisfy Materials and Type specified on the plans.

The paving mixture shall consist of a uniform mixture of coarse aggregate, fine aggregate, asphaltic material and mineral filler, if required. When properly proportioned, the mineral aggregate shall produce a gradation which will conform to the limitations for the type specified. The gradation will be determined in accordance with TxDOT Test Method Tex-200-F (Dry Sieve Analysis) and shall be based on aggregate only. The amount of asphaltic material shall conform to the limitations shown for the paving type specified and materials and mixture design specified in TxDOT Item 340.

406.1.B. Construction Methods

Design, produce, store, transport, place, and compact the specified paving mixture in accordance with the requirements of TxDOT Item 340.

406.1.B.1. Testing: The OWNER may require the performance of random tests to determine if the materials and the construction procedures produce a product which meets the specifications. The primary sampling point by the testing laboratory will be at the project site at the paving machine ahead of all rollers. Other testing may be at the job site, plant or in the trucks as determined by the OWNER.

The OWNER will determine the sampling schedules for random testing. Gradation and stability samples will be taken at the plant or on the project site as determined by the OWNER. A minimum of 3 samples may be obtained for each project. Field density shall be determined by taking either 6 inch cores or sections of asphaltic pavement at locations selected by the OWNER of completed asphaltic pavement lifts for approximately every 2,000 square yards or part thereof. Acceptability will be based on the mean of the job values.

Any sampling and testing, as required by the OWNER or OWNER, of in place asphalt concrete will be at the cost of the Contractor.

406.1.B.1.a. Surface Tests: The surface of the pavement, after compaction, shall be smooth and true to the established line, grade and cross section, and when tested with a 10 foot straightedge placed parallel to the centerline of the roadway or tested by other equivalent and acceptable means, except as provided herein, the maximum deviation shall not exceed 1/8 inch in 10 feet and any point in the surface not meeting this requirement shall be corrected. The completed surface shall meet the approval of the OWNER for riding surface, finish and appearance.

406.1.B.2. Compaction: The mix shall be thoroughly compressed and uniformly compacted immediately after placing to the required density. All vibratory and flat wheel compaction rolling shall be complete before the mat cools below 175º F. Pneumatic tire rolling may be undertaken on the mat below 175º F.

All rollers must be in good mechanical condition. Necessary precautions shall be taken to prevent the dropping of gasoline, oil, grease or other foreign matter on the pavement, either when the rollers are in operation or when standing.

It is the intent of this specification that the material be placed and compacted to between 91 and 95 percent of the maximum theoretical density as determined by TxDOT Tex-227-F. The OWNER may secure 6 inch core

samples or sections of completed asphaltic pavements lifts for approximately every 2,000 square yards or part thereof, of asphaltic concrete pavement placed. The in place density at the sampled locations shall be determined by the following equation:

$$\text{Percent in place Density} = (GA \times 100)/GT$$

Where GA = Bulk specific gravity of core when tested in accordance with Tex-207-F
GT = Maximum theoretical specific gravity of combined cores when tested in accordance with Tex-277-F

The Contractor shall patch the surface where specimens are taken with no extra payment being made for this work. The OWNER may remove the asphaltic concrete pavement specimen on the day following placement or as soon as practicable thereafter. Other methods of determining in place density which correlate satisfactorily with those results obtained by cores or sections may be used.

406.1.C. Measurement and Payment

Asphaltic concrete pavement will be measured by the square yard (SY) of the specified total thickness, or per Ton (2000-lbs), of the type actually used in the completed and accepted work in accordance with the plans and specifications.

The work performed and materials furnished as prescribed by this item and measured as provided under "Measurement and Payment" will be paid for at the unit prices bid or the pay adjusted unit price for "Hot Mix Asphaltic Concrete" of the type and lift specified, which prices shall be full compensation for furnishing all materials, freight involved; for all heating, mixing, hauling, cleaning the existing base course or pavement, saw cutting, placing asphaltic concrete mixture, rolling and finishing, for all manipulations, labor, tools, equipment, temporary pavement markings and incidentals necessary to complete the work. Correcting defective work and the subsequent retesting shall be considered subsidiary to Item for Asphalt Pavement.

The prime coat, or tack coat, when required, will not be measured or paid for directly but shall be considered subsidiary to Item for Asphalt Pavement.

All templates, straightedges, scales and other weighing and measuring devices necessary for the proper construction, measuring and checking of the work shall be furnished, operated and maintained by the Contractor at his expense.

When not included as a specific payment item, installation of all items under this section shall be subsidiary to other items in the contract. Payment, when included as a specific pay item, for work meeting the requirements of this section shall be made either per square yard (SY) or per Ton (2000 lbs) of material installed in place.

406.2 TWO COURSE ASPHALT PAVEMENT

This item shall consist of a wearing surface composed of one or more applications of asphaltic material, each covered with aggregate constructed on the prepared base course herein specified and in accordance with the Contract Documents.

406.2.A. Description

All specifications in this item shall be in conformance with the TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2004, herein referred to as TxDOT 2004 Highway Standards.

Two course surface treatment shall not be applied when the air temperature is below 60° F and is falling, but it may be applied when the air temperature is above 50°F and is rising. Air temperature shall be taken in the shade and away from artificial heat. Asphaltic material shall not be placed when general weather conditions, in the opinion of the OWNER, are not suitable.

406.2.B. Materials

406.2.B.1. Aggregates: Aggregates to be composed of sound and durable particles of gravel, crushed gravel, crushed stone, crushed slag, burned clay, burned shale or natural limestone rock asphalt. These materials shall contain no more than 1 percent (1%) by weight of organic matter (other than native bitumen), clays, loam or pebbles coated therewith and shall contain no more than 5 percent (5%) by weight of any one combination of slate, shale, or soft particles of sandstone when tested in accordance with Test Method TEX-217-F. The percent of wear on natural limestone rock asphalt aggregate as determined by Test Method TEX-410-A shall be made on that portion of the material retained on the #4 sieve, having naturally impregnated asphalt content of less than 1 percent (1%). When tested by Test Method TEX-200-F the percent by weight shall be as follows:

Table 406.2.B.1.a. Gradation (Grade 4)

Sieve Size	Percent Retained
5/8”	0
1/2”	0-5
3/8”	20-40
No. 4	95-100
No. 8	98-100

Application Rate - Min. 1 CY covers 90 SY, max. 1 CY covers 110 SY, 1-110.

406.2.B.2. Asphalts, Oils, and Emulsions: Unless specified otherwise on the Construction Plans, asphaltic materials shall be AC-5 Asphaltic Cement or EA-HVRS, Anionic Emulsion, as specified by TxDOT Item 300 of TxDOT 2004 Highway Standards. Application Temperature for AC-5 shall be between 275 -375°F and for EA-HVRS shall be between 110 - 150°F. Rate of Application shall be 0.35 - 0.45 gal. per square yard for the first course and 0.25 - 0.35 gal. per square yard for the second course.

If AC-5 Asphaltic Cement is used, it shall contain a Latex Additive as specified in the above mentioned TxDOT Item 300. The base shall be prime coated in accordance with TxDOT Item 310 at a rate of 0.10 gal. per square yard min. prior to application of the paving.

406.2.C. Construction Methods

406.2.C.1. Chip Seal: Chip Seal shall be installed as follows: the area to be treated shall be cleaned of dirt, dust, or other deleterious matter by sweeping or other approved methods. If it is found necessary by the OWNER, the surface shall be lightly sprinkled just prior to the first application of asphaltic material.

Asphaltic material, as specified above, shall be applied on the clean surface by an approved type of self-propelled pressure distributor so operated as to distribute the material in the quantity specified, evenly, smoothly, under a pressure necessary for proper distribution. The Contractor shall provide all necessary facilities for determining the temperature of the asphaltic material in all of the heating equipment and in the distributor, for determining the rate at which it is applied, and for securing uniformity at the junction of two distributor loads. The distributor shall have been recently calibrated and the OWNER shall be furnished an accurate and satisfactory record of such calibration. After beginning work, if the yield of the asphaltic material appears to be in error, the distributor shall be recalibrated in a manner satisfactory to the OWNER before proceeding with the work.

Asphaltic material for each course may be applied for the full width of the surface treatment in one application, unless the width exceeds twenty-six feet (26'). No traffic or hauling will be permitted over the freshly applied asphaltic material. Asphaltic material shall not be applied until immediate covering is assured.

Aggregate, of the type and grade shown on the plans for the first course, shall be immediately and uniformly applied and spread by an approved self-propelled continuous feed aggregate spreader, unless otherwise shown on the plans or authorized by the OWNER in writing. The aggregate shall be applied at the approximate rates

indicated on the plans and as directed by the OWNER. The Contractor shall be responsible for the maintenance of the surface of the first course until the second course is applied.

The entire surface shall then be broomed, bladed or raked as required by the OWNER and shall be thoroughly rolled with power rollers of the three-wheel or tandem, self-propelled type, weighing not less than 3 tons nor more than 6 tons. All wheels shall be flat.

In lieu of the rolling equipment specified, the Contractor may, upon written permission from the OWNER, operate the other compacting equipment that will produce equivalent relative compaction in the same period of time as the specified equipment. If the substituted compaction equipment fails to produce the desired compaction within the same period as would be expected of the specified equipment, as determined by the OWNER, its use shall be discontinued.

Rollers shall be maintained in good repair and operating condition and shall be approved by the OWNER.

406.2.C.2. Two Course Surface Treatment: Two Course Surface Treatment shall consist of an initial installation of Chip Seal as detailed in the preceding paragraph, followed by installation of a second course as follows: the second course shall consist of asphaltic material and aggregate of the type and grade indicated on the plans for the second course. The asphaltic material and aggregate for this second course shall be applied and covered in the manner specified for the first application. The surface shall then be broomed, bladed or raked as required by the Engineer, and thoroughly rolled as specified for the first course. Asphaltic materials and aggregates for both courses shall be applied at the approximate rates indicated on the plans and as directed by the Engineer.

The Contractor shall be responsible for the maintenance of the surface until the work is accepted by the Engineer and regulatory agency. The Contractor shall be responsible for the proper preparation of all stockpile areas before aggregates are placed thereon, including leveling of the aggregate to prevent any contamination thereof.

All storage tanks, piping, retorts, booster tanks and distributors used in storing or handling asphaltic materials shall be kept clean and in good operating condition at all times and they shall be operated in such manner that there will be no contamination of the asphaltic material with foreign material. It shall be the responsibility of the Contractor to provide and maintain in good working order a recording thermometer at the storage heating unit at all times.

The Engineer will select the temperature of application based on the temperature-viscosity relationship that will permit application of the asphalt within the limits recommended in TxDOT Item 300, "Asphalts, Oils, Emulsions." The recommended range for the viscosity of the asphalt is 50 seconds to 60 seconds, Saybolt Furol. The Contractor shall apply the asphalt at a temperature within 15°F of the temperature selected.

406.2.D. Measurement and Payment

All acceptable Chip Seal or Two Course Surface Treatment will be measured by the square yard (SY) for completed and accepted work in accordance with the plans and specifications.

The work performed and materials furnished as prescribed by this item will be paid for at the unit price bid or the pay adjusted unit price for “Chip Seal” or "Two Course Surface Treatment" of the type and lift specified, which prices shall be full compensation for furnishing all materials, freight involved; for all heating, mixing, hauling, cleaning the existing base course or pavement, saw cutting, placing asphaltic concrete mixture, rolling and finishing; for all manipulations, labor, tools equipment, temporary pavement markings and incidentals necessary to complete the work. Correction of defective work and the subsequent retesting shall be included at CONTRACTORS expense; no separate pay item shall be provided.

The prime coat, when required, will not be measured or paid for directly but shall be considered subsidiary to this Section.

All templates, straightedges, scales and other weighing and measuring devices necessary for the proper construction, measuring and checking of the work shall be furnished, operated and maintained by the Contractor at his expense.

407 CONCRETE PAVEMENT

This item shall consist of finished pavement constructed of Portland cement concrete on the prepared subgrade or other base course, in conformity with the plans, as herein specified and as supplemented and/or amended by special provisions and to the lines and grades as established by the OWNER. Concrete shall be considered of satisfactory quality and made of materials acceptable to the job and these specifications, in the proportions approved by the OWNER; and mixed, placed, finished and cured in accordance with the requirements of these specifications and any special provisions.

407.1 MATERIALS

Concrete shall be composed of Normal Portland Cement or High Early Strength Cement, coarse aggregate, fine aggregate and water proportioned and mixed as hereinafter provided in these specifications.

407.1.A. Aggregates

Aggregates for Portland cement concrete shall conform to the requirements contained in this Item and shall be approved by the OWNER prior to use. Aggregates shall be of such character that it shall be possible to produce workable concrete within the limits contained in this specification.

407.1.A.1. Storage: The manner of handling and storage of aggregates shall be such as to prevent intrusion of foreign materials and segregation of sizes. If materials are stored on the ground, the stockpile sites shall be grubbed, cleaned of all vegetation and leveled. In this case, the bottom six-in. layer of aggregate shall not be disturbed and shall not be used in the work.

Where two or more sizes or types of aggregates are delivered to the job, each size or type shall be stored separately. Aggregates shall be stockpiled on the job or at a central batching plant for a minimum of 24-hours prior to use in the project. At the plant, the aggregate shall be wetted to a uniform moisture content of not less than three-percent below saturated surface dry condition before or while being loaded for shipment. Care shall be exercised to maintain this uniformity of moisture until the aggregates are used in the mix. Wetting of stockpiles to maintain the required percent moisture shall be performed at least 12-hours prior to use. At the time of use, the aggregates shall be free from frozen material and foreign matter. All grass, wood, sticks, burlap, paper or other material which may have become mixed with the aggregates while stockpiled or in handling must be removed.

407.1.A.2. Measurement: Fine and coarse aggregates shall be measured loose and separately. Aggregate weighing equipment shall conform to the requirements of ASTM C94 Standard Specification for Ready-Mixed Concrete and shall be approved by the OWNER prior to use.

The volume measuring equipment shall consist of approved boxes, pans or mechanical devices, which, while in operation, shall give the required volumes of the different kinds of aggregates required for the several classes of concrete. Equipment shall also be so marked and designed that the OWNER can accurately and conveniently check the quantities of each aggregate being used. Concrete made by continuous mixing shall conform to ASTM C685 Concrete Made by Volumetric Batching and Continuous Mixing.

407.1.A.3. Testing: All fine and coarse aggregates testing shall be done per TxDOT Item 360 "Concrete Pavement."

407.1.A.4. Gradation: The fine aggregate shall be well graded from fine to coarse and shall meet the requirements of Table 407.1.A.4.a. Fine Aggregates Gradation Requirements. Fine aggregate shall consist of natural sand, manufactured sand, or a combination thereof, conforming to the current ASTM Specification C-33. Stone dust or crushed sand may be added as mineral filler, if so directed by the OWNER. Amounts of mineral filler shall not exceed 5-percent of the fine aggregate to improve the workability or quality specified for fine or coarse aggregates. Aggregates shall be free from injurious amounts of salt, alkali, vegetable matter, or other objectionable material either free or as an adherent coating. At the time of their use, aggregates shall be free from frozen and/or all foreign material that may have become mixed with them in the stockpile.

Table 407.1.A.4.a. Fine Aggregates Gradation Requirements

Sieve Size	Percent Retained
3/8"	0
No. 4	0-5
No. 8	0-20
No. 16	15-30
No. 30	35-75
No. 50	70-90
No. 100	90-100
No. 200	97-100

When subjected to the color test for organic impurities, TxDOT Test Method Tex-408-A, the fine aggregate shall not show a color darker than standard.

Coarse aggregate shall consist of gravel or crushed stone meeting the requirements of the current ASTM Specifications C-33. Coarse aggregate shall consist of durable particles of gravel, crushed blast furnace slag and/or crushed stone of reasonably uniform quality throughout, free from injurious amounts of salt, alkali, vegetable matter or other objectionable material, either free or as an adherent coating on the aggregate. It shall not contain more than 0.25 percent by weight of clay lumps nor more than 1.0 percent by weight of shale nor more than 5.0 percent by weight of laminated and/or friable particles when tested in accordance with TxDOT Test Method Tex-413-A.

Coarse aggregate shall have a wear of not more than 45 percent when tested according to TxDOT Test Method Tex-410-A and when tested by standard laboratory methods shall meet the requirements of Table 407.1.A.4.b. Coarse Aggregates Gradation Requirements.

Table 407.1.A.4.b. Coarse Aggregates Gradation Requirements

Aggregate Grade No.[1]	Nominal Size	Percent Passing on Each Sieve								
		2-1/2"	2"	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 8
1	2"	100	80–100	50–85		20–40			0–5	
2(467)	1–1/2"		100	95–100		35–70		10–30	0–5	
3	1–1/2"		100	95–100		60–90	25–60		0–5	
4 (57)	1"			100	95–100		25–60		0–10	0–5
5(67)	3/4"				100	90–100		20–55	0–10	0–5
6(7)	1/2"					100	90–100	40–70	0–15	0–5
7	3/8"						100	70–95	0–25	
8	3/8"						100	95–100	20–65	0–10

1. Corresponding ASTM C 33 gradation shown in parentheses.

Loss by Decantation per TxDOT Test Method Tex-406-A. 1.0% Maximum. In the case of aggregate made primarily from crushing of stone. If the material finer than the 200 sieve is definitely established to be the dust

of fracture essentially free from clay or shale as established by Part III of TxDOT Test Method Tex-406-A, the percent may be increased to 1.5.

Aggregates which fail to meet the requirements of these specifications may be rejected by the OWNER. Such rejection shall incur no cost to the OWNER. Coarse aggregate sources, from which materials with properties not meeting these specifications are delivered, may be rejected as further supply sources to the project by the OWNER. Such rejection shall incur no cost to the OWNER.

407.1.B. Portland Cement

Portland cement shall be in accordance with Item 405.2 for Portland Cement Treatment. Only one brand of cement shall be used in any one (1) structure, except by written permission of the Engineer. When such permission is granted and more than one (1) brand is used in one (1) structure, the resulting concrete shall be uniform in color.

407.1.C. Admixtures

Unless otherwise provided in the plans or special provisions, approved types of chemical admixtures to minimize segregation, to improve workability or to reduce the amount of mixing water may be used in the rate of dosage specified by the OWNER and in accordance with the manufacturer's recommendations.

407.1.C.1. Chemical Admixtures: Chemical admixtures shall conform to ASTM C494 Chemical Admixtures for Concrete, Types "A", "D," "F" and "G" for concrete dosages in accordance with manufacturers' recommendations as specified by the OWNER.

Water-reducing admixtures conforming to ASTM C494, Types "A" and "F", shall be used to improve quality of concrete by obtaining specified strength at tower cement content and to increase stump without increasing water-cement ratio and may also be utilized in improving properties of concrete containing aggregates that are harsh or poorly graded.

Water-reducing, set retarding admixtures, conforming to ASTM C494, Type "D" and "G", may be used during hot weather concrete placement, so as to keep concrete workable during the entire placing period, in order that succeeding placements may be made without development of cold joints or discontinuities in the structural unit.

Air Entraining Admixture shall be used where specified or directed to improve workability and increase resistance to freeze and thawing, and scaling. The admixture shall comply with ASTM C 260 and shall be used in accordance with manufacturer's recommendations. Products shall be Air-Tite by Gifford Hill; Daravair by W.R. Grace; MB-VR by Master Builders, or approved equal.

The total air content of the concrete shall be three percent to six (6) percent.

407.1.C.2. Mineral Admixtures: Fly ash shall conform to the requirements of ASTM C618 Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete, with the exception that the "Loss on Ignition" requirements shall be a maximum of 3-percent. Fly ash shall be sampled and tested at a frequency schedule in accordance with the requirements of ASTM C311 Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete. All sources of fly ash for use in Portland cement concrete shall conform to the requirements of Texas Department of Transportation (TxDOT) Material Specification DMS-8900 Fly Ash.

407.1.C.3. Fiber: At the OWNER'S option, fibrous reinforcement in concrete may be used unless otherwise shown on the plans or in the contract documents. Fibrous reinforcement shall not be used as a replacement for any reinforcement required for structural purposes. Add steel or polypropylene fibers only when called for on the plans or approved by the Engineer.

407.1.C.3.a. Polypropylene Fiber: Ratio shall be 1.5 pounds of fiber per cubic yard of concrete. Acceptable Manufacturer: W. R. Grace Company, Fibermesh, or approved equal.

Physical Properties:

1. Material: Polypropylene.
2. Length: 3/4 inch.
3. Specific Gravity: 0.91.
4. Absorption: None.
5. Tensile Strength: 70-110 Ksi.
6. Modulus of Elasticity: 500 Ksi.
7. Melt Point: 140 degrees F (60 degrees C).
8. Flash Point: 932 degrees F (500 degrees C).
9. Density: 3.pounds/cubic yard.

407.1.C.3.b. Steel Fiber: Steel fiber shall comply with applicable provisions of ACI 544 and ASTM A820. Ratio shall be 50 to 200 pounds of fiber per cubic yard of concrete.

Physical Properties:

1. Material: Steel.
2. Aspect Ratio (for fiber lengths of 0.5 to 2.5 inch, length divided by diameter or equivalent diameter): 30:1 to 100:1.
3. Specific Gravity: 7.8.
4. Tensile Strength: 40-400 ksi.
5. Young's Modulus: 29,000 ksi.
6. Minimum Average Tensile Strength: 50,000 psi.
7. Bending Requirements: Withstand bending around 0.125-inch diameter mandrel to an angle of 90 degrees, at temperatures not less than 60 degrees F, without breaking.

Fibrous reinforcement or fiber-reinforced concrete may be rejected for failure to meet any of the requirements of this specification or ASTM C1116.

407.1.D. Water

Water for use in concrete shall be reasonably clean and free of oil, acid, alkali, organic matter or other deleterious substances. Water which is suitable for drinking or ordinary household uses may be accepted for use without being tested. Water used shall meet the requirements of ASTM C94

If the water is of questionable quality, it shall be tested in accordance with the standard Method of Test of Quality of Water to be used in concrete, AASHTO T26. Water for use with cement may be rejected for failure to meet any of the requirements of this specification and replaced at CONTRACTORS expense.

407.1.E. Formwork

Formwork shall be clean and in good condition, free from dents and rust, grease or other foreign material that tend to disfigure or discolor concrete in a gage and condition capable of supporting concrete and construction loads without significant distortion. Form Ties shall be metal or fiberglass of approved type with tie holes not larger than 7/8 inch in diameter. Wire ties will not be allowed.

407.1.E.1. Lumber and Plywood: Materials shall be seasoned and of good quality, free from loose or unsound knots, knot holes, twists, shakes, decay and other imperfections which would affect strength or impair the finished surface of concrete. Forms for bottoms of caps: At least 2-inch (nominal) lumber or 3/4-inch form plywood backed adequately to prevent misalignment and distortion. General use: Provide lumber of 1-inch nominal thickness or form plywood of approved thickness.

407.1.E.2. Rubbed Finish Exposed Concrete: Form or form-lining surfaces free of irregularities; plywood of 3/4-inch minimum thickness, preferably oiled at the mill.

407.1.E.3. Chamfer Strips: Materials shall be redwood, cypress or pine that will not split when nailed and which can be maintained to true line. Use mill-cut molding dressed on all faces.

407.1.E.4. Metal Forms: Clean and in good condition, free from dents and rust, grease or other foreign material that tend to disfigure or discolor concrete in a gage and condition capable of supporting concrete and construction loads without significant distortion. Countersink bolt and rivet heads on facing sides. Use only metal forms which present a smooth surface and which line up properly.

407.1.F. Reinforcing

Concrete reinforcement is the metal (rods or fabric) imbedded in concrete in such a manner that the reinforcement and concrete act together in resisting forces.

407.1.E.1. Steel Reinforcement: Unless otherwise specified or designated on the plans, the metal for all bar reinforcement shall meet following:

All bar reinforcement shall be open hearth new billet steel of structural, intermediate, or hard grade. New billet steel shall conform to the requirements of the latest Standard Specification for Billet-Steel Concrete Reinforcement Bars, ASTM Designation A615, A767 or A775, grade 40 or grade 60.

Unless otherwise shown on the plans, all reinforcing bars shall be deformed bars. Twisted bars are not considered as deformed bars and will not be used. The form of deformed bars shall be such as to provide a net sectional area at all points equivalent to that of the plain round bars of equal nominal size.
Reinforcement bars shall be bent cold to the shapes indicated on the plans. All bending of hard grade new billet steel shall be done in the shop. Bends shall be true to the shapes indicated, and irregularities shall be cause for rejection. Unless otherwise shown on the plans, bends for stirrups and ties shall be made around a pin having a diameter not less than two times the minimum thickness of the bar. Other bends shall be made according to the latest code of Standard Practice of the Reinforcing Steel Institute.

Reinforcement shall be stored above the ground surface upon skids, platforms or other supports, and shall be protected from mechanical injury and surface deterioration caused by exposure to the conditions producing rust. When placed in the work, the reinforcement shall be free from dirt, loose rust, scale, painting, oil or other foreign material.

Reinforcement may be rejected for failure to meet any of the requirements of this specification.

407.1.E.2. Steel Wire: At the OWNER's option the use of welded wire fabric may be used in lieu of deformed reinforcement bars unless otherwise shown on the plans or in the contract specifications. Welded wire fabric shall be delivered to the job site in sheets. Rolls of wire fabric shall not be permitted. The size of welded wire fabric shall be 12 x 12- W4 x W4. Wire for fabric reinforcement shall be cold-drawn from rods hot rolled from open hearth billets. Wire shall conform to the requirements of the latest Standard Specification for Drawn Wire for Concrete Reinforcement, ASTM Designation A-185 or A884.

Reinforcement shall be stored above the ground surface upon skids, platforms or other supports, and shall be protected from mechanical injury and surface deterioration caused by exposure to the conditions producing rust. When placed in the work, the reinforcement shall be free from dirt, loose rust, scale, paint, oil or other foreign materials.

Reinforcement may be rejected for failure to meet any of the requirements of this specification.

407.1.E.3. Tie Wire: Tie wire shall be per ASTM A82. Use 16½ gauge minimum for tie wire, unless otherwise indicated.

407.1.E.4. Reinforcement Bar Chairs: Reinforcement bar chairs or supports shall be of adequate strength (if specified) to support the reinforcement bars and shall not bend or break under the weight of the reinforcement bars or CONTRACTOR'S personnel walking on the reinforcing bars.

Bar chairs may be made of metal (free of rust), precast mortar or concrete blocks or plastic. Pre-cast mortar or concrete blocks must be approved by the OWNER; and the CONTRACTOR shall supply test data showing the strength of the mortar or concrete blocks. For approval of plastic chairs, representative samples of the plastic shall show no visible indications of deterioration after immersion in a 5-percent solution of sodium hydroxide for 120-hours.

407.1.E.5. Dowel Bars: Dowel and tie bars shall be either straight or bent, smooth or deformed, as shown on the plans and shall conform to the requirements of Item for Steel Reinforcement. The dowel bars shall be coated with either hot asphalt or an alternate coating, as designated on the plans, to the extent shown on the plans.

Load Transmission Devices for Expansion and Contraction Joints, when indicated, shall meet the requirements specified herein:

Smooth steel bar dowels, used when indicated, shall be of the size and type indicated and shall be open-hearth, basic oxygen or electric-furnace steel conforming to the properties specified for grade 60 in ASTM A-615. The free end of dowel bars shall be smooth and free of shearing burrs.

When indicated, one end of each dowel bar shall be encased in an approved cap. The dowel caps and dowel bars shall be held securely in place by bar ties as indicated on the drawings. Mechanical methods of implanting dowel bars in the plastic concrete may be used when approved by the Engineer or designated representative.
Where required, dowel bars shall be coated with a plastic material meeting the requirements indicated. Where red lead and oil bar coating is indicated, the red lead may be of any standard commercial grade and the oil shall be clean and no lighter than Standard No. 30 SAE grade. Approved thinner and dryer may be added to the red lead, but the material upon application shall be of such consistency that will provide a uniform and heavy coating on the bar. Where asphalt bar coating is indicated, the material may be any standard grade of oil asphalt and shall be applied hot. Cutback asphalt will not be permitted for bar coating.

Caps for slip dowel bars shall be of the length shown on the plans and shall have an internal diameter sufficient to permit the cap to freely slip over the bar. In no case shall the internal diameter exceed the bar diameter by more than 1/8"-in., and one end of the cap shall be rightly closed. The cap shall be installed to allow the bar to move not less than 1-¼"-in. in either direction.

407.1.G. Joints

Joint filler is the material placed in concrete pavement and concrete structures to allow for the expansion and contraction of the concrete. Visible joint material shall have the color gray. Pre-molded Expansion Joint Filler shall conform to the requirements of ASTM Designation D-994 or other as approved by City Engineer.

Grout shall be non-shrink and shall conform to ASTM C 1107, Packaged, Dry, Hydraulic Cement Grout (Non-shrink), Grade C. Grout shall be packaged with mixed ingredients requiring the addition of water only.

407.1.G.1. Preformed Asphalt Board: Preformed asphalt board formed from cane or other suitable fibers of a cellular nature securely bound together and uniformly impregnated with a suitable asphaltic binder and meeting the requirements of the Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction, ASTM D 1751.

407.1.G.2. Preformed Non-bituminous Fiber Material: Preformed non-bituminous fiber material shall meet the requirements of the Standard Specifications for the Preformed Expansion Joint Filler for Concrete Paving and Structural Construction, ASTM D 1751, except that the requirements pertaining to bitumen content, density and water absorption shall be voided.

407.1.G.3. Boards: Boards obtained from Redwood timber, of sound heartwood, free from sapwood, knots, clustered birdseye, checks and splits. Occasional sound or hollow birdseye, when not in clusters, will be permitted provided the board is free from any other defects that will impair its usefulness as a joint filler.

407.1.G.4. Backer Rod: Backer Rod shall be expanded closed cell polyethylene foam compatible with sealant. No bond or reaction shall occur between rod and sealant. Backer Rod shall be of sufficient width to be in compression after placement and shall be used with joint sealer.

407.1.G.5. Joint Sealer: This material shall be a one-part low modulus silicone especially designed to cure at ambient temperatures by reacting with moisture in the air. The sealant material shall have the following properties:

Table 407.1.G.5.a. Joint Sealer Supplied Properties

Description	Property
Color	Gray
Flow, MIL-2-8802D Sec. 4.8.4	0.2 Max.
Working Time	10 min.
Tack-Free Time at 77 F±2 F Min. MIL-2-8802D Sec.4.8.7	60
Cure time, at 77 F	7-14 Days
Full Adhesion Time	14-21 Days
As Cured-after 7 days at 77 F (25 C) and 40% RH	90-100
No. 200	97-100

Table 407.1.G.5.b. Joint Sealer Cured Properties

Description	Property
Elongation	1200% Min.
Durometer Hardness, Shore A, ASTM D 2240	15 Min.
Joint movement capability	+100/50 Percent
Tensile Strength, elongation	100% Max.
Peal strength	25-psi (172-kPa)

Properties are As Cured-after 7 days at 77 F (25 C) and 40% RH

The joint sealer shall adhere to the sides of the concrete joint or crack and shall be an effective seal against infiltration of water and incompressible. A backer rod shall be required which will be compatible with the sealant. No bond or reaction shall occur between the rod and sealant. The sealant shall adhere to the sides of the concrete joint. It shall not crack or break when exposed to temperatures below 32°F (0°C).

Asphalt, Redwood board or other materials used shall extend the full depth of the concrete and shall be perpendicular to the exposed face. All joints shall be shaped to conform to the contour of the finished section in which they are installed. All material shall be a minimum of ½ inch thick or as indicated. Wood materials shall be anchored to the adjacent concrete to permanently hold them in place. Joint sealer shall be installed in accordance with the manufacturer's recommendations.

The material used for sidewalk expansion joints, shall conform to Item for Boards above, unless otherwise indicated.

The material used for curb and gutter expansion joints filler shall conform to any of the above, except when placed adjacent to concrete pavement, the joint material shall match the pavement joint material.

407.1.H. Concrete Properties

Concrete shall be composed of cementitious materials, fine aggregate, coarse aggregate, mineral filler and/or admixture if used and water, mixed in the proportions designated by the approved Mix Design and in the manner set forth in this specification. On the basis of job and laboratory investigations of the proposed materials, the Contractor will fix proportions by weight of water, coarse aggregate, fine aggregate, cementitious materials, admixture and mineral filler where required, in order to produce concrete of the specified strength and workability for the actual delivery time and site conditions to be encountered.

Concrete shall be proportioned- as detailed in the approved mix design. The total volume of materials in the concrete mixture shall be so regulated that the cement content per cubic yard of concrete shall not be less than the minimum specified for that class of concrete.

It shall be the responsibility of the Contractor to furnish the mix design, using a Coarse Aggregate Factor acceptable to the City, for the class of concrete specified. The mix shall be designed by a certified testing laboratory to conform with the requirements contained herein and in accordance with ASTM C1077. The Contractor shall perform, at his own expense, the work required to substantiate the design, and testing of concrete strength. Complete concrete design data shall be submitted to the Engineer for approval.

407.1.H.1. Concrete Classes: The concrete shall be uniform and workable and the minimum cement content, maximum water content, for the various classes of mixes shall conform to the following table The concrete mix will be designed with the intention of producing concrete which will have compressive or flexural strength equal to or greater than the following when using current ASTM Designation C-39 and C-293:

Table 407.1.H.1.a. Concrete Classes

Class of Concrete[1]	Min. Cementitious (lb/CY)	28 Day Min. Compressive Strength[2] (psi)	28 Day Min. Beam Strength[2] (psi)	Max. Water/ Cementitious Ratio	Max. Coarse Aggregate Size[4]
A[5]	470	3000	500	0.58	1 ½"
C	564	3600	600	0.53	1 ½"
P1[5]	517	4000	N/A	0.49	1 ½"
P2	564	4500	N/A	0.45	1 ½"
M	As Directed by OWNER				

1. All exposed horizontal concrete shall have entrained - air.
2. Minimum Strength Required by OWNER [Compressive or Flexural]
3. ASTM C78 (Third-Point); Reduce by 10% when Type II Cement is Used
4. Smaller nominal maximum size aggregate may be used if strength requirement is satisfied
5. Sidewalks, separate curb and gutter, and 4-inch thick median pavement
6. Machine Finished
7. Hand Finished

407.1.H.2. Slump: Slump requirements for pavement and related concrete shall be as specified in Table 407.1.H.2.a. Slump Requirements. No concrete shall be permitted with slump in excess of the maximums shown. Any concrete mix failing to meet the above consistency requirements, although meeting the slump requirements, shall be considered unsatisfactory, and the mix shall be changed to correct such unsatisfactory conditions.

Table 407.1.H.2.a. Slump Requirements

Concrete Designation	Recommended Slump (in.)	Maximum Acceptable Placement Slump (in.)
Drilled shafts	5-7	8
Thin walled section (9 in. or less)	4	6-1/2
Approach slabs, concrete overlays, caps, columns, piers, wall sections (over 9 in.)	3	5
Bridge slabs	4	5-1/2
Prestressed concrete members	4	6-1/2
Concrete traffic barrier, concrete bridge railing	4	6-1/2
Dense concrete overlay	3/4	2
Latex-modified conc. for bridge deck overlays	3	7-1/2
Concrete placed underwater	6	8-1/2
Concrete pavement (slip-formed)	1-1/2	3
Concrete pavement (formed)	4	6-1/2
Riprap, curb, gutter, slip-formed, and extruded concrete	As approved	As approved

407.1.I. Submittals

The proposed methods, materials, installations, and other details in the submittals shall be modified as required to obtain the Engineer's approval before beginning of construction. Prior to beginning construction, for each class of concrete to be used, the Contractor shall submit to the Engineer for approval the following items:

1. A concrete mix design that has been prepared by a certified testing laboratory to conform to the requirements contained in this Section. The submittal shall address all mixing and handling requirements as specified in this section.
2. A forming plan showing the forms to be used, the types of ties and bracing to be used, any construction joints that are proposed, pour rates, and other critical data. The form design is the complete responsibility of the Contractor, and the Contractor shall be required to obtain professional engineering assistance at his sole expense where appropriate for proper design.
3. A reinforcing schedule showing the size, type, grade, lengths, installation details, proposed supports, ties, and any other pertinent information related to the proposed reinforcing and its installation.

407.2 EQUIPMENT

All equipment necessary for the construction of this item shall be on the project and shall be approved by the OWNER as to condition before the CONTRACTOR shall be permitted to begin construction operations on which the equipment is to be used.

407.2.A. Forms

The side forms shall be metal, of approved cross section and bracing, of a height not less than the prescribed edge thickness of the concrete section and a minimum of 10-ft. in length for each individual form. Forms shall be

of ample strength and shall be provided with adequate devices for secure setting so that when in place they shall withstand the impact and vibration of equipment imposed thereupon without appreciable springing or settlement. In no case shall the base width be less than 8-in. for a form 8-in. or more in height. The forms shall be free from warps, bends or kinks and shall show no variation from the true plane for face or top. Each 10-ft. length of forms shall be provided with at least 3 pins for securely staking in position. Sufficient forms shall be provided for satisfactory prosecution of the work. 10-ft. metal form sections shall be used in forming curves with a 250-ft., and larger radius. For curves with a radius of less than 250-ft., acceptable flexible metal forms, or wood forms, may be used upon approval by the OWNER.

Slip form paving equipment shall be provided with traveling side forms of sufficient dimensions, shape and strength so as to support the concrete laterally for a sufficient length of time during placement to produce pavement of the required cross section. The equipment shall spread, consolidate, screed and float-finish the freshly placed concrete in such a manner as to provide a dense and homogeneous pavement.

407.2.B. Vibratory Equipment

All concrete placed as Machine Finish class concrete shall be consolidated by approved mechanical vibrators attached to the machine, operated ahead of the transverse finishing screen, and designed to vibrate the concrete internally. Unless otherwise shown on the plans, vibrators of the surface-pan type may also be used for full-depth placement provided that internal vibrators fixed to the machine are also used for vibrating the concrete internally. Vibratory members shall extend across the pavement practically to, but shall not come in contact with, the side forms. Mechanically-operated vibrators shall be mounted in such manner as not to interfere with the transverse or longitudinal joints.

The internal-type vibrators shall be spaced at not more than 24-in. and shall be equipped with synchronized vibratory units. Separate Vibratory units shall be spaced at sufficiently close intervals to provide uniform vibration and consolidation to the entire width of the pavement. The frequency in air of the internal spud-type Vibratory units shall be not less than 8,000-cycles-per-minute and not less than 5,000-cycles-per-minute for tube types. The method of operation shall be as directed by the OWNER. The CONTRACTOR shall have a satisfactory tachometer available for checking the vibratory elements.

The pavement vibrators shall not be used to level or spread the concrete but shall be used only for purposes of consolidation. The vibrators shall not be operated where the surface of the concrete, as spread, is below the elevation of the finished surface of the pavement, except for the first lift of concrete where the double strike-off method of placement is employed. The vibrators shall not be operated for more than 15-seconds while the machine upon which they are installed is still.

The pan-type vibrator units shall apply the vibrating impulses directly to the surface of the concrete. The operating frequency shall not be less than 3,500-cycles- nor more than 4,200-cycles-per-minute in air. The CONTRACTOR shall have a satisfactory tachometer available for checking the speed of the vibratory elements.
Approved hand manipulated mechanical vibrators shall be furnished in the number required for provision of proper consolidation of the concrete along the forms, at joints and in areas not covered by mechanically controlled vibrators. These vibrators shall be sufficiently rigid to insure control of the operating position of the vibrating head.

407.2.C. Miscellaneous Equipment

The CONTRACTOR shall furnish a broom of the push broom type not less than 18-in. in width with stiff bristles for the final surface finish of concrete base or as the OWNER directs.

The CONTRACTOR shall furnish a sufficient number of bridges equipped to ride on the forms and span the pavement for finishing operations and for the installation and finishing of joints. The CONTRACTOR shall furnish, operate and maintain at least two standard 10-ft. (3m) steel straightedges and all necessary finishing and edging tools as may be required to complete the pavement in accordance with the plans and specifications.

407.2.C.1. Transverse Finishing Machine: The transverse finishing machine may be used for Machine Finish class concrete placement for pavement provided that internal vibrators fixed to the machine are also used for vibrating the concrete internally. The requirements for fixed internal vibrators given in part Item for

Vibratory Equipment, shall apply. The transverse finishing machine shall be provided with two screeds accurately adjusted to the crown of the pavement, shall be power driven, and mounted in a substantial frame equipped to ride on the forms. The machine shall be so designed and operated as to strike off and consolidate the concrete internally with internal-type vibrators as required in part Item for Vibratory Equipment.

Finishing machines shall be maintained in a tight and good operating condition, accurately adjusted to the required crown or profile and free from deflection, wobble, or vibration tending to affect the surface finish. Machines failing to meet these requirements shall be rejected by the OWNER, and the CONTRACTOR shall provide approved equipment.

407.2.C.2. Vibrating Screed: The mechanically vibrated screed shall be provided with a template adjusted to the crown of the concrete section. The template shall be power vibrated, adjustable in height and mounted to ride on the forms. The mechanical vibration of one of the screeds on the transverse finishing machine specified in Item for Transverse Finishing Machine shall be acceptable.

407.2.C.3. Hauling Equipment: Batch hauling equipment for the transportation of measured materials from the batching plant to the mixer shall be equipped with tight covers, which shall be used to prevent excessive evaporation of moisture or any loss of material.
If a central mixer is used, concrete may be transported to the point of delivery in truck agitators or non-agitating trucks.
If a truck mounted paving mixer is used, it may be used to transport the concrete after mixing is complete.
If non-agitator trucks are used they shall conform to the following requirements:

The bed of non-agitating hauling equipment shall be a smooth, mortar-tight, metal container. The hauling equipment shall be capable of delivering the concrete to the work site in a thoroughly mixed and uniform mass and capable of discharging the concrete at a satisfactory controlled rate without segregation. If in the opinion of the Engineer any appreciable segregation or accumulation of excess water and/or mortar occurs on the surface of the concrete, this may be cause for rejection and this method of transporting the concrete to the point of delivery shall be suspended as directed by the Engineer.

407.3 CONSTRUCTION METHODS

407.3.A. Mix Design

The Contractor shall perform at the Contractor's own expense and be responsible for the design of the concrete mix. The mix design shall be prepared and sealed by a person qualified and experienced in such work. Establish proportions on the basis either of laboratory trial batches or of field experience with the materials to be employed.

When ice is used to lower the concrete temperature during hot weather, the addition of ice shall not exceed 50 percent of the total mix water weight.

The consistency of the concrete as placed should allow the completion of all finishing operations without the addition of water to the surface. When field conditions are such that additional moisture is needed for the final concrete surface finishing operation, the required water shall be applied to the surface by fog spray only; and shall be held to a minimum amount. The concrete shall be workable, cohesive, possess satisfactory finishing qualities and be of the stiffest consistency that can be placed and vibrated into a homogeneous mass. Excessive bleeding shall be avoided.

If the strength or consistency required for the class of concrete being produced is not secured with the minimum cement specified or without exceeding the maximum water/cement ratio, the CONTRACTOR may use, or the OWNER may require, an approved cement dispersing agent {water reducer}; or the CONTRACTOR shall furnish additional aggregates, or aggregates with different characteristics, or the CONTRACTOR may use additional cement in order to produce the required results. The additional cement may be permitted as a temporary

measure, until aggregates are changed and designs checked with the different aggregates or cement dispersing agent.
The CONTRACTOR is solely responsible for the quality of the concrete produced. The OWNER reserves the right to independently verify the quality of the concrete through inspection of the batch plant, testing of the various materials used in the concrete and by casting and testing concrete cylinders or beams on the concrete actually incorporated in the pavement.

At least 10-days prior to the start of concrete paving operations, the CONTRACTOR shall submit to the OWNER a design of the concrete mix it proposes to use together with samples, if requested, of all materials to be incorporated into the mix and a full description of the source of supply of each material component.

The design of the concrete mix shall produce a quality concrete complying with these specifications and meet the requirements of ACI 318 (1992) - PART 3 Construction Requirements, CHAPTER 5, Concrete Quality, except as amended by these provisions. The concrete mix design shall include the following information:

1. Design Requirements and Design Summary
2. Material source
3. Dry weight of cement/cu. yd. and type
4. Dry weight of fly ash/cu. yd. and type, if used
5. Saturated surface dry weight of fine and coarse aggregates/cu. yd.
6. Design water/cu. yd.
7. Quantities, type, and name of admixtures with manufacturer's data sheets
8. Current strength tests or strength tests in accordance with ACI 318
9. Current Sieve Analysis and -200 Decantation of fine and coarse aggregates and date of tests
10. Fineness modulus of fine aggregate
11. Specific Gravity and Absorption Values of fine and coarse aggregates
12. L.A. Abrasion of coarse aggregates

All material samples submitted to the OWNER shall be sufficiently large to permit laboratory batching for the construction of test specimens to check the adequacy of the design. When the OWNER has approved the design mix, there shall be no change or deviation from the proportions thereof or sources of supply except as hereinafter provided. No concrete may be placed on the job site until the mix design has been approved by the OWNER in writing to the CONTRACTOR.

407.3.A.1. Testing: The Contractor shall prepare a minimum of four concrete test cylinders of each mix design, cure and test two each at the age of 7 and 28 days. From these preliminary tests the water-cement ratio required to produce concrete of the specified strength will be selected by the Contractor for approval by the Engineer or designated representative. The Contractor may at any time present in writing a suggested mix design and if the Engineer or designated representative concurs with the suggested design, the Contractor shall conduct trial batches necessary to determine its acceptability under these specification requirements.

The Contractor shall furnish and operate the mixer approved for use on this project unless the concrete is to be furnished from a transit mix (ready-mix) plant. For mixing the concrete to be used in making the preliminary test specimens, a minimum 1 cubic yard batch shall be mixed or a batch of sufficient size to afford proper mixing, whichever is the greater. In lieu of the above mixer and procedure, the Contractor may furnish a portable mixer of sufficient rated capacity to mix a minimum 3-sack batch; in which case, the batch mixed for the preliminary test not to be less than the rated capacity of the mixer furnished. A coating batch will be mixed prior to mixing for test cylinders.

Test beams or cylinders shall be required for each fifty (50) cubic yards or portion thereof, placed each day. The Engineer shall take test cylinders for compressive strength values on a random basis. The comparative results shall consist of the average of 2 cylinders each at 7 and 28 days for regular concrete, high early strength concrete and high range water reducing admixture concrete.

After the mix proportions and water-cement ratio required to produce concrete of the specified strength have been determined, placing of the concrete may be started. The strength of the concrete in the completed pavement will be determined by a minimum of four compressive strength test specimens made, cured with a minimum of two each tested at 7 and 28 days as provided in TxDOT Bulletin C-11. Modifications of the mix design may be requested by the Contractor on basis of conformity of the strength of these test specimens with the requirements and intent of this specification.

Changes in the water-cement ratio and the mix design, including an increase in cement factor if necessary, will be made when the average 7 day and/or 28 day compressive strength of the concrete, as indicated by the last 10 compressive strength values obtained from tests of cylinders made from concrete of the same water-cement ratio, departs from the desired minimum average strength by more than 4 percent.

Additional tests may be taken as determined by the concrete placement conditions or for adequately determining the strength of concrete where the early opening of the pavement to traffic is dependent upon concrete strength tests. No extra compensation will be allowed for materials and work involved in fulfilling these requirements.

407.3.A.2. Batching and Mixing: All batching and mixing of concrete materials shall conform to ACI 304-73 "Recommended Practice for Measuring, Mixing and Placing Concrete". All materials shall be measured separately and accurately and batches shall be uniform. The coarse and fine aggregate shall be measured or weighed, loose and separately.

When transit mix concrete is used, the delivery of concrete shall be continuous at regular and uniform intervals, without stoppages or interruptions. Transit mix concrete shall not be placed in the job after a period of forty-five (45) minutes after the cement has been placed in the mixer.

407.3.A.3. Delivery: The rate of delivery of transit mixed concrete shall be so arranged that a cold joint is not allowed to form between loads. Concrete shall be hauled in vehicles so constructed and operated to provide constant agitation during transportation. Concrete improperly mixed shall not be placed in the structure.
The transit mixer shall be of an approved revolving drum or revolving blade type so constructed as to produce a thoroughly mixed concrete with a uniform distribution of the materials throughout the mass and shall be equipped with a discharge mechanism which will insure the discharging of the mixed concrete without segregation.

The mixer drum shall be water-tight when closed and shall be equipped-with a locking device which will automatically prevent the discharging of the mixer prior to receiving the required number of revolutions.

The rate of delivery of the mixed concrete shall be such that the interval between loads shall not exceed 10-minutes. The concrete shall be delivered to the site of the work and discharged from the mixer before the drum has been revolved 300 revolutions, after the introduction of the mixing water with the dry materials.
The entire quantity of mixing water shall be accurately measured and controlled. Each batch shall be mixed to the consistency as described in the approved mix design. Any additional mixing shall be done at a slower speed specified by the manufacturer for agitation and shall be continuous until the batch is discharged.

407.3.A.3. Consistency: In general, the consistency of concrete mixtures shall be such that:
a. The mortar will cling to the coarse aggregate.
b. The aggregate will not segregate in the concrete when it is transported to the place of deposit.
c. The concrete and mortar will show no free water when removed from the mixer.
d. The surface of the finished concrete will be free from a surface film of "laitance".

Any concrete mix failing to meet the above outlined consistency requirements, although meeting the slump requirements will be considered unsatisfactory, and the mix shall be changed to correct such unsatisfactory conditions.

407.3.B. Placing Concrete

The Contractor shall give the Engineer at least twenty-four (24) hours advance notice that he intends to pour concrete in any unit of the structure. Prior to starting work the Contractor shall inform the Engineer as to the methods of construction and the amount and character of equipment he proposes to use, the adequacy of which shall be subject to the approval of the Engineer. The mixing of concrete and placing of same in the forms shall not be commenced until the Engineer has given his approval. No concrete shall be placed in any unit prior to completion of the form work and the placement of the reinforcing and other steel.

407.3.B.1. Subgrade Preparation: When manipulation or treatment of subgrade is required on the plans, the work shall be performed in proper sequence with the preparation of the subgrade for pavement. Subgrade shall be prepared as indicated in Items 402, 403, 404, and 405. Density tests must be taken no more than 72-hours prior to placement of concrete. After the specified moisture and density are achieved, the CONTRACTOR shall maintain the subgrade moisture and density in accordance with Item for Subgrade Preparation until the pavement is placed. In the event that rain or other conditions may have adversely affected the condition of the subgrade or base, additional tests may be required as directed by the OWNER.

407.3.B.2. Forms: Facing of ¾" grade B plywood will be permitted for general use on the various portions of structures, if backed by a sufficient number of studs and wales. Forms shall be mortar tight, and of sufficient strength to prevent bulging between supports. Forms shall be maintained to the lines designated until the concrete is sufficiently hardened to permit form removal and until the minimum time for forms to remain in place has elapsed in accordance with ACI Standard 318-71 "Building Code Requirements for Reinforced Concrete (ASI318-71)". Where corners occur, suitable chamfer strips shall be placed at the angle of the forms to round off or level them. All forms shall be constructed so as to permit removal without injuring the concrete. At the time of placing concrete, the forms shall be clean and entirely free of all chips, dirt, sawdust, and other extraneous matter.
For thin wall sections and other locations where access to the bottom of the forms by other methods would be cumbersome and inadequate, clean-out opening shall be provided.

Only spreaders approved by the Engineer shall be used.

Form ties of an approved type shall be used to hold forms in place. Such ties shall be of a type especially designed for use in connection with concrete work, and they shall have provision to permit ease of removal of the metal as hereinafter specified. The use of metal form ties of types that are encased in paper or other materials to allow the removal of the complete tie, leaving a hole through the concrete structure, will not be permitted. Metal ties shall be held in place by devices attached to walls. Each device shall be capable of developing the strength of the tie.
All cavities produced by the removal of metal ties shall be carefully cleaned and completely filled with re-tempered sand cement mortar mixed in proportion of one to three, and the concrete shall be left smooth and even. Forms shall remain in place until the concrete has taken its final set. At the time the forms are removed, earth shall be banked against the sides of the slab and immediately and thoroughly wetted.

When forms settle over 1/8-in. under finishing operations, paving operations shall be stopped, the forms reset to line and grade and the pavement then brought to the required section and thickness.

Forms shall be thoroughly cleaned after each use and well-oiled before reuse.

407.3.B.3. Placing Reinforcing: Reinforcing steel, welded wire mesh, tie bars, dowels, etc., shall be placed as shown on the plans. All reinforcing shall be clean, free from rust in the form of loose or objectionable scale, and of the type, size and dimensions shown on the plans. Reinforcing bars shall be securely wired together at the alternate intersections and all splices and shall be securely wired to each intersection dowel and load-transmission unit intersected. All bars shall be installed in their required position as shown on the plans. The storing of reinforcing or structural steel on completed roadway slabs generally shall be avoided and, where permitted, such storage shall be limited to quantities and distribution that shall not induce excessive stresses.

Dowel bars shall be accurately installed in joint assemblies as indicated on the drawings, each parallel to the pavement surface and to the center line of the pavement and shall be rigidly secured in the required position by such means as indicated that will prevent their displacement during placing and finishing of the concrete.

All reinforcing bars and bar mats shall be installed in the slab at the required depth below the finished surface and supported by and securely attached to bar chairs installed on prescribed longitudinal and transverse centers as shown by sectional and detailed drawings on the plans. After the reinforcing steel is securely installed above the subgrade, as specifically required by plans and as herein prescribed, there shall be no loading imposed upon (or walking upon) the bar mats or individual bars before or during the placing or finishing of the concrete.

When welded wire fabric is selected, the Contractor shall pour the lower half of the slab; place the welded wire fabric and then place the remaining concrete. Tie bars shall be installed in the required position by the method and device indicated. Bar coating indicated and of material specified, shall be completed and the bars and coating shall be free of dirt or other foreign matter at the time of installation in the concrete. Dowel bars shall be accurately installed in joint assemblies as indicated on the drawings, each parallel to the pavement surface and to the center line of the pavement and shall be rigidly secured in the required position by such means as indicated that will prevent their displacement during placing and finishing of the concrete.

407.3.B.4. Joints: Expansion joints or dummy joints which may require an assembly of parts supported by special devices shall be completely assembled and rigidly supported in the correct position well in advance of the placing of concrete.

407.3.B.4.a. Joint Dimensions: The width of the joint shall be shown on the plans, creating the joint sealant reservoir. The depth of the joint shall be shown on the plans. Dimensions of the sealant reservoir shall be in accordance with manufacturer's recommendations. Normal width/depth ratios are 1 to 1, not to exceed 1 to1½. After curing, the joint sealant shall be 1/8-in. to 1/4-in. below the pavement surface at the center of the joint. Expansion joints shall be installed perpendicularly to the surface and to the centerline of the pavement at the locations shown on the plans.

When no transverse joints are indicated, joints shall not exceed 40 feet. Such stakes, braces, brackets or other devices shall be used as necessary to keep the entire joint assembly in true vertical and horizontal position. Where concrete base is overlaid by asphaltic concrete, the joints to be prepared as specified herein, but joint sealing will not be required unless indicated.

407.3.B.4.b. Joint Materials: Board joint material with less than 25-percent of moisture at the time of installation shall be thoroughly wetted on the job. Green lumber of much higher moisture content is desirable and acceptable. The joint filler shall be appropriately drilled to admit the dowel bars when required. The bottom edge of the filler shall extend to or slightly below the bottom of the slab. The top edge shall be held approximately 1/2-in. below the finished surface of the pavement in order to allow the finishing operations to be continuous.

Where the joint filler is of a pre-molded asphaltic type, the top edge shall be protected, while the concrete is being placed and finished, by a metal cap of at least 10 gauge material having flanges not less than 1½-in. in depth. The channel cap may remain in place during the joint finishing operations to serve as a guide for tooling the edges of the joint. After the removal of the side forms, the ends of the joints at the edges of the slab shall be carefully opened for the entire depth of the slab.

Routine pavement joints shall be filled to a depth of 1½-in. Materials shall generally be handled and applied according to the manufacturer's recommendations, with additional requirements as stated herein.

Dowel bars, where required on the plans, shall be installed through the predrilled joint filler and rigidly supported in true horizontal and vertical positions by an assembly of bar chairs and dowel holders welded to

transverse bars extending across the slab and placed on each side of the joint. The chair assembly shall be similar and equal to that shown on the plans and shall be approved by the OWNER prior to extensive fabrication.

407.3.B.4.c. Contraction Joints: Contraction or dummy joints shall be installed at the locations and at the intervals shown on the plans in accordance with this section and Item for Sawing. The joints shall be constructed by sawing to a 1/4-in. width and to a depth of 1/4 of the pavement thickness, or deeper if so indicated on the plans. Unless otherwise specified on the plans, joints shall be sawed into the completed pavement surface as soon as sawing can be accomplished without damage to the pavement and before 24 hours after the concrete has been placed, so that some raveling of the green concrete is observed in order for the sawing process to prevent uncontrolled shrinkage cracking. If sharp edge joints are being obtained, the sawing process shall be sped up to the point where some raveling is observed. Damage by blade action to the slab surface and to the concrete immediately adjacent to the joint shall be minimized. Any portion of the curing membrane which has been disturbed by sawing operations shall be restored by spraying the areas with additional curing compound. The sawed groove shall immediately be thoroughly cleaned for the full depth and width of the joint and filled. The type of equipment and method for performing this work shall be approved by the OWNER.

407.3.B.4.d. Construction Joints: Construction joints formed at the close of each day's work or when the placing of concrete has been stopped for 30-minutes or longer shall be constructed by use of metal or wooden bulkheads cut true to the section of the finished pavement and cleaned and oiled.

Asphalt, Redwood board or other materials used shall extend the full depth of the concrete and shall be perpendicular to the exposed face. All joints shall be shaped to conform to the contour of the finished section in which they are installed. All material shall be a minimum of ½ inch thick or as indicated in contract documents. Wood materials shall be anchored to the adjacent concrete to permanently hold them in place. Joint sealer shall be installed in accordance with the manufacturer's recommendations.

Wooden bulkheads shall have a thickness of not less than 1½-in. Longitudinal bars shall be held securely in place in a plane perpendicular to the surface and at right angles to the centerline of the pavement. Edges shall be rounded to ¼-in. radius. Any surplus concrete on the subgrade shall be removed upon the resumption of the work. In no case shall an emergency construction joint be placed within 8-ft. following a regular installation of expansion or contraction joint. If the emergency construction joint should fall within this limitation, the concrete shall be removed back to the previously installed joint.

Longitudinal construction joints shall be of the type shown on the plans. Longitudinal joints shall be constructed accurately to required lines in order to coincide with traffic lane lines. No width between longitudinal construction joints shall exceed 24-ft., unless specifically authorized or directed by the OWNER in writing.

407.3.B.4.e. Expansion Joints: Transverse expansion joints shall be formed perpendicular to the centerline and surface of pavement and shall be constructed in accordance with the sequence of operations indicated on the drawings. After the transverse finishing machine and before the longitudinal finishing machine have passed over the joint, the Contractor shall test the joint filler for correctness of position and make any required adjustment in the position of the filler and shall install the joint seal space form as indicated on the drawings. After removal of the joint seal form as indicated on the drawings, the joint seal space above the joint filler shall be thoroughly sandblasted or machine routed to remove all projecting concrete, laitance, dirt or foreign matter. The concrete faces of the joint seal space shall be left true to line and section throughout the entire length of the joint. On completion of curing of the pavement, the joint sealing filler of the type specified shall be placed as indicated. The faces of the joint seal space shall be clean and surface dry at the time joint sealing filler is placed. On completion of the joint seal, the pavement adjacent to the joint shall be left free of joint sealing material. The joint seal space shall be exactly above and not narrower than the joint filler with no concrete over-hangings.

407.3.B.5. Pouring: The Contractor shall give the Engineer at least twenty-four (24) hours advance notice that he intends to pour concrete in any unit of the structure. The mixing of concrete and placing of same in the forms shall not be commenced until the Engineer has given his approval. No concrete shall be placed in any unit prior to completion of the form work and the placement of the reinforcing and other steel.

Unless otherwise shown on the plans, the concrete shall be placed using either forms or slipform paver. The concrete shall be rapidly deposited on the subgrade in successive batches and shall be distributed to the required depth and for the entire width of the pavement by shoveling or other approved methods. Any concrete not placed as herein prescribed within the time limits specified in Table 407.3.B.5.a. Concrete Temperature-Time Requirements will be rejected.

Table 407.3.B.5.a. Concrete Temperature-Time Requirements

Concrete Temp (at point of placement)	Max Time – (min) (no retarding agent)	Max Time – (min) (no retarding agent)[1]
Non-Agitated Concrete All Temps	30	45
Agitated Concrete		
Above 90˚F	45	75
Above 75˚F thru 90˚F	60	90
75°F and Below	90	120

1. Normal dosage of retarder.

Where the Contractor's operations involve the placing of concrete from above directly into an excavated area or through the completion of forms, all concrete so placed shall be deposited through a vertical sheet metal or other approved pipe or tremie not less than six (6) inches nor more than ten (10) inches in diameter. The pipe shall be made in sections so that the outlet may be adjusted to proper heights during placing operations.
Concrete shall be placed in continuous horizontal layers approximately (12) inches in thickness. The rate of delivery shall be so arranged that a cold joint is not allowed to form between loads. The Contractor shall avoid unauthorized construction joints by placing required portions of abutments, paving, piers, walls, floors, slabs columns or superstructures in one continuous operation. If required by specific jobsite conditions, openings in the forms shall be provided for the removal of laitance and other foreign material. At the end of the day, or in case of unavoidable interruption or delay of more than 30-minutes, a transverse construction joint shall be placed.

Concrete shall not be placed before the time of sunrise and shall not be placed later than shall permit the finishing of the pavement during sufficient natural light.

Any concrete not placed as herein prescribed within 30 minutes after mixing shall be rejected and disposed of as directed except as provided otherwise herein. If in the opinion of the Engineer or designated representative, the temperature, wind and/or humidity conditions are such that the quality of concrete will not be adversely affected, the specified placing time may be extended by a maximum of 45 minutes.

407.3.B.5.b. Compaction: All concrete shall be well compacted and the mortar flushed to the surface of the forms by continuous working with concrete spading implements and mechanical vibrators of an approved type. Vibrators of the type which operate by attachment to forms or reinforcement will not be permitted. The vibrators shall be applied to the concrete immediately after deposit and shall be moved throughout the mass, thoroughly working the concrete around the reinforcement, embedded fixtures, and into the corners and angles of the forms until it has been reduced to a plastic mass. The mechanical vibrator shall not be operated so that it-will penetrate or disturb layers placed previously which have become partially set or hardened. The vibration shall be of sufficient duration to accomplish thorough compaction and complete embedment of reinforcement and fixtures, but shall not be done to an extent that will cause segregation. Vibration shall be supplemented by hand spading to insure the flushing of mortar to the surface of all forms.

Special care shall be taken in placing and spading the concrete against the forms and at all joints and assemblies so as to prevent honeycombing. Excessive voids and honeycombing in the edge of the pavement, revealed by the removal of the side forms, may be cause for rejection of the section of slab in which the defect occurs.

The use of rakes will not be permitted. Workers will not be permitted to walk in the concrete with any earth or foreign material on their boots or shoes.

407.3.B.5.c. Weather Conditions: Except by specific written authorization of the OWNER, no concrete shall be placed when the air temperature is less than 40°F and falling but may be placed when the air temperature is above 35°F and rising. The temperature shall be taken in the shade away from artificial heat.
When and if such permission is granted, the CONTRACTOR shall furnish sufficient protective material and devices (canvas and frame work or other type of housing) to enclose and protect the fresh concrete in such a way as to maintain the temperature of the air surrounding the fresh concrete at not less than 50°F for a period of at least 5-days. Sufficient heating apparatus such as stoves, salamanders, or steam equipment and fuel to furnish all required heat shall be supplied. It is to be distinctly understood that the CONTRACTOR is responsible for the quality and strength of the concrete placed under any weather conditions. No concrete shall be placed on a frozen subgrade. The Contractor shall be responsible for the quality and strength of concrete under cold weather conditions and any concrete damaged by freezing shall be removed and replaced at the Contractor's expense.

Concrete shall not be placed when it's temperature is greater than95˚F. During hot weather placement additional steps shall be taken to insure proper curing, including, but not limited to, the use of ice in the batch process, white pigmented curing compound, dampening of forms, steel, and subgrade beneath concrete. Additionally, placement of wet burlap on the surface of concrete, fogging or wet curing may be used and maintained for a minimum of 7 days.

407.3.B.6. Finishing: As soon as concrete placing operations have been completed for a slab section of sufficient width to permit finishing operations, the concrete shall be approximately leveled and then struck, off, tamped, and screeded using a longitudinal screed. The screed shall be of a design adaptable to the use intended, shall have provisions for vertical adjustment, and shall be sufficiently rigid to hold true to shape during use.

Finishing shall be done on all exposed surfaces up to 1-ft below finished grade.

Tamping and screeding operations shall be continued until the concrete is properly consolidated and the surface voids are eliminated. The surface shall then be brought to a smooth true alignment by means of longitudinal screeding, floating, betting, and/or other methods approved by the Engineer. When templates are used, they shall be of such design as to permit early removal in order to avoid construction joints and to permit satisfactory finishing at and adjacent to the site of the template.

While the concrete is still workable, it shall be tested for irregularities with a 10-ft. metal straightedge placed parallel to the centerline of the pavement so as to bridge depressions and to touch all high spots. Ordinates measured from the face of the straightedge to the surface of the pavement shall at no place exceed 1/16 inch-per-foot from the nearest point of contact. In no case shall the maximum ordinate to a 10-ft. straightedge be greater than 1/8-in. Any surface not within the tolerance limits shall be reworked and refinished.

The edges of slabs and all joints requiring edging shall be carefully tooled with an edger of the radius required by the plans at the time the concrete begins to take its "set' and becomes non-workable. All such work shall be left smooth and true to lines.

407.3.B.6.a. Texturing: After completion of the straightedge operation, as soon as construction operations permit, texture shall be applied with 1/8 inch wide metal tines with clear spacing between the tines being not less than ¼ inch nor more than ½ inch.
If approved by the Engineer or designated representative, other equipment and methods may be used, provided that a surface texture meeting the specified requirements is obtained. The texture shall be applied transversely.

It is the intent that the average depth resulting from the number of tests directed by the Engineer or designated representative shall not be less than 0.060 inch with a minimum texture depth of 0.050 inch for any one test when tested in accordance with TxDOT Test Method Tex-436-A. Should the texture depth fall below that intended, the finishing procedures shall be revised to produce the desired texture.

The Contractor shall have available at all times hand rakes with tines for the purpose of providing textures in the event of equipment breakdown. The Contractor also shall have available a conventional garden spray type can, containing a commercially available monomolecular film compound. This shall be applied in the case of equipment breakdown or other emergencies to prevent the pavement from drying too rapidly. The use of this product will give the Contractor additional time to provide adequate texturing.

After completion of texturing and about the time the concrete becomes hard, the edge of the slab and joints shall be carefully finished with an edger and the pavement shall be left smooth and true to line.

407.3.B.6.b. Stamping: All concrete including curbs, curb with gutter, sidewalks, alleys, driveways and other structures shall be marked by means of a substantial stamp or die so designed to make an impression in the finish of the concrete. The stamp or die shall designate the firm name or CONTRACTOR and the month and year in which the work was done. The design of the stamp or die shall be approved by the Engineer.

407.3.B.6.c. Hand Finishing: Hand finishing shall be permitted only in intersections and areas inaccessible to a finishing machine. The addition of one-sack of cement per cubic-yard shall be required for all hand finish concrete.

When the hand method of striking off and consolidating is permitted, the concrete, as soon as placed, shall be approximately leveled and then struck off and screeded to such elevation above grade that, when consolidated and finished, the surface of the pavement shall be at the grade elevation shown on the plans. The entire surface shall then be tamped and the concrete consolidated so as to insure maximum compaction and a minimum of voids. For the strike off and consolidation, both a strike template and tamping template shall be provided on the work. In operation the strike template shall be moved forward with a combined longitudinal and transverse motion and so manipulated that neither end of the template is raised from the forms during the striking off process. A slight excess of material shall be kept in front of the cutting edge at all times. The straightedge and joint finishing shall be as hereinabove prescribed.

407.3.C. Curing Concrete

All concrete pavements shall be cured by protecting it against loss of moisture for a period of not less than 72 hours from the beginning of the curing operations. Immediately after finishing operations have been completed, the entire surface of the newly laid concrete shall be covered and cured in accordance with the requirements specified for whichever of the following methods the Contractor may elect. The curing method as herein specified does not preclude the use of any of the other commonly used methods of curing, and the OWNER may approve another method of curing if so requested by the CONTRACTOR. If any selected method of curing does not afford the desired results, the OWNER shall have the right to order that another method of curing be instituted.

The curing of concrete pavement shall be thorough and continuous throughout the entire curing period. Failure to provide proper curing as herein prescribed shall be considered as sufficient cause for immediate suspension of the paving operations.

Immediately after removal of the side and end forms of non-exposed surfaces, and after required finishing of exposed surfaces, the formed surfaces of all concrete shall receive a like coating. The solution shall be applied under pressure with a spray nozzle in such a manner as to cover the entire exposed surface thoroughly and completely with a uniform film.

The rate of application shall be such as to insure complete coverage, but the area covered shall not exceed two hundred (200) square feet per gallon of curing compound. The coating shall be sufficiently transparent and free

from permanent color to result in no pronounced change in color from that of the natural concrete at the conclusion of the curing period. It shall, however, contain a fugitive dye of color strength to render the film distinctly visible on the concrete for a period of at least four (4) hours after application.

Under normal conditions, the curing compound, after application, shall dry to touch within one (1) hour and shall dry thoroughly and completely within four (4) hours. When thoroughly dry, it shall provide a continuous flexible membrane free from cracks or pinholes and will not disintegrate, check, peel, or crack during the required curing period. If for any reason the seal is broken during the curing period, it shall be immediately repaired with additional sealing solution.

All concrete shall be cured and sealed with a continuous acrylic membrane-forming compound meeting the requirements of ASTM C-309. Products shall be Sealco 309 by Gifford-Hill; Horn Clear Seal by W.R. Grace and Company, or an approved equal.

Bonding agent shall be a liquid polymer latex compound such as Daraweld-C manufactured by W.R. Grace and Company or an approved equal.

407.3.D. Opening to Traffic

All traffic shall be excluded from the pavement for a period of not less than 14-days or until field cured test specimens indicate concrete meets at least 75% of design strength, or as otherwise approved by the OWNER. In all cases the pavement shall be cleaned and joints shall be filled and trimmed before being opened to traffic.

When it is necessary to provide for traffic across the pavement, the CONTRACTOR shall, at its own expense, construct suitable and substantial crossings over the concrete which shall be adequate for the traffic using same.

Opening pavement to traffic shall not relieve the CONTRACTOR of responsibility for the work and shall not in any way affect the time charge on the entire project. The number of days stated in the contract shall govern for the completion of the entire work covered by the contract.

407.3.E. Testing and Evaluation

All testing shall be in accordance with applicable ASTM Standards and concrete testing technician must be ACI certified or equivalent.
During the progress of the work, the CONTRACTOR shall cast test cylinders, in accordance with ASTM C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field, to maintain a check on the compressive strengths of the concrete being placed. In accordance with ASTM C31 and ASTM C172 Standard Practice for Sampling Freshly Mixed Concrete, four test cylinders shall be taken from a representative portion of the concrete being placed for every 150-cubic yards of concrete pavement placed, but in no case shall less than 2 sets of cylinders be taken from any one day's placement.

After the cylinders have been cast, they shall remain on the job site and then transported, moist cured, and tested by the OWNER in accordance with ASTM C31 and ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens. In each set, one of the cylinders shall be tested at 7-days, two cylinders shall be tested at 28-days, and one cylinder shall be held or tested at 56-days, if necessary.

407.3.E.1. Deficient Pavement: The adjustment in unit prices provided for in this item will apply only when measurement for payment is by the square yard. It is the intent of this specification that the pavement be constructed in strict conformity with the thickness, strength and typical sections indicated on the drawings. Where any pavement is found not so constructed, the following rules relative to adjustment of payment for acceptable pavement and to replacement of faulty pavement shall govern.

The pavement will be core drilled after any grinding operations have been completed for surface corrections prior to final acceptance. Locations of core tests may be selected by the Engineer or designated representative; however, spacing interval for core tests, as specified herein, shall be maintained. The

thickness of the pavement will be determined by measurement of the cores in accordance with TxDOT Test Method Tex-424-A.
One core will be taken at the location selected by the Engineer or designated representative or at random in each unit. If the measurement deficiency of the core is less 0.2-in from the plan thickness, full payment will be made. When the measurement of the core is deficient more than 0.2 inch but less than 0.75 inch from the plan thickness, 2 additional cores (at directed locations) will be taken from the unit and the average of the 3 cores determined. The 2 additional cores from any 1,000-foot unit will be taken at intervals of not less than 300 feet. The 2 additional cores from any 1,000 square yard unit will be taken at locations such that the pavement in the unit will be well represented. If the average measurement of these 3 cores is not deficient more than 0.2 inches from the plan thickness, full payment will be made. If the average thickness of the 3 cores is deficient by more than 0.2 inch but not more than 0.75 inch from the indicated thickness, an adjusted unit price as provided below will be paid for the areas represented by these cores.

After any grinding or milling operations have been completed to meet the surface-testing requirement of this specification, if average thickness of pavement is deficient in thickness by more than 0.2 inch, but not more than 0.75 inch, payment will be made at an adjusted price as specified in the following table:

Table 407.3.E.1.a. Concrete Pavement Thickness Deficiency

Thickness Deficiency (in)	Contract Price Allowed (%)
0.00 to 0.20	100
0.21 to 0.30	80
0.31 to 0.40	72
0.41 to 0.50	68
0.51 to 0.75	57

Any area of pavement found deficient in thickness by more than 0.75 inch but not more than 1 inch or 1/8 of the indicated thickness, whichever is greater, shall be evaluated by the Engineer. If, in the judgment of the Engineer, the area of such deficiency should not be removed and replaced, there will be no payment for the area retained. If, in the judgment of the Engineer, the area of such deficiency warrants removal, the area shall be removed and replaced at the Contractor's entire expense, with concrete of the thickness indicated on the drawings.

If the average compressive strength based on concrete test cylinders at 28 days is less than the specified minimum strength of the concrete, then payment will be made at an adjusted price as specified in the following table. The Ration shall be that of the Average Strength from Test Cylinders to Specified Minimum Compressive Strength both at 28 Days.

Table 407.3.E.1.b. Concrete Pavement Strength Deficiency

Ratio of Average Strength	Contract Price Allowed (%)
0.95-1.00	100
0.90-0.95	85
0.85-0.90	70
0.80-0.85	60
Less than 0.80	0 or Remove and Replace

When, in the opinion of the Engineer or designated representative, the compressive strength test results appear unrepresentative, additional testing of field cores may be authorized. To be considered acceptable for consideration the field cores shall be acquired, properly handled and tested in accordance with ASTM C 42/C 42M, "Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete" within 45 days of the original concrete placement date. The retesting will be at the expense of the Contractor and the results of the retesting shall be averaged with the results of the original testing. If the results of retesting indicate that the original test results were erroneous by more than 15% in the opinion of the Engineer or designated representative, the original test results will be discarded. In the instance of erroneous original test results the subsequent first set of retests will be at the expense of the Owner.

When, in the opinion of the Engineer or designated representative, the concrete compressive strength is deemed unacceptable for the intended use of the pavement, the concrete shall be removed and replaced to the limits indicated by test results.

407.3.E.2. Pavement Cracks: Random drying shrinkage cracks or stress cracks of widths greater than 0.025-inches in recently placed reinforced Portland cement concrete pavement placed on stabilized subbase or slabs on grade are subject to being removed and replaced at the discretion of the OWNER.

Random drying shrinkage cracks or stress cracks of any nature in recently placed non-reinforced Portland cement concrete pavement placed on non-stabilized subbase or slabs on grade are subject to being removed and replaced at the discretion of the OWNER. Recently placed concrete pavement or slabs on grade are those for which the one-year maintenance bond has not expired. Routing, by any means, and sealing random cracks will not be permitted.

When Portland cement concrete pavement or slabs on grade must be removed and replaced, the area of removal must extend from the nearest contraction or dummy joint or construction joint a minimum distance of 10-feet, measured parallel to the longitudinal axis of the pavement, and include that portion of the concrete pavement or slab on grade containing the random crack. A sawed dummy joint will be required to be sawed across the opposing, non-damaged, slab in line with the saw cut made for the removal of the damaged slab. The area of removal and replacement of slabs containing longitudinal random cracks will be determined by the OWNER or its representative. Randomly cracked Portland cement concrete sidewalks will require removal and replacement of only the five-feet long section or sections containing random cracks.

407.4 MEASUREMENT AND PAYMENT

When specifically included on the bid form as a pay item, concrete placed under this Section shall be measured complete in place by physically measuring the completed concrete structure after removal of forms and all required finishing has been completed. Length and width (or depth) shall be measured, and the constructed volume of the placed concrete shall be computed in square yards (SY). When not specifically included on the bid form as a pay item, there shall be no direct measurement of installed concrete, and all installed concrete not included in a specific bid item shall be paid as a subsidiary item to other bid items in the contract.

Concrete Pavement, if included in the bid, shall be measured as specified above and paid for at the contract unit price bid for "Concrete Pavement" which price shall be full compensation for shaping and fine grading the roadbed, including furnishing and applying all water required; for furnishing, loading and unloading, storing, hauling and handling all concrete ingredients, including all freight and royalty involved; for placing and adjusting forms, including supporting material or preparing track grade; for mixing, placing, finishing, sawing, cleaning and sealing joints and curing all concrete; for furnishing and installing all reinforcing steel; for furnishing all materials for sealing joints and placing longitudinal, expansion and weakened plane joints, including all steel dowel caps and load transmission devices required and wire and devices for placing, holding and supporting steel bars, load transmission devices and joint filler material in proper position, for coating steel bars, all other materials and methods, equipment, tools, testing, labor, and incidentals necessary to complete the work.

408 SIDEWALKS, DRIVEWAYS, RAMPS, AND VALLEY GUTTERS

This item includes sidewalk, concrete driveway approaches, barrier free access ramps, and valley gutter construction within public right-of-way. All sidewalks, drive approaches, barrier free access ramps, and valley gutters shall conform to the standard plans and details appended to these Standard Specifications.

408.1 MATERIALS

Materials for the various features of work under this item of these specifications shall meet the following requirements:

A. Concrete shall conform to the requirements of Item 407, "Concrete Pavement".
B. Flexible Base Material shall conform to the requirements of Item 403, "Flexible Base".

408.1.A. Reinforcing: Driveway approaches and walk reinforcing, when required, shall be No. 3 bars on 24-in. centers or No. 4 on 30-in. centers. No. 6 gauge, 6-in. x 6-in. wire fabric conforming to Item 407.1.F. Reinforcing may be used only as approved by the OWNER.
Sidewalk reinforcing (except in driveway approach) may be No.3 bars on 24-in. centers or No. 10, 6-in. x 6-in.

All excavation, construction of fills or embankments and grading within the, public right-of-way shall conform to the appropriate section(s) of the standard specifications.

408.2 CONSTRUCTION METHODS

Construction of concrete valley gutters, sidewalks, barrier free access ramps, and concrete driveway approaches shall conform to the following requirements. Concrete shall be Class A as specified under Item 407, "Concrete Pavement", of these Standard Specifications. No concrete shall be placed until the forms have been checked and approved by the City Inspector. Dimensions and conformation shall comply with the details in the approved plans or Standard Details appended to these specifications. Grades, alignment, and tolerances shall be as specified.

Forms shall be of wood or metal, of a section satisfactory to the Engineer, straight, free of warp and of a depth equal to the depth of the concrete face. They shall be securely staked to line and grade, and maintained in a true position during the depositing of concrete. Thin plywood, steel, or other similar material may be used to form short radius curb returns at concrete driveway approaches. The reinforcing steel shall be placed in position as shown on the details in the approved plans. Care shall be exercised to keep all steel in its proper location during concrete placement.

Concrete surface shall be floated with a steel trowel to provide a smooth, burnished surface. After floating and before the finish has set, the surfaces shall be lightly brushed with a fine brush to remove the surface. After the surface has become firm, the surface shall be given a single floating with a wood float to provide a uniform surface.

The CONTRACTOR shall do all necessary filling, leveling and fine grading required to bring the subgrade to the exact grades specified and compacted to at least 90-percent of maximum density as determined by ASTM 0698 Test Methods, from -2 to +4 of optimum.

408.2.A. Valley Gutters

Concrete Valley Gutters shall be constructed in accordance with details in the approved plans or Standard Details and to the grades indicated on-the plans. Transitions to and from the standard curb and gutter sections at each end shall be such that water will not be trapped in the gutter section. The structure shall be monolithic with the curb and gutter at either end. Valleys shall have a wood float finish with transverse tooled joints as shown in the details. Steel reinforcement shall be provided as shown.

408.2.B. Sidewalks, Driveways, and Ramps

Sidewalks, barrier free access ramps, and Concrete Driveway Approach shall conform to the details in the approved plans or Standard Details appended to these specifications. The subgrade shall be compacted uniformly to the approximate density of the surrounding undisturbed material, and a one (1) inch sand cushion provided on the subgrade. Wire mesh reinforcement shall be provided in both sidewalks and concrete driveway approach. Reinforcing shall conform to the details in the approved plans or Standard Details appended to these

specifications. Expansion joints shall be installed at the intersection of drives and walks as indicated on Item 407, where cold joints occur, and where walks or drives abut other concrete structures. Walks and drives shall have a light brush finish as specified under Item 407, of these specifications. The edges shall be tooled with a one-quarter (1/4) inch radius edging tool, and walks shall also be tooled transversely at five (5) foot intervals. This pattern shall be continued through the concrete driveway approach apron. Curing compound shall be applied to the surface immediately after finishing is completed.

408.2.B.1. Sidewalks: Concrete sidewalks shall have a minimum thickness of 4-in., except sidewalks constructed in driveway approach sections shall have a minimum thickness equal to that of driveway approach or as called for by plans and specifications within the limits of the driveway approach. Standard slope for walks shall be ¼-in. per-ft. in the direction of the curb or perpendicular to sidewalk direction, with a tolerance of 1/8-in. per-ft. When sidewalk is against the curb, expansion joints and tooled grooves shall match those in the curb.

408.2.B.2. Ramps: Ramps shall comply with provisions of Texas Accessibility Standards including location, slope, width, shapes, texture and coloring. At the locations shown on the plans or at locations designated by the OWNER, the separate curb, integral curb, or curb and gutter shall be laid down to a uniform width of not less than the specified height of the curb from the back of the curb line for access to future driveways. The return radii and partial curb return shall be built from the face of the curb to the back of the curb lay-down.

408.2.B.2. Driveways: Where a driveway approach or ramp is to be constructed at a location where there exists a separate curb and gutter, said curb and gutter shall be removed for the full width of the gutter to the nearest joint or to a sawed point at the point of radius. On concrete pavement with monolithic curb, the breakout line shall be 12-in. from the face of the curb line and shall be parallel to it and form a right angle with the concrete surface. The breakout line shall be a sawed groove in accordance with the requirements of Item for Sawing. Alternately, the OWNER may approve use of equipment designed to cut concrete curbs. All faces and edges exposed as a result of cutting shall be smoothed.

408.3 MEASUREMENT AND PAYMENT

All Concrete Valley Gutters, Sidewalks, and Concrete Driveway Approach will be measured per square yard (SY) complete in place.
All barrier free access ramps will be measured per Each (EA) complete in place.
Price of Concrete Valley Gutter, Sidewalks, ramps, and Concrete Driveway Approach if included in the bid, shall be measured as specified above, which price shall be full compensation for all work herein specified, including the furnishing of all materials, equipment, tools, labor, and incidentals necessary to complete the work.

409 CONCRETE CURB AND GUTTER

This item shall consist of Portland Cement concrete curb or curb and gutter with reinforcing steel as required, constructed on an approved subgrade and base in accordance with this specification and in conformity with the lines, grades, section and details indicated or as established by the Engineer.

409.1 MATERIALS

Materials for the various features of work under this item of these specifications shall meet the following requirements:

A. Concrete and reinforcing shall conform to the requirements of Item 407, “Concrete Pavement”.
B. Flexible Base Material shall conform to the requirements of Item 403, “Flexible Base”.
C. Reinforcing steel shall conform to Item 407, “Concrete Pavement”. All bars shall be wired at their intersections and at all laps or splices. All bars at splices shall be lapped a minimum of 20-diameters of the bar or 12-in., whichever is greater.
D. Expansion joint materials shall conform to Item 407, “Concrete Pavement”.

409.2 CONSTRUCTION METHODS

This section is intended to comply with section 402, 403, and 407. If anything in this section appears to contradict the above sections then the CONTRACTOR shall bring it to the attention of the OWNER for further guidance. Subgrade for curb and gutter shall be excavated and prepared to required depth and width including a minimum of 12 inches behind the curb, unless a greater width is indicated, to construct the work to grades and dimensions indicated. If dry, the subgrade shall be sprinkled with water lightly before concrete is deposited thereon.

The reinforcing steel shall be placed in position as shown on the typical section. Care shall be taken to keep all steel in its proper location.

409.2.A. Joints: Expansion joint material, ½-in thickness, shall be provided at intervals not to exceed 40 feet and at intersection returns and other rigid structures, or matching abutting sidewalk joints and pavement joints, or as otherwise specified by the OWNER. The expansion joints in concrete pavement shall coincide with the expansion joints in the curb and gutter and sidewalk. Joints shall extend the full width and depth of the concrete.

Longitudinal dowels, across the expansion joints in the curb and gutter, shall be required. There shall be three No. 4, round, smooth bars for dowels at each expansion joint. Dowels shall be spaced in accordance with standard reinforcement steel specifications. The dowel shall be a minimum of 24-in. in length. One-half of the dowel shall be coated with asphalt and terminated with an expansion cap. The cap shall provide a minimum of 1-in free expansion. Dowels shall be supported by an approved method to provide a true horizontal and longitudinal alignment.

Weakened plane joints or tooled joints shall be made ¾ inch deep at 10-foot intervals or matching abutting sidewalk joints and pavement joints. All joint headers shall be braced perpendicular and at right angles to the curb.

Two round smooth dowel bars, ½ inch in diameter and 24 inches in length, shall be installed at each expansion joint. Sixteen inches of one end of each dowel shall be thoroughly coated with hot oil, asphalt or red lead, so that it will not bond to the concrete. The dowels shall be installed with a dowel sleeve on the coated end as indicated or equivalent as directed by the Engineer.

409.2.A. Forms: All forms shall be of well-seasoned wood or steel, straight, free of warp and framed, braced or staked in a substantial and approved manner so as to insure perfect alignment and grade.
The length of the forms shall be not less than 10 feet. Flexible or curved forms shall be used for curves of 100-foot radius or less. Wood forms for straight sections shall be not less than 2 inches in thickness. Forms shall be clean, straight, free from warp and oiled with a light form oil. All forms shall be securely staked to line and grade and maintained in a true position during the depositing of concrete.

409.2.B. Workmanship: Concrete shall be placed in the forms, rodded and tamped to exclude all air and honeycomb. Not more than 1 hour after the concrete has been placed, a thin coating not more than ½ inch nor less than ¼ inch thick of finish mortar, composed of 1 part Portland Cement to 2 parts fine aggregate, shall be worked into the exposed faces of the curb and gutter by means of a "mule." After the concrete has become sufficiently set, the exposed edges shall be rounded by the use of an edging tool to the radii indicated. The entire exposed surface of the curb and gutter shall be floated to a uniform smooth surface, then finished with a camel hair brush to a gritty texture. The forms shall remain in place a minimum of 24 hours unless approved otherwise by the Engineer. After removal of the forms, any minor honeycombed surfaces shall be plastered with a mortar mix as described above. Excessively honeycombed curb and gutter, as determined by the Engineer, shall be completely removed and replaced when directed.

409.2.A. Finishing: After the concrete has been struck off and while it is still plastic, the exposed surfaces may be plastered with 1/4-in. mortar topping. The mortar topping shall be applied with a steel "mule," or a finishing tool or method which produces results equivalent to that obtained with the mule. All exposed surfaces shall then be floated or troweled and lightly brushed as required by the OWNER to produce a smooth and uniform finish. Excess working of the surfaces shall be avoided. Excess water, laitance and inert materials shall be removed from the surfaces.

The top of all the work and the face of all curbs shall be checked for irregularities as soon as the surface is finished, using a 10-ft. straightedge, and the maximum distance from the straightedge to the concrete shall not exceed ¼-in. All variations greater than specified shall be immediately corrected. All honeycombed areas disclosed by removal of forms shall be immediately chipped out and patched with Portland cement mortar.

After a minimum of 3 days curing and before placing the final course base, the curb shall be backfilled to the full height of the concrete, tamped and sloped as directed by the Engineer. The top 4 inches of backfill shall be of clean topsoil, free of stones and debris.

409.3 MEASUREMENT AND PAYMENT

Accepted work as prescribed by this item will be measured by the linear foot (LF) of concrete curb and gutter, complete in place. The work, when direct payment is provided for in the Bid, performed as prescribed by this item will be paid for at the unit price bid per linear foot for "Concrete Curb and Gutter" and / or "Concrete Curb," which price shall be full compensation for all work for excavation, preparing the subgrade, for furnishing and placing all base material, reinforcing steel, dowels, expansion joint material, backfilling and for all other materials, manipulations, labor, tools, equipment and incidentals necessary to complete the work.

410 MEDIANS

This item shall consist of concrete medians and headers in accordance with these specifications and in conformance with the lines and grades established by the OWNER and details shown on the plans.

410.1 MATERIALS

All material requirements for constructing concrete medians shall conform to the requirements of Item for Concrete Curb and Gutter. Where a monolithic concrete median is indicated, concrete and reinforcement shall match the adjacent pavement. Concrete material requirements shall be the same as those for Item for Concrete Paving.

410.2 CONSTRUCTION METHODS

Excavation and fine grading shall be done according to Item for Unclassified Street Excavation, and shall be subsidiary to the item. Forms and concrete placement shall conform to the requirements of Item for Concrete Curb and Gutter and shall be of a depth equal to the depth of the required section. Forms shall be securely staked to line and grade and maintained in a true position during the depositing of concrete.

The surface shall be finished with a float and lightly brushed to obtain a uniform finish. Tooled joints shall be placed longitudinally and transversely at intervals not to exceed 6-ft. center to center, as shown on the plans, or as directed by the OWNER. Joints in the median shall coincide with joints in curb and gutter. Expansion joint material shall be placed between the median and the back of curb and around all obstructions protruding through the concrete median.

Concrete header shall be constructed at the location(s) shown on the plans and shall be constructed as shown on the plans in accordance with Item for Concrete Pavement.

410.3 MEASUREMENT AND PAYMENT

Concrete median shall be measured by the square-yard (SY) complete in place.
Concrete header shall be paid per each (EA) complete in place.

The work performed and materials furnished as prescribed by this item, measured as provided for in this item, shall be paid for at the contract unit price bid for "concrete median," and "concrete header," which price shall be full compensation for constructing concrete median, concrete header, necessary excavation, and for preparing the subgrade; furnishing and placing all materials, reinforcing steel, including sand cushion, reinforcement and expansion materials; and for all manipulation, labor, tools, equipment and incidentals necessary to complete the work.

411 PAVEMENT REPAIR

No interference with traffic flow on the thoroughfares and collectors shall be permitted during the hours of 6:30 a.m. to 9:30 a.m. and 3:30 p.m. to 6:30 p.m., Monday through Friday, unless directed otherwise by the OWNER. A traffic lane shall be considered satisfactorily open if it is paved with hot-mix or cold mix asphalt paving, or paved with another suitable material approved by the OWNER, or covered.

If the cut is to be covered, the CONTRACTOR shall use steel plates of sufficient strength and thickness to support all the traffic. A transition of hot-mix or cold-mix asphalt conforming to the requirements of Item for Asphalt Pavement shall be constructed from the top of the steel plate to the existing pavement to create a smooth riding surface. Exceptions to these specifications must be approved by the OWNER.

411.1 REPAIR DIMENSIONS

Exact pavement removal locations must be approved by the OWNER prior to construction. If multiple repairs are closer than 10-ft. apart from edge of one repair to the edge of a second repair, a continuous section shall be replaced.

411.1.A. Concrete Repairs

Sidewalks shall be removed and replaced to the nearest existing joint. No sidewalk or driveway section to be replaced shall be smaller than 30-in. in either length or width unless otherwise approved by the OWNER.

A gutter of at least 12-in. may remain, provided that the curb and gutter is not damaged by the construction activity. Damaged curbs shall be replaced at the expense of the CONTRACTOR.

In a concrete paved street or alley, no horizontal dimension of any cut along the street path shall be less than 3-ft. or no less than 1-ft. from the edge of the trench on each end, whichever is greater. Where saw-cut locations coincide with or fall within 3-ft. of the present location of dummy joints, cold joint, construction joints, expansion joints, or edge, removal shall be to the existing joint or edge. If the trench edge or point repair is located greater than 1-ft. from a lane line on the side of the line closest to the curb, pavement shall be removed and replaced from the curb to the lane line. If the edge of a trench or point repair is located less than 1-ft. from a lane line on the side of the line closest to the curb, pavement shall be removed and replaced from the curb to the 2nd lane line beyond the trench edge or point repair.

411.1.B. Asphalt Repairs

In an asphalt paved street or alley, no horizontal dimension of any cut along the street path shall be less than 4-ft. or no less than 2-ft. from the edge of the trench on each end, whichever is greater.

If the edge of a trench or point repair is located less than or equal to ½ lane width but greater than 2-ft. from a lane line, the lane-width of pavement shall be removed and replaced. If the edge of a trench or point repair is located less than 2-ft. from a lane line, the pavement shall be removed and replaced to ½ lane width on each

side. In the lane along the curb, if the trench edge or point repair plus 2-ft. toward the lane line is less than ½ lane width, pavement shall be removed and replaced from the curb to ½ lane width.

411.2 SAWING

This item shall apply in the removal of bituminous or concrete pavement, curb, gutter, sidewalk or driveways. This item shall also govern for the sawing of weakened plane joints (contraction joints). Sawing shall be in accordance with the requirements of this item unless otherwise shown on the plans or in the special provisions.
The removal and replacement of portions of permanent pavement (Portland cement concrete or hot-mix asphalt), drives, slabs, sidewalks, etc. shall require a full-depth cut to be sawed by the use of an approved power driven concrete saw in accordance with this specification or as directed by the OWNER.

Sawing shall be considered subsidiary to the items requiring sawing if no pay item exists in the Contract.

411.2.A. Equipment

The saw shall be power driven, shall be manufactured especially for the purpose of sawing pavement, shall be suitable for the work to be performed including dust control and shall be maintained in good operating condition.
Saw blades shall make a clean, smooth cut, producing a groove 1/8-in. to 1/4-in. wide and to the full depth required by these specifications or as shown on the plans. The saw, with its control devices, shall be mounted on a sturdy frame supported on rubber-tired wheels.

411.2.B. Construction Methods

Dust and residues from sawing shall be prevented from entering the atmosphere or storm drain. The edge of pavements, curb, gutter, sidewalk and/or driveways shall be neatly sawed. Saw cuts shall be made perpendicularly to the surface to full pavement depth or as directed by the OWNER. The edges of pavement and appurtenances damaged subsequent to sawing shall again be saw cut to neat straight lines for the purpose of removing the damaged areas. Such saw cuts shall be parallel to the original saw cut. Concrete sidewalk or driveway to be removed shall be neatly sawed in straight lines either parallel to the curb or at right angles to the alignment of the sidewalk.

For repairs due to trench excavations the existing pavement shall be precut, sawed or scored so as to result in an even, straight cut. After completion of the trench backfill, and upon approval of the Engineer, on all paved streets other than gravel streets, the Contractor shall cut and excavate the surface and base of the streets back on each side of the trench to form a shoulder for the new base and surfacing. The base material shall then be replaced in three (3) inch layers tamped in place. Replaced base material shall comply with Item for Flexible Base, and in no case be less than 8 inches thick. On gravel streets, six (6) inches of road gravel shall be rolled in place to serve as a wearing surface. All cutbacks shall be to a neat, straight line, and the paving cut shall be made with a concrete saw and shall be parallel to the center line of the pipe. Removal of excess surfacing beyond the nominal limits of the ditch shall be kept to a minimum, and such areas shall be outlined with straight saw-cuts and included in areas to be repaired as described above. Base material shall be compacted to ninety-five (95) percent of maximum density as determined by TxDOT Test Method TX-113/114. The replaced surface course shall consist with Item for Hot Mix Asphaltic Concrete.

In all paved streets the trench shall be finished in a workmanlike manner consistent with the same type of roadway which was removed so that the underlying courses, as well as the wearing surface, shall conform to the remainder of the roadway and shall be equal in every respect to the improvements existing prior to excavation.

411.3 MICRO-SURFACING AND SLURRY SEAL

This item shall apply to all the specified work for pavement repair or rehabilitation via the use of Micro-Surfacing or Slurry Seal. The work covered by this specification includes testing, construction, and quality control required for the proper application of micro-surfacing and slurry seal treatment services. Both the Micro-Surfacing and the Slurry Seal shall consist of a mixture of an approved emulsified asphalt, mineral

aggregate, mineral filler, and water and specified additives, proportioned, mixed and uniformly spread over a properly prepared surface. The completed micro-surface shall leave a homogenous mat, adhere firmly to the prepared surface and have a skid resistant surface texture.

Micro-Surfacing: This blend is used to give maximum skid resistance and an improved wearing surface. An example would be on pavements which have high traffic volume. Rate of application: 20 pounds per square yard for residential streets and 25 to 28 pounds per square yard collectors and larger streets as indicated in the design documents.

Slurry Sealing: TYPE IIA: This blend is used to give maximum skid resistance and an improved wearing surface. An example would be on pavements which have highly textured surfaced and require this size aggregate to fill in the voids and provides an improved wearing surface. Rate of application:
20 to 22 pounds per square yard.

411.3.A. Materials

Before work commences, the CONTRACTOR shall submit a signed original of a mix design containing the test results and proportioning of the specific materials to be used on the project. This design shall have been performed by a qualified laboratory. Previous lab reports covering the exact materials to be used may be accepted provided they were made during the calendar year. This initial mix design will be done at the CONTRACTOR's expense. Upon receipt of the original mix design, an independent qualified laboratory selected by the City will perform tests using the same materials as used in the initial mix design for verification of the results. This testing will be done at the City's expense. No work will begin until all materials and/or mix design proportions have met the specifications as required. Once the materials are approved, no substitutions will be permitted unless first tested and approved by the methods stated above.

411.3.A.1. Aggregates: The mineral aggregate shall consist of a natural or manufactured crushed stone such as granite, slag, limestone or other high quality aggregates or a combination thereof that conforms to the quality requirement of ASTM Specification Dl073 and shall be free of dirt, organic matter, clay balls, and adherent films of clay, dust or other objectionable material. The aggregate shall contain no free water.

Micro-Surfacing: Application Rate Lb. Sq. Yd. 25-Lbs to 28-lbs. One hundred percent (100%) crushed material from a single source is required. The gradation of the aggregate shall be per the table below:

Table 411.3.A.1.a. Micro-Surfacing Aggregates Gradation Requirements

Sieve Size	Percent Passing
3/8”	99-100
No. 4	86-94
No. 8	45-65
No. 16	25-46
No. 30	15-35
No. 50	10-25
No. 100	7-18
No. 200	5-15

Slurry Seal: Smooth textured sands of less than 1.25 % water absorption shall not exceed 50% of the total aggregate blend. Type IIA is a modification of ISSA Type II gradation to provide a coarser mix. The CONTRACTOR shall be required to utilize a screening plant at the stockpile site and all aggregate loaded for use shall first pass thru the screening plant to remove any oversized material. The size of the screen opening on the screening plant shall be appropriate for the gradation approved by the City. Residual Asphalt Content, 8% to 12% % Weight of Dry Aggregate; Application Rate Lb. Sq. Yd. 20-Lbs to 22-lbs. Based on Weight of Total Mix the gradation of the aggregate shall be per the table below:

Table 411.3.A.1.b. Slurry Seal Aggregates Gradation Requirements

Sieve Size	Percent Passing
3/8"	100
No. 4	85-100
No. 8	55-80
No. 16	35-60
No. 30	25-45
No. 50	18-30
No. 100	10-21
No. 200	5-15

Table 411.3.A.1.c. Alternative Slurry Seal Aggregates Gradation Requirements

Sieve Size	Percent Passing
3/8"	100
No. 4	85-100
No. 8	53-80
No. 16	30-60
No. 30	20-45
No. 50	15-30
No. 100	10-21
No. 200	5-15

411.3.A.2. Mineral Filler: The mineral filler shall be a recognized brand of Type I and II Portland cement with no entrained air that meets the requirements of ASTM D 242 if required by the mix design. 0.5% to 2% by dry weight of aggregate will be the range of mineral filler in the mix design. The mineral filler shall be considered as part of the dry aggregate.

411.3.A.3. Water: All water shall be potable and compatible with the micro-surfacing and slurry seal mix. Compatibility shall be ensured by the CONTRACTOR. The percent of water in the mix design shall produce proper mix consistency.

411.3.A.4. Emulsified Asphalt: The asphalt emulsion shall be homogeneous and show no separation after mixing.

Micro-Surfacing: The emulsified asphalt shall be a quick-set polymer modified cationic type CSS-1P, CQS-1HLM, or CSS-1EP (E-Flex or approved equal) emulsion and conform to the requirements specified in AASHTO M 208 and ASTM D 2397. It shall pass all applicable storage and settlement test. The polymer material shall be milled into the emulsion or blended into the asphalt cement prior to the emulsification process. The cement mixing test shall be waived.

411.3.A.4.a. Alternate E-FLEX Emulsified Asphalt: When specified, E-FLEX, CQS-1EP and shall meet the requirements shown in Table below. Asphalt emulsion delivered to the project shall be accompanied by a laboratory certification of analysis.

After recovering the residue from AASHTO R-78, the sample may be annealed prior to testing to remove any excess moisture and provide for a consistent sample. The annealing can be accomplished by placing 20 grams of residue in a 6 oz. metal container (approx. 3-inch diameter) and heating to 163 °C for no more than 15 minutes. The sample should be stirred with a spatula every 5 minutes. The sample can then be poured directly into a 25mm DSR silicone mold for evaluation.

Perform the mixture design using an AASHTO-accredited laboratory experienced in the design of microsurfacing systems. Provide the Engineer with representative samples of all component materials for verification of the mixture design, unless otherwise directed. Identify additives used to control mixture set times and cohesion, as determined by design testing, and provide acceptable limits. The Construction Division will verify the mixture design to ensure it meets the minimum requirements for wet track abrasion as recommended by manufacturer.

Table 411.3.A.4.b. Polymer-Modified Cationic Emulsified Asphalt

Property	Test Procedure	Emulsion CSS-1EP	
		Min	Max
Asphalt Base Properties			
Original DSR, kPa (G*/sinδ, 10 rad./sec) @ 76ºC	T 315	1.00	
Emulsion Properties			
Viscosity, Saybolt-Furol, @ 122ºF, SFS	T 59	15	150
Sieve Test, %	T 59		0.1
Storage Stability, 1 day, %	T59		1
Distillation test			
Residue by distillation, % by weight	T 59	62	
Oil distillate, % by volume of emulsion			0.5
Tests on Residue Properties from Low Temp Evaporation (AASHTO R-78[1]):			
MSCR @ 70ºC, Recovery @ 3.2 kPa,%	T 350	80	
MSCR @ 70ºC, J_{nr} @ 3.2, 1/kPa	T 350		0.50
ODSR, kPa (G*/sin δ, 10 rad./sec) @ 76°C	T 315	1	
ODSR, deg (phase angle δ, 10 rad./sec) @ 76°C			60

Slurry Seal: Typically grade CSQS-1EP, CSSQS-1HLM (Quick Set Low Viscosity, Hard Penetration Latex Modified) shall be used. Alternatives with prior approval form the City. As directed by the City, the grade of emulsion shall conform to the requirements specified in ASTM D 2397 for Cationic Emulsions. (Quick Set). The emulsion used shall be modified with latex (SBR) which shall be milled into the emulsion or blended into the asphalt cement prior to the emulsification process. It shall pass all applicable storage and settlement tests. The cement mixing testing shall be waived. Asphalt emulsion, type CSSQS-1HLM (Quick Set) shall be specified on all city streets to minimize the amount of time the street will be closed.

411.3.A.5. Latex Modifier: A 3% latex content based on bitumen weight, certified by the emulsion supplier, shall be milled into the asphalt emulsion. The Latex Modifier shall be certified from the emulsion supplier, along with special quick setting emulsifier agents, shall be milled into the asphalt emulsion. The emulsified asphalt shall be so formulated that when the paving mixture is applied with the relative humidity at no more than 50% and ambient air temperature of at least 75 degrees Fahrenheit, it will cure sufficiently such that uniformly moving traffic can be allowed on completed travel lanes within 1 hour after placement with no damage to the surface. If determined necessary by the City, the mixture properties shall be adjusted according to humidity conditions and ambient air temperatures to allow uniformly moving traffic on completed travel lanes within 1 hour after placement with no damage to the surface.

Any additive used to accelerate or retard the break-set of the slurry seal shall be approved by the mix design laboratory as part of the mix design. The amount and type of additive (if needed) will be shown in the mix design.

411.3.A.6. Material Testing: All materials which first meet all quality test specifications shall be shown in the mix design by type of material and recommended proportions of said material.

411.3.A.6.a. Aggregate Testing: All aggregate material testing shall be done per the chart below:

TEST	TEST METHOD		SPECIFICATION
	AASHTO	ASTM	
Gradation Analysis	T-27	C-136	See Gradation Chart
Sand Equivalent	T-176	D-2419	45% Min
Soundness	T-104	C-88	Sodium Solfate:15% max loss Magnesium Sulfate: 20%
Hardness	T-96	C-131	35% Max
Unit Weight	T-19	C-29	Lb/cu.ft

411.3.A.6.b. Emulsion Testing: All emulsion testing shall be done per the chart below:

TEST	TEST METHOD		SPECIFICATION
	AASHTO	ASTM	
Particle Charge		D-244	
Distillation Residue	T-59	D-244	Weight 62% Min
Saybolt Furol Viscosity @ 77°F SSF, sec	T-59	D-88	15-50
Sieve Test, Retained on 20 Mesh Sieve	T-59	D-244	0.1% Max
24-hr Storage Stability	T-59	D-244	1% Max
5-Day Settlement Test	T-59	D-244	5% Max

411.3.A.6.c. Distillation Residue Testing: All Distillation Residue testing shall be done per the chart below:

TEST	TEST METHOD		SPECIFICATION
	AASHTO	ASTM	
Penetration@77°F, 100g, 5-sec	T-49	D-243	40-90
Solubility in Trichloroethylene	T-44	D-2042	97.5% Min
Ductility, 77°F, cm	T-44	D-113	40 Min
Softening Point, degrees F (Ring and Ball)		D-2398	140°F Min.

411.3.A.6.d. Micro-Surfacing Mixture Testing: All material mixture testing shall be done per the chart below:

TEST	TEST METHOD		SPECIFICATION
	AASHTO	ASTM	
Set Time		D-3910	12-hrs Max
Cure Time		D-3910	24-hrs Max
Wet Stripping Test, % Coating	TB-114		80% Max
Wet Track Abrasion		D-3910	75 grams/sf Max

Set Time 30-min Blotter	TB-102		No Brown Strain
Displacement	TB-102		No Displacement
Water Resistance at 30-Min	TB-102		No Discoloration

411.3.A.6.e. Slurry Seal Mixture Testing: All material mixture testing shall be done per the chart below:

TEST	TEST METHOD		SPECIFICATION
	AASHTO	ASTM	
Consistency Test		D-3910	2-3 cm flow
Set Time		D-3910	12-hrs Max
Cure Time		D-3910	24-hrs Max
Wet Stripping Test, % Coating	TB-114		80% Max
Wet Track Abrasion		D-3910	75 grams/sf Max

411.3.A.7. Material Storage: The CONTRACTOR shall provide a suitable storage facility for all equipment and materials needed to perform the work. This site should be located as close as possible to the area of work being done to reduce turnaround time and ensure an acceptable rate of work. Any site selected shall be subjected to final approval by the City. Erosion control measures shall be implemented as needed to comply with applicable laws.

Precautions shall be taken to ensure the aggregate does not become contaminated with oversized rock, clay, silt or excessive amount of moisture. The stockpile shall be kept in areas that have good drainage. Segregation of aggregates proposed for use and as supplied to the mixing plant shall be uniform.

411.3.B. Equipment

All methods and equipment employed in performing the work shall be subject to the approval of the City before work is started and whenever found unsatisfactory, they shall be changed and improved as required. All equipment shall be maintained in a satisfactory condition.

411.3.B.1. Mixing Equipment: The mixing machine shall be equipped with a water pressure system and nozzle type spray bar to provide a water spray immediately ahead of and outside the spreader box with 0.05 to 0.15 gallons per square yard immediately ahead of the spreader box. The equipment shall adhere to the requirements below:

411.3.B.1.a. Micro-Surfacing: The material shall be mixed by a self-propelled micro surfacing mixing machine which shall be a continuous flow mixing unit able to accurately deliver and proportion the aggregate, emulsified asphalt, mineral filler and water to a revolving multi-blade mixer and discharge the mixed product on a continuous flow basis. The machine shall have enough storage capacity for aggregate, emulsified asphalt, mineral filler and water to maintain an adequate supply to the proportioning controls. The machine shall be equipped with self-loading devices which provide for the loading of all materials while continuing to lay micro-surfacing, thereby minimizing construction joints. Individual volume or weight controls for proportioning each material to be added to the mix shall be provided. Each material control device shall be calibrated and properly marked.

The aggregate feed to the mixer shall be equipped with a revolution counter or similar device so the amount of aggregate used may be determined at any time.

The emulsion pump shall be a positive displacement type and shall be equipped with a revolution counter or similar device so that the amount of emulsion used may be determined at any time.

The mixing machine shall be equipped with an approved fines feeder that shall provide a uniform, accurately metered, predetermined amount of specified mineral filler.

411.3.B.1.b. Slurry Seal: The slurry seal mixing equipment shall be a continuous flow mixing unit or continuous-run design machines as to give a uniform and complete circulation of the batch in the mixer, so as not to segregate the aggregate, but will provide a thorough and uniform free flowing mix with the asphalt and water. The units shall be equipped with approved devices so that the machine can be accurately calibrated and the quantities of material used can be determined.

The CONTRACTOR shall have a minimum of 1 Slurry Seal machines at the project site in good working condition each having a capacity of at least 8 cubic yards to assure enough production capability.

411.3.B.2. Spreading Equipment: The equipment shall adhere to the requirements below:

411.3.B.2.a. Micro-Surfacing: The surface mixture shall be spread uniformed by means of a mechanical type spreader box attached to the mixer, equipped with paddles to agitate and spread the materials throughout the box. A front seal shall be provided to ensure no loss of the mixture at the road contact point. The rear seal shall act as final strike off and shall be adjustable. The mixture shall be spread to fill cracks and minor surface irregularities and leave a uniform skid resistant application of material on the pavement, the longitudinal joint where two passes join shall be neat appearing, uniform and lapped. All excess material shall be removed from the job site prior to opening the road. The spreader box shall have suitable means provided to side shift the box to compensate for variations in pavement geometry.

411.3.B.2.b. Slurry Seal: The spreader box shall be equipped to prevent loss of slurry seal from all sides and with a flexible rear strike-off capable of being adjusted. It shall suitable means for side tracking to compensate for deviation in pavement geometry. The box shall be kept free of built-up asphalt and aggregate. The strike-off drag shall always be kept completely flexible.

411.3.B.3. Auxiliary Equipment: Suitable crack and pavement cleaning equipment, hand tools and any support equipment will be provided by the CONTRACTOR as necessary to perform the work. The CONTRACTOR shall use a vacuum equipped street sweeper to remove all swept debris. Sweeping of debris into the gutter shall not be permitted.

411.3.B.4. Testing & Equipment Calibration: Each Slurry unit to be used shall be calibrated in the presence of the City prior to construction. Previous calibration documentation covering the exact materials to be used may be accepted provided they were made during the calendar year. No machine shall be allowed to work on the project until the calibrations have been completed and/or accepted.

CONTARCTOR shall lay Test strips (location to be determined by the City) before construction begins. The City will observe the test strip for verification or rejection according to the specifications. Upon failure of any of the test, additional test strips will be laid at no cost to the City. The square yards of the first test strip will be measured and paid for at the contract unit price. (Keeping proper consistency is a major concern. A wet mix will cause an asphalt rich surface. Consistency can be checked in the field by making a line through the slurry-surface immediately behind the spreader box. If the line stays, the slurry is at a proper consistency level. If the line fills up, the slurry is too wet.)

411.3.C. Construction Methods

The CONTRACTOR shall notify all homeowners and businesses affected by the construction a minimum of 24-hrs in advance of the surfacing. Should the work not occur on the specified day, new notification will be distributed as required. Complete street closures are allowed when approved by the City in consultation with the City Engineer. In general, complete street closures are allowed on residential streets for more efficient and effective completion and for reduction of the project duration impact to the neighborhood.

All Micro-Surfacing/Slurry Seal will be applied between March 1 and December 1 unless otherwise approved by the City. The Micro-Surfacing/Slurry Seal will be placed on the location and within the time limits as specified by the City. The Slurry Seal shall be applied only when the air and pavement temperature is 50°F and rising. No Slurry Seal shall be applied when:

1. In the period following precipitation with water remaining on the surface to be coated.
2. In foggy conditions.
3. If there is a threat of rain before the slurry seal can fully cure.
4. If there is danger that the finished product will freeze within 24-hrs after application.
5. If weather conditions prolong opening to traffic beyond the time specified by the City.
6. Any base failures, severe pavement defects, or similar conditions which are present will be properly repaired by the City to ensure correct application and performance of the pavement material. CONTRACTOR shall notify the City if there are any such defects present and shall not proceed until they have been corrected.

411.3.C.1. Temporary Markings: Whenever the work causes obliteration of existing pavement markings or delineation, temporary markings or delineation shall be in place prior to opening the traveled way to public traffic. Lane line and centerline pavement delineation shall be provided at all times for traveled ways open to public traffic. Other markings such as crosswalks, stop bars, and pavement arrows shall be delineated prior to opening the roadway to public traffic if directed by the City.

All work necessary to establish satisfactory temporary marking and lane delineation shall be performed by the CONTRACTOR. Surfaces on which temporary marking and lane delineation is to be applied shall be cleaned of all dirt and loose material, and shall be dry when it is applied. Temporary markings and lane delineation shall be maintained until replaced with permanent markings.

Temporary lane delineation shall consist of either a 4-inch by 4-inch square stripe or a 4-inch reflectorized tab, as directed by the City. Temporary lane delineators shall be placed on lane lines and centerlines at longitudinal intervals of not more than 24 feet apart, or 12 feet apart on radii. The temporary markings and lane delineators shall be the same color as the lane line, centerline, or pavement marking being replaced.

Unless noted otherwise, temporary markings and lane delineation shall not be paid for as a separate pay item and shall be considered subsidiary to the contract unit price per square yard of Slurry Seal or Micro-Surfacing, which pay item shall be the total compensation for the furnishing of all labor, materials, tools, equipment, and incidentals necessary to locate, install, and maintain the temporary markings and lane delineation.

411.3.C.2. Surface Preparation: Immediately prior to applying the slurry seal, the pavement shall be thoroughly cleaned of all loose materials, vegetation, soil and other objectionable material. Any breakdowns, base failures, or other defects will be properly repaired by the city before application of the slurry seal begins. Manholes, valve boxes, grate inlet, and other designated objects shall be covered by the CONTRACTOR to ensure their integrity. After completion of slurry placement, the CONTRACTOR shall remove said covers so the objects protected will remain fully functional. Any objects damaged by the CONTRACTOR shall be repaired or replaced at no cost to the City.

If conditions require, the pavement shall be pre-wetted by fogging ahead of the spreader box. Water used in fogging the surface shall be applied so that the entire surface is damp with no flowing water in front of the box. Rate of spray: 0.05 to 0.15 gal/sq. yd. (or as directed by the City); no streaks, lumps, balls, or unmixed aggregated shall be permitted.

411.3.C.3. Application: The slurry shall be sufficiently stable during the spreading period so that the emulsion does not break, there is no segregation of the fines from the coarser aggregate and the liquid of the mix does not float to the surface.

No excessive buildup or unsightly appearance shall be permitted on longitudinal or transverse joint. An excessive overlap will not be permitted on longitudinal joints. The CONTRACTOR shall provide suitable width

spreading equipment to produce a minimum number of longitudinal joints throughout the project. Longitudinal joints shall be placed on lane lines when possible. If half passes are used, they shall not be the last pass of any paved area.

In areas where the spreader box cannot be used, the slurry shall be applied by hand squeegees to provide complete and uniform coverage. Any joint or cracks not dilled by the slurry shall be corrected by use of hand squeegees. Hand work shall be completed during the machine applying process. Due to difficulty in hand working micro-surfacing material due to the quickset nature of the emulsion, hand work areas should be kept to a minimum.

Straight lines along curb gutters and shoulder will be required. No runoff on these areas will be permitted. Lines at intersections shall be kept straight to provide a good appearance. Slurry shall be placed at the lip of the gutter or at a distance from the face of the curb as directed by the City.

All objects covered (manhole covers, valve covers, grate inlets, etc.) shall be restored to their original integrity. The CONTRACTOR shall remove all unused material and debris from the site prior to final acceptance.

411.3.C.4. Curing: All traffic shall be kept off the slurry until it has cured to a firm condition that will prevent damage to the Micro-Surfacing or Slurry. Any uncured slurry damaged will be repaired to the satisfaction of the City at the CONTRACTOR's expense.

For Micro-Surfacing the emulsified asphalt shall be so formulated that when the paving mixture is applied with the relative humidity at no more than 50% and ambient air temperature of at least 75°F, it will cure sufficiently such that uniformly moving traffic can be allowed on completed travel lanes within 1 hour after placement with no damage to the surface. Failure to comply with this requirement may result in cessation of all work until such time that the CONTRACTOR provides the proper adjustments in his operations. If determined necessary by the City, the mixture properties shall be adjusted according to humidity conditions and ambient air temperatures to allow uniformly moving traffic on completed travel lanes within 1 hour after placement with no damage to the surface. Failure to comply with this requirement may result in cessation of all work until such time that the CONTRACTOR provides the proper adjustments in his operations. Protect other locations subject to sharp turning or stopping and starting traffic for longer periods when necessary. Any uncured micro damaged will be repaired to the satisfaction of the City at the CONTRACTOR's expense.

411.4 FOG SEAL

This item shall apply to all the specified work for pavement repair or rehabilitation via the use of Fog Sealing. The work covered by this specification includes testing, construction, and quality control required for the proper application of treatment services.

411.4.A. Materials

Before work commences, the CONTRACTOR shall submit a signed original of a mix design containing the test results of the mix. The emulsion mix shall be a polymer-modified, fiber reinforced asphalt emulsion coating that is job-mixed with specially graded aggregate and applied to pavement surfaces. The result should be a durable, slip-resistant surface treatment that greatly extends pavement service life. Mix should meet ASTM D8099/D8099M-17 Standard Specifications for Asphalt Emulsion Pavement Sealer. Approved brands are Jennite AE and Liquid Road. All other materials must be re-approved by the City.

Pre-approved material color shall be satin black color.

411.4.A.1. Aggregates: The mineral aggregate shall consist of a natural or manufactured crushed stone such as granite, slag, limestone or other high-quality aggregates or a combination thereof that conforms to the quality requirement of ASTM Specifications and shall be free of dirt, organic matter, clay balls, and adherent

films of clay, dust or other objectionable material. The aggregate shall contain no free water. Sand or Aggregate shall have a typical AFS of 11-15 Mesh.

The gradation of the aggregate shall be per the table below:

Table 411.3.A.1.a. Fog Seal Aggregates Gradation Requirements

Sieve Size	Percent Passing
3/8"	100
No. 4	100
No. 8	100
No. 10	95-100
No. 12	90-98
No. 16	40-70
No. 20	50-80
No. 30	90-98
No. 50	95-99
No. 100	7-18
No. 200	95-100

411.4.A.2. Storage: In the liquid state, the mixture must be protected from freezing. Do not store in direct sunlight or where temperature exceeds 120°F.

411.4.A.3. Testing: The emulsion mixture is to meet the composition and performance standards listed below when tested according to the following ASTM methods:

a. D140: Sampling of Bituminous Materials
b. D244: Standard Test Methods for Emulsified Asphalts
c. D529: Testing of Bituminous Materials
d. D2939: Standard Test Methods for Emulsified Bitumen used as Protective Coatings

In the liquid state, the mixture must meet the following requirements when tested according to ASTM D2939:

Table 411.4.A.3.a. Testing Result Requirements

Requirement	Maximum	Minimum
Non-Volatiles	52%	50%
Water	50%	46%
Ash of Non-Volatiles	38%	34%
Specific Gravity	-	1.15

The cured coating should be a water-based material and to show no tendency to flash or ignite. The cured coating exhibits no penetration, blistering, loss of adhesion, nor tendency to re-emulsify after immersion for 24 hours. The emulsion mixture is to be considered nonhazardous when tested according to the EPA's TCLP.

The manufactures to provide the City a 2-yr written warranty prior to installation.

411.4.B. Construction Methods

The CONTRACTOR shall notify all homeowners and businesses affected by the construction a minimum of 24-hrs in advance of the surfacing. Should the work not occur on the specified day, new notification will be distributed as required. Complete street closures are allowed when approved by the City in consultation with the City Engineer. In general, complete street closures are allowed on residential streets for more efficient and

effective completion and for reduction of the project duration impact to the neighborhood. Night-time application is not allowed.

411.4.B.1. Surface Preparation: Surface must be clean and free from loose material and dirt. Cracks should be filled with Sealant Filler. On extremely weathered and oxidized pavement surfaces, tack coating (priming) may beneficial. Material shall not be applied when temperature (surface and ambient) is expected to drop below 50°F during application and for a period of at least 24 hours after application. Both surface and ambient temperature shall be a minimum of 50°F and rising during application.

411.4.B.2. Application: Properly mix mixture and apply one gallon of the mixture to cover approximately 36-45 square feet (4-5 square yards) per coat, or as recommended by the manufacturer. Application shall be done as recommended by the manufacturer assuming high traffic areas.

Apply first squeegee/brush coat of mixed at a rate of 30-40 square feet (3.3 to 4.4 square yards) per gallon. Allow first coat to dry thoroughly before applying second coat. Apply second squeegee/brush coat of mixed at a rate of 30- 40 square feet (3.3 to 4.4 square yards) per gallon. Allow second coat to dry thoroughly before opening to traffic.

Use 100% Acrylic Traffic paint for line striping and traffic markings.

When tested according to ASTM D2939, “set to touch” in 1 hour, exhibit “final set” in less than 8 hours.

411.5 JOINT AND CRACK SEALING

This item shall govern the cleaning and/or sealing of joints and cracks that are (typically 1/16 inch or greater) in asphaltic concrete pavement, with HOT POURED Sealant, in conformity to the lines, grades and details indicated on the Drawings or as established by the Engineer or designated representative. This specification is applicable for projects or work involving either inch-pound or SI units.

411.5.A. Materials

Joints and/or cracks shall be sealed with the materials indicated on the Drawings.

411.5.A.1. Submittals: The submittal requirements of this specification item include:
a. Sealant Type (Polymer Modified Emulsion, Rubber-Asphalt or Self-Leveling Low Silicone) and method of application (crack sealing, joint sealing, squeegee, etc),
b. Manufacturer certification that the product to be supplied meets or exceeds the specification requirements,
c. Manufacturer recommended procedures for preparation, dispensing, application, curing etc. of the sealant, and
d. Listing of the equipment proposed for the Work.

Fine aggregate used to cover the crack-sealing compound shall meet with the approval of the Engineer or designated representative. The sealing compound shall be delivered in the manufacturer's original sealed containers. Each container shall be legibly marked with the name of the manufacturer, the trade name of the sealer, the manufacturer's batch number or lot, the pouring temperature, and the safe heating temperature.

411.5.A.2. Equipment: Equipment, tools and machinery necessary for proper prosecution of the Work shall be on the project and shall be approved by the Engineer or designated representative prior to the initiation of the joint and crack cleaning and sealing operations:

411.5.A.2.a. Polymer Emulsified Emulsion: Polymer Emulsified Emulsion may be heated in a conventional asphalt distributor or in an asphalt heater equipped with an agitator to ensure that the emulsified

asphalt is circulated during the heating process and achieves a uniform temperature rise. Temperature gauges shall be provided at strategic locations to enable the operator to accurately control the temperature of the emulsion to avoid overheating the material. The unit shall be equipped with a gear-driven asphalt pump with adequate pressure to dispense the emulsion in joints and cracks.

411.5.A.2.b. Rubber-Asphalt Crack Sealing Compound: The sealant shall be heated in a double jacketed heater using a heat transfer oil so that no direct flame is in contact with the shell of the vessel containing the sealing compound. The heater reservoir shall be equipped with an agitator to ensure that the sealing compound is circulated during the heating process to achieve a uniform temperature rise and to maintain the desired temperature. Accurate temperature gauges and positive temperature controls shall be provided to monitor the temperature of the vessel contents and prevent overheating the material. The heater shall be equipped with a gear-driven asphalt pump with adequate pressure to dispense the rubber-asphalt crack sealing compound. The material should be maintained between 350°F and 375°F

411.5.A.2.c. Self-Leveling Low Modulus Silicone: The sealant shall be prepared and dispensed using the manufacturer's recommended equipment.

411.5.A.2.d. Joint and Crack Cleaning Equipment: All equipment used in cleaning joints and cracks shall be capable of delivering a enough volume of filtered air, free of oil, water or other contaminants, to insure the removal of all loose debris from the joints or cracks to be sealed. When specified on the Drawings, joints shall be routed. The router shall be of enough size to rout the joints to the widths and depths shown on the Drawings.

411.5.B. Construction Methods

The Contractor may propose a different method of construction other than detailed herein for approval. No work shall commence using different construction methods unless the City Engineer approves said method.

Pavement and cracks shall be dry, and the ambient temperature shall be no less than 45°F and rising or 50°F and falling. No sealing of any joints or cracks shall be done when the joints or cracks are damp, unless drying of the joints and cracks with compressed air can be demonstrated and meets with the approval of the Engineer or designated representative.

Crack sealing should generally be done during the winter months when the cracks are open; and thus, sealant can more easily penetrate the crack.

411.5.B.1. Crack Cleaning: The bonding surface of cracks and joints shall be cleaned of infiltrated material with compressed air or other methods approved by the Engineer or designated representative to a depth at least twice the joint or crack width. When routing of the joints is indicated on the Drawings, the joints shall be routed and blown clean with filtered compressed air. Airflow should be free of oil and moisture and the compressed air should have a minimum pressure of 100-lb/in^2 and minimum blast flow of 150 ft^3/min. These blasting operations are to always be directed away from passing traffic.

All material removed from joints and cracks shall be removed from the paved surface of the roadway. If dry mud or other organic material is visible inside the crack, then Contractor shall use a metallic brush and attempt to remove such material before sealant can be placed. For drying, a hot air lance shall be used. Sealant should be placed immediately after crack cleaning.

411.5.B.2. Sealant Application: The joint or crack sealing material shall be Hot Poured and applied using a pressure nozzle. Polymer modified emulsion and rubber- asphalt crack sealing compound shall penetrate and completely fill each crack and/or joint. All cracks and/or joints filled with these materials shall be squeegeed. The amount of sealing compound used shall be limited so that after the squeegee has been applied, the finished band shall be no more than 1-1/2 inches (38 mm) wide and shall not exceed a depth of 1/8 in. (3.2 mm) above the pavement surface. The squeegee should be kept over the center of the crack channel and as close

as possible to the applicator wand so that the sealant is fluid and workable. It is critical that the squeegee work be completed immediately after the sealant is placed and before it cools.

Excess sealant should be removed before hardening occurs. An over-band should be formed during, or immediately after, sealant application. The over-band should not be more than 3 inches wide.

When the number of cracks is so great that crack sealing in the manner described previously is impractical, the area shall be squeegee sealed. Areas to be squeegee sealed shall be indicated on the Drawings or established by the Engineer or designated representative. When all cracks in the area have been cleaned, the crack sealing material shall be applied, and the excess shall be squeegeed over the area between the cracks. All polymer modified emulsion or hot poured rubber squeegee sealed areas shall be covered immediately after application with a light coating of fine aggregate.

411.5.B.3. Sand Aggregate Application: A light coating of fine aggregate shall be applied to the cracks and joints before opening to traffic to prevent tracking. The fine aggregate (or sand), shall cover the entire area that has been affected by the sealant. The aggregate shall be dry, no larger than 1/16 inch, and applied immediately after the sealant has been leveled.
If the cracks are greater than ¼" in diameter, or there are indicators of forming alligator cracks, the contractor shall apply angular crushed rock 1/8"-1/4" in diameter to the treated area, prior to opening to traffic.

411.5.B.4. Safety: During the sealing procedure, the materials and the equipment involved can present safety hazards to both workers and the traveling public. All safety precautions regarding material handling and the operation of the equipment should be strictly adhered to. Additionally, construction workers to wear safety apparel such as long sleeved shirts, leather gloves, steel toed boots, hard hats, and adequate eye protection.

411.5.B.5. Traffic Control: In order to ensure the safety of all workers and the traffic traveling near the work area, proper traffic control devices should be installed. The Texas Manual of Uniform Traffic Control Devices (MUTCD) provides guidance to use in implementing the traffic control plan. Contractor to consider the traffic volume and the curing time (or time between placement of sealant and removal of the traffic control devices) of the sealant selected for a work location. After application, CONTRACTOR shall open the treated section to the traffic within 30-min of application, but no sooner than 15-mi., allowing for cure time

411.6 MEASUREMENT AND PAYMENT

If provided, the pavement repair shall be measured by the square-yard (SY) complete in place. If not provided in the contract documents, Pavement Repair shall be considered subsidiary to the items requiring repair if no pay item exists in the Contract.

If provided, the pavement crack sealing shall be measured by the square-yard (SY) of the entire pavement, regardless of the length and width of longitudinal cracks treated, complete in place.

The work performed, and materials furnished as prescribed by this item, measured as provided for in this item, shall be paid for at the contract unit price bid for "pavement repair," which price shall be full compensation for constructing pavement, necessary removal and excavation, saw cutting, temporary striping, traffic control, and for preparing the subgrade; furnishing and placing all materials, reinforcing steel, including sand cushion, reinforcement and expansion materials; and for all manipulation, labor, tools, equipment and incidentals necessary to complete the work.

412 ROCK RIPRAP

This item shall include the construction of all Rock Riprap, and all of the materials, labor, and other incidentals required to complete the work at location specified by the Engineer.

412.1 MATERIALS

All Rock Riprap materials and construction shall conform to the Contract Documents.

A. Geotextile Fabric – 6 OZ non-woven needle punch geotextile or as approved by Engineer.
B. Clean native rock, size as indicated in the Contract Documents - as approved by Engineer.
C. Grout – As indicated in item 405 and 407 with the use of only fine aggregates.

412.2 CONSTRUCTION METHODS

All Rock Riprap construction shall conform to the Contract Documents. Geotextile shall be placed in such manner that edge of geotextile is 12-in. from edge of rock riprap. Geotextile is not required if riprap is grouted. When geotextile is required, rock size shall be 6" min as measured on shortest axis.

412.3 MEASUREMENT AND PAYMENT

All Rock Riprap shall be measured by the square-yard (SY) complete in place.
Rock Riprap, if included in the bid, shall be measured as specified above and paid as described above, which price shall be full compensation for all work herein specified, including the furnishing of all materials, equipment, tools and labor and incidentals necessary to complete the work.

413 HIKE AND BIKE TRAIL

This item shall govern the furnishing and installation of hike and bike trails of the type and depth specified on a prepared surface to the typical sections and to the lines and grades indicated.

413.1 MATERIALS

Subgrade Preparation shall conform to Section for "Subgrade Preparation," except that compaction requirements may be evaluated by either proof rolling or density testing, as established by the Owner. Any material necessary to establish the required grade shall conform to Item for Borrow.

Flexible Base shall conform to Item for "Flexible Base." Concrete shall conform to Item for "Concrete Pavement." Concrete Curb shall conform Item for "Concrete Curb and Gutter."

Hot Mix Asphaltic Concrete shall conform to Item for "Hot Mix Asphaltic." All Hot Mix used for Hike and Bike Trails shall be Type D with a minimum thickness of 1.5".

Reinforcing steel and fiber reinforcing shall conform to Item for "Concrete Pavement."

413.1.A. Granite Gravel

The material shall be Texas decomposed unwashed granite aggregate and clay fines meeting the requirements hereinafter specified and shall be screened to the required particle size. The material shall be from approved sources.

Testing of granite gravel materials shall be in accordance with the following TxDOT standard laboratory test procedures:

1) Preparation for Soil Constants and Sieve Analysis	Tex-101-E
2) Liquid Limit	Tex-104-E
3) Plastic Limit	Tex-105-E
4) Plasticity Index	Tex-106-E
5) Sieve Analysis	Tex-110-E

Granite gravel material will be stockpiled and tested by the testing agency designated by the Owner and reviewed by the Owner prior to being hauled to the project site.

The material shall be well graded and when properly tested, shall meet the following requirements:

Table 413.1.A.1. Granite Gravel Gradation Requirements

Sieve Size	Percent Passing
5/8"	100
No. 40	40-45
No. 200	15-25
Properties	
Liquid Limit	35 Max.
Plasticity Index	12-18

413.1.B. Submittals

Prior to beginning construction, the Contractor shall submit to the Engineer for approval the following items:

1. Concrete: Concrete submittals shall be in accordance with Section 300 "Concrete."

2. Hot Mix Asphaltic Concrete: Hot Mix Asphaltic Concrete submittals shall be in accordance with Section 410 "Hot Mix Asphaltic Concrete."

3. Flexible Base: Flexible Base submittals shall be in accordance with Section 240 "Flexible Base."

4. Fiber Reinforcing: Fiber type, supplier, and product properties. Submit fiber documentation for compliance with this specification and ASTM C-1116.

5. Granite Gravel: Prior to construction, a sealed laboratory report shall be provided to verify compliance with the material requirements for granite gravel.

413.2 CONSTRUCTION METHODS

Granite gravel shall be compacted to not less than 92 percent of optimum density, as determined by TxDOT test method Tex-114, in accordance with ASTM D2167 Nuclear Test Method. Field density determinations shall be made in accordance with approved methods. Tests shall be performed at intervals not exceeding 500 feet at random points on the Hike and Bike Trail cross section.

When granite gravel is utilized as the finished surface for a Hike and Bike Trail, both sides shall be protected throughout the length of the trail by a concrete ribbon curb six inches in width, and shall match the depth of the granite gravel material. Alternatively, tightly fitted or mortared cut limestone blocks may be used, provided that no gaps larger than 1/4 of an inch are present between blocks. In addition, any areas with steep topography, or that may be subject to erosion potential, shall be required to have a concrete surface a minimum of four inches in depth.

412.3 MEASUREMENT AND PAYMENT

Hike and Bike Trail will be measured by the square yard (SY) of gravel area, complete in place regardless of depth required.
Concrete curbs, as prescribed by this item will be measured by the linear foot (LF), complete in place.

"Hike and Bike Trail," if included in the bid, shall be measured as specified above and paid for at the contract unit price bid for "Hike and Bike Trail" which price shall be full compensation for all work herein specified, including the furnishing of all materials, compacting, excavation, embankment, equipment, tools, labor, water for

sprinkling, proof rolling and incidentals necessary to complete the work. Payment for "Concrete," "Concrete Curb and Gutter," "Class B Borrow," "Reinforcing Steel," "Flexible Base," "Hot Mix," and "Subgrade Preparation" necessary constructing "Hike and Bike Trail" in accordance with this specification, shall be subsidiary to payment for "Hike and Bike Trail."

414 PAVEMENT MARKINGS

This item shall govern for the type, quality and application of paint or appropriate coatings for pavement surfaces. Such applications include liquid coatings and galvanizing. Items to receive applications may include, but are not limited to, bridges, barriers, concrete pavement, and asphalt pavement.

414.1 DESCRIPTION

Painting, coating and other protective treatments shall include, unless otherwise provided in the contract, the preparation of the surfaces; the application, protection and drying of the paint, coating(s) or treatments; the protection of all traffic upon, underneath, or near the structure, material or pavement; the protection of all parts of the structure, material or pavement against disfigurement by any and all painting operations; and the supplying of all tools, tackle, scaffolding, labor, workmanship, paint, coating and/or other materials necessary for the completion of the entire work in accordance with the plans and these specifications.

The intent of the design herein specified is to procure the paints, coatings or treatments on surfaces so that the durability and protective value of these designs shall be realized in service. Accordingly, the best quality materials and workmanship are implied throughout. Surface conditions and application requirements are specified with the intent to obtain full adhesion of paint, coatings or treatments to clean, dry, firm surfaces. This shall require careful attention to preparation of surface, to the prevention of contamination and marring of the coating during and after drying, and to uniform, skilled application.

Fire Lanes shall be installed in accordance with the International Fire Code (IFC), as well as the requirements set forth in the construction documents or referenced in the local governing authority's regulations and/or ordinances.

414.1.A. Safety

Some paints are harmful to the health. All paints shall be handled according to the information contained on the paint safety data sheet. The CONTRACTOR shall be responsible for safety during all cleaning and painting operations.
Unless shown otherwise on the plans, the CONTRACTOR shall be responsible for necessary precautions to contain refuse, dust and paint overspray generated during cleaning and painting operations. Containment shall be such that all falling material is contained and collected for disposal. Non-containment of airborne particles is permissible provided they are not visible over 100-feet from the actual cleaning or painting operation. A skimmer shall be used when cleaning and painting is over bodies of water. Disposal of collected refuse shall be in accordance with Federal, State and Local rules and regulations.

If spray application is used, workers shall be adequately protected with respirators, and provisions shall be made to prevent infliction of harm upon all other humans and/or animals that might be exposed to the fumes or might eat food upon which the fumes have deposited. This warning shall absolve the OWNER from blame in the event of harm to persons or property from the named cause, and full responsibility for any such harm shall rest upon the CONTRACTOR.

414.2 MATERIALS

All materials used in the painting and marking herein specified shall conform to the material and composition requirements of the applicable TxDOT Material Specification Item 666, Item 667, Item 672, Item 677, and Item 678.

414.2.A. Striping

Pavement Striping shall comply with:

DMS-8200 Traffic Paint - Type II Marking Materials,
DMS-8220 Hot Applied Thermoplastic - Type II Marking Materials,
DMS-8240, Prefabricated Pavement Markings – Permanent,
DMS-8241, Prefabricated Pavement Markings – Removable,
DMS-8242, Temporary Flexible-Reflective Roadway Marker Tabs,
DMS-8290 Glass Traffic Beads

Including any official TxDOT amendment or modification of these specifications, where reference to TxDOT or its representatives shall mean the OWNER. The CONTRACTOR shall certify to the OWNER that paint or coatings provided meet TxDOT material requirements.

414.2.B. Raised Pavement Markers

Raised Pavement Markers shall comply with TxDOT Item 672 and Specifications:

DMS-4100, Jiggle Bar Tile,
DMS-4200, Pavement Markers (Reflectorized),
DMS-4300, Traffic Buttons,
DMS-4210, Pavement Markers (Plowable Reflectorized),
DMS-6100, Epoxies and Adhesives,
DMS-6130, Bituminous Adhesive for Pavement Markers

The inspector will sample in accordance with Tex-729-I.

414.2.C. Testing

All paint and paint materials shall be sampled and tested prior to use. All tests shall be conducted in accordance with the methods specified by ASTM or methods set forth in Federal Standard FEDSTD-141 C/GEN Paint, Varnish, Lacquer, and Related Materials: Methods of Inspection, Sampling, and Testing. In the absence of any such methods, other suitable methods may be designated and utilized by the OWNER.

Raw materials and finished products that fail to meet any requirements of these specifications shall be subject to rejection. Final acceptance or rejection shall be based on results of tests on samples of raw materials and finishes as soon as practicable after their arrival at the shipping destination. Approval of materials, as a result of preliminary testing prior to manufacture into finished coatings, shall not be binding upon final approval or rejection. The judgment of the OWNER shall be final in all questions relative to conformance with the provisions of these specifications.

414.3 EQUIPMENT

Use equipment that is maintained in satisfactory condition, meets or exceeds the requirements of the National Board of Fire Underwriters and the RRC for this application, uses an automatic bead dispenser attached to the pavement marking equipment, and can provide continuous mixing and agitation of the pavement marking material. Provide a hand-held thermometer capable of measuring the temperature of the marking material when applying Type I material.

414.4 CONSTRUCTION METHODS

Throughout paint application, including shop and field painting, no paint shall be applied over a surface that evidences a loose or scaly condition. Every effort shall be made by means of the most effective and practical methods to remove all loose mill scale, rust, dirt, oil and grease, as well as all other foreign surfaces which would be deleterious to the procurement of the firm paint coating. Markings shall be applied only when the pavement surface is dry and clean, which may be accomplished with machinery specialized to prepare pavement in front of the marking operation. The CONTRACTOR shall comply with all environmental condition restrictions recommended by the manufacturer of pavement paints or other markings. Glass beads or other refractive material and application rates shall be as identified on the plans.

Temporary markings shall be thoroughly removed to the satisfaction of the OWNER using an approved method prior to the application of permanent markings.

When the CONTRACTOR is responsible for marking pavements, as identified in the plans, cleaning and marking shall conform to these specifications and the Texas Manual on Uniform Traffic Control Devices. Place markings before opening to traffic unless short term or work zone markings are allowed.

On roadways already open to traffic, place markings with minimal interference to the operations of that roadway. Use traffic control as shown on the plans or as approved. Protect all markings placed under open-traffic conditions from traffic damage and disfigurement.

414.4.A. Surface Preparation

Unless otherwise shown on the plans, prepare surfaces in accordance with this section. When existing pavement markings are present, remove loose and flaking material. Ensure that the bond surfaces are free of dirt, curing compound, grease, oil, moisture, loose or unsound pavement markings, and any other material that would adversely affect the adhesive bond. Approved pavement surface preparation methods are sweeping, air blasting, flail milling, and blast cleaning unless otherwise specified on the plans.

414.4.A.1. New Pavement Surfaces: Air-blast or broom the pavement surface to remove loose material, unless otherwise shown on the plans. A sealer for Type I markings is not required unless otherwise shown on the plans.
Furnish raised pavement markers for each class from the same manufacturer. Place raised pavement markers on the new asphaltic concrete surface or surface treatment only after the new surface has aged at least 14 days. Surface shall be prepared in accordance with TxDOT Item 678.

414.4.A.2. Old Pavement Surfaces: For old surfaces and all concrete surfaces, clean in accordance with TxDOT Item 678, "Pavement Surface Preparation for Markings," to remove curing membrane, dirt, grease, loose and flaking existing construction markings, and other forms of contamination.

414.4.A.3. Sealer for Type I Markings: For old surfaces and all concrete surfaces, apply a pavement sealer before placing Type I markings on locations that do not have existing markings, unless otherwise approved. The pavement sealer may be either a Type II marking or an acrylic or epoxy sealer unless otherwise shown on the plans. Follow the manufacturer's directions for application of acrylic or epoxy sealers. When the sealer becomes dirty after placement, clean by washing as directed. Place the sealer in the same configuration and color (unless clear) as the Type I markings unless otherwise shown on the plans.

Apply markings on pavement that is completely dry and passes the following tests:

414.4.A.4. Type I Marking Test: Place a sample of Type I marking material on a piece of tarpaper placed on the pavement. Allow the material to cool to ambient temperature, and then inspect the underside of the tarpaper in contact with the pavement. Pavement will be considered dry if there is no condensation on the tarpaper.

414.4.A.5. Type II Marking Test: Place a 1-sf piece of clear plastic on the pavement, and weight down the edges. The pavement is considered dry if, when inspected after 15 min., no condensation has occurred on the underside of the plastic.

414.4.B. Application

Establish guides to mark the lateral location of pavement markings as shown on the plans or as directed, and have guide locations verified. Use material for guides that will not leave a permanent mark on the roadway.
Apply markings that meet the requirements of Tex-828-B, using information as shown on plans. Alignment must not deviate than 1 in. per 200 ft. of roadway or more than 2 in. max. Markings shall be clean and reflectorized.

414.4.B.1. Weather Conditions: Apply markings during good weather unless otherwise directed. If markings are placed at Contractor option when inclement weather is impending and the markings are damaged

by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the markings if required. As a general rule if the material manufacturer does not establish temperature requirements, do not place material if the pavement temperature is below 60°F or above 120°F.

414.4.B.1.a. Type I Markings: Place the Type I marking after the sealer cures, and within the temperature limits recommended by the material manufacturer. If during a spray application, operations cease for 5 min. or longer, flush the spray head by spraying marking material into a pan or similar container until the material being applied is at the recommended temperature. Apply on clean, dry pavements passing the moisture test described above, and with a surface temperature above 50˚F when measured in accordance with Tex-829-B.

414.4.B.1.b. Type II Markings: Apply on surfaces with a minimum surface temperature of 50°F and within temperature limits recommended by the material manufacturer.

414.4.B.2. Application: Apply markings and install markers as shown on plans. Do not make permanent marks on the roadway for the guides.

414.4.B.2.a. Type I Markings: Apply TY-I markings with a minimum thickness of 0.1-in. for new markings and retracing water based markings and 0.06-in. for retracing on thermoplastic pavement markings, or 0.09-in. for all other Type I markings. The maximum thickness for Type I markings should not exceed 0.18-in. as measured in accordance with Tex-854-B using the tape method.

414.4.B.2.b. Type II Markings: Apply TY-II markings at least 20 gal. per mile on concrete and asphalt surfaces for a solid 4-in. line. Adjust application rates proportionally for other widths. When Type II markings are used as a sealer for Type I markings, apply at least 15 gal. per mile using Type II drop-on beads.

414.4.B.2.c. Beads: Bead Application for Type I and Type II markings shall be provided with a uniform distribution of beads across the surface of the stripe, with 40% to 60% bead embedment.

414.4.B.2.d. Raised Markers: Epoxy adhesive and bituminous adhesive will be used for jiggle bar tile and reflectorized pavement markers. For traffic buttons on hydraulic cement concrete pavements and for plowable reflectorized pavement markers use only epoxy adhesive. For traffic buttons on bituminous pavements use only bituminous adhesive.

Apply adhesives in sufficient quantity to ensure that 100% of the bonding area of raised pavement markers is in contact with the adhesive. Do not heat bituminous adhesive above 400°F. Agitate bituminous adhesive to ensure even heat distribution. Place raised pavement markers immediately after the adhesive is applied and ensure proper bonding. Do not use adhesives or any other material that impairs the functional retro-reflectivity of the raised pavement markers.

414.4.C. Testing

All markings and replacement markings must meet the requirements of Tex-828-B for at least 30 calendar days after installation. Markings should not lift, shift, smear, spread, flow, or tear by traffic action. Markings that fail these requirements within 30-days shall be removed and replaced according to this Item at CONTRACTOR's expense.

414.5 MEASUREMENT AND PAYMENT

Linear pavement markings shall be measured per Linear Foot (LF) of installed marking as measured along the centerline of stripe. Other markings and raised pavement markers shall be measured either per Each (EA) or per Lump Sum (LS).

Payment shall be made per unit described above and shall include any type, color specified and the shape, width, size, and thickness, all types of paint (TY-I, TY-II, Beads, Sealer), surface preparation, testing, and furnishing and placing all materials, tools, labor, for removing existing markers and markings; furnishing and installing raised pavement markers; and equipment, materials, labor, tools, and incidentals to complete the work.

415 TRAFFIC CONTROL

This item shall consist of furnishing, installing and removing all temporary traffic control devices necessary to meet the requirements of the latest version of the Texas Manual on Uniform Traffic Control Devices (TMUTCD), and the requirements set in the traffic control plan.

415.1 INSTALLATION

Temporary traffic control devices shall be installed as required before the beginning of any construction adjacent to active traffic lanes. Temporary traffic controls shall be modified as required at the beginning of each construction phase to comply with the construction phasing and actual traffic patterns to be accommodated. If at any time during the project, the temporary traffic controls are not installed or maintained in a manner consistent with the Contract Documents and the TMUTCD, the Engineer shall have the authority to order all work stopped until the temporary traffic controls are brought into full compliance. No additional contract time or extra pay shall be allowed for such shutdown periods.

Temporary striping shall be as denoted on the plans and shall conform to TxDOT Item 662 for Type II work-zone pavement markings.

415.2 MEASUREMENT AND PAYMENT

Temporary traffic control devices will be measured by Lump Sum (LS), Per Month (Mo), or Per Each (EA), which shall include all maintenance, revisions, removal, and relocations.

Payment for all items and tasks described in this Specification Item shall include the cost of materials, labor and all incidental and subsidiary materials and work necessary to complete installation and meet all requirements as indicated.

TXDOT General Notes
(for work within TxDOT ROW)

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GENERAL NOTES: Version: March 10, 2025

Item	Description	**Rate
**204	**Sprinkling**	
	(Dust)	30 GAL/CY
	(Item 132)	30 GAL/CY
	(Item 247)	30 GAL/CY
**210	**Rolling (Flat Wheel)**	
	(Item 247)	1 HR/200 TON
	(Item 316)	1 HR/6000 SY
**210	**Rolling (Tamping and Heavy Tamping)**	1 HR/200 CY
**210	**Rolling (Lt Pneumatic Tire)**	
	(Item 132)	1 HR/500 CY
	(Item 247)	1 HR/200 TON
	(Item 316 - Seal Coat)	1 HR/6000 SY
	(Item 316 - Two Course)	1 HR/3000 SY
247	**Flexible Base (CMP IN PLC)**	132 LB/CF
310	**Prime Coat**	0.20 GAL/SY
314	**Emulsified Asphalt Treatment (SS-1 or MS-2)**	0.30 GAL/SY
316	**Underseals Asphalts (Multi Option)**	0.20 GAL/SY
	Surface Treatments	
	Seal Coat	
	Grade 4	
	Asphalt	0.38 GAL/SY
	Aggregate	1 CY/120 SY
	Grade 5	
	Asphalt	0.32 GAL/SY
	Aggregate	1 CY/150 SY
	Two Course Surface Treatment	
	Asphalt 1st Application	0.28 GAL/SY
	Asphalt 2nd Application	0.24 GAL/SY
	Aggregate 1st Application Grade 4	1 CY/110 SY
	Aggregate 2nd Application Grade 4	1 CY/130 SY
341, 344	**Dense-Graded Hot-Mix Asphalt and Superpave**	110 LB/SY/IN
3007	**Bonding Course**	0.09 GAL/SY

** For Informational Purposes Only

GENERAL

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed will be free of organic material prior to placing any section of the pavement structure.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Keep the roadway free of debris and sediment caused by construction activities. Dispose of all material in accordance with federal, state, and local regulations. This work is subsidiary.

Damage to existing pipes and SET's due to Contractor operations will be repaired at Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right-of-way, will be as directed. Use of right-of-way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right-of-way but will cooperate in the use of the right-of-way with the city/county and various public utility companies as required.

During evacuation periods for Hurricane events the Contractor will cooperate with Department for the restricting of Lane Closures and arranging for Traffic Control to facilitate Coastal Evacuation Efforts.

ITEM 5 – CONTROL OF THE WORK
Place construction or silt fence 2 ft. inside TxDOT ROW along the Railroad ROW. This work is subsidiary.

Place construction stakes at intervals of no more than 100 ft. This work is subsidiary.

Precast Alternate Proposals.
When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with the latest version of the Department's details, PCA-SUP and PCA-SUB found at https://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm

Thermoplastic Pipe Alternate Proposals
When a reinforced concrete or corrugated metal pipe is included in the plans, a thermoplastic polypropylene pipe alternate may be submitted in a 2-phase process. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Phase 1 submit an official request to TxDOT PM with a summary of proposed locations, max depth of placement for each location, cover depth, and pipe diameters. TxDOT goal is to review and respond within 10 days. Phase 1 approval does not guarantee Phase 2 approval.

Phase 2 submit the following documents with all documents signed and sealed by a licensed Engineer in the state of Texas. 1-Provide a redline or revised set of drainage plans reflecting the revised locations. 2-Provide certification that the use of the alternate pipe and proposed bedding are adequate for the proposed application, depth, etc. 3-Provide a completed thermoplastic pipe installation drawing using the following,

https://ftp.txdot.gov/pub/txdot/brg/thermoplastic-pipe-installation-drawing.pdf
https://ftp.txdot.gov/pub/txdot/brg/thermoplastic-pipe-installation-drawing.dgn

For all uses of thermoplastic pipe as an alternate, furnish, install, and inspect the thermoplastic pipe in accordance with Item 468 or latest thermoplastic pipe special specification at time of letting. Minimum values, such as cover depth, required by the specification, installation drawing, etc. will not be waived. Use granular backfill unless flowable fill or CSB is required by the alternate design. Backfill locations shown in the bid plans using flowable fill or CSB must use the backfill per the bid plans.

ITEM 6 - CONTROL OF MATERIALS
Give a minimum of 1 business day notice for materials, which require inspection at the Plant.

Storage of Material Near Structures
Do not store equipment or flammable material within 100 ft. of bridges, culverts, or near their openings (portals). Flammable materials include all material that is not metal or aluminum.

ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES
Roadway closures during key dates, significant traffic generators, and/or special events are prohibited. See notes for Item 502 for the key dates and/or special events.

Refer to the Environmental Permits, Issues and Commitments (EPIC) plan sheets for additional requirements and permits.

When any abandoned well is encountered, cease construction operations in this area and notify the Engineer who will coordinate the proper plugging procedures. A water well driller licensed in the State of Texas must be used to plug a well.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

Locate aboveground storage tanks kept on-site for construction purposes in a contained area as to not allow any exposure to soils. The containment will be sized to capture 150% of the total capacity of the storage tanks.

Work within a USACE Jurisdictional Area.
Do not initiate activities within a U.S. Army Corps of Engineers (USACE) jurisdictional area that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Obtain written approval from the Engineer for activities not specifically addressed in the plans. Provide a signed sketch and description of the location 60 business days prior to begin work at the location. Complete and return any forms provided by TxDOT. Approval of the work is not guaranteed. Un approved work is not a compensable impact.

Vehicle Idle Restrictions
Within the limits of City of Lago Vista and Travis County, on road vehicles may not idle more than 5 minutes except for following exemptions: vehicle 14,000 pounds or less, vehicles over 14,000 pounds are certified clean ideal as defined by the EPA, or other exemptions as listed in TAC Title 30, Part 1, Chapter 114, Subchapter J, Division 2, 114.517.

Birds and bats may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16 and February 28. Prevent migratory birds from re-nesting between March 1 and September 15. Prevention shall include all areas within 25 ft. of proposed work. All methods used for the removal of old nesting areas and the prevention of re-nesting must be submitted to TxDOT 30 business days prior to begin work. This work is subsidiary.

If active nests are encountered on-site during construction, all construction activity within 25 ft. of the nest must stop. Contact the Engineer to determine how to proceed.

Tree and Brush Trimming and Removal.
Work will be conducted September 16 thru February 28. Work conducted outside this timeframe will require a bird survey.

Upon begin removal operations, all removal work for the project must be completed within 21 calendar days. Completion of removal includes removing from ROW or mulching of all debris.

No extension of time or compensation will be granted for a delay or suspension due to the above bird, bat, and tree/brush requirements.

ITEM 8 – PROSECUTION AND PROGRESS
A CPM schedule in Primavera format and a PSSR is required. Use software fully compatible with Primavera P6. Provide schedule in pdf and format native to Primavera P6 program.

ITEM 105 – REMOVING TREATED AND UNTREATED BASE AND ASPHALT PAVEMENT
Existing typical is based on information available. This typical may not account for all maintenance work such as overlays or pavement repairs. A change in material type or thickness does not warrant additional payment. Payment is full compensation for removing all material to the depth specified.

ITEM 110 – EXCAVATION
The Engineer will define unsuitable material.

ITEM 132 – ALL EMBANKMENT
The Engineer will define unsuitable material. Material which the Contractor might deem to be unsuitable due to moisture content will not be considered unsuitable material.

Prior to begin embankment of existing area, correct or replace unstable material to a depth of 6 in. below existing grade. Embankment areas will be inspected prior to beginning work.

Rock or broken concrete produced by the project is allowed in earth embankments. The size of the rock or broken concrete will not exceed the layer thickness requirements in Section 132.3.4., "Compaction Methods." The material will not be placed vertically within 5 ft. of the finished subgrade elevation.

Embankment placed vertically within 5 ft. of the finished subgrade elevation or within the edges of the subgrade and treated with lime, cement, or other calcium-based additives must have a sulfate content less than 3000 ppm. Allow 5 business days for testing. Treatment of sulfate material 3000 ppm to 7000 ppm requires 7 days of mellowing and continuous water curing, in accordance TxDOT guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures (9/2005). Material over 7000 ppm is not allowed.

ITEM 160 - TOPSOIL
Off-site topsoil will have a minimum PI of 25.

No Sandy Loam allowed.

Obtain approval of the actual depth of the topsoil sources for both on-site and off-site sources.

Construct topsoil stockpiles of no more than five (5) feet in height.

It is permissible to use topsoil dikes for erosion control berms within the right-of-way, as directed.

Seed or track slopes within 14 days of placement.

Salvage topsoil from sites of excavation and embankment. Maximum salvage depth is 6 inches.

Windrowing of topsoil obtained from the right-of-way is not allowed.

ITEM 164 – SEEDING FOR EROSION CONTROL
Hydro mulch seeding will be allowed as a substitute for drill seeding if placed October 1 thru January 31. It may only be substituted in areas with a slope less than 1 in. vertical to 12 in. horizontal. It may not be used in the bottom of a ditch or channel. Payment will be made using the existing drill seed item.

ITEM 168 – VEGETATIVE WATERING
Water all areas of project to be seeded or sodded.

Maintain the seedbed in a condition favorable for the growth of grass. Watering can be postponed immediately after a rainfall on the site of ½ inch or greater but will be resumed before the soil dries out. Continue watering until final acceptance.

Vegetative watering rates and quantities are based on ¼ inch of watering per week over a 3-month watering cycle. The actual rates used and paid for will be as directed by the city of Lago Vista and will be based on prevailing weather conditions to maintain the seedbed.

Obtain water at a source that is metered (furnish a current certification of the meter being used) or furnish the manufacturer's specifications showing the tank capacity for each truck used. Notify the Engineer, each day that watering takes place, before watering, so that meter readings or truck counts can be verified.

ITEM 204 – SPRINKLING
Apply dust control to haul roads, construction traffic routes, staging areas, field office areas, material storage areas, parking areas, and stockpiles as directed. If dust control is not being maintained, the Department may cease operations until dust is controlled. This work is subsidiary.

ITEM 216 - PROOF ROLLING
Correct and perform "Proof Rolling" retest at the Contractor's expense, to the satisfaction of the Engineer, when initial "Proof Rolling" yields a failing result.

ITEM 247 - FLEXIBLE BASE
Placing in a single layer is allowed when total thickness of base is 8 in. or less. When placed in multiple layers, compact the bottom and middle layers to at least 95% and 98% of the maximum dry density, respectively. When placed in a single layer or the final layer, compact to at least 100%.

Correction of subgrade soft spots is subsidiary.

Complete per plans the subgrade, ditches, slopes, and drainage structures prior to the placement of base.

Do not use a vibratory roller to compact base placed directly on top of a drainage structure.

ITEM 310 – PRIME COAT
Apply blotter material to all driveways and intersections. This work is subsidiary.

Rolling to ensure penetration is required.

ITEM 320 - EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT
Use of motor grader is allowed for placement of mixtures greater than 10 inches from the riding surface, when hot-mix is used in lieu of flexible base, or as allowed.

Use of motor grader is allowed for placement of non-surface hot-mix on off system (non-state maintained roads) projects when length of placement is 500 ft. or less.

ITEMS 341 THRU 348 - HOT-MIX ASPHALT PAVEMENT

Core holes may be filled with an Asphaltic patching material meeting the requirements of DMS-9203 or with SCM meeting requirements of DMS-9202.

Remove and dispose of off the ROW the audible/profile markings, reflectorized markings, and raised markers.

Install transverse butt joints with 50 ft. H: 1 in. V transition from the new ACP to the existing surface. Install a butt joint with 24 in. H: 1 in. V transition from the new ACP to a driveway, pullout or intersection. Saw cut the existing pavement at the butt joints. This work is subsidiary.

Use a device to create a maximum 3H:1V notched wedge joint on all longitudinal joints of 2 in. or greater. This work is subsidiary.

Ensure placement sequence to avoid excess distance of longitudinal joint lap back not to exceed one day's production rates.

Submit any proposed adjustments or changes to a JMF before production of the new JMF.
Tack every layer. Do not dilute tack coat. Apply it evenly through a distributor spray bar.

Provide a minimum transition of 10-ft for intersections, 10-ft for commercial driveways, and 6-ft for residential driveways unless otherwise shown on the plans.

Irregularities will require the replacement of a full lane width using an asphalt paver. Replace the entire sublot if the irregularities are greater than 40% of the sublot area.

Lime or an approved anti-stripping agent must be used when crushed gravel is utilized to meet a SAC "A" requirement.

When using RAP or RAS, include the management methods of processing, stockpiling, and testing the material in the QCP submitted for the project. If RAP and RAS are used in the same mix, the QCP must document that both of these materials have dedicated feeder bins for each recycled material. Blending of RAP and RAS in one feeder bin or in a stockpile is not permitted.

Asphalt content and binder properties of RAP and RAS stockpiles must be documented when recycled asphalt content greater than 20% is utilized.

No RAS is allowed in surface courses.

Department approved warm-mix additives are required for all surface mix applications when RAP is used. Dosage rates will be approved during JMF approval.

The Hamburg Wheel Test will have a minimum rut depth of 3mm except for SMA with HPG or PG 76.

ITEMS 341 - DENSE-GRADED HOT-MIX ASPHALT
Design all Type D mixtures as a surface mix, maximum 15% RAP, and without RAS.

For all mix types, contractor may not use a substitute PG binder for 76-22. When using substitute binders, mold specimens for mix design and production at the temperature required for the substitute binder used to produce the HMA.

The Hamburg Wheel minimum number of passes for PG 64 or lower is reduced to 7,000. The Engineer may accept Hamburg Wheel test results for production and placement if no more than 1 of the 5 most recent tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.

ITEM 467 - SAFETY END TREATMENT
Field adjust pipe end to maintain the necessary slope. Field cutting of pipe end is allowed. Coat all metal field cuts or exposed reinforcement with asphalt paint.

For all Type II SETs, provide riprap apron shown in the cast-in-place standards and precast riprap detail standard. This work is subsidiary.

Cast-in-place or precast will be allowed unless stated otherwise.

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING

Roadway	Limits	Allowable Closure Time
RM 1431	All (1 lane closed)	9 P to 5 A

Daytime or Friday night lane closures will not be allowed unless otherwise shown on the plans. One lane in each direction will remain open at all times for all roadways unless otherwise shown on the plans.

No closures will be allowed on the weekends, business day prior, and business day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend.

No closures will be allowed 1 P.M. to 11 P.M. the Sunday of the Super Bowl.

Time charges will not be suspended during the large and special events listed below. These events are provided in the contract to allow scheduling of work around these lane closure restrictions.

All lanes will be open by noon of the day before the large events listed in below table. No closures will be allowed on Friday and the weekends for projects within 20 miles of these large events:

Event	City	Dates
Formula 1 @ COTA	Austin	Annually (See Event Website)
Moto GP @ COTA	Austin	Annually (See Event Website)
ACL Fest	Austin	Annually (See Event Website)
SXSW	Austin	Annually (See Event Website)
ROT Rally	Bastrop	Annually (See Event Website)
UT Football Games	Austin	Annually (See Event Website)
Sales Tax Holiday	All	Annually (See Event Website)
Rodeo Austin	Austin	Annually (See Event Website)

Due to FIFA World Cup 2026, closures will be restricted for the following dates and roadways. Closure restriction period begins 8 PM the day before and ends at 8 AM the day after.

FIFA Houston Roadways: SH 71 east of IH 35 and US 290 east of IH 35.
FIFA Houston Dates: 6/14/26, 6/17/26, 6/20/26, 6/23/26, 6/26/26, 6/29/26, 7/4/26

FIFA Dallas Roadways: IH 35 north of RM 620
FIFA Dallas Dates: 6/14/26, 6/17/26, 6/22/26, 6/25/16, 6/27/26, 6/30/26, 7/3/26, 7/6/26, 7/14/26

All lanes will be open by noon of the day before the special events listed in below table. No closures will be allowed on Friday and the weekends for projects within 10 miles of these special events:

Event	City	Dates
Eaker BBQ Competition	Fredericksburg	March 10, 2024
Sherwood Forest Faire	McDade / Paige	Weekends in March and April
Smithville Jamboree	Smithville	April 4-6, 2024
Two Step Inn	Georgetown	April 20-24, 2024
Wiener Dog Races	Buda	April 27-28, 2024
Founders Day Festival	Dripping Springs	April 26-28, 2024
Red Poppy Festival	Georgetown	April 26-28, 2024
Crawfish Open	Llano	3rd Friday and Saturday in April
Fair and Rodeo	Liberty Hill	May 18, 2023
Founders Day Ceremony	Fredericksburg	2nd Weekend in May
Crawfish Festival	Fredericksburg	Saturday before Memorial Day
Lakefest Boat Races	Marble Falls	June 10-11, 2023
Watermelon Thump	Luling	Last Full Weekend in June
Pie in the Sky	Kyle	Sept 1-2, 2023
Wine and Music Festival	Georgetown	Last Saturday of September
Deer Season Opening Weekend	All Counties in Burnet Area Office	1st Friday and Saturday of Season
Christmas Nights of FBG Lights	Fredericksburg	Nov 21, 2023
Christmas on Mercer	Dripping Springs	Dec 2, 2023
Lady of Guadalupe Procession	Fredericksburg	Dec 12, 2023
Texas State Graduation Fall	San Marcos	TBD
Texas State Graduation Spring	San Marcos	TBD

All the large and special events listed in the above tables occur annually. Coordinate with the Department and review the city/event website to plan around the future events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed.

Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal.

Provide 2-hour notice prior to implementation and immediately upon removal of the closure.

Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

For all roadways: Submit request for traffic detours and full roadway closures 168 hours prior to implementation. Submit request for nighttime work 96 hours to implementation date.

Cancellations of accepted closures (not applicable to full closures or detours) due to weather will not require resubmission in accordance with the above restrictions if the work is completed during the next allowable closure time.

Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify current and future traffic control, if at any time the queue becomes greater than 20 minutes.

Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Cover, relocate, or remove existing small, large, and overhead signs that conflict with traffic control. Cover large and overhead signs to remain using latest standard TS-CD. This work is subsidiary.

Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Place a 28-inch cone, meeting requirements of BC (10) and Ty III barricades, on top of foundations that have protruding studs. This work is subsidiary.

Vertical panels used on roadways with speed limit 55 mph or greater must be round in shape or have a self-righting mechanism. The "flat" or "oblong" shaped vertical panels are not allowed.

A series of sequential flashing warning lights, per BC(7), must be installed in a merging taper for long term stationary TCP. This includes all TCP setups, such as those shown on the plans or TCP setups per the standards.

Edge condition treatment types must be in accordance with the TxDOT standard. Installation and removal of a safety slope is subsidiary.

ITEM 503 – PORTABLE CHANGEABLE MESSAGE SIGN
Place PCMS 10 calendar days prior to begin work stating "Road Work Begin Soon, Contact 832-7000 For Info".

Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as "RIGHT LN CLOSED XXX FT".

ITEM 505 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR
The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS
If SW3P plan sheets are not provided, place the control measures as directed.

Install, maintain, remove control measures in areas of the right-of-way utilized by the Contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

Erosion control measures must be initiated immediately in areas where construction activities have ceased and will not resume for a period exceeding 14 calendar days. Vertical track all exposed soil, stockpiles, and slopes. Re-track after each rain event or every 14 days, whichever occurs first. Sheep foot roller is allowed for vertical tracking. This work is subsidiary.

Notify the Engineer within 1 hour of beginning emergency or recent rainfall dewatering. Water located within the ROW that will leave the ROW must appear free of pollutants such as suspended sediment, oil sheen, floating solids, etc. Dirty water must pass thru adequate BMPs prior to leaving the ROW to prevent discharge of dirty water. Bypass pumping of water found in a navigable waterway that enters from outside the ROW and is discharged downstream of the ROW will not require the use of BMPs. Dewatering BMPs will be paid for in conformance with the applicable bid items. However, if the necessary BMP item is not included in the Contract, payment for the BMP will be in accordance with Article 9.7., "Payment

for Extra Work and Force Account Method." The act of dewatering and the equipment used to dewater will not be paid for directly but will be subsidiary to pertinent bid items.

Unless a specific pay item is provided in the plans, the installation of the 6:1 or flatter for RFD side slopes in the safety zone will be subsidiary to pertinent bid items.

Cover small waste containers (100 gallons or less) at all times. This work is subsidiary. Large waste containers (more than 100 gallons) must have a secondary discharge containment system around the container using erosion control logs. Installation of the log for each container location will be paid using existing bid items. Repair, remove, or replace of the log will not be paid. Revisions, repairs, remove or replace of the log during exchange of empty/full containers at the same location will not be paid.

Portable restrooms must be located more than 50 ft. from a waterway. Tie or stake down portable restrooms to prevent tipping due to vandalism or weather. This work is subsidiary.

Provide a designated location for disposal when excess and waste, including waste generated from cleaning of all equipment used for mixing, hauling, and transfer concrete is disposed in the ROW or PSL. Manufactured disposal containers must be metal or a plastic material with minimum 10 mil thickness. Paper, earthen berms, or pits must be lined with minimum 10 mill thickness polyethylene sheeting. Disposal locations must be located a minimum of 50 ft. from a waterway, tree, or sensitive feature. The disposal location must have a minimum height of 6 in. Maintain a minimum 4 in. of freeboard at all times. Disposal locations are not required for cleaning of small hand tools. Hardened concrete waste may be used as embankment if placed in accordance with Item 132.

Dust Control
Stockpiles that will be inactive for greater than 14 days must be treated to contain dust by covering with chemical dust suppressant, soil blanket, vertical tracking, or method other than sprinkling with water. Stockpiles that are actively being used must be treated to contain dust by vertical tracking or a method determined by the Contractor. This work is subsidiary.

Provide designated construction traffic routes when feasible. Construction site traffic must be directed to use designated routes.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES
Triangular slip base must be the clamp style to secure the post to the slip base. Set screw style slip base will not be allowed.

ITEM 658 – DELINEATOR AND OBJECT MARKER ASSEMBLIES
All delineator, reflector, and object marker posts and supports, excluding metal components, must be manufactured in the same color that matches the color of the reflector. Field painting is not allowed.

Flexible posts YFLX and WFLX must be tubular in shape. The "flat" flexible posts are not allowed.

ITEM 666 - RETROREFLECTORIZED PAVEMENT MARKINGS
Notify the Engineer at least 24 hr. before beginning work.

All projects, including resurfacing, must increase center-to-center width for center line markings to 18 in. unless the plans or existing is greater than 18 in.

When the raised portion of a profile marking is placed as a separate operation from the pavement marking, the raised portion must be placed first then covered with TY I.

When using black shadow to cover existing stripe apply a non-retroreflective angular abrasive bead drop. The marking color shall be adjusted to resemble the pavement color. If Item 677 is not used prior to placement of black shadow, scrape the top of the marking with a blade or large piece of equipment unless surface is a seal coat. The scraping of the marking is subsidiary.

ITEM 677 - ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS
Dispose of removed materials and debris at locations off the right-of-way.

Elimination using a pavement marking will not be allowed in lieu of methods listed in specification.

The surface treatment method (seal coat) shall be used on surfaces other than concrete.

Remove pavement markings on concrete surfaces by a blasting method. Flail milling will be allowed when total quantity of removal on concrete surfaces is less than 1000 ft.

Strip seal is only method allowed on seal coat surface unless project includes placement of a new surface. If total quantity of removal on a seal coat surface is less than 2000 ft., elimination using a pavement marking is allowed if a test section is approved by the Engineer. Test section shall demonstrate the thermo marking color matches the existing pavement color.

Remove pavement markings outside the limits of the new surface by a blasting method.

Use a TRAIL or a non-retroreflective paint to cover stripe remnants that remain after elimination.

The test requirements for these materials are waived. The paint color shall be adjusted to resemble the existing pavement color. Installation and maintenance is subsidiary.

ITEM 752 – TREE AND BRUSH REMOVAL
Tree and brush removal shall be considered subsidiary to Item 100.

Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush even if Item 752 is not included as a pay item.

Flailing equipment is not allowed. Burning brush is not allowed in urban areas or on ROW. Use hand methods or other means of removal if doing work by mechanical methods is impractical.
Prior to begin tree pruning, send email confirmation to the Engineer that training and demonstration of work methods has been provided to the employees. This work is subsidiary.

Shredded vegetation may be blended, at a rate not to exceed 15 percent by volume, with Item 160 if the maximum dimension is not greater than 2 in.

ITEM 3007 – BONDING COURSE

The minimum application rates are listed in Table BC. Miscellaneous Tack is allowed for use with dense-graded Type B HMA. If a tack bid item is not provided, use bonding course item.

Table BC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Emulsified Asphalt	0.06
TRAIL – Hot Asphalt	0.12
Spray Applied Underseal Membrane	0.10

Table BCS (For Informational Tests)

Material	Target Shear Bond Strength (Tex-249-F psi)
SMA – Stone-Matrix Asphalt	60.0
PFC – Permeable Friction Course	N/A
All Other Materials	40.0

TXDOT 2024 Standard Specifications
(for work within TxDOT ROW)

Control : 1378-01-053
Project : CC 1378-1-53
Highway : RM 1431
County : TRAVIS

TEXAS DEPARTMENT OF TRANSPORTATION AND THE CITY OF LAGO VISTA

GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS

ALL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT FOR WORK WITHIN TXDOT RIGHT-OF-WAY ARE IDENTIFIED AS FOLLOWS:

STANDARD SPECIFICATIONS: ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION SEPTEMBER 1, 2024. STANDARD SPECIFICATIONS ARE INCORPORATED INTO THE CONTRACT BY REFERENCE.

ITEM	100	PREPARING RIGHT OF WAY(103) (752)
ITEM	105	REMOVING TREATED AND UNTREATED BASE AND ASPHALT PAVEMENT
ITEM	110	EXCAVATION(132)
ITEM	132	EMBANKMENT(100) (110) (160) (204) (210) (216) (400)
ITEM	160	TOPSOIL(168)
ITEM	164	SEEDING FOR EROSION CONTROL(162) (166) (168)
ITEM	168	VEGETATIVE WATERING
ITEM	247	FLEXIBLE BASE(105) (204) (210) (216) (520)
ITEM	310	PRIME COAT(300) (316)
ITEM	341	DENSE-GRADED HOT-MIX ASPHALT(300) (301) (320) (520) (585)
ITEM	464	REINFORCED CONCRETE PIPE(400) (402) (403) (420) (421) (424) (440) (462) (465) (467) (471) (476)
ITEM	467	SAFETY END TREATMENT(400) (420) (421) (432) (440) (442) (445) (460) (464)
ITEM	496	REMOVING STRUCTURES
ITEM	502	BARRICADES, SIGNS, AND TRAFFIC HANDLING(503) (505) (510)
ITEM	503	PORTABLE CHANGEABLE MESSAGE SIGN
ITEM	505	TRUCK-MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)
ITEM	506	TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS (161) (432) (556)
ITEM	530	INTERSECTIONS, DRIVEWAYS, AND TURNOUTS(247) (260) (275) (276) (292) (316) (330) (334) (341) (360) (421) (440)
ITEM	644	SMALL ROADSIDE SIGN ASSEMBLIES(421) (440) (441) (442) (445) (636) (656)
ITEM	658	DELINEATOR AND OBJECT MARKER ASSEMBLIES(445)
ITEM	666	RETROREFLECTORIZED PAVEMENT MARKINGS(316) (502) (667) (677) (678)
ITEM	672	RAISED PAVEMENT MARKERS(677) (678)
ITEM	677	ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS(300) (302) (315) (316)
ITEM	678	PAVEMENT SURFACE PREPARATION FOR MARKINGS(677)

SPECIAL PROVISIONS:

ITEM	506-001L	TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

SPECIAL SPECIFICATIONS:

ITEM	3007	BONDING COURSE

Item 100
Preparing Right of Way

1. DESCRIPTION

Prepare the right of way and designated easements for construction operations by removing and disposing of all obstructions when removal of such obstructions is not specifically shown on the plans to be paid by other Items.

2. MATERIALS

Furnish materials in conformance with the plans and Specifications.

3. CONSTRUCTION

Protect designated features on the right of way and prune trees and shrubs as directed. Do not park equipment, service equipment, store materials, or disturb the root area under the branches of trees designated for preservation. Follow all local and state regulations when burning. Pile and burn brush at approved locations as directed. Spread mulched material at approved locations as directed. Handle hazardous materials in accordance with Article 6.10., "Hazardous Materials."

Clear areas shown on the plans of all obstructions, except those landscape features that are to be preserved. Such obstructions include remains of houses and other structures, foundations, floor slabs, concrete, brick, lumber, plaster, septic tank drain fields, basements, abandoned utility pipes or conduits, equipment, fences, retaining walls, and other items as specified on the plans. Remove vegetation and other landscape features not designated for preservation, curb and gutter, driveways, paved parking areas, miscellaneous stone, sidewalks, drainage structures, manholes, inlets, abandoned railroad tracks, scrap iron, and debris, whether above or below ground. Remove culverts, storm sewers, manholes, and inlets in proper sequence to maintain traffic and drainage. Removal of live utility facilities is not included in this Item.

Perform tree and brush removal and trimming in accordance with Article 752.4, "Work Methods."

Notify the Engineer in writing when items not shown on the plans and not reasonably detectable (buried with no obvious indication of presence) are encountered and required to be removed. These items will be handled in accordance with Article 4.5., "Differing Site Conditions."

Remove obstructions not designated for preservation to 2 ft. below natural ground in areas receiving embankment. Remove obstructions to 2 ft. below the excavation level in areas to be excavated. Remove obstructions to 1 ft. below natural ground in all other areas. Remove trees and stumps to 6 in. below ground level. Plug the remaining ends of abandoned underground structures over 3 in. in diameter using concrete to form a tight closure. Backfill, compact, and restore areas where obstructions have been removed unless otherwise directed. Use approved material for backfilling. Dispose of wells in accordance with Item 103, "Disposal of Wells."

Accept ownership, unless otherwise directed, and dispose of removed materials and debris at locations off the right of way in conformance with local, state, and federal requirements.

3.1. **Tree Protection**. Install tree protection for trees designated for preservation. Unless otherwise shown on the plans, install tree protection along the drip line of the trees using 4-ft. tall chain link fencing with line posts no more than 10 ft. apart. Install tree protection before beginning work.

4. MEASUREMENT

This Item will be measured by the acre; by the 100-ft. station, regardless of the width of the right of way; or by each tree removed.

Tree removal diameter will be measured in accordance with Article 752.5, "Measurement."

Tree protection will be measured by the acre of trees protected, by the foot of fencing, or by each tree protected.

5. PAYMENT

For "acre" and "station" measurement, the work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Preparing Right of Way." For "each" measurement, the work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Preparing Right of Way (Tree)" of the diameter specified. This price is full compensation for removal and trimming of designated trees and shrubs; removal and disposal of structures and obstructions; backfilling of holes; furnishing and placing concrete for plugs; and equipment, labor, tools, and incidentals.

Total payment of this Item will not exceed 10% of the original Contract amount until final acceptance. The remainder will be paid on the estimate after final acceptance in accordance with Article 5.12., "Final Acceptance."

5.1. **Tree Protection**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows.

5.1.1. **Subsidiary Work**. The following will not be measured or paid for directly, but will be subsidiary to "Tree Protection":

- protection for Contractor project-specific locations inside and outside the right of way;
- repair to areas to be protected that are damaged by Contractor operations;
- removal and re-installation of devices and features needed for the convenience of the Contractor;
- finish grading and dressing upon removal of the protection; and
- minor adjustments, including, but not limited to, plumbing posts and re-attaching protection.

5.1.2. **Installation**. Installation will be paid for as "Tree Protection (Install)." This price is full compensation for furnishing and operating equipment and for labor, materials, tools, and incidentals.

5.1.3. **Removal**. Removal will be paid for as "Tree Protection (Remove)." This price is full compensation for furnishing and operating equipment and for proper disposal, labor, materials, tools, and incidentals.

Item 105

Removing Treated and Untreated Base and Asphalt Pavement

1. DESCRIPTION

Break, remove, and store or dispose of existing asphalt pavement, including surface treatments, and treated or untreated base materials.

2. CONSTRUCTION

Break material retained by the Department into pieces not larger than 24 in. unless otherwise shown on the plans. Remove existing asphalt pavement before disturbing stabilized base. Avoid contamination of the asphalt materials and damage to adjacent areas. Repair material damaged by operations outside the designated locations.

Stockpile materials designated salvageable at designated sites when shown on the plans or as directed. Prepare stockpile site by removing vegetation and trash and by providing for proper drainage. Material not designated to be salvaged will become the property of the Contractor. When this material is disposed of, do so in conformance with federal, state, and local regulations.

3. MEASUREMENT

This Item will be measured by the 100-ft. station along the baseline of each roadbed, by the square yard of existing treated or untreated base and asphalt pavement in their original position, or by the cubic yard of existing treated or untreated base and asphalt pavement in their original position, as calculated by the average end area method or as shown on the plans. Square yard and cubic yard measurement will be established by the widths and depths shown on the plans and the lengths measured in the field.

4. PAYMENT

The work performed in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Removing Treated and Untreated Base and Asphalt Pavement” of the depth specified. This price is full compensation for breaking the material, loading, hauling, unloading, and stockpiling or disposing; repair to areas outside designated locations for removal; and equipment, labor, tools, and incidentals.

Item 110
Excavation

1. DESCRIPTION

Excavate areas as shown on the plans or as directed. Remove materials encountered to the lines, grades, and typical sections shown on the plans and cross-sections.

2. MATERIALS

Accept ownership of unsuitable or excess material and dispose of material in conformance with local, state, and federal regulations, at locations outside the right of way.

3. CONSTRUCTION

Maintain drainage in the excavated area to avoid damage to the roadway section. Correct any damage to the subgrade caused by weather at no additional cost to the Department.

Shape slopes to avoid loosening material below or outside the proposed grades. Remove and dispose of slides or slope failures as directed.

Excavate to the grade and sections shown on the plans. Manipulate and compact subgrade in accordance with Section 132.3.4., "Compaction Methods," unless excavation is to clean homogenous rock at final grade.

Correct unsuitable material encountered at or below subgrade as directed.

3.1. **Rock Cuts**. Use approved embankment material compacted in accordance with Section 132.3.4., "Compaction Methods," to replace undercut material at no additional cost if excavation extends below the grade shown on the plans.

3.2. **Earth Cuts**. Scarify remaining material to a depth at least 6 in. below the grade shown on the plans in areas where pavement structure will be placed. Compact subgrade in accordance with Section 132.3.4., "Compaction Methods."

3.3. **Acceptance Criteria**.

3.3.1. **Grade Tolerances**.

3.3.1.1. **Staged Construction**. Grade to within 1.25 in. in the cross-section and 1.25 in. in 16 ft. measured longitudinally.

3.3.1.2. **Turnkey Construction**. Grade to within 0.5 in. in the cross-section and 0.5 in. in 16 ft. measured longitudinally.

4. MEASUREMENT

This Item will be measured by the cubic yard in its original position as computed by the method of average end areas or as shown on the plans.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

Limits of measurement for excavation in retaining wall areas will be as shown on the plans.

Shrinkage or swelling factors will not be considered in determining the calculated quantities.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Excavation (Roadway)," "Excavation (Channel)," "Excavation (Special)," or "Excavation (Roadway and Channel)." This price is full compensation for authorized excavation; drying; undercutting subgrade in rock cuts and reworking or replacing the undercut material; hauling; disposal of material not used elsewhere on the project; scarification and compaction; and equipment, labor, materials, tools, and incidentals.

Drying subgrade deeper than 6 in. below grade as shown on the plans will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." Excavation and replacement of unsuitable material below grade as shown on the plans will be performed and paid for in conformance with the applicable bid items. However, if Item 132, "Embankment," is not included in the Contract, payment for replacement of unsuitable material will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

Removing, reworking, reshaping, or re-laying existing pavement structure will be paid for in conformance with the appropriate Item.

When a slide or slope failure not due to the Contractor's negligence or operation occurs, payment for removal and disposal of the slide material will be in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

Excavation in backfill areas of retaining walls will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Item 132
Embankment

1. DESCRIPTION

Furnish, place, and compact materials for construction of roadways, embankments, levees, dikes, or any designated section of the roadway where additional material is required.

2. MATERIALS

Furnish approved material capable of forming a stable embankment from required excavation in the areas shown on the plans or from sources outside the right of way. Provide one or more of the following types as shown on the plans.

- **Type A**. Granular material that is free of vegetation or other objectionable material and meets the requirements shown in Table 1.

Table 1
Testing Requirements

Property	Test Method	Specification Limit
Liquid limit	Tex-104-E	≤45
Plasticity index (PI)	Tex-106-E	≤15
Bar linear shrinkage	Tex-107-E	≥2

Perform the linear shrinkage test only as indicated in Tex-104-E.

- **Type B**. Materials such as rock, loam, clay, or other approved materials.
- **Type C**. Material meeting the specification requirements shown on the plans. Type C may be further designated as Type C1, C2, etc.
- **Type D**. Material from required excavation areas shown on the plans.

Meet the requirements of the pertinent retaining wall Items for retaining wall backfill material.

3. CONSTRUCTION

Meet the requirements of Item 7, “Legal Relations and Responsibilities,” when off right of way sources are used. Notify the Engineer before opening a material source to allow for required testing. Complete preparation of the right of way in accordance with Item 100, “Preparing Right of Way,” for areas to receive embankment.

Backfill tree-stump holes or other minor excavations with approved material and tamp. Restore the ground surface, including any material disked loose or washed out, to its original slope. Compact the ground surface by sprinkling in accordance with Item 204, “Sprinkling,” and by rolling using equipment complying with Item 210, “Rolling,” when directed.

Scarify and loosen the unpaved surface areas, except rock, to a depth of at least 6 in. unless otherwise shown on the plans. Bench slopes before placing material. Begin placement of material at the toe of slopes. Do not place trees, stumps, roots, vegetation, or other objectionable material in the embankment. Simultaneously recompact scarified material with the placed embankment material. Do not exceed the layer depth specified in Section 132.3.4., “Compaction Methods.”

Construct embankments to the grade and sections shown on the plans. Construct the embankment in layers approximately parallel to the finished grade for the full width of the individual roadway cross-sections unless otherwise shown on the plans. Ensure that each section of the embankment conforms to the detailed sections or slopes. Maintain the finished section, density, and grade until the project is accepted.

3.1. **Earth Embankments**. Earth embankment is mainly composed of material other than rock. Construct embankments in successive layers, evenly distributing materials in lengths suited for sprinkling and rolling.

Obtain approval to incorporate rock and broken concrete produced by the construction project in the lower layers of the embankment. Place the rock and concrete outside the limits of the completed roadbed when the size of approved rock or broken concrete exceeds the layer thickness requirements in Section 132.3.4., "Compaction Methods." Cut and remove all exposed reinforcing steel from the broken concrete.

Move the material dumped in piles or windrows by blading or by similar methods and incorporate it into uniform layers. Featheredge or blend abutting layers of dissimilar material for at least 100 ft. to ensure there are no abrupt changes in the material. Break down clods or lumps of material.

Apply water free of industrial wastes and other objectionable matter to achieve the uniform moisture content specified for compaction.

Roll and sprinkle each embankment layer in accordance with Section 132.3.4.1., "Ordinary Compaction," when ordinary compaction is specified. Compact the layer to the required density in accordance with Section 132.3.4.2., "Density and Moisture Control," when density control is specified.

3.2. **Rock Embankments**. Rock embankment is mainly composed of rock. Construct rock embankments in successive layers for the full width of the roadway cross-section with a depth of 18 in. or less. Increase the layer depth for large rock sizes as approved. Do not exceed a depth of 2-1/2 ft. in any case. Fill voids created by the large stone matrix with smaller stones during the placement and filling operations.

Ensure the depth of the embankment layer is greater than the maximum dimension of any rock. Do not place rock greater than 2 ft. in its maximum dimension, unless otherwise approved. Construct the final layer with graded material so that the density and uniformity are in accordance with Section 132.3.4., "Compaction Methods." Break up exposed oversized material as approved.

Roll and sprinkle each embankment layer in accordance with Section 132.3.4.1., "Ordinary Compaction," when ordinary compaction is specified. Compact each layer to the required density in accordance with Section 132.3.4.2., "Density and Moisture Control," when density control is specified. Proof-roll each rock layer as directed, where density testing is not possible, in accordance with Item 216, "Proof Rolling," to ensure proper compaction.

3.3. **Embankments Adjacent to Culverts and Bridges**. Compact embankments adjacent to culverts and bridges in accordance with Item 400, "Excavation and Backfill for Structures."

3.4. **Compaction Methods**. Begin rolling longitudinally at the sides and proceed toward the center, overlapping on successive trips by at least 1/2 the width of the roller. Begin rolling at the lower side and progress toward the high side on superelevated curves. Alternate roller trips to attain slightly different lengths. Compact embankments in accordance with Section 132.3.4.1., "Ordinary Compaction," or Section 132.3.4.2., "Density and Moisture Control," as shown on the plans.

3.4.1. **Ordinary Compaction**. Use approved rolling equipment complying with Item 210, "Rolling," to compact each layer. Use specific equipment when required by the Engineer or as shown on the plans. Do not allow the loose depth of any layer to exceed 8 in., unless otherwise approved. Bring each layer to the moisture content directed before and during rolling operations. Compact each layer until there is no evidence of further consolidation. Maintain a level layer to ensure uniform compaction. Recompact and refinish the subgrade at no additional expense to the Department if the required stability or finish is lost for any reason.

3.4.2. **Density and Moisture Control**. Compact each layer to the required density using equipment complying with Item 210. Determine the maximum lift thickness based on the ability of the compacting operation and equipment to meet the required density. Do not exceed layer thickness of 16 in. loose or 12 in. compacted material unless otherwise approved. Maintain a level layer to ensure uniform compaction.

The Engineer will use Tex-114-E to determine the maximum dry density (D_a) and optimum moisture content (W_{opt}). Meet the requirements for field density and moisture content shown in Table 2 unless otherwise shown on the plans.

Table 2
Field Density Control Requirements

Description	Density	Moisture Content
	Tex-115-E	
PI ≤15	≥98% D_a	–
15 <PI ≤35	≥98% D_a and ≤102% D_a	≥$W_{opt.}$
PI> 35	≥ 95%D_a and ≤100% D_a	≥$W_{opt.}$

Each layer is subject to testing by the Engineer for density and moisture content. Each layer must be brought to the moisture content necessary to obtain the required density and placed in a manner to ensure uniform compaction over the entire layer. The density and moisture contents for the descriptions shown in Table 2 are illustrated in the Moisture-Density Curve of Tex-114-E.

Provide the Engineer with the beginning and ending station numbers of the area completed for testing. The Engineer will determine roadway density and moisture content of completed sections in accordance with Tex-115-E, Part I. The Engineer will determine random locations for testing in accordance with Tex-115-E, Part IV. When the density is less than the required density shown in Table 2, the Engineer may perform additional testing to determine the extent of the area to correct.

Remove small areas of the layer to allow for density tests as required. Replace the removed material and recompact at no additional expense to the Department. Proof-roll in accordance with Item 216, when shown on the plans or as directed. Correct soft spots as directed.

3.5. **Maintenance of Moisture and Reworking**. Maintain the density and moisture content once all requirements shown in Table 2 are met. Maintain the moisture content no lower than 4% below optimum for soils with a PI greater than 15. Rework the material to obtain the specified compaction when the material loses the required stability, density, moisture, or finish. Alter the compaction methods and procedures on subsequent work to obtain specified density as directed.

3.6. **Acceptance Criteria**.

3.6.1. **Grade Tolerances**.

3.6.1.1. **Staged Construction**. Grade to within 1.25 in. in the cross-section and 1.25 in. in 16 ft. measured longitudinally.

3.6.1.2. **Turnkey Construction**. Grade to within 0.5 in. in the cross-section and 0.5 in. in 16 ft. measured longitudinally.

3.6.2. **Gradation Tolerances**. Ensure no more than one of the five most recent gradation tests is outside the specified limits on any individual sieve by more than 5% when gradation requirements are shown on the plans.

3.6.3. **Density Tolerances**. Ensure no more than one of the five most recent density tests for compaction work is outside the specified density limits and no test is outside the limits by more than 3 pcf.

3.6.4. **Plasticity Tolerances**. Ensure no more than one of the five most recent PI tests for material is outside the specified limit by more than 2 points.

4. MEASUREMENT

Shrinkage or swell factors are the Contractor's responsibility. When shown on the plans, factors are for informational purposes only.

Measurement of retaining wall backfill in embankment areas will be paid for as embankment unless otherwise shown on the plans. Limits of measurement for embankment in retaining wall areas are shown on the plans.

Embankment will be measured by the cubic yard. Measurement will be further defined for payment as follows.

4.1. **Final**. The cubic yard will be measured in its final position using the average end area method or as shown on the plans. The volume is computed between the original ground surface or the surface upon which the embankment is to be constructed and the lines, grades, and slopes of the embankment. In areas of salvaged topsoil, payment for embankment will be made in accordance with Item 160, "Topsoil." Shrinkage or swell factors will not be considered in determining the calculated quantities.

When measured by the cubic yard in its final position, this is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

4.2. **Original**. The cubic yard will be measured in its original and natural position using the average end area method or as shown on the plans.

4.3. **Vehicle**. The cubic yard will be measured in vehicles at the point of delivery.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Embankment (Final)," "Embankment (Original)," or "Embankment (Vehicle)" of the compaction method and type specified. This price is full compensation for furnishing embankment; hauling; placing, compacting, finishing, and reworking; disposal of waste material; and equipment, labor, tools, and incidentals.

When proof rolling is directed, it will be paid for in accordance with Item 216.

All sprinkling and rolling, except proof rolling, will not be paid for directly, but will be subsidiary to this Item, unless otherwise shown on the plans.

In fill sections, excavation and replacement of unsuitable material below existing elevations will be performed and paid for in conformance with the applicable bid items. However, if Item 110, "Excavation," is not included in the Contract, payment for replacement of unsuitable material will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

Where subgrade is constructed under this Contract, correction of soft spots in the subgrade will be at the Contractor's expense. Where subgrade is not constructed under this Contract, correction of soft spots in the subgrade will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

When rework, removal, or scarification is required for existing pavement structure that will remain, it will be measured and paid for as shown on the plans for the appropriate type.

Item 160
Topsoil

1. DESCRIPTION

Furnish and place topsoil to the depths and on the areas shown on the plans.

2. MATERIALS

Use easily cultivated, fertile topsoil that is free of objectionable material and resists erosion. Obtain topsoil from the right of way at sites of proposed excavation or embankment when specified on the plans, or as directed. Secure additional topsoil, if necessary, from approved sources outside the right of way in accordance with Article 7.7., "Preservation of Cultural and Natural Resources and the Environment." Ensure that the topsoil obtained from sites outside the right of way has a pH of 5.5–8.5, per Tex-128-E. Topsoil is subject to testing by the Engineer. Furnish water in accordance with Article 168.2., "Materials."

3. CONSTRUCTION

Remove and dispose of objectionable material from the topsoil source before beginning the work. Stockpile topsoil, when necessary, in a windrow at designated locations along the right of way line or as directed. Keep source and stockpile areas drained during topsoil removal and leave them in a neat condition when removal is complete. Scarify the area to a depth of 4 in. before placing topsoil. Spread the topsoil to a uniform loose cover at the thickness specified. Place and shape the topsoil as directed. Water and roll the topsoil using a light roller or other suitable equipment.

4. MEASUREMENT

This Item will be measured by the 100-ft. station along the baseline of each roadbed, by the square yard, or by the cubic yard in vehicles at the point of delivery.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Furnishing and Placing Topsoil" of the depth specified on the plans (except for measurement by the cubic yard). This price is full compensation for securing necessary sources and royalties; furnishing topsoil; excavation, loading, hauling, stockpiling, and placing; watering; rolling; and equipment, labor, materials, tools, and incidentals. Limits of excavation and embankment for payment are shown in Figure 1.

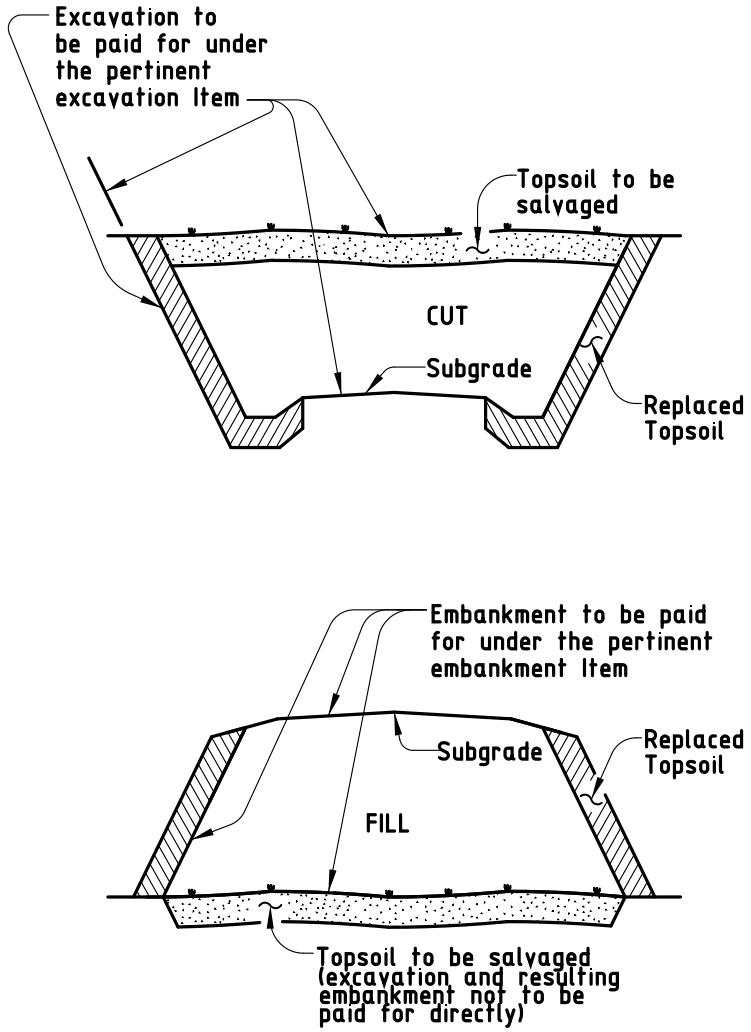


Figure 1
Roadway Cross-Sections Showing Payment for Excavation and Embankment

Item 164
Seeding for Erosion Control

1. DESCRIPTION

Prepare the surface and provide and distribute temporary or permanent seeding for erosion control as shown on the plans or as directed.

2. MATERIALS

2.1. **Seed**. Provide seed from the previous season's crop meeting the requirements of the Texas Seed Law, including the testing and labeling for pure live seed (PLS = Purity × Germination). Furnish seed of the designated species in labeled unopened bags or containers to the Engineer before planting. Use within 12 mo. from the date of the analysis. When Buffalograss is specified, use seed that is treated with potassium nitrate (KNO_3) to overcome dormancy.

Use Tables 1–5 to determine the appropriate seeding mix and rates as shown on the plans. Include flower seeding mix in accordance with Table 5 with seeding mix shown in Table 1 and Table 2.

If a grass plant species is not available by the producers, the other grass plant species in the seeding mix will be increased proportionally by the percentage of the missing plant grass species. If a flower plant species is not available by the producers, the other flower species in the seeding mix will be increased proportionally by the percentage of the missing flower species. Substitute species and rates require approval of the Engineer before being incorporated into the seeding mx. The rates listed in the tables are for drill seeding. All other methods of placing seed will require a 25% increase in rate.

Table 1
Permanent Rural Seeding Mix

District	Clay Soils Species, Percent, and Rate (lb. PLS per acre)		Sandy Soils Species, Percent, and Rate (lb. PLS per acre)	
1 (Paris)	Hooded Windmillgrass (Burnet)	15% 0.3	Hooded Windmillgrass (Burnet)	15% 0.3
	White Tridens (Guadalupe)	20% 0.4	Sand Dropseed (Taylor)	15% 0.3
	Little Bluestem (Coastal Plains)	20% 2.0	Little Bluestem (Coastal Plains)	20% 2.0
	Florida Paspalum (Harrison)	15% 2.25	Florida Paspalum (Harrison)	15% 2.25
	Sideoats Grama (Haskell)	05% 0.5	Splitbeard Bluestem (Neches)	10% 1.0
	Splitbeard Bluestem (Neches)	05% 0.5	Sand Lovegrass (Mason)	10% 0.4
	Sand Dropseed (Taylor)	05% 0.1	Green Sprangletop (Van Horn)	15% 0.6
	Canada Wildrye (Lavaca)	10% 2.0		
	Green Sprangletop (Van Horn)	05% 0.2		
2 (Fort Worth)	Hooded Windmillgrass (Burnet)	15% 0.3	Sand Dropseed (Taylor)	15% 0.3
	White Tridens (Guadalupe)	15% 0.3	Sideoats Grama (Haskell)	15% 1.5
	Sideoats Grama (Haskell)	10% 1.0	Little Bluestem (OK Select)	15% 1.05
	Little Bluestem (OK Select)	10% 0.7	Hairy Grama (Chaparral)	15% 0.6
	Buffalograss (Texoka)	10% 1.5	Green Sprangletop (Van Horn)	10% 0.2
	Silver Bluestem (Santiago)	10% 0.4	Hooded Windmillgrass (Burnet)	10% 0.2
	Green Sprangletop (Van Horn)	10% 0.4	Shortspike Windmillgrass (Welder)	10% 0.2
	Sand Dropseed (Taylor)	10% 0.2	Silver Bluestem (Stantiago)	10% 0.4
	Canada Wildrye (Lavaca)	10% 2.0		

Table 1 (continued)
Permanent Rural Seeding Mix

District	Clay Soils Species, Percent, and Rate (lb. PLS per acre)		Sandy Soils Species, Percent, and Rate (lb. PLS per acre)	
3 (Wichita Falls)	Sideoats Grama (Haskell)	15% 1.5	Hooded Windmillgrass (Burnet)	10% 0.2
	Green Sprangletop (Van Horn)	10% 0.4	Sand Dropseed (Taylor)	15% 0.3
	Hooded Windmillgrass (Burnet)	10% 0.2	Green Sprangletop (Van Horn)	15% 0.6
	White Tridens (Guadalupe)	10% 0.2	Sideoats Grama (Haskell)	10% 1.0
	Little Bluestem (OK Select)	15% 1.05	Little Bluestem (OK Select)	10% 0.7
	Silver Bluestem (Santiago)	10% 0.4	Silver Bluestem (Santiago)	10% 0.4
	Buffalograss (Texoka)	10% 1.5	Hairy Grama (Chaparral)	10% 0.4
	Blue Grama (Hachita)	05% 0.2	Arizona Cottontop (La Salle)	10% 0.4
	Sand Dropseed (Taylor)	05% 0.1	Blue Grama (Hachita)	10% 0.4
	Canada Wildrye (Lavaca)	10% 2.0		
4 (Amarillo)	Sideoats Grama (Haskell)	15% 1.5	Green Sprangletop (Van Horn)	15% 0.6
	Silver Bluestem (Santiago)	15% 0.6	Sideoats Grama (Haskell)	10% 1.0
	Buffalograss (Texoka)	15% 2.25	Sand Dropseed (Taylor)	10% 0.2
	Green Sprangletop (Van Horn)	10% 0.4	Silver Bluestem (Santiago)	10% 0.4
	Blue Grama (Hachita)	15% 0.6	Little Bluestem (OK Select)	15% 1.05
	Hooded Windmillgrass (Burnet)	05% 0.1	Arizona Cottontop (La Salle)	10% 0.4
	White Tridens (Guadalupe)	10% 0.2	Blue Grama (Hachita)	10% 0.4
	Western Wheatgrass (Barton)	10% 3.0	Sand Lovegrass (Mason)	10% 0.3
	Canada Wildrye (Lavaca)	05% 1.0	Hooded Windmillgrass (Burnet)	10% 0.2
5 (Lubbock)	Sideoats Grama (Haskell)	15% 1.5	Green Sprangletop (Van Horn)	15% 0.6
	Blue Grama (Hachita)	15% 0.6	Blue Grama (Hachita)	15% 0.6
	Silver Bluestem (Santiago)	15% 0.6	Sideoats Grama (Haskell)	10% 1.0
	Buffalograss (Texoka)	10% 1.5	Little Bluestem (OK Select)	10% 0.7
	White Tridens (Guadalupe)	10% 0.2	Hooded Windmillgrass (Burnet)	10% 0.2
	Green Sprangletop (Van Horn)	10% 0.4	Sand Dropseed (Taylor)	10% 0.2
	Hooded Windmillgrass (Burnet)	05% 0.1	Silver Bluestem (Santiago)	10% 0.4
	Galleta Grass (Viva)	05% 0.3	Arizona Cottontop (La Salle)	10% 0.4
	Western Wheatgrass (Barton)	10% 3.0	Sand Lovegrass (Mason)	10% 0.3
	Canada Wildrye (Lavaca)	05% 1.0		
6 (Odessa)	Whiplash Pappusgrass (Permian)	15% 0.9	Sand Dropseed (Taylor)	15% 0.3
	Green Sprangletop (Van Horn)	10% 0.4	Green Sprangletop (Van Horn)	10% 0.4
	Silver Bluestem (Santiago)	15% 0.6	Sideoats Grama (Brewster)	15% 1.5
	Sideoats Grama (Brewster)	10% 1.0	Whiplash Pappusgrass (Permian)	10% 0.6
	Sand Dropseed (Taylor)	10% 0.2	Hooded Windmillgrass (Burnet)	10% 0.2
	Alkali Sacaton (Saltalk)	10% 0.2	Blue Grama (Hachita)	10% 0.4
	Arizona Cottontop (La Salle)	10% 0.4	Hairy Grama (Chaparral)	10% 0.4
	Blue Grama (Hachita)	10% 0.4	Sand Lovegrass (Mason)	10% 0.3
	Galleta Grass (Viva)	10% 0.6	Little Bluestem (Pastura)	05% 0.5
			Galleta Grass (Viva)	05% 0.3
7 (San Angelo)	Sideoats Grama (Brewster)	15% 1.5	Sand Dropseed (Taylor)	15% 0.3
	Hooded Windmillgrass (Burnet)	10% 0.2	Green Sprangletop (Van Horn)	15% 0.6
	Silver Bluestem (Santiago)	10% 0.4	Hooded Windmillgrass (Burnet)	15% 0.3
	Sand Dropseed (Taylor)	10% 0.2	Shortspike Windmillgrass (Welder)	10% 0.2
	White Tridens (Guadalupe)	10% 0.2	Hairy Grama (Chaparral)	10% 0.4
	Whiplash Pappusgrass (Permian)	15% 0.9	Sand Lovegrass (Mason)	10% 0.3
	Texas Grama (Atascosa)	05% 0.5	Sideoats Grama (Brewster)	10% 1.0
	Green Sprangletop (Van Horn)	10% 0.4	Little Bluestem (OK Select)	10% 0.7
	Little Bluestem (OK Select)	05% 0.35	Whiplash Pappusgrass (Permian)	05% 0.3
	Blue Grama (Hachita)	05% 0.2		
	Galleta Grass (Viva)	05% 0.3		

Table 1 (continued)
Permanent Rural Seeding Mix

District	Clay Soils Species, Percent, and Rate (lb. PLS per acre)		Sandy Soils Species, Percent, and Rate (lb. PLS per acre)	
8 (Abilene)	Sideoats Grama (Haskell)	10% 1.0	Sand Dropseed (Taylor)	15% 0.3
	Hooded Windmillgrass (Burnet)	10% 0.2	Green Sprangletop (Van Horn)	10% 0.4
	Buffalograss (Texoka)	10% 1.5	Hooded Windmillgrass (Burnet)	15% 0.3
	Blue Grama (Hachita)	10% 0.4	Silver Bluestem (Santiago)	10% 0.4
	Silver Bluestem (Santiago)	10% 0.4	Little Bluestem (OK Select)	10% 0.7
	White Tridens (Guadalupe)	15% 0.2	Shortspike Windmillgrass (Welder)	10% 0.2
	Little Bluestem (OK Select)	10% 0.7	Hairy Grama (Chaparral)	10% 0.4
	Green Sprangletop (Van Horn)	10% 0.4	Sand Lovegrass (Mason)	10% 0.3
	Whiplash Pappusgrass (Permian)	10% 0.6	Arizona Cottontop (La Salle)	10% 0.4
	Galleta Grass (Viva)	10% 0.6		
9 (Waco)	Sideoats Grama (Haskell)	15% 1.5	Hooded Windmillgrass (Burnet)	15% 0.3
	White Tridens (Guadalupe)	15% 0.3	Shortspike Windmillgrass (Welder)	10% 0.2
	Hooded Windmillgrass (Burnet)	10% 0.2	Hairy Grama (Chaparral)	10% 0.4
	Little Bluestem (OK Select)	10% 0.7	Sand Dropseed (Taylor)	15% 0.3
	Buffalograss (Texoka)	10% 1.6	Sideoats Grama (Haskell)	10% 1.0
	Halls Panicum (Oso)	05% 0.1	Little Bluestem (OK Select)	10% 0.7
	Silver Bluestem (Santiago)	10% 0.4	Green Sprangletop (Van Horn)	10% 0.4
	Sand Dropseed (Taylor)	05% 0.1	Texas Grama (Atascosa)	05% 0.15
	Green Sprangletop (Van Horn)	10% 0.4	Silver Bluestem (Santiago)	10% 0.4
	Canada Wildrye (Lavaca)	05% 1.0	Canada Wildrye (Lavaca)	05% 1.0
	Texas Grama (Atascosa)	05% 0.5		
10 (Tyler)	Hooded Windmillgrass (Burnet)	15% 0.3	Hooded Windmillgrass (Burnet)	15% 0.3
	White Tridens (Guadalupe)	15% 0.3	Sand Dropseed (Taylor)	10% 0.2
	Sand Dropseed (Taylor)	05% 0.1	Little Bluestem (Coastal Plains)	20% 2.0
	Little Bluestem (Coastal Plains)	20% 2.0	Florida Paspalum (Harrison)	15% 2.25
	Florida Paspalum (Harrison)	15% 2.25	Splitbeard Bluestem (Neches)	10% 1.0
	Splitbeard Bluestem (Neches)	10% 1.0	Green Sprangletop (Van Horn)	05% 0.2
	Green Sprangletop (Van Horn)	05% 0.2	Sand Lovegrass (Mason)	10% 0.4
	Sideoats Grama (Haskell)	05% 0.5	Red Lovegrass (Duval)	10% 0.2
	Canada Wildrye (Lavaca)	10% 2.0	Hairy Grama (Chaparral)	05% 0.2
11 (Lufkin)	Hooded Windmillgrass (Burnet)	15% 0.3	Hooded Windmillgrass (Burnet)	15% 0.3
	White Tridens (Guadalupe)	15% 0.3	Sand Dropseed (Taylor)	10% 0.2
	Little Bluestem (Coastal Plains)	20% 2.0	Little Bluestem (Coastal Plains)	20% 2.0
	Florida Paspalum (Harrison)	15% 2.25	Florida Paspalum (Harrison)	15% 2.25
	Green Sprangletop (Van Horn)	05% 0.2	Splitbeard Bluestem (Neches)	10% 1.0
	Sideoats Grama (Haskell)	05% 0.5	Green Sprangletop (Van Horn)	05% 0.2
	Splitbeard Bluestem (Neches)	10% 1.0	Red Lovegrass (Duval)	10% 0.2
	Sand Dropseed (Taylor)	05% 0.1	Sand Lovegrass (Mason)	10% 0.4
	Canada Wildrye (Lavaca)	10% 2.0	Hairy Grama (Chaparral)	05% 0.2
12 (Houston)	White Tridens (Guadalupe)	10% 0.2	Hooded Windmillgrass (Mariah)	15% 0.3
	Hooded Windmillgrass (Mariah)	10% 0.2	Sand Dropseed (Nueces)	15% 0.3
	Shortspike Windmillgrass (Welder)	15% 0.3	Shortspike Windmillgrass (Welder)	10% 0.2
	Little Bluestem (Coastal Plains)	15% 1.5	Little Bluestem (Coastal Plains)	15% 1.5
	Florida Paspalum (Harrison)	15% 2.25	Red Lovegrass (Duval)	10% 0.2
	Red Lovegrass (Duval)	05% 0.1	Florida Paspalum (Harrison)	15% 2.25
	Halls Panicum (Oso)	10% 0.2	Splitbeard Bluestem (Neches)	10% 1.0
	Splitbeard Bluestem (Neches)	05% 0.5	Hairy Grama (Chaparral)	05% 0.2
	Sand Dropseed (Nueces)	05% 0.1	Green Sprangletop (Van Horn)	05% 0.2
	Canada Wildrye (Lavaca)	10% 2.0		
13 (Yoakum)	White Tridens (Guadalupe)	15% 0.3	Hairy Grama (Chaparral)	15% 0.6
	Shortspike Windmillgrass (Welder)	15% 0.3	Hooded Windmillgrass (Mariah)	15% 0.3
	Halls Panicum (Oso)	10% 0.2	Shortspike Windmillgrass (Welder)	10% 0.2
	Plains Bristlegrass (Catarina Blend)	10% 0.6	Sand Dropseed (Nueces)	10% 0.2
	Little Bluestem (Coastal Plains)	15% 1.5	Little Bluestem (Carrizo)	10% 1.5
	Sideoats Grama (South Texas)	05% 0.75	Red Lovegrass (Duval)	10% 0.2
	Texas Grama (Atascosa)	10% 1.0	Slender Grama (Dilley)	10% 1.0
	Hooded Windmillgrass (Mariah)	05% 0.1	Plains Bristlegrass (Catarina)	10% 0.4
	Sand Dropseed (Nueces)	05% 0.1	Green Sprangletop (Van Horn)	10% 0.4
	Canada Wildrye (Lavaca)	10% 2.0		

Table 1 (continued)
Permanent Rural Seeding Mix

District	Clay Soils Species, Percent, and Rate (lb. PLS per acre)	Sandy Soils Species, Percent, and Rate (lb. PLS per acre)
14 (Austin)	Hooded Windmillgrass (Burnet) 20% 0.4 White Tridens (Guadalupe) 10% 0.2 Sideoats Grama (South Texas) 10% 1.5 Shortspike Windmillgrass (Welder) 10% 0.2 Plains Bristlegrass (Catarina Blend) 10% 0.6 Silver Bluestem (Santiago) 10% 0.4 Little Bluestem (OK Select) 10% 0.7 Halls Panicum (Oso) 05% 0.1 Texas Grama (Atascosa) 05% 0.5 Canada Wildrye (Lavaca) 10% 2.0	Hairy Grama (Chaparral) 15% 0.6 Shortspike Windmillgrass (Welder) 10% 0.2 Hooded Windmillgrass (Burnet) 10% 0.2 Red Lovegrass (Duval) 10% 0.2 Sand Dropseed (Nueces) 10% 0.2 Little Bluestem (Carrizo) 10% 1.5 Sideoats Grama (South Texas) 10% 1.5 Silver Bluestem (Santiago) 10% 0.4 Plains Bristlegrass (Catarina) 10% 0.4 Arizona Cottontop (La Salle) 05% 0.2
15 (San Antonio)	Sideoats Grama (South Texas) 15% 2.25 White Tridens (Guadalupe) 15% 0.3 Shortspike Windmillgrass (Welder) 10% 0.2 Halls Panicum (Oso) 10% 0.2 Plains Bristlegrass (Catarina Blend) 10% 0.6 False Rhodes Grass (Kinney) 05% 0.1 Hooded Windmillgrass (Mariah) 05% 0.1 Pink Pappusgrass (Maverick) 10% 0.6 Texas Grama (Atascosa) 05% 0.5 Multiflower False Rhodes Grass (Hidalgo) 10% 0.2 Arizona Cottontop (La Salle) 05% 0.2	Slender Grama (Dilley) 15% 1.5 Hairy Grama (Chaparral) 15% 0.6 Shortspike Windmillgrass (Welder) 10% 0.2 Hooded Windmillgrass (Mariah) 10% 0.2 Red Lovegrass (Duval) 10% 0.2 Sand Dropseed (Nueces) 10% 0.2 Pink Pappusgrass (Maverick) 05% 0.3 Little Bluestem (Carrizo) 10% 1.5 Arizona Cottontop (La Salle) 05% 0.2 Multiflower False Rhodes Grass (Hidalgo) 05% 0.1 Plains Bristlegrass (Catarina) 05% 0.2
16 (Corpus Christi)	Shortspike Windmillgrass (Welder) 15% 0.3 Pink Pappusgrass (Maverick) 10% 0.6 Halls Panicum (Oso) 10% 0.2 Plains Bristlegrass (Catarina Blend) 10% 0.6 White Tridens (Guadalupe) 10% 0.2 Multiflower Galse Rhodes Grass (Hidalgo) 10% 0.2 Hooded Windmillgrass (Mariah) 10% 0.2 Arizona Cottontop (La Salle) 05% 0.2 Sand Dropseed (Nueces) 05% 0.1 Sideoats Grama (South Texas) 10% 1.5 Texas Grama (Atascosa) 05% 0.5	Slender Grama (Dilley) 15% 1.5 Hairy Grama (Chaparral) 15% 0.6 Hooded Windmillgrass (Mariah) 10% 0.2 Red Lovegrass (Duval) 10% 0.2 Sand Dropseed (Nueces) 10% 0.2 Shortspike Windmillgrass (Welder) 10% 0.2 Pink Pappusgrass (Maverick) 10% 0.6 Multiflower False Rhodes Grass (Hidalgo) 10% 0.2 Arizona Cottontop (La Salle) 05% 0.2 Little Bluestem (Carrizo) 05% 0.75
17 (Bryan)	White Tridens (Guadalupe) 15% 0.3 Hooded Windmillgrass (Burnet) 15% 0.3 Little Bluestem (Coastal Plains) 15% 1.5 Florida Paspalum (Harrison) 15% 2.25 Shortspike Windmillgrass (Welder) 10% 0.2 Splitbeard Bluestem (Neches) 05% 0.5 Green Sprangletop (Van Horn) 05% 0.2 Halls Panicum (Oso) 05% 0.1 Sand Dropseed (Taylor) 05% 0.1 Canada Wildrye (Lavaca) 10% 2.0	Sand Dropseed (Taylor) 10% 0.2 Shortspike Windmillgrass (Welder) 10% 0.2 Little Bluestem (Coastal Plains) 15% 1.5 Green Sprangletop (Van Horn) 05% 0.2 Florida Paspalum (Harrison) 15% 2.25 Splitbeard Bluestem (Neches) 10% 1.0 Hooded Windmillgrass (Burnet) 15% 0.3 Red Lovegrass (Duval) 10% 0.2 Hairy Grama (Chaparral) 10% 0.4
18 (Dallas)	Sideoats Grama (Haskell) 15% 1.5 Hooded Windmillgrass (Burnet) 15% 0.3 White Tridens (Guadalupe) 15% 0.3 Little Bluestem (OK Select) 15% 1.05 Buffalograss (Texoka) 10% 1.5 Silver Bluestem (Santiago) 05% 0.2 Green Sprangletop (Van Horn) 05% 0.2 Shortspike Windmillgrass (Welder) 05% 0.1 Canada Wildrye (Lavaca) 10% 2.0 Sand Dropseed (Taylor) 05% 0.1	Shortspike Windmillgrass (Welder) 10% 0.2 Hairy Grama (Chaparral) 15% 0.6 Sand Dropseed (Taylor) 10% 0.2 Little Bluestem (OK Select) 15% 1.05 Sideoats Grama (Haskell) 10% 1.0 Green Sprangletop (Van Horn) 10% 0.4 Hooded Windmillgrass (Burnet) 10% 0.2 Sand Lovegrass (Mason) 10% 0.4 Silver Bluestem (Santiago) 10% 0.4

Table 1 (continued)
Permanent Rural Seeding Mix

District	Clay Soils Species, Percent, and Rate (lb. PLS per acre)		Sandy Soils Species, Percent, and Rate (lb. PLS per acre)	
19 (Atlanta)	White Tridens (Guadalupe)	15% 0.3	Hooded Windmillgrass (Burnet)	15% 0.3
	Hooded Windmillgrass (Burnet)	15% 0.3	Sand Dropseed (Taylor)	10% 0.2
	Little Bluestem (Coastal Plains)	20% 2.0	Little Bluestem (Coastal Plains)	20% 2.0
	Florida Paspalum (Harrison)	15% 2.25	Florida Paspalum (Harrison)	15% 2.25
	Sideoats Grama (Haskell)	10% 1.0	Splitbeard Bluestem (Neches)	10% 1.0
	Splitbeard Bluestem (Neches)	05% 0.5	Sand Lovegrass (Mason)	10% 0.4
	Green Sprangletop (Van Horn)	05% 0.2	Red Lovegrass (Duval)	10% 0.2
	Sand Dropseed (Taylor)	05% 0.1	Hairy Grama (Chaparral)	10% 0.4
	Canada Wildrye (Lavaca)	10% 2.0		
20 (Beaumont)	White Tridens (Guadalupe)	10% 0.2	Hooded Windmillgrass (Mariah)	15% 0.3
	Hooded Windmillgrass (Mariah)	10% 0.2	Sand Dropseed (Nueces)	15% 0.3
	Shortspike Windmillgrass (Welder)	15% 0.3	Shortspike Windmillgrass (Welder)	10% 0.2
	Little Bluestem (Coastal Plains)	15% 1.5	Little Bluestem (Coastal Plains)	15% 1.5
	Florida Paspalum (Harrison)	15% 2.25	Red Lovegrass (Duval)	10% 0.2
	Red Lovegrass (Duval)	05% 0.1	Florida Paspalum (Harrison)	15% 2.25
	Halls Panicum (Oso)	10% 0.2	Splitbeard Bluestem (Neches)	10% 1.0
	Splitbeard Bluestem (Neches)	05% 0.5	Hairy Grama (Chaparral)	05% 0.2
	Sand Dropseed (Nueces)	05% 0.1	Green Sprangletop (Van Horn)	05% 0.2
	Canada Wildrye (Lavaca)	10% 2.0		
21 (Pharr)	Shortspike Windmillgrass (Welder)	10% 0.2	Slender Grama (Dilley)	10% 1.0
	Halls Panicum (Oso)	10% 0.2	Hairy Grama (Chaparral)	10% 0.4
	White Tridens (Guadalupe)	10% 0.2	Shortspike Windmillgrass (Welder)	10% 0.2
	Plains Bristlegrass (Catarina Blend)	10% 0.6	Red Lovegrass (Duval)	10% 0.2
	Pink Pappusgrass (Maverick)	10% 0.6	Sand Dropseed (Nueces)	10% 0.2
	Texas Grama (Atascosa)	10% 1.0	Hooded Windmillgrass (Mariah)	10% 0.2
	Multiflower False Rhodes Grass (Hidalgo)	05% 0.1	Pink Pappusgrass (Maverick)	10% 0.6
			Whiplash Pappusgrass (Webb)	10% 0.6
	Hooded Windmillgrass (Mariah)	10% 0.2	Multiflower False Rhodes Grass (Hidalgo)	10% 0.2
	Arizona Cottontop (La Salle)	10% 0.4		
	Sand Dropseed (Nueces)	05% 0.1	Arizona Cottontop (La Salle)	10% 0.4
	Whiplash Pappusgrass (Webb)	10% 0.6		
22 (Laredo)	Sideoats Grama (South Texas)	15% 2.25	Slender Grama (Dilley)	15% 1.5
	Pink Pappusgrass (Maverick)	10% 0.6	Hairy Grama (Chaparral)	15% 0.6
	Halls Panicum (Oso)	10% 0.2	Hooded Windmillgrass (Mariah)	10% 0.2
	Plains Bristlegrass (Catarina Blend)	10% 0.6	Red Lovegrass (Duval)	10% 0.2
	White Tridens (Guadalupe)	10% 0.2	Sand Dropseed (Nueces)	10% 0.2
	Whiplash Pappusgrass (Webb)	10% 0.6	Pink Pappusgrass (Maverick)	10% 0.6
	Shortspike Windmillgrass (Welder)	05% 0.1	Arizona Cottontop (La Salle)	10% 0.4
	Texas Grama (Atascosa)	10% 1.0	Little Bluestem (Carrizo)	05% 0.75
	False Rhodes Grass (Kinney)	10% 0.2	Sideoats Grama (South Texas)	10% 1.5
	Hooded Windmillgrass (Mariah)	10% 0.2	Shortspike Windmillgrass (Welder)	05% 0.1
23 (Brownwood)	Sideoats Grama (Haskell)	15% 1.5	Green Sprangletop (Van Horn)	15% 0.6
	Hooded Windmillgrass (Burnet)	15% 0.3	Sand Dropseed (Taylor)	15% 0.3
	White Tridens (Guadalupe)	15% 0.3	Sideoats Grama (Haskell)	10% 1.0
	Texas Grama (Atascosa)	10% 1.0	Little Bluestem (OK Select)	15% 1.05
	Little Bluestem (OK Select)	10% 0.7	Silver Bluestem (Santiago)	10% 0.4
	Buffalograss (Texoka)	10% 1.5	Hooded Windmillgrass (Burnet)	10% 0.2
	Silver Bluestem (Santiago)	10% 0.4	Shortspike Windmillgrass (Welder)	10% 0.2
	Shortspike Windmillgrass (Welder)	05% 0.1	Hairy Grama (Chaparral)	10% 0.4
	Sand Dropseed (Taylor)	05% 0.1	Sand Lovegrass (Mason)	05% 0.2
	Green Sprangletop (Van Horn)	05% 0.2		

Table 1 (continued)
Permanent Rural Seeding Mix

District	Clay Soils Species, Percent, and Rate (lb. PLS per acre)		Sandy Soils Species, Percent, and Rate (lb. PLS per acre)	
24 (El Paso)	Green Sprangletop (Van Horn)	10% 0.4	Sand Dropseed (Taylor)	20% 0.4
	Sideoats Grama (Brewster)	10% 1.0	Sideoats Grama (Brewster)	15% 1.5
	Whiplash Pappusgrass (Permian)	10% 0.6	Green Sprangletop (Van Horn)	15% 0.6
	Silver Bluestem (Santiago)	10% 0.4	Hooded Windmillgrass (Burnet)	10% 0.2
	Blue Grama (Hachita)	10% 0.4	Blue Grama (Hachita)	10% 0.4
	Galleta Grass (Viva)	10% 0.6	Hairy Grama (Chaparral)	05% 0.2
	Alkali Sacaton (Saltalk)	10% 0.2	Spike Dropseed (Potter)	10% 0.1
	Arizona Cottontop (La Salle)	10% 0.4	Little Bluestem (Pastura)	05% 0.5
	Plains Bristlegrass (Catarina Blend)	10% 0.4	Galleta grass (Viva)	10% 0.6
	False Rhodes Grass (Kinney)	10% 0.2		
25 (Childress)	Sideoats Grama (Haskell)	15% 1.5	Sideoats Grama (Haskell)	15% 1.5
	Hooded Windmillgrass (Burnet)	15% 0.3	Green Sprangletop (Van Horn)	10% 0.4
	Blue Grama (Hachita)	10% 0.4	Sand Dropseed (Taylor)	10% 0.2
	Buffalograss (Texoka)	10% 1.5	Hooded Windmillgrass (Burnet)	10% 0.2
	Galleta Grass (Viva)	10% 0.6	Arizona Cottontop (La Salle)	10% 0.4
	Silver Bluestem (Santiago)	15% 0.6	Blue Grama (Hachita)	10% 0.4
	White Tridens (Guadalupe)	10% 0.2	Little Bluestem (OK select)	10% 1.0
	Green Sprangletop (Van Horn)	05% 0.2	Galleta Grass (Viva)	10% 0.6
	Western Wheatgrass (Barton)	05% 1.5	Sand Lovegrass (Mason)	05% 0.15
	Canada Wildrye (Lavaca)	05% 1.0	Canada Wildrye (Lavaca)	10% 2.0

Table 2
Permanent Urban Seeding Mix

District	Clay Soils Species and Rates (lb. PLS per acre)		Sandy Soils Species and Rates (lb. PLS per acre)	
1 (Paris)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
2 (Fort Worth)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sideoats Grama (El Reno)	3.6
	Bermudagrass	2.4	Bermudagrass	2.1
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
3 (Wichita Falls)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	4.5	Sideoats Grama (El Reno)	3.6
	Bermudagrass	1.8	Bermudagrass	1.8
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.4
4 (Amarillo)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sideoats Grama (El Reno)	2.7
	Blue Grama (Hachita)	1.2	Blue Grama (Hachita)	0.9
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.4
			Buffalograss (Texoka)	1.6
5 (Lubbock)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sideoats Grama (El Reno)	2.7
	Blue Grama (Hachita)	1.2	Blue Grama (Hachita)	0.9
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.4
			Buffalograss (Texoka)	1.6
6 (Odessa)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Sideoats Grama (Haskell)	2.7
	Blue Grama (Hachita)	1.2	Sand Dropseed (Borden Co.)	0.4
	Buffalograss (Texoka)	1.6	Blue Grama (Hachita)	0.9
			Buffalograss (Texoka)	1.6
7 (San Angelo)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	7.2	Sideoats Grama (Haskell)	3.2
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
			Blue Grama (Hachita)	0.9
			Buffalograss (Texoka)	1.6

Table 2 (continued)
Permanent Urban Seeding Mix

District	Clay Soils Species and Rates (lb. PLS per acre)		Sandy Soils Species and Rates (lb. PLS per acre)	
8 (Abilene)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Sand Dropseed (Borden Co.)	0.3
	Blue Grama (Hachita)	1.2	Sideoats Grama (Haskell)	3.6
	Buffalograss (Texoka)	1.6	Blue Grama (Hachita)	0.8
			Buffalograss (Texoka)	1.6
9 (Waco)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	1.8	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Sideoats Grama (Haskell)	4.5	Sand Dropseed (Borden Co.)	0.4
10 (Tyler)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
11 (Lufkin)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
12 (Houston)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	4.5	Bermudagrass	5.4
	Bermudagrass	2.4		
13 (Yoakum)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	4.5	Bermudagrass	5.4
	Bermudagrass	2.4		
14 (Austin)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	4.8
	Sideoats Grama (South Texas)	3.6	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6		
15 (San Antonio)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Bermudagrass	4.8
	Bermudagrass	2.4	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6		
16 (Corpus Christi)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Bermudagrass	4.8
	Bermudagrass	2.4	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6		
17 (Bryan)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
18 (Dallas)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Bermudagrass	2.4	Sand Dropseed (Borden Co.)	0.4
19 (Atlanta)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
20 (Beaumont)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	2.4	Bermudagrass	5.4
	Sideoats Grama (Haskell)	4.5		
21 (Pharr)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Bermudagrass	2.4	Sand Dropseed (Borden Co.)	0.4
22 (Laredo)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	4.5	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	3.6
	Bermudagrass	1.8	Sand Dropseed	0.4
23 (Brownwood)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Buffalograss (Texoka)	1.6
	Bermudagrass	1.2	Bermudagrass	3.6
	Blue Grama (Hachita)	0.9	Sand Dropseed (Borden Co.)	0.4

Table 2 (continued)
Permanent Urban Seeding Mix

District	Clay Soils Species and Rates (lb. PLS per acre)		Sandy Soils Species and Rates (lb. PLS per acre)	
24 (El Paso)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (South Texas)	3.6	Buffalograss (Texoka)	1.6
	Blue Grama (Hachita)	1.2	Sand Dropseed (Borden Co.)	0.4
	Buffalograss (Texoka)	1.6	Blue Grama (Hachita)	1.8
25 (Childress)	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Sand Dropseed (Borden Co.)	0.4
	Blue Grama (Hachita)	1.2	Buffalograss (Texoka)	1.6
	Buffalograss (Texoka)	1.6	Bermudagrass	1.8

Table 3
Temporary Cool Seeding Mix

District	All Soils Species and Rates (lb. PLS per acre)	
1 (Paris), 2 (Fort Worth), 3 (Wichita Falls), 4 (Amarillo), 5 (Lubbock), 6 (Odessa), 7 (San Angelo), 8 (Abilene), 18 (Dallas), 19 (Atlanta), 23 (Brownwood), 24 (El Paso), 25 (Childress)	Oats	30.0
	Wheat	30.0
	Little Barley	5.0
	Western Wheatgrass	5.0
9 (Waco), 10 (Tyler), 11 (Lufkin), 12 (Houston), 13 (Yoakum), 14 (Austin), 15 (San Antonio), 16 (Corpus Christi), 17 (Bryan), 20 (Beaumont), 21 (Pharr), 22 (Laredo)	Oats	40.0
	Little Barley	5.0

Table 4
Temporary Warm Seeding Mix

District	All Soils Species and Rates (lb. PLS per acre)	
All	Brownton Millet	20.0

Table 5
Flower Seeding Mix

District	All Soils Species and Rates (lb. PLS per acre)	
1 (Paris), 10 (Tyler), 11 (Lufkin), 12 (Houston), 17 (Bryan), 19 (Atlanta), 20 (Beaumont)	Herbaceous Mimosa (Crockett)	1.5
	Illinois Bundleflower (Sabine)	1.5
	Thickspike Gayfeather (Pineywoods)	1.5
	Purple Prairie Clover (Kaneb)	0.6
	Rio Grange Clammyweed (Zapata)	2.0
2 (Fort Worth), 3 (Wichita Falls), 4 (Amarillo), 5 (Lubbock), 6 (Odessa), 7 (San Angelo), 8 (Abilene), 9 (Waco), 18 (Dallas), 23 (Brownwood), 25 (Childress)	Engelmann Daisy (Eldorado)	1.5
	Awnless Bushsunflower (Plateau)	1.5
	Partridge Pea	1.5
	Illinois Bundleflower (Sabine)	1.5
	Rio Grande Clammyweed (Zapata)	2.0
13 (Yoakum), 14 (Austin), 15 (San Antonio), 16 (Corpus Christi, 21 (Pharr), 22 (Laredo), 24 (El Paso)	Indian Blanket (Fuego)	1.0
	Awnless Bushsunflower (Venado)	0.4
	Prostrate Bundleflower (Balli)	1.5
	Orange Zexmenia (Goliad)	0.4
	Rio Grande Clammyweed (Zapata)	2.0

2.2. **Fertilizer**. Use fertilizer in accordance with Article 166.2., “Materials.”

2.3. **Water**. Use water in accordance with Article 168.2, “Materials.”

2.4. **Highly Erodible Land (HEL)**. Add Bermudagrass to the mix shown in Table 1 at 1.0 PLS per acre if shown on the plans.

2.5. **Mulch**.

2.5.1. **Straw or Hay Mulch**. Use straw or hay mulch in accordance with Section 162.2.5., "Mulch."

2.5.2. **Hydro Mulch**. Use mulches that are on the Approved Products List. Submit one full set of manufacturer's literature for the selected material. Keep mulch dry until applied. Do not use molded or rotted material.

2.6. **Tacking Methods**. Use a tacking agent applied in conformance with the manufacturer's recommendations or by a crimping method on all straw or hay mulch operations. Use tacking agents as approved or as shown on the plans.

3. CONSTRUCTION

Scarify the area to a depth of 4 in. before placing the seed, unless otherwise directed. Use approved equipment to vertically track the seedbed as shown on the plans or as directed. Scarify the seedbed to a depth of 4 in. or mow the area before placement of the permanent seed mix when performing permanent seeding after an established temporary seeding. Plant the seed mix specified and mulch, if required, after the area has been completed to lines and grades as shown on the plans.

Apply fertilizer in accordance with Article 166.3., "Construction." Grass seed, flower seed, and fertilizer may be distributed simultaneously during dry seeding operations, provided each component is applied at the specified rate. Do not combine fertilizer and seed in the same slurry during hydro mulch seeding operations. Apply half of the required fertilizer during the temporary seeding operation and the other half during the permanent seeding operation when temporary and permanent seeding are both specified for the same area.

Water the seeded areas at the rates and frequencies as shown on the plans or as directed.

Distribute the seed or seed mixture uniformly over the areas shown on the plans. Provide equipment with an agitator or method to maintain a uniform seed mixture during distribution.

3.1. **Planting Season**.

3.1.1. **Temporary Seed**. Plant cool seeding mix September 1–January 31. Plant warm seeding mix February 1–August 30.

3.1.2. **Permanent Seed**. End planting season for all Districts by May 15. Begin planting season for each District based on the following.

- **January 15**. 1 (Paris), 10 (Tyler), 11 (Lufkin), 12 (Houston), 13 (Yoakum), 15 (San Antonio), 16 (Corpus Christi), 17 (Bryan), 19 (Atlanta), 20 (Beaumont), 21 (Pharr), and 22 (Laredo).
- **February 1**. 2 (Fort Worth), 3 (Wichita Falls), 6 (Odessa), 7 (San Angelo), 8 (Abilene), 9 (Waco), 14 (Austin), 18 (Dallas), 23 (Brownwood), 24 (El Paso), and 25 (Childress).
- **February 15**. 4 (Amarillo) and 5 (Lubbock).

3.2. **Broadcast Seeding**. Use hand or mechanical distribution or hydro-seeding on top of the soil unless otherwise directed. Apply the mixture to the area to be seeded within 30 min. of placement of components in the equipment when seed and water are to be distributed as a slurry during hydro-seeding. Roll the planted area using a light roller or other suitable equipment. Roll sloped areas along the contour of the slopes.

3.3. **Straw or Hay Mulch Seeding**. Plant seed in accordance with Section 164.3.2., "Broadcast Seeding." Apply straw or hay mulch uniformly over the seeded area immediately after planting the seed or seed mixture. Apply straw or hay mulch in accordance with Section 164.3.6., "Straw or Hay Mulching." Apply tack in accordance with Section 164.2.6., "Tacking Methods."

3.4. **Hydro Mulch Seeding**. Plant seed in accordance with Section 164.3.2, “Broadcast Seeding,” before placing mulch. Apply mulch uniformly over the seeded area immediately after planting the seed or seed mixture at the following rates.

- **Sandy Soils with Slopes of 3:1 or Less**. 2,500 lb. per acre.
- **Sandy Soils with Slopes Greater than 3:1**. 3,000 lb. per acre.
- **Clay Soils with Slopes of 3:1 or Less**. 2,000 lb. per acre.
- **Clay Soils with Slopes Greater than 3:1**. 2,300 lb. per acre.

Mulch rates are based on dry weight of mulch per acre. Mix mulch and water to make a slurry and apply uniformly over the seeded area using suitable equipment.

3.5. **Drill Seeding**. Plant at a depth of 1/4–1/3 in. using a pasture- or rangeland-type drill unless otherwise directed. Plant seed along the contour of the slopes.

3.6. **Straw or Hay Mulching**. Apply straw or hay mulch uniformly over the area as shown on the plans. Apply straw mulch at 2–2.5 ton per acre. Apply hay mulch at 1.5–2 ton per acre. Use a tacking method over the mulched area in accordance with Section 164.2.6., “Tacking Methods.”

4. MEASUREMENT

This Item will be measured by the square yard or by the acre.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Broadcast Seeding (Perm)” of the rural or urban seed mixture and sandy or clay soil specified, “Broadcast Seeding (Temp)” of warm or cool season specified, “Straw or Hay Mulch Seeding (Perm)” of the rural or urban seed mixture and sandy or clay soil specified, “Straw or Hay Mulch Seeding (Temp)” of warm or cool season specified, “Hydro Mulch Seeding (Perm)” of the rural or urban seed mixture and sandy or clay soil specified, “Hyrdro Mulch Seeding (Temp)” of warm or cool season specified, “Drill Seeding (Perm)” of the rural or urban seed mixture and sandy or clay soil specified, “Drill Seeding (Temp)” of warm or cool season specified, and “Straw or Hay Mulching.” This price is full compensation for furnishing materials, seeding mix, flower seeding mix, HEL seeding mix, water for hydro-seeding and hydro-mulching operations, mowing, tacking, labor, equipment, tools, supplies, and incidentals.

Fertilizer will not be paid for directly, but will be subsidiary to this Item.

Water for irrigating the seeded area, when specified, will be paid for under Item 168, “Vegetative Watering.”

Item 168
Vegetative Watering

1. DESCRIPTION

Provide and distribute water to promote growth of vegetation as directed.

2. MATERIALS

Use water that is clean and free of industrial wastes and other substances harmful to the growth of vegetation.

3. CONSTRUCTION

Apply water when directed. Furnish and operate equipment to distribute water at a uniform and controllable rate. Ensure that watering does not erode soil or plantings. Apply water in the required quantity where shown on the plans or as directed.

4. MEASUREMENT

This Item will be measured by the 1,000 gal. (TGL) of water as applied.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Vegetative Watering." This price is full compensation for furnishing and operating watering equipment and measuring devices and for furnishing and applying water, including hauling, equipment, labor, and incidentals.

Item 204
Sprinkling

1. DESCRIPTION

Apply water for dust control, earthwork, or base construction.

2. MATERIALS

Furnish water free of industrial wastes and other objectionable matter.

3. EQUIPMENT

Use sprinklers and spray bars equipped with positive and rapidly working cut-off valves.

4. CONSTRUCTION

Apply water at a uniform rate and in the required quantity, or as directed.

5. MEASUREMENT

This Item will be measured by the 1,000 gal. (TGL) of water as applied.

6. PAYMENT

Unless sprinkling is specified as a pay item, the work performed and materials furnished in accordance with this Item will not be measured or paid for directly, but will be subsidiary to pertinent Items.

When sprinkling is specified on the plans as a pay item, the work performed and water furnished will be paid for at the unit price bid for “Sprinkling (Base),” “Sprinkling (Earthwork),” or “Sprinkling (Dust Control).” This price is full compensation for furnishing and applying water; furnishing and operating sprinklers and measuring devices; and hauling, equipment, labor, fuel, materials, tools, and incidentals.

Item 210
Rolling

1. DESCRIPTION

Compact embankment, subgrade, base, surface treatments, broken concrete pavement, or asphalt pavement using rollers. Break up asphalt mats, pit run material, or base materials.

2. EQUIPMENT

Use any type of roller to meet the production rates and quality requirements of the Contract unless otherwise shown on the plans or directed. Use equipment that meets the requirements of this Item when specific types of equipment are required. The Engineer may allow the use of rollers that operate in one direction only when turning does not affect the quality of work or encroach on traffic.

Table 1
Roller Requirements[1]

Roller Type	Materials to be Compacted	Load (ton)	Contact Pressure	Roller Speed (mph)
Steel wheel	Embankment, subgrade, base, asphalt concrete	≥10	≥325 lb. per inch of wheel width	2–3
Tamping	Embankment, subgrade	–	125–550 psi per tamping foot	2–3
Heavy tamping	Embankment, subgrade	–	≥550 psi per tamping foot	2–3
Vibratory	Embankment, subgrade, base, asphalt concrete	Type A < 6 Type B > 6 Type C as shown on the plans	Per equipment specification and as approved	As approved
Light pneumatic	Embankment, subgrade, surface treatment	4.5–9.0	≥45 psi	2–6
	Asphalt concrete			4–12
Medium pneumatic	Embankment, subgrade, base, surface treatment	12–25	≥80 psi, as directed	2–6
	Asphalt concrete			4–12
Heavy pneumatic	Embankment, subgrade, base, previously broken concrete pavement, other pavements	≥25	≤150 psi	2–6
Grid	Embankment, breaking up existing asphalt mats or base	5–13	–	2–3

1. Unless otherwise specified in the Contract.

2.1. **Static Steel Wheel Rollers**. Furnish single, double, or triple steel wheel, self-propelled power rollers weighing at least 10 ton capable of operating in a forward and backward motion. Ensure all wheels are flat. The Contractor may use vibratory rollers in the static mode when static steel wheel rollers are required.

For single steel wheel rollers, pneumatic rear wheels are allowed for embankment, subgrade, and base. Provide rear wheels for triple steel wheel rollers with a minimum diameter of 48 in., a minimum width of 20 in., and a minimum compression of 325 lb. per inch of wheel width.

2.2. **Tamping Rollers**. Furnish self-propelled rollers with at least one self-cleaning metal tamping drum capable of operating in a forward or backward motion with a minimum effective rolling width of 5 ft. Mount drums in a frame so that each drum moves independently of the other for rollers with more than one drum. Operate rollers in static or vibratory mode.

2.2.1. **Tamping Roller (Minimum Requirement)**. Provide tamping feet that exert a static load of 125–550 psi and project at least 3 in. from the surface of the drum for all tamping rollers except for heavy tamping rollers.

2.2.2. **Heavy Tamping Roller**. Provide tamping rollers that have:

- two metal tamping drums, rolls, or shells, each with a 60-in. minimum diameter and a 5-ft. minimum width; or
- one rear and two forward drums, each with a 60-in. minimum diameter. Arrange drums so that the rear drum compacts the space between the two forward drums and the minimum overall rolling width is 10 ft.

Equip drums with tamping feet that:

- project at least 7 in. from the drum surface,
- have an area of 7–21 sq. in.,
- are self-cleaning,
- exert a static load of at least 550 psi, and
- are spaced at 1 tamping foot per 0.65–0.70 sq. ft. of drum area.

2.3. **Vibratory Rollers**. Furnish self-propelled rollers with at least one drum equipped to vibrate. Select and maintain amplitude and frequency settings per manufacturer's specifications to deliver maximum compaction without material displacement or shoving, as approved. Furnish the equipment manufacturer's specifications concerning settings and controls for amplitude and frequency. Operate rollers at speeds that will produce at least 10 blows per foot unless otherwise shown on the plans or approved. Pneumatic rear wheels are allowed for embankment, subgrade, and base. Equip each vibrating drum with:

- separate frequency and amplitude controls,
- controls to manually start and stop vibration, and
- a mechanism to continuously clean the face of the drum.

For asphalt-stabilized base and asphalt concrete pavement, furnish a roller that also can:

- automatically reverse the direction of the rotating eccentric weight,
- stop vibration before the motion of the roller stops, and
- thoroughly moisten the drum with water or approved asphalt release agent.

2.3.1. **Drum (Type A)**. Furnish a roller with a static weight less than 6 ton and a vibratory drum.

2.3.2. **Drum (Type B)**. Furnish a roller with a minimum static weight of 6 ton and a vibratory drum.

2.3.3. **Drum (Type C)**. Furnish a roller as shown on the plans.

2.4. **Pneumatic Tire Rollers**. Pneumatic tire rollers consist of rubber tire wheels on axles mounted in a frame with either a loading platform or body suitable for ballast loading. Arrange the rear tires to cover the gaps between adjacent tires of the forward group. Furnish rollers capable of forward and backward motion. Compact asphalt pavements and surface treatments using a roller equipped with smooth-tread tires. Compact without damaging the surface. Moisten the wheels with water or an approved asphalt release agent when necessary.

Select and maintain the operating load and tire air pressure within the range of the manufacturer's charts or tabulations to attain maximum compaction throughout the lift, as approved. Furnish the manufacturer's chart or tabulations showing the contact areas and contact pressures for the full range of tire inflation pressures and for the full range of loadings for the tires furnished. Maintain individual tire inflation pressures within 5 psi of each other. Provide uniform compression under all tires.

2.4.1. **Light Pneumatic Tire**. Furnish a unit:

- with at least nine pneumatic tires,
- with an effective rolling width of approximately 5 ft.,
- capable of providing a total uniform load of 4.5–9 ton, and
- with tires capable of maintaining a minimum ground contact pressure of 45 psi.

2.4.2. **Medium Pneumatic Tire**. Furnish a unit:

- with at least seven pneumatic tires,
- with an effective rolling width of approximately 7 ft.,
- capable of providing a total uniform load of 12–25 ton, and
- with tires capable of maintaining a minimum ground contact pressure of 80 psi or 90 psi as directed.

2.4.3. **Heavy Pneumatic Tire**. Furnish a unit:

- with at least four pneumatic-tired wheels mounted on axles carrying no more than two wheels,
- with wheels arranged to carry approximately equal loads on uneven surfaces,
- with a width between 8 and 10 ft. that can turn 180° in the crown width,
- capable of providing a total uniform load of at least 25 ton,
- with tires capable of maintaining a maximum ground contact pressure of 150 psi, and
- with liquid-filled tires inflated to such a level that liquid will flow from the valve stem when the stem is in the uppermost position.

2.5. **Grid Rollers**. Furnish rollers that have two cylindrical cages with a minimum diameter of 66 in. and a minimum width of 32 in. Mount cages in a rigid frame with weight boxes. Use a cage surface of cast or welded steel fabric grid with bars 1-1/2 in. wide, spaced on 5-in. centers in each direction, that undulate approximately 1 in. between the high and low points.

Furnish rollers capable of providing a total load of 5–13 ton and capable of being operated in a forward or backward motion.

2.6. **Alternate Equipment**. The Contractor may use alternate compaction equipment that produces results equivalent to the specified equipment as approved. Discontinue the use of the alternate equipment and furnish the specified equipment if the desired results are not achieved.

3. CONSTRUCTION

Perform this work in conformance with the applicable Items using equipment and roller speeds shown in Table 1. Use only rubber-tired equipment to push or pull compaction equipment on base courses. Use equipment that does not damage material being rolled.

4. MEASUREMENT AND PAYMENT

The work performed, materials furnished, equipment, labor, tools, and incidentals will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Item 247
Flexible Base

1. DESCRIPTION

Construct a foundation course composed of flexible base.

2. MATERIALS

Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications. Notify the Engineer of the proposed material sources and of changes to material sources. The Engineer may sample and test project materials at any time before compaction throughout the duration of the project to assure specification compliance.

2.1. **Aggregate**. Furnish aggregate of the type and grade shown on the plans and meeting the requirements shown in Table 1. Each source must meet Table 1 requirements for liquid limit, plasticity index, and wet ball mill for the grade specified. Do not use additives, such as but not limited to lime, cement, or fly ash to modify aggregates to meet the requirements of Table 1, unless shown on the plans.

Unless otherwise shown on the plans, the unconfined compressive strength is waived when the flexible base material meets the #200 sieve requirement. When the #200 sieve requirement does not meet the specification in Table 1, the unconfined compressive strength is required.

Table 1
Material Requirements

Property	Test Method	Grade 1–2[3]	Grade 3	Grade 4	Grade 5
Master gradation sieve size (cumulative % retained)	Tex-110-E			As shown on the plans	
2-1/2"		0	0		0
1-3/4"		0–10	0–10		0–5
7/8"		10–35	–		10–35
3/8"		30–65	–		35–65
#4		45–75	45–75		45–75
#40		65–90	50–85		70–90
#200[1, 2]		85–95	–		–
Liquid limit, % Max	Tex-104-E	40	40		35
Plasticity index, Max	Tex-106-E	10	12		10
Plasticity index, Min		As shown on the plans	As shown on the plans		As shown on the plans
Wet ball mill, % Max	Tex-116-E	40	–		40
Wet ball mill, % Max increase passing the #40 sieve		20	–		20
Min compressive strength[2], psi	Tex-117-E				
lateral pressure 0 psi		35	–		–
lateral pressure 3 psi		–	–		90
lateral pressure 15 psi		175	–		175

1. The #200 sieve test is only required to meet the waiver of the unconfined compressive strength requirement. The #200 sieve test requirement is only applicable to stockpile samples from Section 247.2.4.
2. Compressive strength and #200 sieve test requirements are waived when the flexible base is mixed with or without existing material and treated with cement, emulsion, foamed asphalt, or lime, unless otherwise shown on the plans.
3. Grade 3 may be substituted for Grade 1–2 or Grade 5 when the flexible base is mixed with or without existing material and treated with cement, emulsion, foamed asphalt, or lime, as approved. Grade 3 flexible base must meet the wet ball mill requirements of Grade 1–2 or Grade 5 as applicable.

2.1.1. **Material Tolerances**. The Engineer may accept material if no more than one of the five most recent gradation tests has an individual sieve outside the specified limits of the gradation. This allowance does not apply to the #200 sieve requirement.

The Engineer may accept material if no more than one of the five most recent liquid limit or plasticity index tests is outside the specified limit. No single failing liquid limit or plasticity index test may exceed the allowable limit by more than 2 percentage points.

2.1.2. **Material Types**. Do not use fillers or binders unless approved. Furnish the type shown on the plans in accordance with the following.

2.1.2.1. **Type A**. Crushed stone produced and graded from oversize quarried aggregate that originates from a single, naturally occurring source. Do not use gravel or multiple sources.

2.1.2.2. **Type B**. Crushed or uncrushed gravel. Blending of two or more sources is allowed.

2.1.2.3. **Type C**. Crushed gravel with a minimum of 60% of the particles retained on a No. 4 sieve with two or more crushed faces as determined in accordance with Tex-460-A, Part I. Blending of two or more sources is allowed.

2.1.2.4. **Type D**. Type A material or crushed concrete. Crushed concrete containing gravel will be considered Type D material. Crushed concrete must meet the requirements of Section 247.2.1.2.6., "Recycled Material," and be managed in a way to provide for uniform quality. The Engineer may require separate dedicated stockpiles to verify compliance.

2.1.2.5. **Type E**. Caliche, iron ore, or as otherwise shown on the plans.

2.1.2.6. **Recycled Material**. Reclaimed asphalt pavement (RAP) and other recycled materials may be used when shown on the plans. Request approval to blend two or more sources of recycled materials. When RAP is allowed, do not exceed 20% RAP by weight, unless otherwise shown on the plans. The percentage limitations for other recycled materials will be as shown on the plans.

Provide recycled materials, other than RAP, that have a maximum sulfate content of 3,000 ppm when tested in accordance with Tex-145-E. Certify compliance with DMS-11000, "Evaluating and Using Nonhazardous Recyclable Materials Guidelines." In addition, recycled materials must be free of reinforcing steel and other objectionable material and have at most 1.5% deleterious material when tested in accordance with Tex-413-A. The liquid limit, plasticity index, wet ball mill, and compressive strength for all recycled materials are waived. When using RAP, crush RAP so that 100% passes the 2-in. sieve and does not exceed a maximum percent loss from decantation of 5.0% when tested in accordance with Tex-406-A. Test RAP without removing the asphalt. The final product must meet the requirements shown in Table 1 for the grade specified except when the Department requires a specific amount of Department-furnished RAP be added to the blend, unless otherwise shown on the plans.

The Contractor is responsible for uniformly blending the recycled material with the flexible base material to build a stockpile to meet the percentages required. Any Contractor-furnished surplus of recycled materials will remain the property of the Contractor. Remove Contractor-owned recycled materials from the project and dispose of them in accordance with federal, state, and local regulations before project acceptance.

2.2. **Water**. Furnish water free of industrial wastes and other objectionable matter.

2.3. **Material Sources**. Expose the vertical faces of all strata of material proposed for use when non-commercial sources are used. Secure and process the material by successive vertical cuts extending through all exposed strata, when directed.

2.4. **Stockpile Approval**. Stockpile is approved when the Engineer's test results meet the material requirements shown in Table 1.

2.4.1. **Sampling**. The Contractor and the Engineer will sample flexible base from completed stockpiles in accordance with Tex-100-E. Personnel conducting sampling must be certified by the Department-approved soils and base certification program.

Sampling stockpiles may be located at the production site or at the project location. The Contractor will witness the Engineer's sampling and sample the stockpile for their own testing, and label as deemed necessary.

Sample the stockpile for the Engineer when shown on the plans. When the Contractor samples the stockpile for the Engineer, the Engineer must witness the sampling of material designated for the Engineer and the Materials and Tests Division (MTD). The Engineer will label their sampling containers as "Engineer" and "MTD," or as deemed necessary.

The Engineer will take immediate possession of the sample containers for the Engineer and MTD. The Engineer will maintain custody of the samples until all testing and reporting are completed.

2.4.2. **Referee Testing**. Referee testing is applicable for stockpile testing only. MTD is the referee laboratory. MTD may designate a laboratory from the Department's MPL for Commercial Laboratories Approved for Flexible Base Referee Requests as the referee laboratory as deemed necessary. The designated laboratory cannot be performing any testing under this Item for the Engineer or Contractor.

The Contractor may request referee testing when the Engineer's test results fail to meet any of the material requirements shown in Table 1 and the Contractor's sample from Section 2.4.1., "Sampling," for the same failing Department test, passes. The tests must be performed by a laboratory listed on the Department's MPL for Commercial Laboratories Approved for Flexible Base Referee Requests. Submit the request by email within 5 working days after receiving failing test results from the Engineer. Include completed test reports passing the applicable requirements shown in Table 1 in the email.

Record and submit completed test reports electronically on Department-provided templates in their original format meeting the applicable material requirements shown in Table 1. Use Department-provided templates to record and calculate all test data. The Engineer and the Contractor will provide any available test results to the other party when requested.

3. EQUIPMENT

Provide machinery, tools, and equipment necessary for proper execution of the work.

3.1. **Rollers**. Provide rollers in accordance with Item 210, "Rolling." Provide proof rollers in accordance with Item 216, "Proof Rolling," when required.

3.2. **Inertial Profiler**. When ride quality measurement is required, provide a high-speed or lightweight inertial profiler certified at the Texas A&M Transportation Institute. Provide equipment certification documentation. Display a current decal on the equipment indicating the certification expiration date.

4. CONSTRUCTION

Construct each layer uniformly, free of loose or segregated areas, and with the required density and moisture content. Provide a smooth surface that conforms to the typical sections, lines, and grades shown on the plans or as directed.

Stockpile base material temporarily at an approved location before delivery to the roadway. Build stockpiles in layers no greater than 2 ft. thick. Stockpiles must have a total height between 10 and 16 ft. unless otherwise approved. After construction and acceptance of the stockpile in accordance with Section 247.2.4., "Stockpile Approval," loading from the stockpile for delivery is allowed. Load by making successive vertical cuts through the entire depth of the stockpile.

Do not add or remove material from temporary stockpiles that require sampling and testing before delivery, unless otherwise approved. Charges for additional sampling and testing required as a result of adding or removing material will be deducted from the Contractor's estimates.

Haul approved flexible base in clean trucks. Deliver the required quantity to each 100-ft. station or designated stockpile site as shown on the plans. Prepare stockpile sites as directed. When delivery is to the 100-ft. station, manipulate in conformance with the applicable Items.

4.1. **Preparation of Subgrade or Existing Base**. Remove or scarify existing asphalt concrete pavement in accordance with Item 105, "Removing Treated and Untreated Base and Asphalt Pavement," when shown on the plans or as directed. Shape the subgrade or existing base to conform to the typical sections shown on the plans or as directed.

When new base is required to be mixed with existing base, deliver, place, and spread the new flexible base in the required amount per station. Manipulate and thoroughly mix the new base with existing material to provide a uniform mixture to the specified depth before shaping.

Proof roll the roadbed in accordance with Item 216 before pulverizing or scarifying when shown on the plans or directed. Correct soft spots as directed.

4.2. **Placing**. Spread and shape flexible base into a uniform layer using an approved spreader the same day as delivered unless otherwise approved. Construct layers to the thickness shown on the plans. Maintain the shape of the course. Control dust by sprinkling, as directed. Correct or replace segregated areas as directed at no additional expense to the Department.

Place successive base courses and finish courses using the same construction methods required for the first course.

4.3. **Compaction**. Compact using density control unless otherwise shown on the plans. Multiple lifts are permitted when shown on the plans or approved. Bring each layer to the moisture content directed. When necessary, sprinkle the material in accordance with Item 204, "Sprinkling." Maintain moisture during compaction within ±2.0% of the optimum moisture content as determined in accordance with Tex-113-E.

Begin rolling longitudinally at the sides and proceed toward the center, overlapping on successive trips by at least 1/2 the width of the roller unit. Begin rolling at the low side and progress toward the high side on superelevated curves. Offset alternating trips of the roller. Operate rollers at a speed between 2 and 6 mph as directed.

Rework, recompact, and refinish material that fails to meet or that loses required moisture, density, stability, or finish requirements before the next course is placed or the project is accepted. Continue work until specification requirements are met. Perform the work at no additional expense to the Department.

Before final acceptance, the Engineer will select the locations of tests and measure the flexible base depth in accordance with Tex-140-E. Correct areas deficient by more than 1/2 in. in thickness by scarifying, adding material as required, reshaping, recompacting, and refinishing at the Contractor's expense.

4.3.1. **Ordinary Compaction**. Roll using approved compaction equipment as directed. Correct irregularities, depressions, and weak spots immediately by scarifying the areas affected, adding or removing approved material as required, reshaping, and recompacting.

4.3.2. **Density and Moisture Control**. Compact to a minimum of 100% of the maximum dry density and within ±2.0% of the optimum moisture content as determined in accordance with Tex-113-E, unless otherwise shown on the plans. Provide the Engineer with the beginning and ending station numbers of the area completed for testing. The Engineer will determine roadway density and moisture content of completed sections in accordance with Tex-115-E, Part I. The Engineer will determine random locations for testing in accordance with Tex-115-E, Part IV. Do not achieve density by drying the material after compaction.

When the density is less than 100% of the maximum dry density, the Engineer may perform additional testing to determine the extent of the area to correct. The Engineer may accept the section if no more than one of the five most recent density tests is below the specified density and the failing test is no more than 3 pcf below the specified density.

4.3.3. **Miscellaneous and Small Areas**. Miscellaneous areas are those that typically involve handwork or discontinuous paving operations, such as temporary detours, driveways, mailbox turnouts, crossovers, gores, spot level-up areas, and other similar areas. Miscellaneous and small areas are not subject to density testing but may be tested as directed.

4.4. **Finishing.** After completing compaction, clip, skin, or tight-blade the surface using a maintainer or subgrade trimmer to a depth of approximately 1/4 in. Remove loosened material and dispose of it at an approved location. Seal the clipped surface immediately by rolling using a pneumatic tire roller until a smooth surface is attained. Add small increments of water as needed during rolling. Shape and maintain the course and surface in conformity with the typical sections, lines, and grades as shown on the plans or as directed.

Correct grade deviations greater than 1/4 in. in 16 ft. measured longitudinally. Correct grade deviations greater than 1/4 in. over the entire width of the cross-section in areas where surfacing is to be placed. Correct by loosening and adding or removing material. Reshape and recompact in accordance with Section 247.4.3., "Compaction."

4.5. **Curing**. Cure the finished section until the moisture content is at least 2 percentage points below optimum or as directed before applying the next successive course or prime coat.

4.6. **Ride Quality.** Measurement of ride quality only applies to the final travel lanes that receive a one- or two-course surface treatment for the final riding surface, unless otherwise shown on the plans. Measure the ride quality of the base course either before or after the application of the prime coat, as directed, and before placement of the surface treatment. Use a certified profiler operator listed on the Department's MPL. When requested, furnish the Engineer with documentation for the person certified to operate the profiler.

Provide all profile data to the Engineer in electronic data files within 3 days of measuring the ride quality using the format specified in Tex-1001-S. The Engineer will use Department software to evaluate longitudinal profiles to determine areas requiring corrective action. Correct 0.1-mi. sections with an average international roughness index (IRI) value greater than 100 in. per mile to an IRI value of 100 in. per mile or less, unless otherwise shown on the plans. Reprofile and correct sections that fail to maintain ride quality before the placement of the surface treatment, as directed. Unless ride deterioration is due to environmental impact, traffic, or other incidents outside the Contractor's control, perform this work at no additional expense to the Department, as approved.

5. MEASUREMENT

Flexible base will be measured as follows.

- **Flexible Base (Complete in Place)**. The ton, square yard, or any cubic yard method.
- **Flexible Base (Roadway Delivery)**. The ton or any cubic yard method.
- **Flexible Base (Stockpile Delivery)**. The ton, cubic yard in vehicle, or cubic yard in stockpile.

Measurement by the cubic yard in final position and square yard is a plans quantity measurement. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

Measurement is further defined for payment as follows.

5.1. **Cubic Yard in Vehicle**. By the cubic yard in vehicles of uniform capacity at the point of delivery.

5.2. **Cubic Yard in Stockpile**. By the cubic yard in the final stockpile position, by the method of average end areas, or as shown on the plans.

5.3. **Cubic Yard in Final Position**. By the cubic yard in the completed and accepted final position. The volume of base course is computed in place by the method of average end areas between the original subgrade or existing base surfaces and the lines, grades, and slopes of the accepted base course, or as shown on the plans.

5.4. **Square Yard**. By the square yard of surface area in the completed and accepted final position. The surface area of the base course is based on the width of flexible base, or as shown on the plans.

5.5. **Ton**. By the ton of dry weight in vehicles as delivered. The dry weight is determined by deducting the weight of the moisture in the material at the time of weighing from the gross weight of the material. The Engineer will determine the moisture content in the material in accordance with Tex-103-E from samples taken at the time of weighing.

When material is measured in trucks, the weight of the material will be determined on certified scales, or the Contractor must provide a set of standard platform truck scales at an approved location. Scales must meet the requirements of Item 520, "Weighing and Measuring Equipment."

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the types of work described below. No additional payment will be made for thickness or width exceeding that shown on the typical section or provided on the plans for cubic yard in the final position or square yard measurement.

Sprinkling and rolling, except proof rolling, will not be paid for directly, but will be subsidiary to this Item unless otherwise shown on the plans. When proof rolling is shown on the plans or directed, it will be paid for in accordance with Item 216.

Where subgrade is constructed under this Contract, correction of soft spots in the subgrade will be at the Contractor's expense. Where subgrade is not constructed under this Contract, correction of soft spots in the subgrade will be paid in conformance with pertinent Items or in accordance with Article 4.4., "Changes in the Work."

6.1. **Flexible Base (Complete in Place)**. Payment will be made for the type and grade specified. For cubic yard measurement, "In Vehicle," "In Stockpile," or "In Final Position" will be specified. For square yard measurement, a depth will be specified. This price is full compensation for furnishing materials, temporary stockpiling, assistance provided in stockpile sampling and operations to level stockpiles for measurement, loading, hauling, delivery of materials, spreading, blading, mixing, shaping, placing, compacting, reworking, finishing, correcting locations where thickness is deficient, curing, furnishing scales and labor for weighing and measuring, equipment, labor, tools, and incidentals.

6.2. **Flexible Base (Roadway Delivery)**. Payment will be made for the type and grade specified. For cubic yard measurement, "In Vehicle," "In Stockpile," or "In Final Position" will be specified. The unit price bid will not include processing at the roadway. This price is full compensation for furnishing materials, temporary stockpiling, assistance provided in stockpile sampling and operations to level stockpiles for measurement, loading, hauling, delivery of materials, furnishing scales and labor for weighing and measuring, equipment, labor, tools, and incidentals.

6.3. **Flexible Base (Stockpile Delivery)**. Payment will be made for the type and grade specified. For cubic yard measurement, "In Vehicle" or "In Stockpile" will be specified. The unit price bid will not include processing at the roadway. This price is full compensation for furnishing and disposing of materials, preparing the stockpile area, temporary or permanent stockpiling, assistance provided in stockpile sampling and operations to level

stockpiles for measurement, loading, hauling, delivery of materials to the stockpile, furnishing scales and labor for weighing and measuring, equipment, labor, tools, and incidentals.

Item 310
Prime Coat

1. DESCRIPTION

Prepare and treat existing or newly constructed surface with an asphalt binder or other specialty prime coat binder material. Apply blotter material as required.

2. MATERIALS

2.1. **Binder**. Use material of the type and grade shown on the plans in accordance with Item 300, "Asphalts, Oils, and Emulsions."

2.2. **Blotter**. Use either base course sweepings obtained from cleaning the base or native sand as blotter materials unless otherwise shown on the plans or approved.

3. EQUIPMENT

Provide applicable equipment in accordance with Article 316.3., "Equipment."

4. CONSTRUCTION

4.1. **General**. Apply the mixture when the air temperature is at or above 60°F, or above 50°F and rising. Measure the air temperature in the shade away from artificial heat. The Engineer will determine when weather conditions are suitable for application.

Do not permit traffic, hauling, or placement of subsequent courses over freshly constructed prime coats. Maintain the primed surface until placement of subsequent courses or acceptance of the work.

4.2. **Surface Preparation**. Prepare the surface by sweeping or other approved methods. Lightly sprinkle the surface with water before applying bituminous material, when directed, to control dust and ensure absorption.

4.3. **Application**.

4.3.1. **Binder**. The Engineer will select the application temperature within the limits recommended in Item 300, or by the material manufacturer. Apply material within 15°F of the selected temperature, but do not exceed the maximum allowable temperature.

Distribute the material smoothly and evenly at the rate selected by the Engineer. Roll the freshly applied prime coat using a pneumatic-tire roller to ensure penetration when directed.

4.3.2. **Blotter**. Spread blotter material before allowing traffic to use a primed surface. Apply blotter material to primed surface at the specified rate when "Prime Coat and Blotter" is shown on the plans as a bid item or as directed. Apply blotter to spot locations when "Prime Coat" is shown on the plans as a bid item or as directed to accommodate traffic movement through the work area. Remove blotter material before placing the surface. Dispose of blotter material in conformance with applicable state and federal requirements.

5. MEASUREMENT

This Item will be measured by the gallon of binder placed and accepted.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Prime Coat" or "Prime Coat and Blotter" of the type and grade of binder specified. This price is full compensation for cleaning and sprinkling the area to be primed; materials, including blotter material; and rolling, equipment, labor, tools, and incidentals.

Item 316
Seal Coat

1. DESCRIPTION

Construct a surface treatment consisting of one or more applications of a single layer of asphalt material covered with a single layer of aggregate.

2. MATERIALS

Furnish materials of the type and grade shown on the plans in conformance with the following.

2.1. **Asphalt**. Furnish asphalt materials meeting the requirements of Item 300, "Asphalts, Oils, and Emulsions."

Furnish Type II or Type III asphalt-rubber (A-R) binder in accordance with Section 300.2.10., "Asphalt-Rubber Binders," as shown on the plans. Furnish a blend design for approval. Include in the design, at a minimum, the following:

- manufacturer and grade of asphalt cement;
- manufacturer and grade of crumb rubber;
- manufacturer, type, and percentage of extender oil, if used;
- test report pertinent to crumb rubber gradation in accordance with Tex-200-F, Part I;
- design percentage of crumb rubber versus asphalt content;
- blending temperature; and
- test results pertinent to the properties at reaction times of 60, 90, 240, 360, and 1,440 min. in accordance with Section 300.2.10., "Asphalt-Rubber Binders."

Furnish a new A-R blend design if the grade or source for any of the components changes.

If a tack coat is specified when using A-R, unless otherwise shown on the plans or approved, furnish CSS-1H, SS-1H, or a performance-grade (PG) binder with a minimum high-temperature grade of PG 58 for tack coat binder. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use. If required, verify that emulsified asphalt proposed for use meets the minimum residual asphalt percentage specified in Item 300.

2.2. **Aggregate**. Furnish aggregate meeting Item 302, "Aggregates for Surface Treatments," of the type and grade shown on the plans. Unless otherwise shown on the plans, furnish aggregate with a minimum Surface Aggregate Classification B.

2.3. **Materials Selections**. Furnish asphalt and aggregate as shown on the plans.

3. EQUIPMENT

3.1. **Distributor**. Furnish a distributor that will apply the asphalt material uniformly at the specified rate or as directed.

3.1.1. **Transverse Variable Rate**. When a transverse variable rate is shown on the plans, ensure that the nozzles outside the wheel paths will output a predetermined percentage more asphalt material by volume than the nozzles over the wheel paths. Use a dual spray bar distributor as desired to provide for a transverse variable rate.

3.1.2. **Agitation for Asphalt-Rubber**. If using A-R, furnish a distributor capable of keeping the rubber in uniform suspension and adequately mixing the asphalt, rubber, and any additional additives.

3.1.3. **Calibration**.

3.1.3.1. **Transverse Distribution**. Furnish a distributor test report, less than 1 yr. old, when tested in accordance with Tex-922-K, Part III. The Department reserves the right to witness the calibration testing. Notify the Engineer 3 days before calibration testing.

Include the following documentation in the test report:

- the serial number of the distributor,
- a method that identifies the actual nozzle set used in the test, and
- the fan width of the nozzle set at a 12-in. bar height.

When a transverse variable rate is required, and a single spray bar is to be used, perform the test using the type and grade of asphalt material to be used on the project. The Engineer may verify the transverse rate and distribution at any time. If verification does not meet the requirements, correct deficiencies and furnish a new test report.

3.1.3.2. **Tank Volume**. Furnish a volumetric calibration and strap stick for the distributor tank in accordance with Tex-922-K, Part I.

Provide documentation of distributor calibration performed no more than 5 yr. before the date first used on the project. The Engineer may verify calibration accuracy in accordance with Tex-922-K, Part II.

3.1.4. **Computerized Distributor**. When paying for asphalt material by weight, the Engineer may allow use of the computerized distributor display to verify application rates. Verify application rate accuracy at a frequency acceptable to the Engineer.

3.2. **Aggregate Spreader**. Use a continuous-feed, self-propelled spreader to apply aggregate uniformly at the specified rate or as directed. If racked-in aggregate is shown on the plans, furnish a second aggregate spreader for the racked-in aggregate to apply aggregate uniformly at the specified rate.

3.3. **Rollers**. Unless otherwise shown on the plans, furnish light pneumatic-tire rollers in accordance with Item 210, “Rolling.”

3.4. **Broom**. Furnish rotary, self-propelled brooms.

3.5. **Asphalt Storage and Handling Equipment**. When the plan or the Engineer allows storage tanks, furnish a thermometer in each tank to indicate the asphalt temperature continuously. Keep equipment clean and free of leaks. Keep asphalt material free of contamination.

3.6. **Aggregate Haul Trucks**. Unless otherwise approved, use trucks of uniform capacity to deliver the aggregate. Provide documentation showing measurements and calculation in cubic yards. Clearly mark the calibrated level. Truck size may be limited when shown on the plans.

3.7. **Digital Distance-Measuring Instrument**. Furnish a vehicle with a calibrated digital distance-measuring instrument accurate to ±6 ft. per mile.

4. CONSTRUCTION

4.1. **General**. Comply with the seal coat season as shown on the plans. Asphalt and aggregate rates shown on the plans are for estimating purposes only. Adjust the rates for existing conditions as directed.

4.2. **Temporary Aggregate Stockpiles**. The Engineer will approve the location of temporary aggregate stockpiles on the right of way before delivery. Place stockpiles in a manner that will not:

- obstruct traffic or sight distance,
- interfere with the access from abutting property, or
- interfere with roadway drainage.

Locate stockpiles at least 30 ft. from roadway when possible. Sign and barricade as shown on the plans.

4.3. **Aggregate Furnished by the Department**. When shown on the plans, the Department will furnish aggregate to the Contractor without cost. Stockpile locations are shown on the plans.

4.4. **Adverse Weather Conditions**. Do not place surface treatments when, in the Engineer's opinion, general weather conditions are unsuitable. Meet the requirements for air and surface temperature shown below.

4.4.1. **Standard Temperature Limitations**. Apply seal coat when air temperature is above 50°F and rising. Do not apply seal coat when air temperature is 60°F and falling. In all cases, do not apply seal coat when surface temperature is below 60°F.

4.4.2. **Polymer-Modified Asphalt Cement Temperature Limitations**. When using materials described in Section 300.2.2., "Polymer-Modified Asphalt Cement," apply seal coat when air temperature is above 70°F and rising. Do not apply seal coat when air temperature is 80°F and falling. In all cases, do not apply seal coat when surface temperature is below 70°F.

4.4.3. **Asphalt-Rubber Temperature Limitations**. Do not place hot A-R seal coat when, in the Engineer's opinion, general weather conditions are unsuitable. Apply seal coat when the air temperature is 80°F and above, or above 70°F and rising. In all cases, do not apply seal coat when surface temperature is below 70°F.

4.4.4. **Cool Weather Night Air Temperature**. The Engineer reserves the right to review the National Oceanic and Atmospheric Administration (NOAA) weather forecast and determine whether the nightly air temperature is suitable for asphalt placement to prevent aggregate loss.

4.4.5. **Cold Weather Application**. When asphalt application is allowed outside the above temperature restrictions, the Engineer will approve the binder grade and the air and surface temperatures for asphalt material application. Apply seal coat at air and surface temperatures as directed.

4.5. **Mixing Hot A-R Binder**. If using A-R, mix in accordance with the approved blend design required in Section 316.2.1., "Asphalt."

At the end of each shift, provide the Engineer with production documentation that includes the following:

- amount and temperature of asphalt cement before addition of rubber,
- amount of rubber and any extender added,
- viscosity of each hot A-R batch just before roadway placement, and
- time of the rubber additions and viscosity tests.

4.6. **Surface Preparation**. Remove existing raised pavement markers. Repair any damage incurred by removal as directed. Remove dirt, dust, or other harmful material before sealing. When shown on the plans, remove vegetation and blade pavement edges. When directed, apply a tack coat before applying the hot A-R treatment on an existing wearing surface in accordance with Section 341.4.7.2., "Tack Coat."

4.7. **Rock Land and Shot**.

4.7.1. **Definitions**.

- **Rock Land**. The area covered at the aggregate rate directed with one truckload of aggregate.
- **Shot**. The area covered by one distributor load of asphalt material.

4.7.2. **Setting Lengths**. Calculate the lengths of both rock land and shot. Adjust shot length to be an even multiple of the rock land. Verify that the distributor has enough asphalt material to complete the entire shot length. Mark shot length before applying asphalt. When directed, mark length of each rock land to verify the aggregate rate.

4.8. **Asphalt Placement**.

4.8.1. **General**. The maximum shot width is the width of the current transverse distribution test required under Section 316.3.1.3.1., "Transverse Distribution," or the width of the aggregate spreader box, whichever is less. Adjust the shot width so operations do not encroach on traffic or interfere with the traffic control plan, as directed. Use paper or other approved material at the beginning and end of each shot to construct a straight transverse joint and to prevent overlapping of the asphalt. Unless otherwise approved, match longitudinal joints with the lane lines. The Engineer may require a string line if necessary to keep joints straight with no overlapping. Use enough pressure to flare the nozzles fully.

Select an application temperature, as approved, in accordance with Item 300. Uniformly apply the asphalt material at the rate directed, within 15°F of the approved temperature, and not above the maximum allowable temperature.

4.8.2. **Limitations**. Do not apply asphalt to the roadway until:

- traffic control methods and devices are in place as shown on the plans or as directed,
- the loaded aggregate spreader is in position and ready to begin,
- haul trucks are loaded with enough aggregate to cover the shot area and are in place behind the spreader box, and
- rollers are in place behind the haul trucks.

4.8.3. **Nonuniform Application**. Stop application if it is not uniform due to streaking, ridging, puddling, or flowing off the roadway surface. Verify equipment condition, operating procedures, application temperature, and material properties. Determine and correct the cause of nonuniform application. If the cause is high- or low-emulsion viscosity, replace emulsion with material that corrects the problem.

4.8.4. **Test Strips**. The Engineer may stop asphalt application and require construction of test strips at the Contractor's expense if any of the following occurs:

- nonuniformity of application continues after corrective action;
- on three consecutive shots, application rate differs by more than 0.03 gal. per square yard from the rate directed; or
- any shot differs by more than 0.05 gal. per square yard from the rate directed.

The Engineer will approve the test strip location. The Engineer may require additional test strips until surface treatment application meets specification requirements.

4.8.5. **Sampling**. Collect all samples in accordance with Tex-500-C from the distributor and with witness by the Engineer.

At least once per project, collect split samples of each binder grade and source used. The Engineer will submit one split sample to the Materials and Tests Division (MTD) for testing and retain the other split sample.

In addition, collect one sample of each binder grade and source used on the project for each production day. The Engineer will retain these samples.

The Engineer will keep all retained samples for 1 yr. for hot-applied binders and cutback asphalts, or for 2 mo. for emulsified asphalts. The Engineer may submit retained samples to MTD for testing as necessary or as requested by MTD.

The Department will furnish sampling containers in accordance with Tex-500-C.

4.9. **Aggregate Placement**. As soon as possible, apply aggregate uniformly at the rate directed without causing the rock to roll over.

4.9.1. **Nonuniform Application**. Stop application if it is not uniform in the transverse direction. Verify equipment condition, operating procedures, and transverse application rate. The transverse application rate should be within 1 lb. Determine and correct the cause of nonuniform application.

4.10. **Rolling**. Start rolling operation on each shot as soon as aggregate is applied. Use enough rollers to cover the entire mat width in one pass; i.e., one direction. Roll in a staggered pattern. Unless otherwise shown on the plans, make at least:

- five passes or
- three passes when the asphalt material is an emulsion.

If rollers are unable to keep up with the spreader box, stop application until rollers have caught up, or furnish additional rollers. Keep roller tires asphalt-free.

4.11. **Patching**. Before rolling, repair spots where coverage is incomplete. Repair can be made by hand spotting or other approved method. When necessary, apply additional asphalt material to embed aggregate.

4.12. **Racked-In Aggregate**. If specified on the plans, apply racked-in aggregate after patching, uniformly at the rate directed. The racked-in aggregate must be applied before opening the roadway or intersection to traffic.

4.13. **Brooming**. After rolling, sweep as soon as aggregate has sufficiently bonded to remove excess. In areas of racked-in aggregate, sweep as directed.

4.14. **Final Acceptance**. Maintain seal coat until the Engineer accepts the work. Repair any surface failures. Before final project acceptance, remove all temporary stockpiles and restore the area to the original contour and grade.

5. MEASUREMENT

5.1. **Asphalt Material**. Unless otherwise shown on the plans, asphalt material will be measured by one of the following methods.

5.1.1. **Volume**. Asphalt material, including all components, will be measured at the applied temperature by strapping the tank before and after road application. The distributor calibrated strap stick will be used for measuring the asphalt level in the distributor asphalt tank. The certified tank chart will be used to determine the beginning gallons and the final gallons in the distributor tank. The quantity to be measured for payment will be the difference between the beginning gallons and the final gallons.

5.1.2. **Weight**. Asphalt material will be measured in tons using certified scales meeting the requirements of Item 520, “Weighing and Measuring Equipment,” unless otherwise approved. The transporting truck must have a seal attached to the draining device and other openings. Random checking on public scales at the Contractor’s expense may be required to verify weight accuracy.

Upon work completion or temporary suspension, any remaining asphalt material will be weighed by a certified public weigher or measured by volume in a calibrated distributor or tank, and the quantity converted

to tons at the measured temperature. The quantity to be measured will be the number of tons received minus the number of tons remaining after all directed work is complete and minus the amount used for other items.

5.1.3. **Quantity Adjustments**. When shown on the plans, the measured quantity will be adjusted to compensate for variation in required application or residual rates for different types of asphalt.

5.1.4. **Aggregate**. Unless otherwise shown on the plans, aggregate will be measured by the cubic yard in the trucks as applied on the road. Strike off the loaded aggregate for accurate measurement when directed.

5.2. **Loading, Hauling, and Distributing Aggregate**. When the Department furnishes the aggregate, the loading, hauling, and distributing will be measured by the cubic yard in the trucks as applied on the road.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Asphalt"; "Aggregate"; and "Loading, Hauling, and Distributing Aggregate" of the types and grades shown on the plans. These prices are full compensation for surface preparation; furnishing, preparing, hauling, and placing materials; removing existing pavement markers and excess aggregate; rolling; cleaning up stockpiles; and equipment, labor, tools, and incidentals.

Hauling of any aggregate to consolidate stockpiles at the end of the project when directed by the Engineer will be paid by force account work.

Item 341
Dense-Graded Hot-Mix Asphalt

1. DESCRIPTION

Construct a hot-mix asphalt (HMA) pavement layer composed of a compacted, dense-graded mixture of aggregate, asphalt binder, and additives mixed hot in a mixing plant. Payment adjustments will apply to HMA placed under this Specification unless the HMA is deemed exempt in accordance with Section 341.4.9.4., "Exempt Production."

2. MATERIALS

Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications.

Notify the Engineer of all material sources and before changing any material source or formulation. The Engineer will verify that the specification requirements are met and document all material source changes when the Contractor makes a source or formulation change. The Engineer may sample and test project materials anytime during the project to verify specification compliance in accordance with Item 6, "Control of Materials."

2.1. **Aggregate**. Furnish aggregates from sources that conform to the requirements shown in Table 1 and this Section. Aggregate requirements in this Section, including those shown in Table 1, may be modified or eliminated when shown on the plans. Additional aggregate requirements may be specified when shown on the plans. Provide aggregate stockpiles that meet the definitions in this Section for coarse, intermediate, or fine aggregate. Aggregate from reclaimed asphalt pavement (RAP) is not required to meet Table 1 requirements unless otherwise shown on the plans. Supply aggregates that meet the definitions in Tex-100-E for crushed gravel or crushed stone. The Engineer will designate the plant or the quarry as the sampling location. Provide samples from materials produced for the project. The Engineer will establish the Surface Aggregate Classification (SAC) and perform Los Angeles abrasion, magnesium sulfate soundness, and Micro-Deval tests. Perform all other aggregate quality tests shown in Table 1. Document all test results in the mixture design report. The Engineer may perform tests on independent or split samples to verify Contractor test results. Stockpile aggregates for each source and type separately. Determine aggregate gradations for mixture design and production testing based on the washed sieve analysis in accordance with Tex-200-F, Part II.

2.1.1. **Coarse Aggregate**. Coarse aggregate stockpiles must have no more than 20% material passing the No. 8 sieve. Aggregates from sources listed in the Department's Bituminous Rated Source Quality Catalog (BRSQC) are preapproved for use. Use only the rated values for HMA listed in the BRSQC. Rated values for surface treatment (ST) do not apply to coarse aggregate sources used in HMA.

For sources not listed in the Department's BRSQC:

- build an individual stockpile for each material;
- request the Department test the stockpile for specification compliance;
- allow 30 calendar days for the Engineer to sample, test, and report results;
- use only when tested and approved; and
- once approved, do not add additional material to the stockpile unless otherwise allowed by the Engineer.

Provide coarse aggregate with at least the minimum SAC shown on the plans. SAC requirements apply only to aggregates used on the surface of travel lanes, unless otherwise shown on the plans. The SAC for sources in the Department's *Aggregate Quality Monitoring Program* (AQMP) (Tex-499-A) is listed in the BRSQC.

2.1.1.1. **Blending Class A and Class B Aggregates**. Class B aggregate meeting all other requirements shown in Table 1 may be blended with a Class A aggregate to meet requirements for Class A materials, unless otherwise shown on the plans. When blending Class A and Class B aggregates to meet a Class A requirement, ensure that at least 50% by weight, or volume if required, of the material retained on the No. 4 sieve comes from the Class A aggregate source, unless otherwise shown on the plans. Blend by volume if the bulk specific gravities of the Class A and Class B aggregates differ by more than 0.300. Coarse aggregate from RAP and recycled asphalt shingles (RAS) will be considered as Class B aggregate for blending purposes.

The Engineer may perform tests anytime during production, when the Contractor blends Class A and Class B aggregates to meet a Class A requirement. The Engineer will use the Department's mix design template, when electing to verify conformance, to calculate the percent of Class A aggregate retained on the No. 4 sieve by inputting the bin percentages shown from readouts in the control room at the time of production and stockpile gradations measured at the time of production. The Engineer may determine the gradations based on either washed or dry sieve analysis from samples obtained from individual aggregate cold feed bins or aggregate stockpiles. The Engineer may perform spot checks to verify the percent of Class A aggregate retained on the No. 4 sieve. The Engineer will use the gradations supplied by the Contractor in the mixture design report as an input for the template. A failing spot check will require confirmation with a stockpile gradation determined by the Engineer.

2.1.1.2. **Micro-Deval Abrasion**. The Engineer will perform at least one Micro-Deval abrasion test in accordance with Tex-461-A for each coarse aggregate source used in the mixture design that has a rated source soundness magnesium (RSSM) loss value greater than 15 as listed in the BRSQC. The Engineer will perform testing before the start of production and may perform additional testing anytime during production. The Engineer may obtain the coarse aggregate samples from each coarse aggregate source or may require the Contractor to obtain the samples. The Engineer may waive all Micro-Deval testing based on a satisfactory test history of the same aggregate source.

The Engineer will estimate the magnesium sulfate soundness loss for each coarse aggregate source, when tested, using the following formula:

$$Mg_{est.} = (RSSM)(MD_{act.}/RSMD)$$

where:
$Mg_{est.}$ = magnesium sulfate soundness loss
$RSSM$ = rated source soundness magnesium
$MD_{act.}$ = actual Micro-Deval percent loss
$RSMD$ = rated source Micro-Deval

When the estimated magnesium sulfate soundness loss is greater than the maximum magnesium sulfate soundness loss specified, the coarse aggregate source will not be allowed for use unless otherwise approved. The Engineer will consult the Materials and Tests Division, and additional testing may be required before granting approval.

2.1.2. **Intermediate Aggregate**. Aggregates not meeting the definition of coarse or fine aggregate will be defined as intermediate aggregate. Supply intermediate aggregates, when used, that are free of organic impurities. Supply intermediate aggregate from coarse aggregate sources, when used, that meet the requirements shown in Table 1, unless otherwise approved.

Test the stockpile if 10% or more of the stockpile is retained on the No. 4 sieve, and verify that it meets the requirements in Table 1 for crushed face count (Tex-460-A) and flat and elongated particles (Tex-280-F).

2.1.3. **Fine Aggregate**. Fine aggregates consist of manufactured sands, screenings, and field sands. Fine aggregate stockpiles must meet the fine aggregate properties in accordance with Table 1 and the gradation requirements in accordance with Table 2. Supply fine aggregates that are free of organic impurities. The Engineer may test the fine aggregate in accordance with Tex-408-A to verify the material is free of organic impurities. Unless otherwise shown on the plans, at most 10% of the total aggregate may be field sand or other uncrushed fine aggregate. Use fine aggregate, except field sand, from coarse aggregate sources that meet the requirements shown in Table 1, unless otherwise approved.

Test the stockpile if 10% or more of the stockpile is retained on the No. 4 sieve and verify that it meets the requirements in Table 1 for crushed face count (Tex-460-A) and flat and elongated particles (Tex-280-F).

Table 1
Aggregate Quality Requirements

Property	Test Method	Requirement
Coarse Aggregate		
SAC	Tex-499-A (AQMP)	As shown on the plans
Deleterious material, %, Max	Tex-217-F, Part I	1.5
Decantation, %, Max	Tex-217-F, Part II	1.5
Micro-Deval abrasion, %	Tex-461-A	Note [1]
Los Angeles abrasion, %, Max	Tex-410-A	40
Magnesium sulfate soundness, 5 cycles, %, Max	Tex-411-A	30
Crushed face count,[2] %, Min	Tex-460-A, Part I	85
Flat and elongated particles @ 5:1, %, Max	Tex-280-F	10
Fine Aggregate		
Linear shrinkage, %, Max	Tex-107-E	3
Sand equivalent, %, Min	Tex-203-F	45[3]
Organic impurities	Tex-408-A	Note [4]

1. Used to estimate the magnesium sulfate soundness loss in accordance with Section 341.2.1.1.2., "Micro-Deval Abrasion."
2. Only applies to crushed gravel.
3. The Department may perform Tex-252-F on fine aggregates not meeting this minimum requirement. Fine aggregates with a methylene blue value of 10.0 mg/g or less may be used.
4. Optional test.

Table 2
Gradation Requirements for Fine Aggregate

Sieve Size	% Passing by Wt. Or Volume
3/8"	100
#8	70–100
#200	0–30

2.2. **Mineral Filler**. Mineral filler consists of finely divided mineral matter such as agricultural lime, crusher fines, hydrated lime, or fly ash. Mineral filler is allowed unless otherwise shown on the plans. Use no more than 2% hydrated lime or fly ash, unless otherwise shown on the plans. Use no more than 1% hydrated lime if a substitute binder is used, unless otherwise shown on the plans or allowed. Test all mineral fillers except hydrated lime and fly ash in accordance with Tex-107-E to ensure specification compliance. The plans may require or disallow specific mineral fillers. Provide mineral filler, when used, that:

- is dry enough, free-flowing, and free of clumps and foreign matter as determined by the Engineer;
- does not exceed 3% linear shrinkage when tested in accordance with Tex-107-E; and
- meets the gradation requirements shown in Table 3, unless otherwise shown on the plans.

Table 3
Gradation Requirements for Mineral Filler

Sieve Size	% Passing by Wt. or Volume
#8	100
#200	55–100

2.3. **Baghouse Fines**. Fines collected by the baghouse or other dust-collecting equipment may be reintroduced into the mixing drum.

2.4. **Asphalt Binder**. Furnish the type and grade of performance-graded (PG) asphalt binder shown on the plans that meets the requirements of Item 300, "Asphalts, Oils, and Emulsions."

2.5. **Tack Coat**. Furnish CSS-1H, SS-1H, EBL, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder in accordance with Item 300. Specialized tack coat materials on the MPL for *Tracking Resistant Asphalt Interlayer* (TRAIL) will be allowed or required when shown on the plans. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use, unless required in conformance with the manufacturer's recommendation for approved TRAIL products on the MPL.

2.6. **Additives**. Use the type of additive specified when shown on the plans. Use the rate of additive specified in conformance with the manufacturer's recommendation. Additives that facilitate mixing and compaction or improve the quality of the mixture are allowed when approved. Provide the Engineer with documentation such as the bill of lading showing the quantity of additives used in the project unless otherwise directed.

2.6.1. **Lime and Liquid Antistripping Agent**. Lime or liquid antistripping agent is required when shown on the plans. When lime or a liquid antistripping agent is used, add in accordance with Item 301, "Asphalt Antistripping Agents." Do not add lime directly into the mixing drum of any plant where lime is removed through the exhaust stream unless the plant has a baghouse or dust collection system that reintroduces the lime into the drum.

2.6.2. **Warm-Mix Asphalt (WMA)**. WMA is defined as HMA that is produced within a target temperature discharge range of 215°F and 275°F using approved WMA additives or processes from the MPL.

WMA is allowed for use on all projects and is required when shown on the plans. When WMA is required, the maximum placement or target discharge temperature for WMA will be set at a value at or below 275°F.

Department-approved WMA additives or processes may be used to facilitate mixing and compaction of HMA produced at target discharge temperatures above 275°F; however, such mixtures will not be defined as WMA.

2.6.3. **Compaction Aid**. Compaction aid is defined as a Department-approved chemical warm-mix additive, denoted as "chemical additive" on the MPL, that is used to facilitate mixing and compaction of HMA at a discharge temperature greater than 275°F.

Compaction aid is allowed for use on all projects. Compaction aid is required when shown on the plans or as required in Section 341.4.7.1., "Weather Conditions."

Warm-mix foaming processes, denoted as "foaming process" on the MPL, may be used to facilitate mixing and compaction of HMA at target discharge temperatures greater than 275°F; however, warm-mix foaming processes are not defined as a compaction aid.

2.7. **Recycled Materials**. Use of RAP and RAS is permitted unless otherwise shown on the plans. Use of RAS is restricted to only intermediate and base mixes unless otherwise shown on the plans. Do not exceed the maximum allowable percentages of RAP and RAS in accordance with Table 4. The allowable percentages in accordance with Table 4 may be decreased or increased when shown on the plans. Determine the asphalt binder content and gradation of the RAP and RAS stockpiles for mixture design purposes in accordance with Tex-236-F, Part I. The Engineer may verify the asphalt binder content of the stockpiles anytime during production. Perform other tests on RAP and RAS when shown on the plans. Asphalt binder from RAP and

RAS is designated as recycled asphalt binder. Calculate and ensure that the ratio of the recycled asphalt binder to total binder does not exceed the percentages in accordance with Table 5 during mixture design and HMA production when RAP or RAS is used. Use a separate cold feed bin for each stockpile of RAP and RAS during HMA production. Surface, intermediate, and base mixes referenced in Table 4 and Table 5 are defined as follows, unless otherwise shown on the plans.

- **Surface**. The final HMA lift placed at the top of the pavement structure.
- **Intermediate**. Mixtures placed below an HMA surface mix and less than or equal to 8.0 in. below the riding surface.
- **Base**. Mixtures placed greater than 8.0 in. below the riding surface. Unless otherwise shown on the plans, mixtures used for bond breaker are defined as base mixtures.

2.7.1. **RAP**. RAP is salvaged, milled, pulverized, broken, or crushed asphalt pavement. Fractionated RAP is defined as a stockpile that contains RAP material with at least 95.0% passing the 1/2-in. sieve, before burning in the ignition oven, unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 1/2-in. screen to fractionate the RAP.

Use of Contractor-owned RAP, including HMA plant waste, is permitted unless otherwise shown on the plans. Department-owned RAP stockpiles are available for the Contractor's use when the stockpile locations are shown on the plans. If Department-owned RAP is available for the Contractor's use, the Contractor may use Contractor-owned fractionated RAP and replace it with an equal quantity of Department-owned RAP. Department-owned RAP generated by required work on the Contract is available for the Contractor's use when shown on the plans. Perform any necessary tests to ensure Contractor- or Department-owned RAP is appropriate for use. The Department will not perform any tests or assume any liability for the quality of the Department-owned RAP unless otherwise shown on the plans. The Contractor will retain ownership of RAP generated on the project when shown on the plans.

Do not use Department- or Contractor-owned RAP contaminated with dirt or other objectionable materials. Do not use Department- or Contractor-owned RAP if the decantation value exceeds 5% and the plasticity index is greater than 8. Test the stockpiled RAP for decantation in accordance with Tex-406-A, Part I. Determine the plasticity index in accordance with Tex-106-E if the decantation value exceeds 5%. The decantation and plasticity index requirements do not apply to RAP samples with asphalt removed by extraction or ignition.

Do not intermingle Contractor-owned RAP stockpiles with Department-owned RAP stockpiles. Remove unused Contractor-owned RAP material from the project site upon completion of the project. Return unused Department-owned RAP to the designated stockpile location.

Table 4
Max Allowable Amounts of RAP[1]

Max Allowable Fractionated RAP (%)		
Surface	**Intermediate**	**Base**
20.0	30.0	35.0

1. Must also meet the recycled binder to total binder ratio shown in Table 5.

2.7.2. **RAS**. RAS is defined as processed asphalt shingle material from manufacturing of asphalt roofing shingles or from re-roofing residential structures. Post-manufactured RAS is processed manufacturer's shingle scrap byproduct. Post-consumer RAS is processed shingle scrap removed from residential structures. Use of post-manufactured RAS or post-consumer RAS (tear-offs) is not permitted in surface mixtures unless otherwise shown on the plans. RAS may be used in intermediate and base mixtures unless otherwise shown on the plans. Up to 3% RAS may be used separately or as a replacement for fractionated RAP in accordance with Table 4 and Table 5. RAS may be used separately or in conjunction with RAP. Comply with all regulatory requirements stipulated for RAS by TCEQ.

Process the RAS by ambient grinding or granulating such that 100% of the particles pass the 3/8-in. sieve when tested in accordance with Tex-200-F, Part I. Perform a sieve analysis on processed RAS material before extraction (or ignition) of the asphalt binder.

Add sand meeting the requirements of Table 1 and Table 2, or fine RAP, to RAS stockpiles if needed to keep the processed material workable. Any stockpile that contains RAS will be considered a RAS stockpile and be limited to no more than 3.0% of the HMA mixture in accordance with Table 4.

Certify compliance of the RAS with DMS-11000, "Evaluating and Using Nonhazardous Recyclable Materials Guidelines." Treat RAS as an established nonhazardous recyclable material if it has not come into contact with any hazardous materials. Use RAS from shingle sources on the MPL. Remove all materials that are not part of the shingle, such as wood, paper, metal, plastic, and felt paper, before use. Determine the deleterious content of RAS material for mixture design purposes in accordance with Tex-217-F, Part III. Do not use RAS if deleterious materials are more than 0.5% of the stockpiled RAS, unless otherwise approved. Submit a sample for approval before submitting the mixture design. The Department will perform the testing for deleterious material of RAS to determine specification compliance.

2.8. **Substitute Binders**. No binder substitution will be allowed when shown on the plans. The Contractor may use a substitute PG binder shown in Table 5 instead of the PG binder originally specified, if using recycled materials, and if the substitute PG binder and mixture made with the substitute PG binder meet the following.

- The substitute binder meets the specification requirements for the substitute binder grade in accordance with Section 300.2.11., "Performance-Graded Binders."
- The mixture has less than 10.0 mm of rutting on the Hamburg wheel test (Tex-242-F) after the number of passes required for the originally specified binder. Use of substitute PG binders may be allowed only at the discretion of the Engineer if the Hamburg wheel test results are between 10.0 mm and 12.5 mm.

Table 5
Allowable PG Binders and Max Recycled Binder Ratios

Originally Specified PG Binder	Allowable Substitute PG Binder for Surface Mixes	Allowable Substitute PG Binder for Intermediate and Base Mixes	Max Ratio of Recycled Binder[1] to Total Binder (%)		
			Surface	Intermediate	Base
76-22	70-22	70-22	15.0	25.0	30.0
70-22	Note [2]	64-22	15.0	25.0	30.0
64-22	Note [2]	Note [2]	15.0	25.0	30.0
76-28	70-28	70-28	15.0	25.0	30.0
70-28	Note [2]	64-28	15.0	25.0	30.0
64-28	Note [2]	Note [2]	15.0	25.0	30.0

1. Combined recycled binder from RAP and RAS. RAS is not permitted in surface mixtures unless otherwise shown on the plans.
2. No binder substitution is allowed.

3. EQUIPMENT

Provide required or necessary equipment in accordance with Item 320, "Equipment for Asphalt Concrete Pavement."

4. CONSTRUCTION

Produce, haul, place, and compact the specified paving mixture. In addition to tests required in accordance with the Specification, the Contractor may perform other QC tests as necessary. Anytime during the project, the Engineer may perform production and placement tests as necessary in accordance with Item 5, "Control of the Work." Schedule and participate in a mandatory pre-paving meeting with the Engineer on or before the first day of paving unless otherwise shown on the plans.

4.1. **Certification**. Personnel certified by the Department-approved HMA certification program must conduct all mixture designs, sampling, and testing in accordance with Table 6. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning production and when personnel changes are made. Provide a mixture design developed and signed by a Level 2-certified specialist. Provide Level 1A-certified specialists at the plant during production operations. Provide Level 1B-certified specialists to conduct placement tests. Provide Level AGG101-certified specialists for aggregate testing.

Table 6
Test Methods, Test Responsibility, and Min Certification Levels

Test Description	Test Method	Contractor	Engineer	Level[1]
Aggregate and Recycled Material Testing				
Sampling	Tex-221-F	✓	✓	1A/AGG101
Dry sieve	Tex-200-F, Part I	✓	✓	1A/AGG101
Washed sieve	Tex-200-F, Part II	✓	✓	1A/AGG101
Deleterious material	Tex-217-F, Part I and Part III	✓	✓	AGG101
Decantation	Tex-217-F, Part II	✓	✓	AGG101
Los Angeles abrasion	Tex-410-A	–	✓	Department
Magnesium sulfate soundness	Tex-411-A	–	✓	Department
Micro-Deval abrasion	Tex-461-A	–	✓	AGG101
Crushed face count	Tex-460-A	✓	✓	AGG101
Flat and elongated particles	Tex-280-F	✓	✓	AGG101
Linear shrinkage	Tex-107-E	✓	✓	AGG101
Sand equivalent	Tex-203-F	✓	✓	AGG101
Methylene blue test	Tex-252-F	–	✓	Department
Bulk-specific gravity	Tex-201-F	✓	✓	AGG101
Organic impurities	Tex-408-A	✓	✓	AGG101
Asphalt Binder and Tack Coat Sampling				
Asphalt binder sampling	Tex-500-C, Part II	✓	✓	1A/1B
Tack coat sampling	Tex-500-C, Part III	✓	✓	1A/1B
Mix Design and Verification				
Design and job-mix formula (JMF) changes	Tex-204-F	✓	✓	2
Mixing	Tex-205-F	✓	✓	2
Molding (Superpave gyratory compactor [SGC])	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F, Part I and Part VI	✓	✓	1A
Rice gravity	Tex-227-F, Part II	✓	✓	1A
Ignition oven correction factors[2]	Tex-236-F, Part II	✓	✓	1A
Indirect tensile strength	Tex-226-F	✓	✓	1A
Hamburg wheel test	Tex-242-F	✓	✓	1A
Witnessing mixing of correction factors	Tex-236-F, Part III	–	✓	1A/Department
Boil test	Tex-530-C	✓	✓	1A
Production Testing				
Selecting production random numbers	Tex-225-F, Part I	–	✓	1A
Mixture sampling	Tex-222-F	✓	✓	1A/1B
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F, Part I and Part VI	✓	✓	1A
Rice gravity	Tex-227-F, Part II	✓	✓	1A
Gradation and asphalt binder content[2]	Tex-236-F, Part I	✓	✓	1A
Control charts	Tex-233-F	✓	✓	1A
Moisture content	Tex-212-F, Part II	✓	✓	1A/AGG101
Hamburg wheel test	Tex-242-F	✓	✓	1A
Micro-Deval abrasion	Tex-461-A	–	✓	AGG101
Boil test	Tex-530-C	✓	✓	1A
Absorption recovery	Tex-211-F	–	✓	Department

Test Description	Test Method	Contractor	Engineer	Level[1]
Placement Testing				
Selecting placement random numbers	Tex-225-F, Part II	–	✓	1B
Trimming roadway cores	Tex-251-F, Part I and Part II	✓	✓	1A/1B
In-place air voids	Tex-207-F, Part I and Part VI	✓	✓	1A
In-place density (nuclear method)	Tex-207-F, Part III	✓	–	1B
Establish rolling pattern	Tex-207-F, Part IV	✓	–	1B
Control charts	Tex-233-F	✓	✓	1A
Ride quality measurement	Tex-1001-S	✓	✓	Note[3]
Segregation (density profile)	Tex-207-F, Part V	✓	✓	1B
Longitudinal joint density	Tex-207-F, Part VII	✓	✓	1B
Thermal profile	Tex-244-F	✓	–	1B
Shear bond strength test	Tex-249-F	–	✓	Department

1. Levels 1A, 1B, AGG101, and 2 are certification levels provided by the Hot Mix Asphalt Center certification program.
2. Refer to Section 341.4.9.2.3., "Production Testing," for exceptions to using an ignition oven.
3. Profiler and operator are required to be certified at the Texas A&M Transportation Institute facility when surface test Type B is specified.

4.2. **Reporting and Responsibilities**. Use Department-provided templates to record and calculate all test data, including mixture design, production and placement QC and QA, control charts, thermal profiles, segregation density profiles, and longitudinal joint density. Obtain the current version of the templates from the Department's website or from the Engineer. The Engineer and the Contractor will provide any available test results to the other party when requested. The maximum allowable time for the Contractor and Engineer to exchange test data is as shown in Table 7, unless otherwise approved. The Engineer and the Contractor will immediately report to the other party any test result that requires suspension of production or placement, or a payment adjustment less than 1.000, or that fails to meet the specification requirements. Record and electronically submit all test results and pertinent information on Department-provided templates.

Subsequent sublots placed after test results are available to the Contractor, which require suspension of operations, may be considered unauthorized work. Unauthorized work will be accepted or rejected at the discretion of the Engineer in accordance with Article 5.3., "Conformity with Plans, Specifications, and Special Provisions."

Table 7
Reporting Schedule

Description	Reported By	Reported To	To Be Reported Within
Production Quality Control			
Gradation[1]	Contractor	Engineer	1 working day of completion of the sublot
Asphalt binder content[1]			
Laboratory-molded density[2]			
Moisture content[3]			
Boil test[4]			
Production Quality Assurance			
Gradation[3]	Engineer	Contractor	1 working day of completion of the sublot
Asphalt binder content[3]			
Laboratory-molded density[1]			
Hamburg wheel test[5]			
Boil test[4]			
Binder tests[5]			
Placement Quality Control			
In-place air voids[2]	Contractor	Engineer	1 working day of completion of the lot
Segregation[1]			
Longitudinal joint density[1]			
Thermal profile[1]			

Description	Reported By	Reported To	To Be Reported Within
Placement Quality Assurance			
In-place air voids[1]	Engineer	Contractor	1 working day after receiving the trimmed cores[6]
Segregation[3]			1 working day of completion of the lot
Longitudinal joint density[3]			
Thermal profile[3]			
Aging ratio[5]			
Shear bond strength test[5]			5 working days after receiving the cores
Payment adjustment summary	Engineer	Contractor	2 working days of performing all required tests and receiving Contractor test data

1. These tests are required on every sublot.
2. Optional test. When performed on split samples, report the results as soon as they become available.
3. To be performed at the frequency shown in Table 16 or as shown on the plans.
4. When shown on the plans.
5. To be reported as soon as the results become available.
6. Two days are allowed if cores cannot be dried to constant weight within 1 day.

The Engineer will use the Department-provided template to calculate all payment adjustment factors for the lot. Sublot samples may be discarded after the Engineer and Contractor sign off on the payment adjustment summary documentation for the lot.

Use the procedures described in Tex-233-F to plot the results of all QC and QA testing. Update the control charts as soon as test results for each sublot become available. Make the control charts readily accessible at the field laboratory. The Engineer may suspend production for failure to update control charts.

4.3. **Quality Control Plan (QCP)**. Develop and follow the QCP in detail. Obtain approval for changes to the QCP made during the project. The Engineer may suspend operations if the Contractor fails to comply with the QCP.

Submit a written QCP before the mandatory pre-paving meeting. Receive approval of the QCP before beginning production. Include the following items in the QCP.

4.3.1. **Project Personnel**. For project personnel, include:

- a list of individuals responsible for QC with authority to take corrective action,
- current contact information for each individual listed, and
- current copies of certification documents for individuals performing specified QC functions.

4.3.2. **Material Delivery and Storage**. For material delivery and storage, include:

- the sequence of material processing, delivery, and minimum quantities to assure continuous plant operations;
- aggregate stockpiling procedures to avoid contamination and segregation;
- frequency, type, and timing of aggregate stockpile testing to assure conformance with material requirements before mixture production; and
- procedure for monitoring the quality and variability of asphalt binder.

4.3.3. **Production**. For production, include:

- loader operation procedures to avoid contamination in cold bins;
- procedures for calibrating and controlling cold feeds;
- procedures to eliminate debris or oversized material;
- procedures for adding and verifying rates of each applicable mixture component (e.g., aggregate, asphalt binder, RAP, RAS, lime, liquid antistrip, compaction aid, foaming process, and WMA);

- procedures for reporting job control test results; and
- procedures to avoid segregation and drain-down in the silo.

4.3.4. **Loading and Transporting**. For loading and transporting, include:

- type and application method for release agents, and
- truck-loading procedures to avoid segregation.

4.3.5. **Placement and Compaction**. For placement and compaction, include:

- proposed agenda for mandatory pre-paving meeting, including date and location;
- proposed paving plan (e.g., production rate, paving widths, joint offsets, and lift thicknesses);
- type and application method for release agents in the paver and on rollers, shovels, lutes, and other utensils;
- procedures for the transfer of mixture into the paver while avoiding physical and thermal segregation and preventing material spillage;
- process to balance production, delivery, paving, and compaction to achieve continuous placement operations and good ride quality;
- paver operations (e.g., speed, operation of wings, and height of mixture in auger chamber) to avoid physical and thermal segregation and other surface irregularities; and
- procedures to construct quality longitudinal and transverse joints.

4.4. **Mixture Design**.

4.4.1. **Design Requirements**. Use the dense-graded design procedure provided in Tex-204-F, unless otherwise shown on the plans. Design the mixture to meet the requirements shown in Tables 1, 2, 3, 4, 5, 8, 9, and 10.

Design the mixture using an SGC, and 50 gyrations as the design number of gyrations (Ndesign). Use a target laboratory-molded density of 96.0% to design the mixture; however, adjustments can be made to the Ndesign value as shown in Table 9. The Ndesign level may be reduced to at least 35 gyrations at the Contractor's discretion.

Use a Department-approved laboratory on the MPL to perform the Hamburg wheel test and provide results with the mixture design, or provide the laboratory mixture and request that the Department perform the Hamburg wheel test. Upon receiving the sample from the Contractor, the Engineer will be allowed 10 working days to provide the Contractor with Hamburg wheel test results on the laboratory mixture design.

The Engineer will provide the mixture design when shown on the plans. The Contractor may submit a new mixture design anytime during the project. The Engineer will verify and approve all mixture designs (JMF1) before the Contractor can begin production.

Provide the Engineer with a mixture design report using the Department-provided template. Include the following items in the report:

- the combined aggregate gradation, source, specific gravity, and percent of each material used;
- the binder source and optimum design asphalt content;
- asphalt binder content and aggregate gradation of RAP and RAS stockpiles;
- the Ndesign level used on the SGC;
- results of all applicable tests;
- the mixing and molding temperatures;
- the signature of the Level 2 person or persons who performed the design;
- the date the mixture design was performed; and
- a unique identification number for the mixture design.

Table 8
Master Gradation Limits (% Passing by Wt. or Volume) and Void in Mineral Aggregate (VMA) Requirements

Sieve Size	DG-B Fine Base	DG-C Coarse Surface	DG-D Fine Surface	DG-F Fine Mixture
2"	–	–	–	–
1-1/2"	100.0[1]	–	–	–
1"	98.0–100.0	100.0[1]	–	–
3/4"	84.0–98.0	95.0–100.0	100.0[1]	–
1/2"	—	—	98.0–100.0	100.0[1]
3/8"	60.0–80.0	70.0–85.0	85.0–100.0	98.0–100.0
#4	40.0–60.0	43.0–63.0	50.0–70.0	70.0–90.0
#8	29.0–43.0	32.0–44.0	35.0–46.0	38.0–48.0
#30	13.0–28.0	14.0–28.0	15.0–29.0	12.0–27.0
#50	6.0–20.0	7.0–21.0	7.0–20.0	6.0–19.0
#200	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0
Design (VMA), % Min				
–	13.0	14.0	15.0	16.0
Production (Plant-Produced) (VMA), % Min				
–	12.5	13.5	14.5	15.5

1. Defined as Max sieve size. No tolerance allowed.

Table 9
Laboratory Mixture Design Properties

Mixture Property	Test Method	Requirement
Target laboratory-molded density, %	Tex-207-F	96.0
Design gyrations (Ndesign)	Tex-241-F	50[1]
Indirect tensile strength (dry), psi	Tex-226-F	85–200[2]
Boil test[3]	Tex-530-C	–

1. Adjust within a range of 35–100 gyrations when shown on the plans, in accordance with the specification, or when mutually agreed between the Engineer and Contractor.
2. The Engineer may allow the indirect tensile test strength to exceed 200 psi if the corresponding Hamburg wheel rut depth is >2.5 mm and <12.5 mm.
3. When shown on the plans. Used to establish baseline for comparison to production results.

Table 10
Hamburg Wheel Test Requirements

High-Temperature Binder Grade	Test Method	Min # of Passes at 12.5-mm[1] Rut Depth, Tested at 50°C
PG 64 or lower	Tex-242-F	10,000[2]
PG 70		15,000[3]
PG 76 or higher		20,000

1. The Hamburg wheel test will have a minimum rut depth of 2.5 mm.
2. May be decreased to at least 5,000 passes when shown on the plans.
3. May be decreased to at least 10,000 passes when shown on the plans.

4.4.2. **Job-Mix Formula Approval**. The JMF is the combined aggregate gradation, Ndesign level, and target asphalt percentage used to establish target values for hot-mix production. JMF1 is the original laboratory mixture design used to produce the trial batch. When WMA is used, JMF1 may be designed and submitted to the Engineer without including the WMA additive, foaming process, or compaction aid. When WMA or a compaction aid is used, document the additive or process used and recommended rate in the JMF1 submittal. The Engineer and the Contractor will verify JMF1 based on plant-produced mixture from the trial batch, unless otherwise approved. The Engineer may accept an existing mixture design previously used on a Department project and may waive the trial batch to verify JMF1. The Department may require the Contractor to reimburse the Department for verification tests if more than two trial batches per design are required.

4.4.2.1. **Contractor's Responsibilities**.

4.4.2.1.1. **Providing Superpave Gyratory Compactor**. Provide an SGC in accordance with Item 504, "Field Office and Laboratory," and make the SGC available to the Engineer for use in molding production samples.

4.4.2.1.2. **Gyratory Compactor Correlation Factors**. Use Tex-206-F, Part II, to perform a gyratory compactor correlation when the Engineer uses a different SGC. Apply the correlation factor to all subsequent production test results.

4.4.2.1.3. **Submitting JMF1**. Furnish a mix design report (JMF1) with representative samples of all component materials and request approval to produce the trial batch. Provide approximately 25 lb. of the design mixture if opting to have the Department perform the Hamburg wheel test on the laboratory mixture, and request that the Department perform the test.

4.4.2.1.4. **Supplying Aggregates**. Provide approximately 40 lb. of each aggregate stockpile unless otherwise directed.

4.4.2.1.5. **Supplying Asphalt**. Provide at least 1 gal. of the asphalt material and enough quantities of any additives proposed for use.

4.4.2.1.6. **Ignition Oven Correction Factors**. Notify the Engineer before performing Tex-236-F, Part II. Allow the Engineer to witness the mixing of ignition oven correction factor sample. Determine the aggregate and asphalt correction factors from the ignition oven in accordance with Tex-236-F, Part II.

If the Engineer witnesses the mixing of the ignition oven correction factor samples, provide the Engineer with identically prepared samples of the mixtures before the trial batch production, including all additives (except water), and blank samples used to determine the correction factors for the ignition oven used for QA testing during production.

Correction factors established from a previously approved mixture design may be used for the current mixture design if the mixture design and ignition oven are the same as previously used, unless otherwise directed. Correction factors must be performed every 12 mo.

4.4.2.1.7. **Boil Test**. When shown on the plans, perform the test and retain the tested sample from Tex-530-C until completion of the project or as directed. Use this sample for comparison purposes during production.

4.4.2.1.8. **Trial Batch Production**. Provide a plant-produced trial batch upon receiving conditional approval of JMF1 and authorization to produce a trial batch. If applicable, include the WMA additive, foaming process, or compaction aid for verification testing of JMF1 and development of JMF2. Produce a trial batch mixture that meets the requirements shown in Tables 4, 5, and 11. The Engineer may accept test results from recent production of the same mixture instead of a new trial batch.

4.4.2.1.9. **Trial Batch Production Equipment**. Use only equipment and materials proposed for use on the project to produce the trial batch.

4.4.2.1.10. **Trial Batch Quantity**. Produce enough quantity of the trial batch to ensure that the mixture meets the specification requirements.

4.4.2.1.11. **Number of Trial Batches**. Produce trial batches as necessary to obtain a mixture that meets the specification requirements.

4.4.2.1.12. **Trial Batch Sampling**. Obtain a representative sample of the trial batch and split it into three equal portions in accordance with Tex-222-F. Label these portions as "Contractor," "Engineer," and "Referee." Deliver samples to the appropriate laboratory as directed.

4.4.2.1.13. **Trial Batch Testing**. Test the trial batch to ensure the mixture produced using the proposed JMF1 meets the mixture requirements shown in Table 11. Ensure the trial batch mixture is also in compliance with the

Hamburg wheel requirement shown in Table 10. Use a Department-approved laboratory listed on the MPL to perform the Hamburg wheel test on the trial batch mixture, or request that the Department perform the Hamburg wheel test. Provide approximately 25 lb. of the trial batch mixture if opting to have the Department perform the Hamburg wheel test, and request that the Department perform the test. Upon receiving the sample from the Contractor, the Engineer will be allowed 10 working days to provide the Contractor with Hamburg wheel test results on the trial batch. Provide the Engineer with a copy of the trial batch test results.

4.4.2.1.14. **Development of JMF2**. After the Engineer grants full approval of JMF1, evaluate the trial batch test results, determine the optimum mixture proportions, and submit as JMF2. Adjust the asphalt binder content or gradation to achieve the specified target laboratory-molded density. The asphalt binder content established for JMF2 is not required to be within any tolerance of the optimum asphalt binder content established for JMF1; however, mixture produced using JMF2 must meet the VMA requirements for production shown in Table 8. If the optimum asphalt binder content for JMF2 is more than 0.5% lower than the optimum asphalt binder content for JMF1, the Engineer may perform or require the Contractor to perform Tex-226-F on Lot 1 production to confirm the indirect tensile strength does not exceed 200 psi. Verify that JMF2 meets the mixture requirements shown in Table 4 and Table 5.

4.4.2.1.15. **Mixture Production**. Use JMF2 to produce Lot 1 in accordance with Section 341.4.9.3.1.1., "Lot 1 Placement," after receiving approval for JMF2 and a passing Hamburg wheel result on the trial batch from a laboratory listed on the MPL. Once JMF2 is approved, and without receiving the results from the Department's Hamburg wheel test on the trial batch, the Contractor may proceed to Lot 1 production at their own risk.

Notify the Engineer if electing to proceed without Hamburg wheel test results from the trial batch. Note that the Engineer may require up to the entire sublot of any mixture failing the Hamburg wheel test to be removed and replaced at the Contractor's expense.

4.4.2.1.16. **Development of JMF3**. Evaluate the test results from Lot 1, determine the optimum mixture proportions, and submit as JMF3 for use in Lot 2.

4.4.2.1.17. **JMF Adjustments**. If JMF adjustments are necessary to achieve the specified requirements, make the adjustments before beginning a new lot. The adjusted JMF must:

- be provided to the Engineer in writing before the start of a new lot,
- be numbered in sequence to the previous JMF,
- meet the mixture requirements in accordance with Table 4 and Table 5,
- meet the master gradation limits in accordance with Table 8, and
- be within the operational tolerances of JMF2 in accordance with Table 11.

4.4.2.1.18. **Requesting Referee Testing**. Use referee testing, if needed, in accordance with Section 341.4.9.1., "Referee Testing," to resolve testing differences with the Engineer.

Table 11
Operational Tolerances

Description	Test Method	Allowable Difference Between JMF2 and JMF1 Target[1]	Allowable Difference Between Current JMF and JMF2[2]	Allowable Difference Between Contractor and Engineer[3]
Individual % retained on #8 sieve and larger	Tex-200-F or Tex-236-F	Must be Within Master Gradation Limits in Table 8	±5.0[4]	±5.0
Individual % retained on sieves smaller than #8 and larger than #200			±3.0[4]	±3.0
% passing the #200 sieve			±2.0[4]	±1.6
Asphalt binder content, %	Tex-236-F	±0.5	±0.3	±0.3
Laboratory-molded density, %	Tex-207-F	±1.0	±1.0	±1.0
In-place air voids, %		–	–	±1.0
Laboratory-molded bulk specific gravity		–	–	±0.020
VMA, %, Min	Tex-204-F	Note[5]	Note[5]	–
Theoretical maximum specific (Rice) gravity	Tex-227-F	–	–	±0.020

1. JMF1 is the approved laboratory mixture design used for producing the trial batch. JMF2 is the approved mixture design developed from the trial batch used to produce Lot 1.
2. Current JMF is JMF3 or higher. JMF3 is the approved mixture design used to produce Lot 2.
3. Contractor may request referee testing when values exceed these tolerances.
4. When within these tolerances, mixture production gradations may fall outside the master gradation limits; however, the % passing the #200 will be considered out of tolerance when outside the master gradation limits.
5. Verify that Table 8 requirements are met for VMA.

4.4.2.2. **Engineer's Responsibilities**.

4.4.2.2.1. **Superpave Gyratory Compactor**. The Engineer will use a Department SGC, calibrated in accordance with Tex-241-F, to mold samples for laboratory mixture design verification. For molding trial batch and production specimens, the Engineer will use the Contractor-provided SGC at the field laboratory or provide and use a Department SGC at an alternate location.

4.4.2.2.2. **Conditional Approval of JMF1 and Authorizing Trial Batch**. The Engineer will review and verify conformance with the following information within 2 working days of receipt:

- the Contractor's mix design report (JMF1);
- the Contractor-provided Hamburg wheel test results;
- all required materials including aggregates, asphalt, additives, and recycled materials; and
- the mixture specifications.

The Engineer will grant the Contractor conditional approval of JMF1 if the information provided on the paper copy of JMF1 indicates that the Contractor's mixture design meets the specifications. When the Contractor does not provide Hamburg wheel test results with laboratory mixture design, 10 working days are allowed for conditional approval of JMF1. The Engineer will base full approval of JMF1 on the test results on mixture from the trial batch.

Unless waived, the Engineer will determine the Micro-Deval abrasion loss in accordance with Section 341.2.1.1.2., "Micro-Deval Abrasion." If the Engineer's test results are pending after 2 working days, conditional approval of JMF1 will still be granted within 2 working days of receiving JMF1. When the Engineer's test results become available, they will be used for specification compliance.

The Contractor is authorized to produce a trial batch after the Engineer grants conditional approval of JMF1.

4.4.2.2.3. **Hamburg Wheel Testing of JMF1**. If the Contractor requests the option to have the Department perform the Hamburg wheel test on the laboratory mixture, the Engineer will mold samples in accordance with Tex-242-F to verify compliance with the Hamburg wheel test requirement shown in Table 10. Upon receiving the sample from the Contractor, the Engineer will be allowed 10 working days to provide the Contractor with Hamburg wheel test results on the laboratory mixture design.

4.4.2.2.4. **Ignition Oven Correction Factors**. The Engineer will determine ignition oven correction factors by one of the following options.

- Witness the mixing of ignition oven correction factor samples by the Contractor in accordance with Tex-236-F, Part III. The Engineer will use the identically prepared samples provided by the Contractor to determine the aggregate and asphalt correction factors for the ignition oven in accordance with Tex-236-F, Part II.
- If the Engineer does not witness the mixing of ignition oven correction factor samples, the Engineer will prepare the samples to determine the aggregate and asphalt correction factors for the ignition oven in accordance with Tex-236-F, Part II. Notify the Contractor before performing Tex-236-F, Part II. Allow the Contractor to witness the Engineer performing Tex-236-F, Part II.

Correction factors must be performed every 12 mo. to be used for QA testing during production.

4.4.2.2.5. **Testing the Trial Batch**. Within 1 full working day, the Engineer will sample and test the trial batch to ensure that the mixture meets the requirements shown in Table 11. If the Contractor requests the option to have the Department perform the Hamburg wheel test on the trial batch mixture, the Engineer will mold samples in accordance with Tex-242-F to verify compliance with the Hamburg wheel test requirement shown in Table 10.

The Engineer will have the option to perform the following tests on the trial batch.

- Tex-226-F, to verify that the indirect tensile strength meets the requirement shown in Table 9.
- Tex-530-C, to retain and use for comparison purposes during production.

4.4.2.2.6. **Full Approval of JMF1**. The Engineer will grant full approval of JMF1 and authorize the Contractor to proceed with developing JMF2 if the Engineer's results for the trial batch meet the requirements shown in Tables 8, 9, and 10. The Engineer will notify the Contractor that an additional trial batch is required if the trial batch does not meet these requirements.

4.4.2.2.7. **Approval of JMF2.** The Engineer will approve JMF2 within 1 working day if the mixture meets the requirements shown in Table 5 and Table 8. The asphalt binder content established for JMF2 is not required to be within any tolerance of the optimum asphalt binder content established for JMF1; however, mixture produced using JMF2 must meet the VMA requirements shown in Table 8. If the optimum asphalt binder content for JMF2 is more than 0.5% lower than the optimum asphalt binder content for JMF1, the Engineer may perform or require the Contractor to perform Tex-226-F on Lot 1 production to confirm the indirect tensile strength does not exceed 200 psi.

4.4.2.2.8. **Approval of Lot 1 Production**. The Engineer will authorize the Contractor to proceed with JMF2 for Lot 1 production after a passing Hamburg wheel test result on the trial batch is achieved from a laboratory listed on the MPL. The Contractor may proceed at their own risk with Lot 1 production without the results from the Hamburg wheel test on the trial batch.

If the Department-approved laboratory's sample from the trial batch fails the Hamburg wheel test, the Engineer will suspend production until further Hamburg wheel tests meet the specified values. The Engineer may require up to the entire sublot of any mixture failing the Hamburg wheel test be removed and replaced at the Contractor's expense.

4.4.2.2.9. **Approval of JMF3 and Subsequent JMF Changes**. JMF3 and subsequent JMF changes are approved if they meet the mixture requirements shown in Table 4 and Table 5, and the master gradation limits shown in Table 8, and they are within the operational tolerances of JMF2 shown in Table 11. The addition of a WMA additive to facilitate mixing or as a compaction aid does not require a new laboratory mixture design or trial batch. Current JMF changes that exceed the operational tolerances of JMF2 in accordance with Table 11 may require a new laboratory mixture design, trial batch, or both.

4.5. **Production Operations**. Perform a new trial batch when the plant or plant location is changed. All source changes for asphalt will require a passing Hamburg wheel test result from a laboratory listed on the MPL. The Contractor may proceed at their own risk with Lot 1 production without the results from the Hamburg wheel test on the trial batch. All aggregate source changes will require a new laboratory mixture design and

trial batch. Take corrective action and receive approval to proceed after any production suspension for noncompliance with the specification. Submit a new mix design and perform a new trial batch when the asphalt binder content of:

- any RAP stockpile used in the mix is more than 0.5% higher than the value shown in the mixture design report, or
- RAS stockpile used in the mix is more than 2.0% higher than the value shown in the mixture design report.

4.5.1. **Storage and Heating of Materials**. Do not heat the asphalt binder above the temperatures specified in Item 300, or outside the manufacturer's recommended values. Provide the Engineer with daily records of asphalt binder and HMA discharge temperatures (in legible and discernible increments) in accordance with Item 320, unless otherwise directed. Do not store mixture for a period long enough to affect the quality of the mixture, nor in any case longer than 12 hr. unless otherwise approved.

4.5.2. **Mixing and Discharge of Materials.** Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed the maximum production temperatures shown in Table 12. The Department will not pay for or allow placement of any mixture produced above the maximum production temperatures shown in Table 12.

Table 12
Max Production Temperature

High-Temperature Binder Grade[1]	Max Production Temperature (°F)
PG 64	325[2]
PG 70	335[2]
PG 76	345[2]

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The Max production temperature of WMA is 275°F.

Produce WMA within the target discharge temperature range of 215–275°F when WMA is required. Take corrective action anytime the discharge temperature of the WMA exceeds the target discharge range. The Engineer may suspend production operations if the Contractor's corrective action is not successful at controlling the production temperature within the target discharge range. Note that when WMA is produced, it may be necessary to adjust burners to ensure complete combustion such that no burner fuel residue remains in the mixture.

Control the mixing time and temperature so that substantially all moisture is removed from the mixture before discharging from the plant. Determine the moisture content, if requested, by oven-drying in accordance with Tex-212-F, Part II, and verify that the mixture contains no more than 0.2% of moisture by weight. Obtain the sample immediately after discharging the mixture into the truck and perform the test promptly.

4.6. **Hauling Operations**. Clean all truck beds before use to ensure that mixture is not contaminated. Use a release agent listed on the MPL to coat the inside bed of the truck when necessary. Do not use diesel or any release agent not listed on the MPL.

Use equipment for hauling as defined in Section 341.4.7.3.3., "Hauling Equipment." Use other hauling equipment only when allowed.

4.7. **Placement Operations**. Collect haul tickets from each load of mixture delivered to the project and provide the Department's copy to the Engineer approximately every hour, or as directed. Use a handheld thermal camera or infrared thermometer, when a thermal imaging system is not used, to measure and record the internal temperature of the mixture as discharged from the truck or material transfer device (MTD) before or as the mix enters the paver. Measure the mixture temperature at a minimum frequency of one per ten trucks, or as approved. Include an approximate station number or Global Positioning System coordinates of the

location where the temperature was taken on each ticket. Ensure the mixture meets the temperature requirements shown in Table 12. Calculate the daily yield and cumulative yield for the specified lift and provide to the Engineer at the end of paving operations for each day unless otherwise directed. The Engineer may suspend production if the Contractor fails to produce and provide haul tickets and yield calculations by the end of paving operations for each day.

Prepare the surface by removing raised pavement markers and objectionable material such as moisture, dirt, sand, leaves, and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. Offset longitudinal joints of successive courses of hot mix by at least 6 in. Place mixture so that longitudinal joints on the surface course coincide within 6 in. of lane lines, are not placed in the wheel path, or will not be covered with pavement markings, or as directed. Ensure that all finished surfaces will drain properly. Place the mixture at the rate or thickness shown on the plans. The Engineer will use the guidelines shown in Table 13 to determine the compacted lift thickness of each layer when multiple lifts are required. The thickness determined is based on the rate of 110 lb. per square yard for each inch of pavement, unless otherwise shown on the plans.

Table 13
Compacted Lift Thickness and Required Core Height

Mixture Type	Compacted Lift Thickness Guidelines		Min Untrimmed Core Height Eligible for Testing (in.)
	Min (in.)	Max (in.)	
DG-B	2.50	5.00	1.75
DG-C	2.00	4.00	1.50
DG-D	1.50	3.00	1.25
DG-F	1.25	2.50	1.25

4.7.1. **Weather Conditions**.

4.7.1.1. **When Using a Thermal Imaging System**. Place mixture when the roadway surface is dry and the roadway surface temperature is at or above the temperatures shown in Table 14A, unless otherwise approved or as shown on the plans. Place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable as determined by the Engineer. Provide output data from the thermal imaging system to demonstrate to the Engineer that no recurring severe thermal segregation exists in accordance with Section 341.4.7.3.1.2., “Thermal Imaging System.”

Table 14A
Min Pavement Surface Temperatures

High-Temperature Binder Grade[1]	Min Pavement Surface Temperatures (°F)	
	Subsurface Layers	Surface Layers
PG 64	35	40
PG 70	45[2]	50[2]
PG 76	45[2]	50[2]

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The Contractor may pave at temperatures 10°F lower than these values when a chemical WMA additive is used as a compaction aid in the mixture or when using WMA.

4.7.1.2. **When Not Using a Thermal Imaging System**. When using a thermal camera instead of the thermal imaging system, place mixture when the roadway surface temperature is at or above the temperatures shown in Table 14B, unless otherwise approved or as shown on the plans. Measure the roadway surface temperature using a handheld thermal camera or infrared thermometer. The Engineer may allow mixture placement to begin before the roadway surface reaches the required temperature if conditions are such that the roadway surface will reach the required temperature within 2 hr. of beginning placement operations. Place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable as determined by the Engineer.

Table 14B
Min Pavement Surface Temperatures

High-Temperature Binder Grade[1]	Min Pavement Surface Temperatures (°F)	
	Subsurface Layers	Surface Layers
PG 64	45	50
PG 70	55[2]	60[2]
PG 76	60[2]	60[2]

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The Contractor may pave at temperatures 10°F lower than these values when a chemical WMA additive is used as a compaction aid in the mixture, when using WMA, or when using a paving process with equipment that eliminates thermal segregation. In such cases, for each sublot and in the presence of the Engineer, use a handheld thermal camera operated in accordance with Tex-244-F to demonstrate to the satisfaction of the Engineer that the uncompacted mat has no more than 10°F of thermal segregation.

4.7.2. **Tack Coat**.

4.7.2.1. **Application.** Clean the surface before placing the tack coat. The Engineer will set the rate between 0.04 and 0.10 gal. of residual asphalt per square yard of surface area. Apply a uniform tack coat at the specified rate unless otherwise directed. Apply the tack coat in a uniform manner to avoid streaks and other irregular patterns. Apply the tack coat to all surfaces that will come in contact with the subsequent HMA placement, unless otherwise directed. Apply adequate overlap of the tack coat in the longitudinal direction during placement of the mat to ensure bond of adjacent mats, unless otherwise directed. Allow adequate time for emulsion to break completely before placing any material. Prevent splattering of tack coat when placed adjacent to curb, gutter, and structures. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use, unless required in conformance with the manufacturer's recommendation for approved TRAIL product use, or when shown on the plans.

4.7.2.2. **Sampling.** The Engineer will obtain at least one sample of the tack coat binder per project per source in accordance with Tex-500-C, Part III, and test it to verify compliance with Item 300. The Engineer will notify the Contractor when the sampling will occur and will witness the collection of the sample from the asphalt distributor immediately before use. Label the can with the corresponding lot and sublot numbers, producer, producer facility location, grade, district, date sampled, all applicable bills of lading (if available), and project information, including highway and control-section-job (CSJ) number. For emulsions, the Engineer may test as often as necessary to ensure the residual of the emulsion is greater than or equal to the specification requirement in Item 300.

4.7.3. **Lay-Down Operations**. Use the placement temperatures shown in Table 15 to establish the minimum placement temperature of the mixture delivered to the paving operation.

Table 15
Min Mixture Placement Temperature

High-Temperature Binder Grade[1]	Min Placement Temperature[2,3,4] (°F)
PG 64	260
PG 70	270
PG 76	280

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The mixture temperature must be measured using a handheld thermal camera or infrared thermometer immediately before entering MTD or paver.
3. Min placement temperatures may be reduced 20°F if using a chemical WMA additive as a compaction aid, MTD with remixing capabilities, or paver hopper insert with remixing capabilities.
4. When using WMA, the minimum placement temperature is 215°F.

4.7.3.1. **Thermal Profile**. Use a handheld thermal camera or a thermal imaging system to obtain a continuous thermal profile in accordance with Tex-244-F. Thermal profiles are not applicable in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas."

4.7.3.1.1. **Thermal Segregation**.

4.7.3.1.1.1. **Moderate**. Any areas that have a temperature differential greater than 25°F, but not exceeding 50°F.

4.7.3.1.1.2. **Severe**. Any areas that have a temperature differential greater than 50°F.

4.7.3.1.2. **Thermal Imaging System**. Review the output results when a thermal imaging system is used, and provide the automated report described in Tex-244-F to the Engineer daily, unless otherwise directed. Modify the paving process as necessary to eliminate any recurring (moderate or severe) thermal segregation identified by the thermal imaging system.

The Engineer may suspend paving operations if the Contractor cannot successfully modify the paving process to eliminate recurring severe thermal segregation. Density profiles are not required and not applicable when using a thermal imaging system.

Provide the Engineer with electronic copies of all daily data files that can be used with the thermal imaging system software to generate temperature profile plots daily or as requested.

4.7.3.1.3. **Thermal Camera**. Provide the Engineer with the thermal profile of every sublot within 1 working day of the completion of each lot. When requested by the Engineer, provide the thermal images generated using the thermal camera. Report the results of each thermal profile in accordance with Section 341.4.2., "Reporting and Responsibilities." The Engineer will use a handheld thermal camera to obtain a thermal profile at least once per project.

Take immediate corrective action to eliminate recurring moderate thermal segregation when a handheld thermal camera is used.

Suspend operations and take immediate corrective action to eliminate severe thermal segregation unless otherwise directed. Resume operations when the Engineer determines that subsequent production will meet the requirements of this Section. No production or placement payment adjustments greater than 1.000 will be paid for any sublot that contains severe thermal segregation. Evaluate areas with severe thermal segregation by performing density profiles in accordance with Section 341.4.9.3.3.3., "Segregation (Density Profile)." Remove and replace the material in any areas that have severe thermal segregation and a failing result for segregation (density profile), unless otherwise directed. The sublot in question may receive a production and placement payment adjustment greater than 1.000, if applicable, when the defective material is successfully removed and replaced.

4.7.3.2. **Windrow Operations**. Operate windrow pickup equipment so that when hot mix is placed in windrows, substantially all the mixture deposited on the roadbed is picked up and loaded into the paver.

4.7.3.3. **Hauling Equipment**. Use belly dump, live-bottom, or end dump trucks to haul and transfer mixture. Except for paving miscellaneous areas, end dump trucks are allowed only when used in conjunction with an MTD with remixing capability or when a thermal imaging system is used, unless otherwise approved.

4.7.3.4. **Screed Heaters**. Turn off screed heaters to prevent overheating of the mat if the paver stops for more than 5 min. The Engineer may evaluate the suspect area in accordance with Section 341.4.9.3.3.5., "Recovered Asphalt Dynamic Shear Rheometer (DSR)," if the screed heater remains on for more than 5 min. while the paver is stopped.

4.8. **Compaction**. Compact the pavement uniformly to contain between 3.8% and 8.5% in-place air voids. Take immediate corrective action to bring the operation within 3.8% and 8.5% when the in-place air voids exceed the range of these tolerances. The Engineer will allow paving to resume when the proposed corrective action is likely to yield between 3.8% and 8.5% in-place air voids.

Obtain cores in areas placed under exempt production, as directed, at locations determined by the Engineer. The Engineer may test these cores and suspend operations or require removal and replacement if the in-place air voids are less than 2.7% or more than 9.9%. Areas defined in Section 341.4.9.3.1.4., "Miscellaneous Areas," are not subject to in-place air void determination.

Furnish the type, size, and number of rollers necessary to ensure desired compaction. Use additional rollers as required to remove any roller marks. Use only water or an approved release agent on rollers, tamps, and other compaction equipment unless otherwise directed.

Use the control strip method shown in Tex-207-F, Part IV, on the first day of production to establish the rolling pattern that will produce the desired in-place air voids, unless otherwise directed.

Use tamps to thoroughly compact the edges of the pavement along curbs, headers, and similar structures and in locations that will not allow thorough compaction using rollers. The Engineer may require rolling using a trench roller on widened areas, in trenches, and in other limited areas.

Complete all compaction operations using breakdown rollers before the pavement temperature drops below 180°F, unless otherwise allowed. Compaction using a pneumatic or light finish roller operated in static mode is allowed for pavement temperatures above 160°F.

Allow the compacted pavement to cool to 160°F or lower before opening to traffic, unless otherwise directed. Sprinkle the finished mat with water or limewater, when directed, to expedite opening the roadway to traffic.

4.9. **Acceptance Plan**. Payment adjustments for the material will be in accordance with Article 341.6., "Payment."

Sample and test the hot mix on a lot and sublot basis. Suspend production if the production payment factor shown in Section 341.6.1., "Production Payment Adjustment Factors," or the placement payment factor shown in Section 341.6.2., "Placement Payment Adjustment Factors," for two consecutive lots is below 1.000. Resume production once test results or other information indicates to the satisfaction of the Engineer that the next material produced or placed will result in payment factors of at least 1.000.

4.9.1. **Referee Testing**. The Materials and Tests Division is the referee laboratory. The Contractor may request referee testing if a "remove and replace" condition is determined based on the Engineer's test results, or if the differences between Contractor and Engineer test results exceed the maximum allowable difference in accordance with Table 11 and the differences cannot be resolved. The Contractor may also request referee testing if the Engineer's test results require suspension of production and the Contractor's test results are within specification limits. Make the request within 5 working days after receiving test results and cores from the Engineer. Referee tests will be performed only on the sublot in question and only for the tests in question. Allow 10 working days from the time the referee laboratory receives the samples for test results to be

reported. The Department may require the Contractor to reimburse the Department for referee tests if more than three referee tests per project are required and the Engineer's test results are closer to the referee test results than the Contractor's test results.

The Materials and Tests Division will determine the laboratory-molded density based on the molded specific gravity and the maximum theoretical specific gravity of the referee sample. The in-place air voids will be determined based on the bulk specific gravity of the cores, as determined by the referee laboratory, and the Engineer's average maximum theoretical specific gravity for the lot. Except for "remove and replace" conditions, referee test results are final and will establish payment adjustment factors for the sublot in question. The Contractor may decline referee testing and accept the Engineer's test results when the placement payment adjustment factor for any sublot results in a "remove and replace" condition. Placement sublots subject to be removed and replaced will be further evaluated in accordance with Section 341.6.2.2., "Placement Sublots Subject to Removal and Replacement."

4.9.2. **Production Acceptance**.

4.9.2.1. **Production Lot**. A production lot consists of four equal sublots. The default quantity for Lot 1 is 1,000 ton; however, when requested by the Contractor, the Engineer may increase the quantity for Lot 1 to no more than 4,000 ton. The Engineer will select subsequent lot sizes based on the anticipated daily production such that approximately three–four sublots are produced each day. The lot size will be between 1,000 ton and 4,000 ton. The Engineer may change the lot size before the Contractor begins any lot.

If the optimum asphalt binder content for JMF2 is more than 0.5% lower than the optimum asphalt binder content for JMF1, the Engineer may perform or require the Contractor to perform Tex-226-F on Lot 1 to confirm the indirect tensile strength does not exceed 200 psi. Take corrective action to bring the mixture within specification compliance if the indirect tensile strength exceeds 200 psi, unless otherwise directed.

4.9.2.1.1. **Incomplete Production Lots**. If a lot is begun but cannot be completed, such as on the last day of production or in other circumstances deemed appropriate, the Engineer may close the lot. Adjust the payment for the incomplete lot in accordance with Section 341.6.1., "Production Payment Adjustment Factors." Close all lots within 5 working days unless otherwise allowed.

4.9.2.2. **Production Sampling**.

4.9.2.2.1. **Mixture Sampling**. The Engineer will perform or witness the sampling of production sublots from trucks at the plant in accordance with Tex-222-F The sampler will split each sample into three equal portions in accordance with Tex-200-F and label these portions as "Contractor," "Engineer," and "Referee." The Engineer will perform or witness the sample splitting and take immediate possession of the samples labeled "Engineer" and "Referee." The Engineer will maintain the custody of the samples labeled "Engineer" and "Referee" until the Department's testing is completed.

4.9.2.2.1.1. **Random Sample**. At the beginning of the project, the Engineer will select random numbers for all production sublots. Determine sample locations in accordance with Tex-225-F. Take one sample for each sublot at the randomly selected location. The Engineer will perform or witness the sampling of production sublots.

4.9.2.2.1.2. **Blind Sample**. For one sublot per lot, the Engineer will sample, split, and test a "blind" production sample instead of the random sample collected by the Contractor. The location of the Engineer's "blind" sample will not be disclosed to the Contractor before sampling. The Engineer's "blind" sample may be randomly selected in accordance with Tex-225-F for any sublot or selected at the discretion of the Engineer. The Engineer may sample and test an additional blind sample when the random sampling process does not result in obtaining a sample.

For one sublot per lot, the Contractor must obtain from the Engineer a "blind" production sample collected by the Engineer. If desired, the Contractor may witness the collection of blind samples. Test either the "blind" or the random sample; however, referee testing for the sublot (if applicable) will be based on a comparison of results from the "blind" sample.

4.9.2.2.2. **Asphalt Binder Sampling**. The Engineer will witness the Contractor obtain a 1-qt. sample of the asphalt binder for each lot of mixture produced. The Contractor will notify the Engineer when the sampling will occur. Obtain the sample at approximately the same time the mixture random sample is obtained. Sample from a port located immediately upstream from the mixing drum or pug mill and upstream from the introduction of any additives in accordance with Tex-500-C, Part II. Label the can with the corresponding lot and sublot numbers, producer name, producer facility, grade, District, date sampled, all applicable bills of lading (if available), and project information, including highway and CSJ number. The Engineer will retain these samples for 1 yr. The Engineer may also obtain independent samples. If obtaining an independent asphalt binder sample and upon request of the Contractor, the Engineer will split a sample of the asphalt binder with the Contractor.

At least once per project, the Engineer will collect split samples of each binder grade and source used. The Engineer will submit one split sample to the Materials and Tests Division to verify compliance with Item 300, and will retain the other split sample for 1 yr.

4.9.2.3. **Production Testing**. The Contractor and Engineer must perform production tests shown in Table 16. The Contractor has the option to verify the Engineer's test results on split samples provided by the Engineer. Determine compliance with operational tolerances shown in Table 11 for all sublots.

Take immediate corrective action if the Engineer's laboratory-molded density on any sublot is less than 95.0% or greater than 97.0% to bring the mixture within these tolerances. The Engineer may suspend operations if the Contractor's corrective actions do not produce acceptable results. The Engineer will allow production to resume when the proposed corrective action is likely to yield acceptable results.

The Engineer may allow alternate methods for determining the asphalt binder content and aggregate gradation if the aggregate mineralogy is such that Tex-236-F, Part I does not yield reliable results. Provide evidence that results from Tex-236-F, Part I are not reliable before requesting permission to use an alternate method unless otherwise directed. Use the applicable test procedure as directed if an alternate test method is allowed.

Table 16
Production and Placement Testing Frequency

Description	Test Method	Min Contractor Testing Frequency	Min Engineer Testing Frequency
Individual % retained on #8 sieve and larger	Tex-200-F or Tex-236-F	1 per sublot	1 per 12 sublots[1]
Individual % retained on sieves smaller than #8 and larger than #200			
% passing #200 sieve			
Laboratory-molded density	Tex-207-F	–	1 per sublot[1]
Laboratory-molded bulk specific gravity			
In-place air voids			
VMA	Tex-204-F		
Segregation (density profile)	Tex-207-F, Part V	1 per sublot[2]	1 per project
Longitudinal joint density	Tex-207-F, Part VII	1 per sublot[3]	1 per project
Moisture content	Tex-212-F, Part II	When directed	1 per project
Theoretical maximum specific (Rice) gravity	Tex-227-F	–	1 per sublot[1]
Asphalt binder content	Tex-236-F, Part I	1 per sublot	1 per lot[1]
Thermal profile	Tex-244-F	1 per sublot[2]	1 per project
Hamburg wheel test	Tex-242-F	–	
Deleterious in RAS[4]	Tex-217-F, Part III	–	
Asphalt binder sampling and testing[4,5]	Tex-500-C, Part II	–	
Tack coat sampling and testing	Tex-500-C, Part III	–	
Boil test[6]	Tex-530-C	1 per lot	
Shear bond strength test[7]	Tex-249-F	–	

1. For production defined in Section 341.4.9.4., "Exempt Production," the Engineer will perform one test per day if 100 ton or more is produced. For exempt production, no testing is required when < 100 ton is produced.
2. To be performed in the presence of the Engineer when not using the thermal imaging system, unless otherwise approved.
3. To be performed in the presence of the Engineer.
4. Testing performed by the Materials and Tests Division or designated laboratory.
5. Sampling performed by the Contractor. The Engineer will witness sampling and retain the samples for 1 yr.
6. When shown on the plans.
7. Testing performed by the Materials and Tests Division or District for informational purposes on a sample obtained by the Contractor within the first four lots of the project.

4.9.2.4. **Operational Tolerances**. Control the production process within the operational tolerances shown in Table 11. When production is suspended, the Engineer will allow production to resume when test results or other information indicates the next mixture produced will be within the operational tolerances.

4.9.2.4.1. **Gradation**. Suspend operation and take corrective action if any aggregate is retained on the maximum sieve size shown in Table 8. A sublot is defined as out of tolerance if either the Engineer's or the Contractor's test results are out of operational tolerance. Suspend production when test results for gradation exceed the operational tolerances shown in Table 11 for three consecutive sublots on the same sieve or four consecutive sublots on any sieve, unless otherwise directed. The consecutive sublots may be from more than one lot.

4.9.2.4.2. **Asphalt Binder Content**. A sublot is defined as out of operational tolerance if either the Engineer's or the Contractor's test results exceed the values shown in Table 11. No production or placement payment adjustments greater than 1.000 will be paid for any sublot that is out of operational tolerance for asphalt binder content. Suspend production and shipment of the mixture if the Engineer's or the Contractor's asphalt binder content deviates from the current JMF by more than 0.5% for any sublot.

4.9.2.4.3. **VMAs**. The Engineer will determine the VMA for every sublot. For sublots when the Engineer does not determine asphalt binder content, the Engineer will use the asphalt binder content results from QC testing performed by the Contractor to determine VMA.

Take immediate corrective action if the VMA value for any sublot is less than the minimum VMA requirement for production shown in Table 8. Suspend production and shipment of the mixture if the Engineer's VMA results on two consecutive sublots are below the minimum VMA requirement for production shown in

Table 8. No production or placement payment adjustments greater than 1.000 will be paid for any sublot that does not meet the minimum VMA requirement for production shown in Table 8 based on the Engineer's VMA determination.

Suspend production and shipment of the mixture if the Engineer's VMA result is more than 0.5% below the minimum VMA requirement for production shown in Table 8. In addition to suspending production, the Engineer may require removal and replacement or may allow the sublot to be left in place without payment.

4.9.2.4.4. **Hamburg Wheel Test**. The Engineer may perform a Hamburg wheel test on plant-produced mixture anytime during production. Suspend production until further Hamburg wheel tests meet the specified values when the production samples fail the Hamburg wheel test criteria shown in Table 10. The Engineer may require up to the entire sublot of any mixture failing the Hamburg wheel test to be removed and replaced at the Contractor's expense.

If the Department-approved laboratory's Hamburg wheel test on plant-produced mixture results in a "remove and replace" condition, the Contractor may request that the Materials and Tests Division determine the final disposition of the material in question by re-testing the failing material.

4.9.2.5. **Individual Loads of Hot Mix**. The Engineer may reject individual truckloads of hot mix. When a load of hot mix is rejected for reasons other than temperature, contamination, or excessive uncoated particles, the Contractor may request that the rejected load be tested. Make this request within 4 hr. of rejection. The Engineer will sample and test the mixture. If test results are within the operational tolerances shown in Table 11, payment will be made for the load. If test results are not within operational tolerances, no payment will be made for the load.

4.9.3. **Placement Acceptance**.

4.9.3.1. **Placement Lot**. A placement lot consists of four placement sublots. A placement sublot consists of the area placed during a production sublot.

4.9.3.1.1. **Lot 1 Placement**. Placement payment adjustments greater than 1.000 for Lot 1 will be in accordance with Section 341.6.2., "Placement Payment Adjustment Factors"; however, no placement adjustment less than 1.000 will be assessed for any sublot placed in Lot 1 when the in-place air voids are greater than or equal to 2.7% and less than or equal to 9.9%. Remove and replace any sublot with in-place air voids less than 2.7% or greater than 9.9%.

4.9.3.1.2. **Incomplete Placement Lots**. An incomplete placement lot consists of the area placed as described in Section 341.4.9.2.1.1., "Incomplete Production Lots," excluding areas defined in Section 341.4.9.3.1.4., "Miscellaneous Areas." Placement sampling is required if the random sample plan for production resulted in a sample being obtained from an incomplete production sublot.

4.9.3.1.3. **Shoulders, Ramps, Etc**. Shoulders, ramps, intersections, acceleration lanes, deceleration lanes, and turn lanes are subject to in-place air void determination and payment adjustments unless shown on the plans as not eligible for in-place air void determination. Intersections may be considered miscellaneous areas when determined by the Engineer.

4.9.3.1.4. **Miscellaneous Areas**. Miscellaneous areas include areas that typically involve significant handwork or discontinuous paving operations, such as temporary detours, driveways, mailbox turnouts, crossovers, gores, spot level-up areas, pavement repair sections less than 300 ft., and other similar areas. Temporary detours are subject to in-place air void determination when shown on the plans. Miscellaneous areas also include level-ups and thin overlays when the layer thickness shown on the plans is less than the minimum untrimmed core height eligible for testing in accordance with Table 13. The specified layer thickness is based on the rate of 110 lb. per square yard for each inch of pavement unless another rate is shown on the plans. When "Level Up" is listed as part of the bid item description, a payment adjustment factor of 1.000 will be assigned for all placement sublots as described in Article 341.6., "Payment." Miscellaneous areas are not eligible for random placement sampling locations. Compact miscellaneous areas in accordance with

Section 341.4.8., "Compaction." Miscellaneous areas are not subject to in-place air void determination, thermal profiles testing, segregation (density profiles), or longitudinal joint density evaluations.

4.9.3.2. **Placement Sampling**. The Engineer will select random numbers for all placement sublots at the beginning of the project. The Engineer will provide the Contractor with the placement random numbers only immediately after the sublot is completed. Mark the roadway location at the completion of each sublot and record the station number. Determine one random sample location for each placement sublot in accordance with Tex-225-F. Adjust the random sample location by no more than necessary to achieve a 2-ft. clearance if the location is within 2 ft. of a joint or pavement edge.

Shoulders, ramps, intersections, acceleration lanes, deceleration lanes, and turn lanes are always eligible for selection as a random sample location; however, if a random sample location falls on one of these areas and the area is shown on the plans as not subject to in-place air void determination, cores will not be taken for the sublot and a 1.000 pay factor will be assigned to that sublot.

Provide the equipment and means to obtain and trim roadway cores onsite. Onsite is defined as in close proximity to where the cores are taken. Obtain the cores within 1 working day of the time the placement sublot is completed, unless otherwise approved. Obtain two 6-in. diameter cores side-by-side from within 1 ft. of the random location provided for the placement sublot. Mark the cores for identification, measure and record the untrimmed core height, and provide the information to the Engineer. The Engineer will witness the coring operation and measurement of the core thickness. Visually inspect each core and verify that the current paving layer is bonded to the underlying layer. Take corrective action if an adequate bond does not exist between the current and underlying layer to ensure that an adequate bond will be achieved during subsequent placement operations.

Trim the cores immediately after obtaining them from the roadway in accordance with Tex-251-F if the core heights meet the minimum untrimmed value in accordance with Table 13. Trim the cores onsite in the presence of the Engineer. Use a permanent marker or paint pen to record the lot and sublot numbers on each core, as well as the designation as Core A or Core B. The Engineer may require additional information to be marked on the core and may choose to sign or initial the core. The Engineer will take custody of the cores immediately after witnessing the trimming of the cores and will retain custody of the cores until the Department's testing is completed. Before turning the trimmed cores over to the Engineer, the Contractor may wrap the trimmed cores or secure them in a manner that will reduce the risk of possible damage occurring during transport by the Engineer. After testing, the Engineer will return the cores to the Contractor.

The Engineer may have the cores transported back to the Department's laboratory at the HMA plant via the Contractor's haul truck or other designated vehicle. In such cases where the cores will be out of the Engineer's possession during transport, the Engineer will use Department-provided security bags and the Protocol for Roadway Core Custody located on the Department's website to provide a secure means and process that protect the integrity of the cores during transport.

Decide whether to include the pair of cores in the air void determination for that sublot if the core height before trimming is less than the minimum untrimmed value shown in Table 13. Trim the cores in accordance with Tex-251-F before delivering to the Engineer if electing to have the cores included in the air void determination. If electing to not have the cores included in air void determination, inform the Engineer of the decision, and deliver untrimmed cores to the Engineer. The placement pay factor for the sublot will be 1.000 if cores will not be included in air void determination.

Instead of the Contractor trimming the cores onsite immediately after coring, the Engineer and the Contractor may mutually agree to have the trimming operations performed at an alternate location, such as a field laboratory or other similar location. In such cases, the Engineer will take possession of the cores immediately after they are obtained from the roadway and will retain custody of the cores until testing is completed. Either the Department or Contractor representative may perform trimming of the cores. The Engineer will witness all trimming operations in cases where the Contractor representative performs the trimming operation.

Dry the core holes and tack the sides and bottom immediately after obtaining the cores. Fill the hole with the same type of mixture and properly compact the mixture. Repair core holes using other methods when approved.

4.9.3.3. **Placement Testing**. Perform placement tests in accordance with Table 16. After the Engineer returns the cores, the Contractor may test the cores to verify the Engineer's test results for in-place air voids. The allowable differences between the Contractor's and Engineer's test results are shown in Table 11.

4.9.3.3.1. **In-Place Air Voids**. The Engineer will measure in-place air voids in accordance with Tex-207-F and Tex-227-F. Before drying to a constant weight, cores may be pre-dried using a CoreDry or similar vacuum device to remove excess moisture. The Engineer will average the values obtained for all sublots in the production lot to determine the theoretical maximum specific gravity. The Engineer will use the average air void content for in-place air voids.

The Engineer will use the vacuum method to seal the core if required in accordance with Tex-207-F. The Engineer will use the test results from the unsealed core to determine the placement payment adjustment factor if the sealed core yields a higher specific gravity than the unsealed core. After determining the in-place air void content, the Engineer will return the cores and provide test results to the Contractor.

4.9.3.3.2. **Informational Shear Bond Strength Testing**. The Engineer will select one random sublot within the first four lots of the project for shear bond strength testing. Obtain full-depth cores in accordance with Tex-249-F unless the HMA is being placed directly on concrete pavement. Label the cores with lot and sublot numbers and provide to the Engineer. Inspector must use pertinent Department form to document the CSJ number, producer of the tack coat, mix type, and shot rate. The Engineer will ship the cores to the Materials and Tests Division or District laboratory for shear bond strength testing. Results from these tests will not be used for specification compliance.

4.9.3.3.3. **Segregation (Density Profile)**. Test for segregation using density profiles in accordance with Tex-207-F, Part V. Density profiles are not required and are not applicable when using a thermal imaging system. Density profiles are not applicable in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas."

Perform at least one density profile per sublot. Perform additional density profiles when any of the following conditions occur, unless otherwise approved:

- areas that are identified by either the Contractor or the Engineer with severe thermal segregation,
- any visibly segregated areas that exist,
- the paver stops due to lack of material being delivered to the paving operations and the temperature of the uncompacted mat before the initial breakdown rolling is less than the temperatures shown in Table 17.

Table 17
Min Uncompacted Mat Temperature Requiring Segregation Profile[1]

High-Temperature Binder Grade[2]	Min Temperature of Uncompacted Mat Allowed Before Initial Breakdown Rolling[3,4,5] (°F)
PG 64	<250
PG 70	<260
PG 76	<270

1. Applicable only to paver stops that occur due to lack of material being delivered to the paving operations and when not using a thermal imaging system.
2. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
3. The surface of the uncompacted mat must be measured using a handheld thermal camera or infrared thermometer.
4. Min uncompacted mat temperature requiring a segregation profile may be reduced 20°F if using a chemical WMA additive as a compaction aid, MTD with remixing capabilities, or paver hopper insert with remixing capabilities.
5. When using WMA, the Min uncompacted mat temperature requiring a segregation profile is 215°F.

Provide the Engineer with the density profile of every sublot in the lot within 1 working day of the completion of each lot. Report the results of each density profile in accordance with Section 341.4.2., "Reporting and Responsibilities."

The density profile is considered failing if it exceeds the tolerances shown in Table 18. When a thermal imaging system is not used, the Engineer will measure the density profile at least once per project. The Engineer's density profile results will be used when available. The Engineer may require the Contractor to remove and replace the area in question if the area fails the density profile and has surface irregularities as defined in Section 341.4.9.3.3.6., "Irregularities." The sublot in question may receive a production and placement payment adjustment greater than 1.000, if applicable, when the defective material is successfully removed and replaced.

Investigate density profile failures and take corrective actions during production and placement to eliminate the segregation. Suspend production if two consecutive density profiles fail unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

Table 18
Segregation (Density Profile) Acceptance Criteria

Mixture Type	Max Allowable Density Range (highest to lowest, pcf)	Max Allowable Density Range (average to lowest, pcf)
DG-B	8.0	5.0
DG-C, DG-D, and DG-F	6.0	3.0

4.9.3.3.4. **Longitudinal Joint Density**.

4.9.3.3.4.1. **Informational Tests**. Perform joint density evaluations while establishing the rolling pattern and verify that the joint density is no more than 3.0 pcf below the density taken at or near the center of the mat. Adjust the rolling pattern, if needed, to achieve the desired joint density. Perform additional joint density evaluations, at least once per sublot, unless otherwise directed.

4.9.3.3.4.2. **Record Tests**. Perform a joint density evaluation for each sublot at each pavement edge that is or will become a longitudinal joint. Joint density evaluations are not applicable in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas." Determine the joint density in accordance with Tex-207-F, Part VII. Record the joint density information and submit results on Department forms to the Engineer. The evaluation is considered failing if the joint density is more than 3.0 pcf below the density taken at the core random sample location and the correlated joint density is less than 90.0%. The Engineer will make independent joint density verification at least once per project and may make independent joint density

verifications at the random sample locations. The Engineer's joint density test results will be used when available.

Provide the Engineer with the joint density of every sublot in the lot within 1 working day of the completion of each lot. Report the results of each joint density in accordance with Section 341.4.2., "Reporting and Responsibilities."

Investigate joint density failures and take corrective actions during production and placement to improve the joint density. Suspend production if the evaluations on two consecutive sublots fail, unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

4.9.3.3.5. **Recovered Asphalt Dynamic Shear Rheometer (DSR)**. The Engineer may take production samples or cores from suspect areas of the project to determine recovered asphalt properties. Asphalt binders with an aging ratio greater than 3.5 do not meet the requirements for recovered asphalt properties and may be deemed defective when tested and evaluated by the Materials and Tests Division. The aging ratio is the DSR value of the extracted binder divided by the DSR value of the original unaged binder. Obtain DSR values in accordance with AASHTO T 315 at the specified high-temperature PG of the asphalt. The Engineer may require removal and replacement of the defective material at the Contractor's expense. The asphalt binder will be recovered for testing from production samples or cores in accordance with Tex-211-F.

4.9.3.3.6. **Irregularities**. Identify and correct irregularities, including segregation, rutting, raveling, flushing, fat spots, mat slippage, irregular color, irregular texture, roller marks, tears, gouges, streaks, uncoated aggregate particles, or broken aggregate particles. The Engineer may also identify irregularities, and in such cases, the Engineer will promptly notify the Contractor. If the Engineer determines that the irregularity will adversely affect pavement performance, the Engineer may require the Contractor to remove and replace (at the Contractor's expense) areas of the pavement that contain irregularities. The Engineer may also require the Contractor to remove and replace (at the Contractor's expense) areas where the mixture does not bond to the existing pavement.

If irregularities are detected, the Engineer may require the Contractor to immediately suspend operations or may allow the Contractor to continue operations for no more than 1 day while the Contractor is taking appropriate corrective action.

4.9.4. **Exempt Production**. The mixture may be deemed as exempt production when mutually agreed upon between the Engineer and the Contractor, or when shown on the plans. Exempt production may be used for the following conditions.

- Anticipated daily production is less than 500 ton.
- Total production for the project is less than 5,000 ton.
- Pavement repair sections are equal to or greater than 300 ft. For pavement repair sections less than 300 ft., refer to Section 341.4.9.3.1.4., "Miscellaneous Areas."

Exempt production is not eligible for referee testing. For exempt production, the Contractor is relieved of all production and placement QC and QA sampling and testing requirements, except for coring operations when required by the Engineer. When mutually agreed upon between the Engineer and the Contractor, production sampling will be allowed at the point of delivery. When 100 ton or more per day is produced, the Engineer must perform acceptance tests for production and placement in accordance with Table 16. If the specification requirements listed below are met, the production and placement pay factors are 1.000:

- produce, haul, place, and compact the mixture in compliance with the specification and as directed;
- control mixture production to yield a laboratory-molded density that is within ±1.0% of the target laboratory-molded density as tested by the Engineer;
- compact the mixture in accordance with Section 341.4.8., "Compaction;"
- when a thermal imaging system is not used, the Engineer may perform segregation (density profiles) and thermal profiles in accordance with the specification; and
- all other specification requirements.

4.9.5. **Ride Quality**. Measure ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces," unless otherwise shown on the plans.

5. MEASUREMENT

5.1. **Dense-Graded HMA**. Hot mix will be measured by the ton of composite hot mix, which includes asphalt, aggregate, and additives. Measure the weight on scales in accordance with Item 520, "Weighing and Measuring Equipment."

5.2. **Tack Coat**. Tack coat will be measured at the applied temperature by strapping the tank before and after road application and determining the net volume in gallons from the calibrated distributor. The Engineer will witness all strapping operations for volume determination. All tack, including emulsions, will be measured by the gallon applied.

The Engineer may allow the use of a metering device to determine asphalt volume used and application rate if the device is accurate within 1.5% of the strapped volume.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.1., "Dense-Graded HMA," will be paid for at the unit price bid for "Dense-Graded Hot-Mix Asphalt" of the mixture type, SAC, and binder specified. These prices are full compensation for surface preparation, materials, placement, equipment, labor, tools, and incidentals.

The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.2., "Tack Coat," will be paid for at the unit price bid for "Tack Coat" of the tack coat provided. These prices are full compensation for materials, placement, equipment, labor, tools, and incidentals. Payment adjustments will be applied as determined in accordance with this Item; however, a payment adjustment factor of 1.000 will be assigned for all placement sublots for level-ups only when "Level Up" is listed as part of the bid item description. A payment adjustment factor of 1.000 will be assigned to all production and placement sublots when "Exempt" is listed as part of the bid item description, and all testing requirements are met.

Payment for each sublot, including applicable payment adjustments greater than 1.000, will be paid only for sublots when the Contractor supplies the Engineer with the required documentation for production and placement QC and QA, thermal profiles, segregation density profiles, and longitudinal joint densities in accordance with Section 341.4.2., "Reporting and Responsibilities." When a thermal imaging system is used, documentation is not required for segregation density profiles on individual sublots; however, the thermal imaging system automated reports described in Tex-244-F are required.

Trial batches will not be paid for unless they are included in pavement work approved by the Department.

Payment adjustment for ride quality will be determined in accordance with Item 585.

6.1. **Production Payment Adjustment Factors**. The production payment adjustment factor is based on the laboratory-molded density using the Engineer's test results. The bulk specific gravities of the samples from each sublot will be divided by the Engineer's maximum theoretical specific gravity for the sublot. The individual sample densities for the sublot will be averaged to determine the production payment adjustment factor in accordance with Table 19 for each sublot, using the deviation from the target laboratory-molded density in accordance with Table 9. The production payment adjustment factor for completed lots will be the average of the payment adjustment factors for the four sublots sampled within that lot.

Table 19
Production Payment Adjustment Factors for Laboratory-Molded Density[1]

Absolute Deviation from Target Laboratory-Molded Density	Production Payment Adjustment Factor (Target Laboratory-Molded Density)
0.0	1.050
0.1	1.050
0.2	1.050
0.3	1.044
0.4	1.038
0.5	1.031
0.6	1.025
0.7	1.019
0.8	1.013
0.9	1.006
1.0	1.000
1.1	0.965
1.2	0.930
1.3	0.895
1.4	0.860
1.5	0.825
1.6	0.790
1.7	0.755
1.8	0.720
>1.8	Remove and replace

1. If the Engineer's laboratory-molded density on any sublot is <95.0% or >97.0%, take immediate corrective action to bring the mixture within these tolerances. The Engineer may suspend operations if the Contractor's corrective actions do not produce acceptable results. The Engineer will allow production to resume when the proposed corrective action is likely to yield acceptable results.

6.1.1. **Payment for Incomplete Production Lots**. Production payment adjustments for incomplete lots, described under Section 341.4.9.2.1.1., "Incomplete Production Lots," will be calculated using the average production payment factors from all sublots sampled.

A production payment factor of 1.000 will be assigned to any lot when the random sampling plan did not result in collection of any samples within the first sublot.

6.1.2. **Production Sublots Subject to Removal and Replacement**. If after referee testing the laboratory-molded density for any sublot results in a "remove and replace" condition as shown in Table 19, the Engineer may require removal and replacement or may allow the sublot to be left in place without payment. The Engineer may also accept the sublot in accordance with Section 5.3.1., "Acceptance of Defective or Unauthorized Work." Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.

6.2. **Placement Payment Adjustment Factors**. The placement payment adjustment factor is based on in-place air voids using the Engineer's test results. The bulk specific gravities of the cores from each sublot will be divided by the Engineer's average maximum theoretical specific gravity for the lot. The individual core densities for the sublot will be averaged to determine the placement payment adjustment factor in accordance with Table 20 for each sublot that requires in-place air void measurement. A placement payment adjustment factor of 1.000 will be assigned to the entire sublot when the random sample location falls in an area shown on the plans as not subject to in-place air void determination. A placement payment adjustment factor of 1.000 will be assigned to quantities placed in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas." The placement payment adjustment factor for completed lots will be the average of the placement payment adjustment factors for up to four sublots within that lot.

Table 20
Placement Payment Adjustment Factors for In-Place Air Voids

In-Place Air Voids	Placement Pay Adjustment Factor	In-Place Air Voids	Placement Payment Adjustment Factor
<2.7	Remove and replace	6.4	1.042
2.7	0.710	6.5	1.040
2.8	0.740	6.6	1.038
2.9	0.770	6.7	1.036
3.0	0.800	6.8	1.034
3.1	0.830	6.9	1.032
3.2	0.860	7.0	1.030
3.3	0.890	7.1	1.028
3.4	0.920	7.2	1.026
3.5	0.950	7.3	1.024
3.6	0.980	7.4	1.022
3.7	0.998	7.5	1.020
3.8	1.002	7.6	1.018
3.9	1.006	7.7	1.016
4.0	1.010	7.8	1.014
4.1	1.014	7.9	1.012
4.2	1.018	8.0	1.010
4.3	1.022	8.1	1.008
4.4	1.026	8.2	1.006
4.5	1.030	8.3	1.004
4.6	1.034	8.4	1.002
4.7	1.038	8.5	1.000
4.8	1.042	8.6	0.998
4.9	1.046	8.7	0.996
5.0	1.050	8.8	0.994
5.1	1.050	8.9	0.992
5.2	1.050	9.0	0.990
5.3	1.050	9.1	0.960
5.4	1.050	9.2	0.930
5.5	1.050	9.3	0.900
5.6	1.050	9.4	0.870
5.7	1.050	9.5	0.840
5.8	1.050	9.6	0.810
5.9	1.050	9.7	0.780
6.0	1.050	9.8	0.750
6.1	1.048	9.9	0.720
6.2	1.046	>9.9	Remove and replace
6.3	1.044	–	–

6.2.1. **Payment for Incomplete Placement Lots**. Payment adjustments for incomplete placement lots described under Section 341.4.9.3.1.2., "Incomplete Placement Lots," will be calculated using the average of the placement payment factors from all sublots sampled and sublots where the random location falls in an area shown on the plans as not eligible for in-place air void determination.

If the random sampling plan results in production samples, but not in placement samples, the random core location and placement adjustment factor for the sublot will be determined by applying the placement random number to the length of the sublot placed.

If the random sampling plan results in placement samples, but not in production samples, no placement adjustment factor will apply for that sublot placed.

A placement payment adjustment factor of 1.000 will be assigned to any lot when the random sampling plan did not result in collection of any production samples.

6.2.2. **Placement Sublots Subject to Removal and Replacement**. If after referee testing the placement payment adjustment factor for any sublot results in a "remove and replace" condition as shown in Table 20, the

Engineer will choose the location of two cores to be taken within 3 ft. of the original failing core location. The Contractor must obtain the cores in the presence of the Engineer. The Engineer will take immediate possession of the untrimmed cores and submit the untrimmed cores to the Materials and Tests Division, where they will be trimmed, if necessary, and tested for bulk specific gravity within 10 working days of receipt.

The bulk specific gravity of each core from each sublot will be divided by the Engineer's average maximum theoretical specific gravity for the lot. The individual core densities for the sublot will be averaged to determine the new payment adjustment factor of the sublot in question. If the new payment adjustment factor is 0.720 or greater, the new payment adjustment factor will apply to that sublot. If the new payment adjustment factor is less than 0.720, no payment will be made for the sublot. Remove and replace the failing sublot, or the Engineer may allow the sublot to be left in place without payment. The Engineer may also accept the sublot in accordance with Section 5.3.1., "Acceptance of Defective or Unauthorized Work." Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.

6.3. **Total Adjusted Pay (TAP) Calculation**. TAP will be based on the applicable payment adjustment factors for production and placement for each lot.

TAP = (A+B)/2

where:
A = Bid price × production lot quantity × average payment adjustment factor for the production lot
B = Bid price × placement lot quantity × average payment adjustment factor for the placement lot + (bid price × quantity placed in miscellaneous areas × 1.000)

Production lot quantity = Quantity actually placed - quantity left in place without payment

Placement lot quantity = Quantity actually placed - quantity left in place without payment - quantity placed in miscellaneous areas

Item 464
Reinforced Concrete Pipe

1. DESCRIPTION

Furnish and install reinforced concrete pipe, materials for precast concrete pipe culverts, or precast concrete storm drain mains, laterals, stubs, and inlet leads.

2. MATERIALS

2.1. **Fabrication**. Multi-project fabrication plants, as defined in DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures," must be approved by the Materials and Tests Division in accordance with DMS-7305 before furnishing precast reinforced concrete pipe for Department projects. The Department's MPL includes approved multi-project reinforced concrete pipe fabrication plants.

Furnish material and fabricate reinforced concrete pipe in accordance with DMS-7305.

2.2. **Design**.

2.2.1. **General**. The class and D-load equivalents are shown in Table 1. Furnish arch pipe in accordance with ASTM C506 and the dimensions shown in Table 2. Furnish horizontal elliptical pipe in accordance with ASTM C507 and the dimensions shown in Table 3. For arch pipe and horizontal elliptical pipe, the minimum height of cover required is 1 ft.

Table 1
Circular Pipe
ASTM C76 and ASTM C655

Class	D-Load
I	800
II	1,000
III	1,350
IV	2,000
V	3,000

Table 2
Arch Pipe

Design Size	Equivalent Diameter (in.)	Rise (in.)	Span (in.)
1	18	13-1/2	22
2	21	15-1/2	26
3	24	18	28-1/2
4	30	22-1/2	36-1/4
5	36	26-5/8	43-3/4
6	42	31-5/16	51-1/8
7	48	36	58-1/2
8	54	40	65
9	60	45	73
10	72	54	88

Table 3
Horizontal Elliptical Pipe

Design Size	Equivalent Diameter (in.)	Rise (in.)	Span (in.)
0	15	12	19
1	18	14	23
2	24	19	30
3	27	22	34
4	30	24	38
5	33	27	42
6	36	29	45
7	39	32	49
8	42	34	53
9	48	38	60
10	54	43	68

2.2.2. **Jacking, Boring, or Tunneling**. Design pipe for jacking, boring, or tunneling considering the specific installation conditions such as the soil conditions, installation methods, anticipated deflection angles, and jacking stresses. Provide design notes and drawings signed and sealed by a Texas licensed professional engineer when requested. Provide steel reinforcement in bell and spigot.

2.3. **Marking**. Furnish each section of reinforced concrete pipe marked with the following information in accordance with DMS-7305:

- class or D-load of pipe,
- ASTM designation,
- date of manufacture,
- pipe size,
- name or trademark of fabricator and plant location,
- designation “TX” for precast units fabricated in accordance with DMS-7305,
- designated fabricator’s approval stamp for each approved unit,
- pipe to be used for jacking and boring (when applicable), and
- designation “SR” for pipe meeting sulfate-resistant concrete plan requirements (when applicable).

Clearly mark one end of each section during the process of manufacture or immediately thereafter for pipe with elliptical reinforcement. Mark the pipe on the inside and outside of opposite walls to show the location of the top or bottom of the pipe as it should be installed unless the external shape of the pipe is such that the correct position of the top and bottom is obvious. Mark the pipe section by indenting or painting with waterproof paint.

2.4. **Inspection**. Provide access for inspection of the finished pipe at the project site before and during installation.

2.5. **Causes for Rejection**. Individual sections of pipe may be rejected for any of the conditions stated in the DMS-7305 Annex.

2.6. **Repairs**. Make repairs, if necessary, in accordance with the DMS-7305 Annex.

2.7. **Jointing Materials**. Use any of the following materials for the making of joints unless otherwise shown on the plans. Furnish a manufacturer’s certificate of compliance for all jointing materials except mortar.

2.7.1. **Mortar**. Provide mortar for joints that meets the requirements of Section 464.3.3., “Jointing.”

2.7.2. **Cold-Applied, Plastic Asphalt Sewer Joint Compound**. Provide a material that consists of natural or processed asphalt base, suitable volatile solvents, and inert filler. Ensure the consistency is such that the ends of the pipe can be coated with a layer of the compound up to 1/2 in. thick by trowel. Provide a joint

compound that cures to a firm, stiff plastic condition after application. Provide a material of a uniform mixture. Stir any small separation found in the container into a uniform mix before using.

Provide a material that meets the requirements shown in Table 4 when tested in accordance with Tex-526-C.

Table 4
Cold-Applied, Plastic Asphalt Sewer Joint Compound Material Requirements

Composition	Analysis
Asphalt base, 100%–% volatiles–% ash, % by weight	28–45
Volatiles, 212°F evaporation, 24 hr., % by weight	10–26
Mineral matter, determined as ash, % by weight	30–55
Consistency, cone penetration, 150 q, 5 sec., 77°F	150–275

2.7.3. **Rubber Gaskets**. Provide gaskets that conform to ASTM C1619 Class A or Class C. Meet the requirements of ASTM C443 for design of the pipe joints and permissible variations in dimensions.

2.7.4. **Pre-Formed Flexible Joint Sealants**. Pre-formed flexible joint sealants may be used for sealing joints of tongue-and-groove concrete pipe. Provide flexible joint sealants that meet the requirements of ASTM C990. Use flexible joint sealants that do not depend on oxidizing, evaporating, or chemical action for its adhesive or cohesive strength. Supply in extruded rope form of suitable cross-section. Provide a size of the pre-formed flexible joint sealant in conformance with the manufacturer's recommendations and large enough to properly seal the joint. Protect flexible joint sealants with a suitable wrapper able to maintain the integrity of the jointing material when the wrapper is removed.

3. CONSTRUCTION

3.1. **Excavation, Shaping, Bedding, and Backfill**. Excavate, shape, bed, and backfill in accordance with Item 400, "Excavation and Backfill for Structures," except where jacking, boring, or tunneling methods are permitted. Jack, bore, or tunnel the pipe in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." Immediate backfilling is permitted if joints consist of materials other than mortar. Take special precautions in placing and compacting the backfill to avoid any movement of the pipe or damage to the joints. Do not use heavy earth-moving equipment to haul over the structure until at least 4 ft. of permanent or temporary compacted fill has been placed over the structure, unless otherwise shown on the plans or permitted in writing. Remove and replace pipe damaged by the Contractor at no expense to the Department.

3.2. **Laying Pipe**. Start the laying of pipe on the bedding at the outlet end with the spigot or tongue end pointing downstream and proceed toward the inlet end with the abutting sections properly matched, true to the established lines and grades unless otherwise authorized. Fit, match, and lay the pipe to form a smooth, uniform conduit. Cut cross trenches in the foundation to allow the barrel of the pipe to rest firmly on the bedding where bell-and-spigot pipe is used. Cut cross trenches no more than 2 in. larger than the bell ends of the pipe. Lower sections of pipe into the trench without damaging the pipe or disturbing the bedding and the sides of the trench. Carefully clean the ends of the pipe before the pipe is placed. Prevent earthen or bedding material from entering the pipe as it is laid. Lay the pipe in the trench, when elliptical pipe with circular reinforcing or circular pipe with elliptical reinforcing is used, so the markings for the top or bottom are not more than 5° from the vertical plane through the longitudinal axis of the pipe. Remove and re-lay, without extra compensation, pipe that is not in alignment or shows excessive settlement after laying.

Lay multiple lines of reinforced concrete pipe with the centerlines of the individual barrels parallel. Use the clear distances between outer surfaces of adjacent pipes shown in Table 5 unless otherwise shown on the plans. Use the equivalent diameter from Table 2 or Table 3 for arch pipe or horizontal elliptical pipe to determine the clear distance requirement shown in Table 5.

Table 5
Minimum Clear Distance Between Pipes

Equivalent Diameter	Min Clear Distance
18 in.	9 in.
24 in.	11 in.
30 in.	1 ft. 1 in.
36 in.	1 ft. 3 in.
42 in.	1 ft. 5 in.
48 in.	1 ft. 7 in.
54 in.	1 ft. 11 in.
60–84 in.	2 ft.

3.3. **Jointing**. Make available an appropriate rolling device similar to an automobile mechanic's "creeper" for conveyance through small-size pipe structures.

3.3.1. **Joints Sealed with Hydraulic Cement Mortar**. Use Type S mortar meeting the requirements of ASTM C270. Clean and wet the pipe ends before making the joint. Plaster the lower half of the bell or groove and the upper half of the tongue or spigot with mortar. Pack mortar into the joint from both inside and outside the pipe after the pipes are tightly jointed. Finish the inside smooth and flush with adjacent joints of pipe. Form a bead of semicircular cross-section over tongue-and-groove joints outside the pipe, extending at least 1 in. on each side of the joint. Form the mortar for bell-and-spigot joints to a 45° fillet between the outer edge of the bell and the spigot. Cure mortar joints by keeping the joints wet for at least 48 hr. or until the backfill has been completed, whichever is first. Place fill or backfill once the mortar jointing material has cured for at least 6 hr. Conduct jointing only when the atmospheric temperature is above 40°F. Protect mortared joints against freezing by backfilling or other approved methods for at least 24 hr.

Driveway culverts do not require mortar banding on the outside of the pipe.

Furnish pipes, with approval, that are large enough for a person to enter with the groove between 1/2 in. and 3/4 in. longer than the tongue. Such pipe may be laid and backfilled without mortar joints. Clean the space on the interior of the pipe between the end of the tongue and the groove of all foreign material, thoroughly wet and fill with mortar around the entire circumference of the pipe, and finish flush after the backfilling has been completed.

3.3.2. **Joints Using Cold-Applied, Plastic Asphalt Sewer Joint Compound**. Ensure both ends of the pipes are clean and dry. Trowel or otherwise place a 1/2-in. thick layer of the compound in the groove end of the pipe covering at least 2/3 of the joint face around the entire circumference. Shove home the tongue end of the next pipe with enough pressure to make a tight joint. Remove any excess mastic projecting into the pipe after the joint is made. Backfill after the joint has been inspected and approved.

3.3.3. **Joints Using Rubber Gaskets**. Make the joint assembly in conformance with the recommendations of the gasket manufacturer. Make joints watertight when using rubber gaskets. Backfill after the joint has been inspected and approved.

3.3.4. **Joints Using Pre-Formed Flexible Joint Sealants**. Install pre-formed flexible joint sealants in conformance with the manufacturer's recommendations. Place the joint sealer so no dirt or other deleterious materials contact the joint sealing material. Pull or push home the pipe with enough force to properly seal the joint. Remove any joint material pushed out into the interior of the pipe that would tend to obstruct the flow. Store pre-formed flexible joint sealants in an area warmed naturally or artificially to above 70°F in an approved manner when the atmospheric temperature is below 60°F. Apply flexible joint sealants to pipe joints immediately before placing pipe in trench, and connect pipe to previously laid pipe. Backfill after the joint has been inspected and approved.

3.4. **Connections and Stub Ends**. Make connections of concrete pipe to existing pipes, pipe storm drains, or storm drain appurtenances as shown on the plans.

Mortar or concrete the bottom of existing structures if necessary to eliminate any drainage pockets created by the connections. Repair any damage to the existing structure resulting from making the connections.

Make connections between concrete pipe and corrugated metal pipe with a suitable concrete collar and a minimum thickness of 4 in. unless otherwise shown on the plans.

Finish stub ends for connections to future work not shown on the plans by installing watertight plugs into the free end of the pipe.

Fill lift holes with concrete, mortar, or precast concrete plugs after the pipe is in place.

4. MEASUREMENT

This Item will be measured by the foot. Measurement will be made between the ends of the pipe barrel along the flow line, not including safety end treatments. Safety end treatments will be measured in accordance with Item 467, “Safety End Treatment.” Pipe that will be jacked, bored, or tunneled will be measured in accordance with Item 476. Measurement of spurs, branches, or new connecting pipe will be made from the intersection of the flow line with the outside surface of the pipe into which it connects. Where inlets, headwalls, catch basins, manholes, junction chambers, or other structures are included in lines of pipe, the length of pipe tying into the structure wall will be included for measurement, but no other portion of the structure length or width will be included.

For multiple pipes, the measured length will be the sum of the lengths of the barrels.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., “Plans Quantity Measurement.” Additional measurements or calculations will be made if adjustments of quantities are required.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Reinforced Concrete Pipe,” “Reinforced Concrete Pipe (Arch),” or “Reinforced Concrete Pipe (Elliptical)” of the size and D-load specified or of the size and class specified. This price is full compensation for constructing, furnishing, transporting, placing, and joining pipes; shaping the bed; cutting pipes on skew or slope; connecting to new or existing structures; breaking back, removing, and disposing of portions of the existing structure; replacing portions of the existing structure; cutting pipe ends on skew or slope; and equipment, labor, tools, and incidentals.

Protection methods for excavations greater than 5 ft. deep will be measured and paid for as required under Item 402, “Trench Excavation Protection,” or Item 403, “Temporary Special Shoring.” Excavation, shaping, bedding, and backfill will be paid for in accordance with Item 400. When jacking, boring, or tunneling is used at the Contractor’s option, payment will be made under this Item. When jacking, boring, or tunneling is required, payment will be made under Item 476.

Item 467
Safety End Treatment

1. DESCRIPTION

Furnish, construct, and install safety end treatments for drainage structures, or install or replace pipe runners or pipe runner assemblies on existing drainage structures.

2. MATERIALS

2.1. **General**. Furnish materials in accordance with the following.

- Item 420, “Concrete Substructures”
- Item 421, “Hydraulic Cement Concrete”
- Item 432, “Riprap”
- Item 440, “Reinforcement for Concrete”
- Item 442, “Metal for Structures”
- Item 445, “Galvanizing”
- Item 460, “Corrugated Metal Pipe”
- Item 464, “Reinforced Concrete Pipe”

Use Class C concrete for cast-in-place and precast concrete units unless otherwise shown on the plans. Furnish cast-in-place or precast safety end treatments unless otherwise shown on the plans. Furnish Class B concrete for concrete riprap unless otherwise shown on the plans. Provide galvanized steel for prefabricated metal end sections in accordance with Item 460.

Furnish pipe runners in accordance with the following:

- ASTM A1085;
- ASTM A53, Type E or S, Grade B;
- ASTM A500, Grade B; or
- API 5L, Grade X42.

Furnish plates and angles in accordance with ASTM A36. Furnish nuts and bolts in accordance with ASTM A307. Galvanize pipes, plates, angles, nuts, and bolts in accordance with Item 445.

2.2. **Fabrication**. Fabricate cast-in-place concrete units and precast units in accordance with Item 420. Provide either prefabricated metal end sections or mitered corrugated metal pipe (CMP) when specified for the pipe structure unless otherwise shown on the plans.

Provide one of the following when reinforced concrete pipe (RCP) is specified for the pipe structure, unless otherwise shown on the plans:

- mitered RCP, or
- precast safety end treatment (SET) units. Provide riprap only if the plans specifically require it for this alternative.

2.2.1. **SET Types**.

2.2.1.1. **Type I**. Provide Type I SET consisting of reinforced concrete headwalls or wingwalls and pipe runners as shown on the plans when required.

2.2.1.2. **Type II**. Provide Type II SET as shown on the plans consisting of the following:

- CMP or RCP mitered to the proper slope, concrete riprap, and pipe runners, when required;
- prefabricated metal end sections, concrete riprap, and pipe runners, when required; or
- precast SET units, concrete riprap, when required, and pipe runners, when required.

2.2.2. **Lifting Holes**. Provide no more than four lifting holes in each section for precast units. Lifting holes may be cast, cut into fresh concrete after form removal, or drilled. Provide lifting holes large enough for adequate lifting devices based on the size and weight of the section. The maximum hole diameter is 3 in. at the inside surface of the wall and 4 in. at the outside surface. Cut no more than one longitudinal wire or two circumferential wires per layer of reinforcing steel when locating lift holes. Repair spalled areas around lifting holes.

2.2.3. **Marking**. Clearly mark the following on each precast unit, mitered CMP, mitered RCP, or metal end section before shipment from the casting or fabrication yard:

- the date of manufacture,
- the name or trademark of the manufacturer, and
- the type and size designation.

2.2.4. **Storage and Shipment**. Store precast units on a level surface. Do not place any loads on precast units until the design strength is reached. Do not ship units until design strength requirements have been met.

2.2.5. **Causes for Rejection**. Precast units may be rejected for not meeting any one of the specification requirements. Individual units may also be rejected for fractures or cracks passing through the wall or surface defects indicating honeycombed or open texture surfaces. Remove rejected units from the project and replace with acceptable units meeting the requirements of this Item.

2.2.6. **Defects and Repairs**. Occasional imperfections in manufacture or accidental damage sustained during handling may be repaired in accordance with the Department's *Concrete Repair Manual*. The repaired units will be acceptable if they conform to the requirements of this Item and the repairs are sound and properly finished and cured in conformance with pertinent specifications. Repair damaged galvanizing in accordance with Section 445.3.4., "Repairs."

3. CONSTRUCTION

3.1. **General**. Remove portions of existing structures in accordance with Section 420.4.8., "Extending Existing Substructures." Drill, dowel, and grout in accordance with Item 420. Furnish concrete riprap in accordance with Item 432.

Provide riprap on all prefabricated metal end sections.

3.2. **Excavation, Shaping, Bedding, and Backfill**. Excavate, shape, bed, and backfill in accordance with Item 400, "Excavation and Backfill for Structures." Take special precautions in placing and compacting the backfill to avoid any movement or damage to the units. Bed precast units on foundations of firm and stable material accurately shaped to conform to the bases of the units.

3.3. **Placement of Precast Units**. Provide adequate means to lift and place the precast units. Fill lifting holes with mortar or concrete and cure. Precast concrete or mortar plugs may be used.

3.4. **Connections**. Make connections to new or existing structures as shown on the plans. Furnish jointing material in accordance with Item 464.

Also remove a length of the existing pipe from the headwall to the joint when removing existing headwalls as shown on the plans or as approved. Re-lay the removed pipe if approved, or furnish and lay a length of new pipe.

3.5. **Install or Replace Pipe Runners or Assemblies**. Install or replace individual pipe runners or pipe runner assemblies on existing drainage structures as shown on the plans.

4. MEASUREMENT

SETs of all types will be measured by each barrel of each structure end.

Pipe runners or pipe runner assemblies installed or replaced on existing structure will be measured by each installed or replaced on each structure end.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the various designations of "Safety End Treatment" specified as follows:

- "SET (Type I) (Barrel Span) (Wall Height) (Slope, Horizontal:Vertical) (Orientation, Cross or Parallel)";
- "SET (Type I) (Pipe Diameter or Design) (Slope, Horizontal:Vertical) (Orientation, Cross or Parallel)";
- "SET (Type II) (Pipe Diameter or Design) (Pipe Material) (Slope, Horizontal:Vertical) (Orientation, Cross or Parallel)";
- "SET (Pipe Runner)"; and
- "SET (Pipe Runner Assembly)."

For payment purposes, the wingwall heights of Type I SETs for box culverts will be rounded to the nearest foot.

This price is full compensation for constructing, furnishing, transporting, and installing the end treatments; pipe runners, or pipe runner assemblies, connecting to existing structure; breaking back, removing and disposing of portions of the existing structure, removing and disposing of existng pipe runner or pipe runner assemblies, and replacing portions of the existing structure as required to make connections; excavation and backfill; furnishing concrete, reinforcing steel, CMP or RCP, and pipe runners; and concrete riprap, nuts, bolts, plates, angles, equipment, labor, tools, and incidentals.

The removal and re-laying of existing pipe or the furnishing of new pipe to replace existing pipe will not be paid for directly, but will be subsidiary to this Item.

The mitered length of CMP or RCP that is a part of the SET (Type II) will not be paid for directly, but will be subsidiary to this Item. The limits for payment for pipe will be as shown on the plans and paid for in accordance with the pertinent bid item.

The limits of riprap to be included in the unit price bid for each SET will be shown on the plans. Any riprap placed beyond the limits shown will be paid for in accordance with Item 432. Riprap between multiple precast SET units will be required as shown on the plans and is included in the unit price bid for SET.

When precast SETs are provided as an option to mitered RCP, riprap aprons will not be required unless shown on the plans. The plans will show the limits of the riprap to be included with the precast SET for payment.

Item 496
Removing Structures

1. DESCRIPTION

Remove and either dispose of or salvage structures.

2. CONSTRUCTION

2.1. **Demolition Plans**. Follow the demolition sequence shown on the plans for bridge structures to be removed or submit a demolition plan if shown on the plans. Include in the required demolition plan the type and location of equipment to be used, the method and sequence of removal of the structural elements, and a narrative indicating the stability of the partially demolished structure is maintained throughout the demolition process. Have these plans signed and sealed by a licensed professional engineer when demolished structure intersects active roadways and as otherwise shown on the plans. Submit required demolition plans at least 14 days before starting work unless otherwise directed. Department approval of these plans is not required, but the Department reserves the right to request modifications to the plans when work could affect the safety of the traveling public and when around other transportation facilities to remain in place. Notify the Department 30 days before starting any bridge demolition work to allow for required notifications to other agencies.

2.2. **Removal**.

2.2.1. **Pipes**. Avoid damaging appurtenances determined by the Engineer to be salvageable.

2.2.2. **Concrete, Brick, or Stone Structures**. Portions of structures that will not interfere with the proposed construction may remain in place 2 ft. or more below the permanent ground line. Square off remaining structures and cut reinforcement flush with the surface of the concrete.

2.2.3. **Steel Structures**. Dismantle steel to be retained by the Department or re-erected by cold-cutting fastener heads and punching or drilling the remaining portion of the fastener, air-arc gouging welded connections, and flame-cutting beams along a straight line. The Engineer may approve other methods of cutting. Cut beams at the locations shown on the plans. Match-mark steel to be re-erected with paint in conformance with the erection drawings. Remove steel piles or cut off 2 ft. or more below the permanent ground line.

2.2.4. **Timber Structures**. Remove all fasteners from timber determined by the Engineer to be salvageable. Remove timber piles or cut off 2 ft. or more below the permanent ground line.

2.3. **Salvage**. Avoid damage to materials shown on the plans to be salvaged. Deliver materials to be retained by the Department to the location shown on the plans. Block up salvaged steel materials off the ground.

2.4. **Disposal**. Material removed that is not deemed to be salvageable is the property of the Contractor. Dispose of removed material off the right of way in conformance with federal, state, and local regulations.

2.5. **Backfill**. Backfill excavation and voids to the original ground line if resulting from the removal of structures. Place backfill that will support any portion of the roadbed or embankment to the same requirements for placing embankment. Backfill other areas in 10-in. layers, loose measurement, and compact to the density of adjacent undisturbed material.

3. MEASUREMENT

This Item will be measured by each structure or by the foot.

4. PAYMENT

The work performed in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Removing Structures” of the type of structure specified. This price is full compensation for demolition plan preparation, loading, hauling, disposal, stockpiling, removal of appurtenances, excavation and backfill, equipment, labor, tools, and incidentals.

Item 502
Barricades, Signs, and Traffic Handling

1. DESCRIPTION

Provide, install, move, replace, maintain, clean, and remove all traffic control devices shown on the plans and as directed.

Temporary work zone (TWZ) traffic control devices manufactured after December 31, 2019, must have been successfully tested to the crashworthiness requirements of the 2016 edition of the AASHTO *Manual for Assessing Safety Hardware* (MASH). An exception to the manufacture date applies when, based on the project's date of letting, a category of MASH-2016 compliant TWZ traffic control devices was not approved, or was not self-certified. In such case, devices that meet NCHRP-350 or MASH-2009 may be used.

Temporary work zone (TWZ) traffic control devices manufactured on or before December 31, 2019, must at a minimum have been successfully tested to the crashworthiness requirements of NCHRP-350 or MASH-2009. These devices may continue to be used throughout their normal service lives.

Such TWZ traffic control devices include:

- portable sign supports,
- barricades,
- portable traffic barriers designated exclusively for use in TWZs,
- crash cushions designated exclusively for use in TWZs,
- longitudinal channelizers, and
- truck-mounted attenuators (TMAs) and trailer attenuators (TAs).

Category I devices (i.e., lightweight devices), such as cones, tubular markers, and drums without lights or signs attached, may be self-certified by the vendor or provider, with documentation provided to the Department, or as shown on Department's Compliant Work Zone Traffic Control Device List.

2. CONSTRUCTION

Comply with the requirements of Article 7.2., "Safety."

Implement the traffic control plan (TCP) shown on the plans.

Install traffic control devices straight and plumb. Make changes to the TCP only as approved. Minor adjustments to meet field conditions are allowed.

Submit Contractor-proposed TCP changes, signed and sealed by a licensed professional engineer, for approval. The Engineer may develop, sign, and seal Contractor-proposed changes. Changes must conform to guidelines established in the TMUTCD using approved products from the Department's Compliant Work Zone Traffic Control Device List.

Maintain traffic control devices by taking corrective action when notified. Corrective actions include, but are not limited to, cleaning, replacing, straightening, covering, and removing devices. Maintain the devices such that they are properly positioned and spaced, are legible, and have retroreflective characteristics that meet requirements day or night and in all weather conditions.

The Engineer may authorize or direct in writing the removal or relocation of project limit advance warning signs. When project limit advance warning signs are removed before final acceptance, provide traffic control in accordance with the TMUTCD for minor operations as approved.

Remove all traffic control devices upon completion of the work as shown on the plans or as directed.

3. MEASUREMENT

"Barricades, Signs, and Traffic Handling" will be measured by the month. Law enforcement personnel with patrol vehicles will be measured by the hour for each person.

4. PAYMENT

4.1. **Barricades, Signs, and Traffic Handling**. Except for Contracts with callout work and work orders, the work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Barricades, Signs, and Traffic Handling." This price is full compensation for installation, maintenance, adjustments, replacements, removal, materials, equipment, labor, tools, and incidentals.

When the plans establish pay items for particular work in the TCP, that work will be measured and paid for under pertinent Items.

TMAs and TAs will be paid for under Item 505, "Truck-Mounted Attenuator (TMA) and Trailer Attenuator (TA)." Portable changeable message signs will be paid for under Item 503, "Portable Changeable Message Sign." Portable traffic signals will be paid for under Item 510, "One-Way Traffic Control," unless otherwise shown on the plans.

In accordance with Section 7.2.3., "Safety Contingency," funds have been included in the project budget to improve the effectiveness of traffic handling and enhance safety during the course of this project.

4.1.1. **Initiation of Payment**. Payment for this Item will begin on the first estimate after barricades, signs, and traffic handling devices have been installed in accordance with the TCP.

4.1.2. **Paid Months**. Monthly payment will be made each succeeding month for this Item provided the barricades, signs, and traffic handling devices have been installed and maintained in accordance with the TCP until the Contract amount has been paid.

If, within the timeframe established by the Engineer, the Contractor fails to provide or properly maintain signs and barricades in compliance with the Contract requirements, as determined by the Engineer, the Contractor will be considered in noncompliance with this Item. No payment will be made for the months in question, and the total final payment quantity will be reduced by the number of months the Contractor was in noncompliance.

4.1.3. **Maximum Total Payment Before Acceptance**. The total payment for this Item will not exceed 10% of the total Contract amount before final acceptance in accordance with Article 5.12., "Final Acceptance." The remaining balance will be paid in accordance with Section 502.4.1.5., "Balance Due."

4.1.4. **Total Payment Quantity**. The quantity paid under this Item will not exceed the total quantity shown on the plans, except as modified by change order and as adjusted in accordance with Section 502.4.1.2., "Paid Months." An overrun of the plans quantity for this Item will not be allowed for approving designs; testing; material shortages; closed construction seasons; curing periods; establishment, performance, test, and maintenance periods; failure to complete the work in the number of months allotted; or delays caused directly or indirectly by Contract requirements.

4.1.5. **Balance Due**. The remaining unpaid months of barricades less non-compliance months will be paid on final acceptance of the project, if all work is complete and accepted in accordance with Article 5.12., "Final Acceptance."

4.1.6. **Contracts with Callout Work and Work Orders**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be subsidiary to pertinent Items, except for federally funded Contracts.

4.2. **Law Enforcement Personnel**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid by Contractor force account for "Law Enforcement Personnel." This price is full compensation for furnishing all labor, materials, supplies, equipment, patrol vehicles, fees, and incidentals necessary to complete the work as directed.

Item 503
Portable Changeable Message Sign

1. DESCRIPTION

Furnish, operate, and maintain trailer-mounted portable changeable message sign (PCMS) units.

2. MATERIALS

Furnish new or used material in accordance with this Item and as shown on the plans. Provide a self-contained PCMS unit with the following:

- sign controller,
- changeable message sign,
- trailer, and
- power source.

Paint the exterior surfaces of the power supply housing, supports, trailer, and sign with Federal Orange No. 22246 or Federal Yellow No. 13538 of Federal Standard 595C, except paint the sign face assembly flat black.

2.1. **Sign Controller**. Provide the following.

- A controller with permanent storage of at least 75 pre-programmed messages
- An external input device for random programming and storage of at least 75 additional messages
- A controller capable of displaying up to three messages sequentially
- A controller with adjustable display rates

Enclose sign controller equipment in a lockable enclosure.

2.2. **Changeable Message Sign**. Provide the following.

- A sign capable of being elevated to at least 7 ft. above the roadway surface from the bottom of the sign
- A sign capable of being rotated 360° and secured against movement in any position
- A sign with three separate lines of text and eight characters per line minimum
- A minimum 18-in. character height
- A 5 × 7-character pixel matrix
- A message legibility distance of 600 ft. for nighttime conditions and 800 ft. for normal daylight conditions
- Capability for manual and automatic dimming light sources

The following are descriptions for three screen types of PCMS.

- **Character Modular Matrix**. This screen type comprises of character blocks.
- **Continuous Line Matrix**. This screen type uses proportionally spaced fonts for each line of text.
- **Full Matrix**. This screen type uses proportionally spaced fonts, varies the height of characters, and displays simple graphics on the entire sign.

2.3. **Trailer**. Provide a two-wheel trailer with square top fenders, four leveling jacks, and trailer lights. Do not exceed an overall trailer width of 96 in. Shock mount the electronics and sign assembly.

2.4. **Power Source**. Provide a diesel generator, solar powered power source, or both. Provide a backup power source as necessary.

2.5. **Cellular Modem**. When shown on the plans, provide a cellular modem connection to communicate with the PCMS unit remotely.

3. CONSTRUCTION

Place or relocate PCMS units as shown on the plans or as directed. The plans will show the number of PCMS units needed, for how many days, and for which construction phases.

Maintain the PCMS units in good working condition. Repair damaged or malfunctioning PCMS units as soon as possible. PCMS units will remain the property of the Contractor.

4. MEASUREMENT

This Item will be measured by each PCMS or by the day used. All PCMS units must be set up on a work area and operational before a calendar day can be considered measurable. When measurement by the day is specified, a day will be measured for each PCMS set up and operational on the worksite.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Portable Changeable Message Sign." This price is full compensation for PCMS units; setup; relocating; removing; replacement parts; batteries (when required); fuel, oil, and oil filters (when required); cellular telephone charge (when required); software; and equipment, materials, tools, labor, and incidentals. Reimbursement for the repair of damaged devices will be in accordance with Section 7.17.1., "Reimbursable Repair."

Item 505

Truck-Mounted Attenuator (TMA) and Trailer Attenuator (TA)

1. DESCRIPTION

Furnish, operate, maintain, and remove upon completion of work, a truck-mounted attenuator (TMA) or trailer attenuator (TA).

2. MATERIALS

Furnish, operate, and maintain new or used TMAs or TAs. Assure used attenuators are in good working condition and are approved for use. A list of approved TMA and TA units can be found on the Department's Compliant Work Zone Traffic Control Devices List. The host vehicle for the TMA and TA must weigh at least 19,000 lb. Host vehicles may be ballasted to achieve the required weight. Any weight added to the host vehicle must be properly attached to or contained within the vehicle so that the weight does not present a hazard and that proper energy dissipation occurs if the attenuator is impacted from behind. The weight of a TA will not be considered in the weight of the host vehicle, but the weight of a TMA may be included in the weight of the host vehicle. Upon request, provide either a manufacturer's curb weight or a certified scale weight ticket to the Engineer.

3. CONSTRUCTION

Place or relocate TMAs or TAs as shown on the plans or as directed. The plans show the number of TMAs or TAs required, the number of days or hours, and for which construction phases.

4. MEASUREMENT

4.1. **Truck-Mounted Attenuator or Trailer Attenuator (Stationary)**. This Item will be measured by the day. TMAs or TAs must be set up in a work area and operational before a calendar day can be considered measurable. A day will be measured for each TMA or TA set up and operational on the worksite.

4.2. **Truck-Mounted Attenuator or Trailer Attenuator (Mobile Operation)**. This Item will be measured by the hour or by the day. The time begins once the TMA or TA is ready for operation at the predetermined site and stops when notified by the Engineer. When measurement by the hour is specified, at least 4 hr. will be paid each day for each operating TMA or TA used in a mobile operation. When measurement by the day is specified, a day will be measured for each TMA or TA set up and operational on the worksite.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Truck-Mounted Attenuators/Trailer Attenuators (Stationary)" or "Truck-Mounted Attenuators/Trailer Attenuators (Mobile Operation)." This price is full compensation for furnishing TMA or TA; setup; relocating; removing; operating; fuel; and equipment, materials, tools, labor, and incidentals. Reimbursement for the repair of damaged devices will be in accordance with Section 7.17.1., "Reimbursable Repair."

Item 506

Temporary Erosion, Sedimentation, and Environmental Controls

1. DESCRIPTION

Install, maintain, and remove erosion, sedimentation, and environmental control measures to prevent or reduce the discharge of pollutants and protect environmental resources in accordance with the Stormwater Pollution Prevention Plan (SWP3) and environmental layout shown on the plans. Comply with Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit (CGP) TXR150000 requirements. Control measures are defined as Best Management Practices (BMPs) used to prevent or reduce the discharge of pollutants and measures to protect environmental resources. Control measures include, but are not limited to, rock filter dams, temporary pipe slope drains, temporary paved flumes, construction exits, earthwork for erosion control, pipe, construction perimeter fence, sandbags, temporary sediment control fence, biodegradable erosion control logs, vertical tracking, temporary or permanent seeding, and other measures. Erosion and sediment control devices must be selected from the Erosion Control Approved Products List. Perform work in a manner to prevent degradation of receiving waters, protect environmental resources, facilitate project construction, and comply with applicable federal, state, and local regulations. Ensure the installation and maintenance of control measures are performed in conformance with the manufacturer's or designer's specifications.

2. MATERIALS

Furnish materials in accordance with the following.

- Item 161, "Compost"
- Item 432, "Riprap"
- Item 556, "Pipe Underdrains"

2.1. **Rock Filter Dams**.

2.1.1. **Aggregate**. Furnish aggregate with approved hardness, durability, cleanliness, and resistance to crumbling, flaking, and eroding. Provide the following.

- **Types 1, 2, and 4 Rock Filter Dams**. Use 3–6-in. aggregate.
- **Type 3 Rock Filter Dams**. Use 4–8-in. aggregate.

2.1.2. **Wire**. Provide minimum 20-gauge galvanized wire for the steel wire mesh and tie wires for Types 2 and 3 rock filter dams. Type 4 dams require:

- a double-twisted, hexagonal weave with a nominal mesh opening of 2-1/2 × 3-1/4 in.,
- minimum 0.0866-in. steel wire for netting,
- minimum 0.1063-in. steel wire for selvages and corners, and
- minimum 0.0866 in. for binding or tie wire.

2.1.3. **Sandbag Material**. Furnish sandbags meeting Section 506.2.8., "Sandbags," except that any gradation of aggregate may be used to fill the sandbags.

2.2. **Temporary Pipe Slope Drains**. Provide corrugated metal pipe, polyvinyl chloride (PVC) pipe, flexible tubing, watertight connection bands, grommet materials, prefabricated fittings, and flared entrance sections as shown on the plans. Recycled and other materials meeting these requirements are allowed if approved.

Furnish concrete in accordance with Item 432.

2.3. **Temporary Paved Flumes**. Furnish asphalt concrete, hydraulic cement concrete, or other comparable non-erodible material as shown on the plans. Provide rock or rubble with a minimum diameter of 6 in. and a maximum volume of 1/2 cu. ft. for the construction of energy dissipaters.

2.4. **Construction Exits**. Provide materials as shown on the plans and in accordance with this Section.

2.4.1. **Rock Construction Exit**. Provide crushed aggregate for long- and short-term construction exits. Furnish aggregates that are clean, hard, durable, and free of adherent coatings such as salt, alkali, dirt, clay, loam, shale, soft or flaky materials, and organic and injurious matter. Use 4–8-in. aggregate for Type 1. Use 2–4-in. aggregate for Type 3.

2.4.2. **Timber Construction Exit**. Furnish No. 2 quality or better railroad ties and timbers for long-term construction exits, free of large and loose knots and treated to control rot. Fasten timbers using nuts and bolts or lag bolts, of at least 1/2 in. diameter, unless otherwise shown on the plans or allowed. Provide plywood or pressed wafer board at least 1/2 in. thick for short-term exits.

2.4.3. **Foundation Course**. Provide a foundation course consisting of flexible base, bituminous concrete, hydraulic cement concrete, or other materials as shown on the plans or directed.

2.5. **Embankment for Erosion Control**. Provide rock, loam, clay, topsoil, or other earth materials that will form a stable embankment to meet the intended use.

2.6. **Pipe**. Provide pipe outlet material in accordance with Item 556 and as shown on the plans.

2.7. **Construction Perimeter Fence**.

2.7.1. **Posts**. Provide essentially straight wood or steel posts that are at least 60 in. long. Furnish soft wood posts with a minimum diameter of 3 in. or use nominal 2 × 4-in. boards. Furnish hardwood posts with a minimum cross-section of 1-1/2 × 1-1/5 in. Furnish T- or L-shaped steel posts with a minimum weight of 1.25 lb. per foot.

2.7.2. **Fence**. Provide orange construction fencing as approved.

2.7.3. **Fence Wire**. Provide 14-gauge or larger galvanized smooth or twisted wire. Provide 16-gauge or larger tie wire.

2.7.4. **Flagging**. Provide brightly colored flagging that is fade-resistant and at least 3/4 in. wide to provide maximum visibility both day and night.

2.7.5. **Staples**. Provide staples with a crown at least 1/2 in. wide and legs at least 1/2 in. long.

2.7.6. **Used Materials**. Previously used materials meeting the applicable requirements may be used if approved.

2.8. **Sandbags**. Provide sandbag material of polypropylene, polyethylene, or polyamide woven fabric with a minimum unit weight of 4 oz. per square yard, a Mullen burst-strength exceeding 300 psi, and an ultraviolet (UV) stability exceeding 70%.

Use natural coarse sand or manufactured sand meeting the gradation shown in Table 1 to fill sandbags. Filled sandbags must be 24–30 in. long, 16–18 in. wide, and 6–8 in. thick.

Table 1
Sand Gradation

Sieve Size	Retained (% by Weight)
#4	Maximum 3%
#100	Minimum 80%
#200	Minimum 95%

Aggregate may be used instead of sand for situations where sandbags are not adjacent to traffic. The aggregate size must not exceed 3/8 in.

2.9. **Temporary Sediment Control Fence**. Provide a net-reinforced fence using woven geotextile fabric. Logos visible to the traveling public will not be allowed.

2.9.1. **Fabric**. Provide fabric materials in accordance with DMS-6230, "Temporary Sediment Control Fence Fabric."

2.9.2. **Posts**. Provide essentially straight wood or steel posts with a minimum length of 48 in., unless otherwise shown on the plans. Furnish soft wood posts at least 3 in. in diameter or use nominal 2 × 4-in. boards. Furnish hardwood posts with a minimum cross-section of 1-1/2 × 1-1/2 in. Furnish T- or L-shaped steel posts with a minimum weight of 1.25 lb. per foot.

2.9.3. **Net Reinforcement**. Provide net reinforcement of at least 12.5-gauge (Standard Wire Gauge) galvanized welded wire mesh, with a maximum opening size of 2 × 4 in., at least 24 in. wide, unless otherwise shown on the plans.

2.9.4. **Staples**. Provide staples with a crown at least 3/4 in. wide and legs 1/2 in. long.

2.9.5. **Used Materials**. Use recycled material meeting the applicable requirements if approved.

2.10. **Biodegradable Erosion Control Logs**.

2.10.1. **Core Material**. Furnish core material that is biodegradable or recyclable. Use compost, mulch, aspen excelsior wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or any other acceptable material unless specifically shown on the plans. Permit no more than 5% of the material to escape from the containment mesh. Furnish compost in accordance with Item 161.

2.10.2. **Containment Mesh**. Furnish containment mesh that is 100% biodegradable, photodegradable, or recyclable, such as burlap, twine, UV photodegradable plastic, polyester, or any other acceptable material.

Furnish biodegradable or photodegradable containment mesh when log will remain in place as part of a vegetative system.

Furnish recyclable containment mesh for temporary installations.

2.10.3. **Size**. Furnish biodegradable erosion control logs with diameters as shown on the plans or as directed. Stuff containment mesh densely so logs do not deform.

3. QUALIFICATIONS, TRAINING, AND EMPLOYEE REQUIREMENTS

3.1. **Contractor Responsible Person Environmental (CRPE) Qualifications and Responsibilities**. Provide and designate in writing at the preconstruction conference a CRPE and alternate CRPE who have overall responsibility for managing environmental compliance. The CRPE will implement stormwater and erosion control practices, oversee and observe stormwater control measure monitoring and management, oversee environmental compliance requirements, and monitor the project site daily and produce daily monitoring reports as long as there are BMPs in place or soil disturbing activities are evident to ensure compliance with the SWP3 and TPDES CGP TXR150000. Take required training in accordance with Section 7.7.4.4, "Training."

Maintain daily monitor reports and make them available within 24 hr. upon request. During time suspensions when work is not occurring or on Contract non-work days, daily inspections are not required unless a rain event has occurred. The CRPE will provide recommendations on how to improve the effectiveness of control measures. Attend the Department's preconstruction conference for the project.

Ensure training is completed in accordance with Section 7.7.4.4., "Training," by all applicable personnel before employees work on the project. Document, maintain, and make available within 24 hr. of a request, a list, signed by the CRPE, of all applicable Contractor and subcontractor employees who have completed the training. Include the employee's name, the training course name, and the date the employee completed the training.

3.2. **Contractor Superintendent Qualifications and Responsibilities**. Provide a superintendent who is competent, has experience with and knowledge of stormwater management, and is knowledgeable of the requirements and the conditions of the TPDES CGP TXR150000. The superintendent will manage and oversee the day-to-day operations and activities at the project site, work with the CRPE to provide effective stormwater management at the project site, represent and act on behalf of the Contractor, and attend the Department's preconstruction conference for the project. Take training as required in Section 7.7.4.4., "Training."

4. CONSTRUCTION

4.1. **Contractor Responsibilities**. Implement the SWP3 for the project site in accordance with the plans and specifications, TPDES CGP TXR150000, and as directed. Coordinate stormwater management with all other work on the project. Develop and implement an SWP3 for project-specific material supply plants within and outside the Department's right of way in conformance with the specific or general stormwater permit requirements. Prevent water pollution from stormwater associated with construction activity from entering any surface water or private property on or adjacent to the project site.

4.2. **Implementation**. The CRPE, or alternate CRPE, must be accessible by telephone and able to respond to project-related stormwater management or other environmental emergencies 24 hr. per day.

4.2.1. **Commencement**. Implement the SWP3 as shown on the plans and as directed. Contractor-proposed recommendations for changes will be allowed as approved. Conform to the established guidelines in the TPDES CGP TXR150000 to make changes. Do not implement changes until approval has been received and changes have been incorporated into the plans. Minor adjustments to meet field conditions are allowed and will be recorded in the SWP3.

4.2.2. **Phasing**. Implement control measures before the commencement of activities that result in soil disturbance. Phase and minimize the soil disturbance to the areas shown on the plans. Coordinate temporary control measures with permanent control measures and all other work activities on the project to assure economical, effective, safe, and continuous water pollution prevention. Provide control measures that are appropriate to the construction means, methods, and sequencing allowed by the Contract. Exercise precaution throughout the life of the project to prevent pollution of ground waters and surface waters. Schedule and perform clearing and grubbing operations so that stabilization measures will follow immediately thereafter if project conditions permit. Bring all grading sections to final grade as soon as possible and implement temporary and permanent control measures at the earliest time possible. Implement temporary control measures when required by TPDES CGP TXR150000 or otherwise necessitated by project conditions.

Do not prolong final grading and shaping. Preserve vegetation where possible throughout the project, and minimize clearing, grubbing, and excavation within stream banks, bed, and approach sections.

4.3. **General**.

4.3.1. **Temporary Alterations or Control Measure Removal**. Altering or removal of control measures is allowed when control measures are restored within the same working day.

4.3.2. **Stabilization**. Initiate stabilization for disturbed areas no more than 14 days after the construction activities in that portion of the site have temporarily or permanently ceased. Establish a uniform vegetative cover or use another stabilization practice in accordance with TPDES CGP TXR150000.

4.3.3. **Finished Work**. Remove and dispose of all temporary control measures upon acceptance of vegetative cover or other stabilization practice unless otherwise directed. Complete soil disturbing activities and establish a uniform perennial vegetative cover. A project will not be considered for acceptance until a vegetative cover of 70% density of existing adjacent undisturbed areas is obtained or equivalent permanent stabilization is obtained in accordance with TPDES CGP TXR150000. The Engineer may accept the work before vegetative cover of 70% density of existing adjacent undisturbed areas. An exception will be allowed in arid areas as defined in TPDES CGP TXR150000.

4.3.4. **Restricted Activities and Required Precautions**. Do not discharge onto the ground or into surface waters any pollutants such as chemicals, raw sewage, fuels, lubricants, coolants, hydraulic fluids, bitumens, or any other petroleum product. Operate and maintain equipment onsite to prevent actual or potential water pollution. Manage, control, and dispose of litter onsite such that no adverse impacts to water quality occur. Prevent dust from creating a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property. Wash out concrete trucks only as described in TPDES CGP TXR150000. Use appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water (i.e., dewatering). Immediately address chemical and hydrocarbon spills caused by the Contractor. Keep a spill kit onsite. Prevent discharges that would contribute to a violation of Edwards Aquifer Rules, water quality standards, the impairment of a listed water body, or other state or federal law.

4.4. **Installation, Maintenance, and Removal Work**. Perform work in accordance with the SWP3, in conformance with manufacturers' guidelines, and in accordance with TPDES CGP TXR150000. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until soil disturbing activities are completed and permanent erosion control features are in place, or the disturbed area has been adequately stabilized as approved.

The Department will inspect and document the condition of the control measures at the frequency shown on the plans and will provide the Construction SWP3 Field Inspection and Maintenance Reports to the Contractor. Make corrections as soon as possible before the next anticipated rain event or within 7 calendar days after being able to enter the worksite for each control measure. The only acceptable reason for not accomplishing the corrections within the timeframe specified is when site conditions are considered "too wet to work." Take immediate action if a correction is deemed critical as directed. When corrections are not made within the established timeframe, all work will cease on the project and time charges will continue while the control measures are brought into compliance. Commence work once the Engineer reviews and documents the project is in compliance. Commencing work does not release the Contractor of the liability for noncompliance with the SWP3, the plans, or TPDES CGP TXR150000.

The Engineer may limit the disturbed area if the Contractor cannot control soil erosion and sedimentation resulting from the Contractor's operations. Implement additional controls as directed.

Remove devices upon approval or as directed. Finish-grade and dress the area upon removal. Stabilize disturbed areas in accordance with TPDES CGP TXR150000, and as shown on the plans or directed. Materials removed are considered consumed by the project. Retain ownership of stockpiled material and remove it from the project when new installations or replacements are no longer required.

4.4.1. **Rock Filter Dams for Erosion Control**. Remove trees, brush, stumps, and other objectionable material that may interfere with the construction of rock filter dams. Place sandbags as a foundation when required or at the Contractor's option.

Place the aggregate to the lines, height, and slopes specified, without undue voids for Types 1, 2, 3, and 5. Place the aggregate on the mesh and then fold the mesh at the upstream side over the aggregate and secure it to itself on the downstream side using wire ties, or hog rings for Type 2 and Type 3, or as directed.

Place rock filter dams perpendicular to the flow of the stream or channel unless otherwise directed. Construct filter dams in accordance with the following criteria unless otherwise shown on the plans.

4.4.1.1. **Type 1 (Non-Reinforced)**.

- **Height**. At least 18 in. measured vertically from existing ground to top of filter dam.
- **Top Width**. At least 2 ft.
- **Slopes**. No steeper than 2:1.

4.4.1.2. **Type 2 (Reinforced)**.

- **Height**. At least 18 in. measured vertically from existing ground to top of filter dam.
- **Top Width**. At least 2 ft.
- **Slopes**. No steeper than 2:1.

4.4.1.3. **Type 3 (Reinforced)**.

- **Height**. At least 36 in. measured vertically from existing ground to top of filter dam.
- **Top Width**. At least 2 ft.
- **Slopes**. No steeper than 2:1.

4.4.1.4. **Type 4 (Sack Gabions)**. Unfold sack gabions and smooth out kinks and bends. Connect the sides by lacing in a single-loop-double-loop pattern on 4–5-in. spacing for vertical filling. Pull the end lacing rod at one end until tight, wrap around the end, and twist four times. Fill with stone at the filling end, pull the rod tight, cut the wire with approximately 6 in. remaining, and twist wires four times.

Place the sack flat in a filling trough, fill with stone, connect sides, and secure ends as described above for horizontal filling.

Lift and place without damaging the gabion. Shape sack gabions to existing contours.

4.4.1.5. **Type 5**. Provide rock filter dams as shown on the plans.

4.4.2. **Temporary Pipe Slope Drains**. Install pipe with a slope as shown on the plans or as directed. Construct embankment for the drainage system in 8-in. lifts to the required elevations. Hand-tamp the soil around and under the entrance section to the top of the embankment as shown on the plans or as directed. Form the top of the embankment or earth dike over the pipe slope drain at least 1 ft. higher than the top of the inlet pipe at all points. Secure the pipe with hold-downs or hold-down grommets spaced at most 10 ft. on center. Construct the energy dissipaters or sediment traps as shown on the plans or as directed. Construct the sediment trap using concrete or rubble riprap in accordance with Item 432, when shown on the plans.

4.4.3. **Temporary Paved Flumes**. Construct paved flumes as shown on the plans or as directed. Provide excavation and embankment (including compaction of the subgrade) of material to the dimensions shown on the plans unless otherwise indicated. Install a rock or rubble riprap energy dissipater, constructed from the materials specified above, to a minimum depth of 9 in. at the flume outlet to the limits shown on the plans or as directed.

4.4.4. **Construction Exits**. Prevent traffic from crossing or exiting the construction site or moving directly onto a public roadway, alley, sidewalk, parking area, or other right of way areas other than at the location of construction exits when tracking conditions exist. Construct exits for either long- or short-term use.

4.4.4.1. **Long-Term**. Place the exit over a foundation course as required. Grade the foundation course or compacted subgrade to direct runoff from the construction exits to a sediment trap as shown on the plans or as directed. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed.

4.4.4.1.1. **Type 1**. Construct to a depth of at least 8 in. using crushed aggregate as shown on the plans or as directed.

4.4.4.1.2. **Type 2**. Construct using railroad ties and timbers as shown on the plans or as directed.

4.4.4.2. **Short-Term**.

4.4.4.2.1. **Type 3**. Construct using crushed aggregate, plywood, or wafer board. This type of exit may be used for daily operations where long-term exits are not practical.

4.4.4.2.2. **Type 4**. Construct as shown on the plans or as directed.

4.4.5. **Earthwork for Erosion Control**. Perform excavation and embankment operations to minimize erosion and to remove collected sediments from other erosion control devices.

4.4.5.1. **Excavation and Embankment for Erosion Control Features**. Place earth dikes, swales, or combinations of both along the low crown of daily lift placement, or as directed, to prevent runoff spillover. Place swales and dikes at other locations as shown on the plans or as directed to prevent runoff spillover or to divert runoff. Construct cuts with the low end blocked with undisturbed earth to prevent erosion of hillsides. Construct sediment traps at drainage structures in conjunction with other erosion control measures as shown on the plans or as directed.

Create a sediment basin, where required, providing 3,600 cu. ft. of storage per acre drained, or equivalent control measures for drainage locations that serve an area with 10 or more disturbed acres at one time, not including offsite areas.

4.4.5.2. **Excavation of Sediment and Debris**. Remove sediment and debris when accumulation affects the performance of the devices, after a rain, and when directed.

4.4.6. **Construction Perimeter Fence**. Construct, align, and locate fencing as shown on the plans or as directed.

4.4.6.1. **Installation of Posts**. Embed posts 18 in. deep or adequately anchor in rock, with a spacing of 8–10 ft.

4.4.6.2. **Wire Attachment**. Attach the top wire to the posts at least 3 ft. from the ground. Attach the lower wire midway between the ground and the top wire.

4.4.6.3. **Flag Attachment**. Attach flagging to both wire strands midway between each post. Use flagging at least 18 in. long. Tie flagging to the wire using a square knot.

4.4.7. **Sandbags for Erosion Control**. Construct a berm or dam of sandbags that will intercept sediment-laden stormwater runoff from disturbed areas, create a retention pond, detain sediment, and release water in sheet flow. Fill each bag with sand so that at least the top 6 in. of the bag is unfilled to allow for proper tying of the open end. Place the sandbags with their tied ends in the same direction. Offset subsequent rows of sandbags 1/2 the length of the preceding row. Place a single layer of sandbags downstream as a secondary debris trap. Place additional sandbags as necessary or as directed for supplementary support to berms or dams of sandbags or earth.

4.4.8. **Temporary Sediment Control Fence**. Provide temporary sediment control fence near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the fence into erosion control measures used to control sediment in areas of higher flow. Install the fence as shown on the plans, in accordance with this Section, or as directed.

4.4.8.1. **Installation of Posts**. Embed posts at least 18 in. deep or adequately anchor, if in rock, with a spacing of 6--8 ft., and install on a slight angle toward the runoff source.

4.4.8.2. **Fabric Anchoring**. Dig trenches along the uphill side of the fence to anchor 6–8 in. of fabric. Provide a minimum trench cross-section of 6 × 6 in. Place the fabric against the side of the trench and align approximately 2 in. of fabric along the bottom in the upstream direction. Backfill the trench, then hand-tamp.

4.4.8.3. **Fabric and Net Reinforcement Attachment**. Attach the reinforcement to wooden posts using staples, or to steel posts using T-clips, in at least four places equally spaced unless otherwise shown on the plans. Sewn vertical pockets may be used to attach reinforcement to end posts. Fasten the fabric to the top strand of reinforcement using hog rings or cord every 15 in. or less.

4.4.8.4. **Fabric and Net Splices**. Locate splices at a fence post with a minimum lap of 6 in. attached in at least six places equally spaced unless otherwise shown on the plans. Do not locate splices in concentrated flow areas.

Requirements for installation of used temporary sediment control fence include the following:

- fabric with minimal or no visible signs of biodegradation (weak fibers),
- fabric without excessive patching (more than one patch every 15–20 ft.),
- posts without bends, and
- backing without holes.

4.4.9. **Biodegradable Erosion Control Logs**. Install biodegradable erosion control logs near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the biodegradable erosion control logs into the erosion measures used to control sediment in areas of higher flow. Install, align, and locate the biodegradable erosion control logs as specified below, as shown on the plans, or as directed.

Secure biodegradable erosion control logs in a method adequate to prevent displacement resulting from normal rain events, to prevent damage to the logs, and as approved, such that flow is not allowed under the logs. Temporarily removing and replacing biodegradable erosion logs to facilitate daily work is allowed at the Contractor's expense.

4.4.10. **Vertical Tracking**. Perform vertical tracking on slopes to temporarily stabilize soil. Provide equipment with a track undercarriage capable of producing a linear soil impression measuring at least 12 in. long × 2–4 in. wide × 1/2–2 in. deep. Do not exceed 12 in. between track impressions. Install continuous linear track impressions where the 12-in. length impressions are perpendicular to the slope. Vertical tracking is required on projects where soil disturbing activities have occurred, unless otherwise approved.

4.5. **Monitoring and Documentation**. Monitor the control measures daily as long as there are BMPs in place or soil disturbing activities are evident to ensure compliance with the SWP3 and TPDES CGP TXR150000. During time suspensions when work is not occurring or contract non-work days, daily inspections are not required unless a rain event has occurred. Monitoring will consist of, but is not limited to, observing, inspecting, and documenting site locations with control measures and discharge points to provide maintenance and inspection of controls in accordance with the SWP3. Keep written records of daily monitoring. Document in the daily monitoring report the control measure condition, the date of inspection, required corrective actions, the responsible person for making the corrections, and the date corrective actions were completed. Maintain records of all monitoring reports at the project site or at an approved place. Provide copies within 7 days. Together, the CRPE and an Engineer's representative will complete the Construction Stage Gate Checklist periodically as directed.

5. MEASUREMENT

5.1. **Rock Filter Dams**. Installation or removal of rock filter dams will be measured by the foot or by the cubic yard. The measured volume will include sandbags, when used.

5.1.1. **Linear Measurement**. When rock filter dams are measured by the foot, measurement will be along the centerline of the top of the dam.

5.1.2. **Volume Measurement**. When rock filter dams are measured by the cubic yard, measurement will be based on the volume of rock computed by the method of average end areas.

5.1.2.1. **Installation**. Measurement will be made in final position.

5.1.2.2. **Removal**. Measurement will be made at the point of removal.

5.2. **Temporary Pipe Slope Drains**. Temporary pipe slope drains will be measured by the foot.

5.3. **Temporary Paved Flumes**. Temporary paved flumes will be measured by the square yard of surface area. The measured area will include the energy dissipater at the flume outlet.

5.4. **Construction Exits**. Construction exits will be measured by the square yard of surface area.

5.5. **Earthwork for Erosion and Sediment Control**.

5.5.1. **Equipment and Labor Measurement**. Equipment and labor used will be measured by the actual number of hours the equipment is operated and the labor is engaged in the work.

5.5.2. **Volume Measurement**.

5.5.2.1. **In Place**.

5.5.2.1.1. **Excavation**. Excavation will be measured by the cubic yard in its original position and the volume computed by the method of average end areas.

5.5.2.1.2. **Embankment**. Embankment will be measured by the cubic yard in its final position by the method of average end areas. The volume of embankment will be determined between:

- the original ground surfaces or the surface upon which the embankment is to be constructed for the feature and
- the lines, grades, and slopes of the accepted embankment for the feature.

5.5.2.2. **In Vehicles**. Excavation and embankment quantities will be combined and paid for under "Earthwork (Erosion and Sediment Control, In Vehicle)." Excavation will be measured by the cubic yard in vehicles at the point of removal. Embankment will be measured by the cubic yard in vehicles measured at the point of delivery. Shrinkage or swelling factors will not be considered in determining the calculated quantities.

5.6. **Construction Perimeter Fence**. Construction perimeter fence will be measured by the foot.

5.7. **Sandbags for Erosion Control**. Sandbags will be measured as each sandbag or by the foot along the top of sandbag berms or dams.

5.8. **Temporary Sediment Control Fence**. Installation or removal of temporary sediment control fence will be measured by the foot.

5.9. **Biodegradable Erosion Control Logs**. Installation or removal of biodegradable erosion control logs will be measured by the foot along the centerline of the top of the control logs.

5.10. **Vertical Tracking**. Vertical tracking will not be measured or paid for directly, but will be subsidiary to this Item.

6. PAYMENT

The following will not be paid for directly, but will be subsidiary to pertinent Items:

- erosion control measures for Contractor project-specific locations (PSLs) inside and outside the right of way (e.g., construction and haul roads, field offices, equipment and supply areas, plants, and material sources);
- removal of litter, unless a separate pay item is shown on the plans;
- repair to devices and features damaged by Contractor operations;

- added measures and maintenance needed due to negligence, carelessness, lack of maintenance, and failure to install permanent controls;
- removal and reinstallation of devices and features needed for the convenience of the Contractor;
- finish grading and dressing upon removal of the device; and
- minor adjustments including but not limited to plumbing posts, reattaching fabric, minor grading to maintain slopes on an erosion embankment feature, or moving small numbers of sandbags.

Stabilization of disturbed areas will be paid for under pertinent Items except vertical tacking, which will be subsidiary.

Furnishing and installing pipe for outfalls associated with sediment traps and ponds will not be paid for directly, but will be subsidiary to the excavation and embankment under this Item.

6.1. **Rock Filter Dams**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows.

6.1.1. **Installation**. Installation will be paid for as "Rock Filter Dams (Install)" of the type and slope as specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

6.1.2. **Removal**. Removal will be paid for as "Rock Filter Dams (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

When the Engineer directs that the rock filter dam installation or portions thereof be replaced, payment will be made at the unit price bid for "Rock Filter Dams (Remove)" and for "Rock Filter Dams (Install)" of the type specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

6.2. **Temporary Pipe Slope Drains**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Temporary Pipe Slope Drains" of the size specified. This price is full compensation for furnishing materials, removal and disposal, furnishing and operating equipment, labor, tools, and incidentals.

Removal of temporary pipe slope drains will not be paid for directly, but will be subsidiary to the installation Item. When the Engineer directs that the pipe slope drain installation or portions thereof be replaced, payment will be made at the unit price bid for "Temporary Pipe Slope Drains" of the size specified, which is full compensation for the removal and reinstallation of the pipe drain.

Earthwork required for the pipe slope drain installation, including construction of the sediment trap, will be measured and paid for under "Earthwork for Erosion and Sediment Control."

Riprap concrete or stone, when used as an energy dissipater or as a stabilized sediment trap, will be measured and paid for in accordance with Item 432.

6.3. **Temporary Paved Flumes**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Temporary Paved Flume (Install)" or "Temporary Paved Flume (Remove)." This price is full compensation for furnishing and placing materials, removal and disposal, equipment, labor, tools, and incidentals.

When the Engineer directs that the paved flume installation or portions thereof be replaced, payment will be made at the unit prices bid for "Temporary Paved Flume (Remove)" and "Temporary Paved Flume (Install)." These prices are full compensation for the removal and replacement of the paved flume and for equipment, labor, tools, and incidentals.

Earthwork required for the paved flume installation, including construction of a sediment trap, will be measured and paid for under "Earthwork for Erosion and Sediment Control."

6.4. **Construction Exits**. Contractor-required construction exits from off right of way locations or on right of way PSLs will not be paid for directly, but will be subsidiary to pertinent Items.

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" for construction exits needed on right of way access to work areas required by the Department will be paid for at the unit price bid for "Construction Exits (Install)" of the type specified or "Construction Exits (Remove)." This price is full compensation for furnishing and placing materials, excavating, removal and disposal, cleaning vehicles, labor, tools, and incidentals.

When the Engineer directs that a construction exit or portion thereof be removed and replaced, payment will be made at the unit prices bid for "Construction Exit (Remove)" and "Construction Exit (Install)" of the type specified. These prices are full compensation for the removal and replacement of the construction exit and for equipment, labor, tools, and incidentals.

Construction of sediment traps used in conjunction with the construction exit will be measured and paid for under "Earthwork for Erosion and Sediment Control."

6.5. **Earthwork for Erosion and Sediment Control**.

6.5.1. **Initial Earthwork for Erosion and Sediment Control**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Excavation (Erosion and Sediment Control, In Place)," "Embankment (Erosion and Sediment Control, In Place)," "Excavation (Erosion and Sediment Control, In Vehicle)," "Embankment (Erosion and Sediment Control, (In Vehicle)," or "Earthwork (Erosion and Sediment Control, In Vehicle)."

This price is full compensation for excavation and embankment, including hauling; disposal of material not used elsewhere on the project; embankments including furnishing material from approved sources and construction of erosion control features; and equipment, labor, tools, and incidentals.

Sprinkling and rolling required by this Item will not be paid for directly, but will be subsidiary to this Item.

6.5.2. **Maintenance Earthwork for Erosion and Sediment Control for Cleaning and Restoring Control Measures**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid under a Contractor Force Account Item from invoice provided to the Engineer.

This price is full compensation for excavation, embankment, and re-grading, including dewatering for removal of accumulated sediment, and the removal of accumulated sediment in various erosion control installations as directed, hauling, and disposal of material not used elsewhere on the project; excavation for construction of erosion control features; embankments, including furnishing material from approved sources and construction of erosion control features; and equipment, labor, tools, and incidentals.

Earthwork needed to remove and obliterate erosion control features will not be paid for directly, but will be subsidiary to pertinent Items unless otherwise shown on the plans.

Sprinkling and rolling required by this Item will not be paid for directly, but will be subsidiary to this Item.

6.6. **Construction Perimeter Fence**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Construction Perimeter Fence." This price is full compensation for furnishing and placing the fence; digging, fence posts, wire, and flagging; removal and disposal; and materials, equipment, labor, tools, and incidentals.

Removal of construction perimeter fence will not be paid for directly, but will be subsidiary to the installation Item. When the Engineer directs that the perimeter fence installation or portions thereof be removed and replaced, payment will be made at the unit price bid for "Construction Perimeter Fence," which is full compensation for the removal and reinstallation of the construction perimeter fence.

6.7. **Sandbags for Erosion Control**. Sandbags will be paid for at the unit price bid for "Sandbags for Erosion Control" (of the height specified when measurement is by the foot). This price is full compensation for materials, placing sandbags, removal and disposal, equipment, labor, tools, and incidentals.

Removal of sandbags will not be paid for directly, but will be subsidiary to the installation Item. When the Engineer directs that the sandbag installation or portions thereof be replaced, payment will be made at the unit price bid for "Sandbags for Erosion Control," which is full compensation for the reinstallation of the sandbags.

6.8. **Temporary Sediment Control Fence**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows.

6.8.1. **Installation**. Installation will be paid for as "Temporary Sediment-Control Fence (Install)." This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

6.8.2. **Removal**. Removal will be paid for as "Temporary Sediment-Control Fence (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

6.9. **Biodegradable Erosion Control Logs**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows.

6.9.1. **Installation**. Installation will be paid for as "Biodegradable Erosion Control Logs (Install)" of the size specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, staking, proper disposal, labor, materials, tools, and incidentals.

6.9.2. **Removal**. Removal will be paid for as "Biodegradable Erosion Control Logs (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

6.10. **Vertical Tracking**. Vertical tracking will not be measured or paid for directly, but will be subsidiary to this Item.

Item 530
Intersections, Driveways, and Turnouts

1. DESCRIPTION

Construct and pave intersections, driveways, and turnouts. Pave existing intersections, driveways, and turnouts.

Intersections are considered areas off the travel lanes and shoulders of the Contract highway on the intersecting highway on the state system. The intersecting on-system highway work will be paid for under this Item only when shown on the plans.

Driveways are defined as private (residential or commercial) and public (county road and city street) access areas off the travel lanes and shoulders.

Turnouts include, but are not limited to, mailbox and litter barrel widenings.

2. MATERIALS

Furnish materials in accordance with the following.

- Item 247, “Flexible Base”
- Item 260, “Lime Treatment (Road-Mixed)”
- Item 275, “Cement Treatment (Road-Mixed)”
- Item 276, “Cement Treatment (Plant-Mixed)”
- Item 292, “Asphalt Treatment (Plant-Mixed)”
- Item 316, “Seal Coat”
- Item 330, “Limestone Rock Asphalt Pavement”
- Item 334, “Hot-Mix Cold-Laid Asphalt Concrete Pavement”
- Item 360, “Concrete Pavement”
- Item 421, “Hydraulic Cement Concrete”
- Item 440, “Reinforcement for Concrete”

3. CONSTRUCTION

Construct and pave intersections, driveways, and turnouts, and pave existing intersections, driveways, and turnouts as shown on the plans or as directed. Place materials in conformance with construction Articles of pertinent Items. Provide uninterrupted access to adjacent property unless otherwise directed. Ensure that abrupt elevation changes in driveway or turnout areas that serve as sidewalks do not exceed 1/4 in. and that the sidewalk area cross slope does not exceed 2%. Ready-mix concrete and hand finishing will be permitted when concrete pavement is specified unless otherwise shown on the plans for intersections.

4. MEASUREMENT

This Item will be measured by the square yard of the final pavement surface, as placed in the field, including radii and turnout.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Intersections," "Driveways," "Turnouts," "Intersections, Driveways, and Turnouts," or "Driveways and Turnouts" of the surface specified.

This price is full compensation for furnishing and operating equipment; excavation and embankment; base and pavement materials; and labor, materials, tools, and incidentals. Drainage structures will be measured and paid for in conformance with the pertinent bid Items.

Item 636
Signs

1. DESCRIPTION

- **Installation**. Furnish, fabricate, and erect aluminum signs. Sign supports are provided for under other Items.
- **Replacement**. Replace existing signs on existing or replaced sign supports.

2. MATERIALS

2.1. **Signs**. Furnish completed signs in accordance with DMS-8301, "Highway Sign Fabrication."

2.2. **Hardware**. Use galvanized steel, stainless steel, or dichromate-sealed aluminum for bolts, nuts, washers, lock washers, screws, and other sign assembly hardware. Use plastic or nylon washers when in direct contact with the reflective sheeting. Furnish steel or aluminum products in accordance with DMS-7120, "Sign Hardware."

When dissimilar metals are used, select or insulate metals to prevent corrosion.

2.3. **Sign Identification Decals**. Furnish materials that meet the requirements of DMS-8315, "Sign Identification Decals."

3. CONSTRUCTION

3.1. **Decals**. The sign fabricator must code the sign identification decals by punching out the appropriate letter or digits for Rows 1–7 as shown in Figure 1 and Table 1.

Rows 8–12 (Installation Date) are only for coding by the Engineer at their discretion.

Affix the decal to lower left corner of the sign back in an upright position.

Figure 1 shows the sign identification decal. The numbers to the far right as shown in Figure 1 are reference row numbers for Table 1 and are not part of the decal. Table 1 describes the information required in each row of the decal.

Texas Department of Transportation												
C	Fabrication Date										T	1
J	F	M	A	M	J	J	A	S	O	N	D	2
	202		203		204		205		206			3
	0	1	2	3	4	5	6	7	8	9		4
Sheeting MFR—Substrate												
A	B	C	D	E	F	G	H	J	K	L	M	5
Film MFR												
A	B	C	D	E	F	G	H	J	K	L	M	6
Sheeting MFR—Legend												
A	B	C	D	E	F	G	H	J	K	L	M	7
Installation Date												
				0	1	2	3					8
	0	1	2	3	4	5	6	7	8	9		9
J	F	M	A	M	J	J	A	S	O	N	D	10
	202		203		204		205		206			11
	0	1	2	3	4	5	6	7	8	9		12
Name of Sign Fabricator Physical Address City, State, Zip Code												13

Figure 1
Decal Design (Row Numbers Explained in Table 1)

Table 1
Decal Description

Row Explanation
1—Sign fabricator
2—Month fabricated
3—First 3 digits of year fabricated
4—Last digit of year fabricated
5—Manufacturer of the sheeting applied to the substrate
6—Film (colored transparent or non-reflective black) manufacturer
7—Manufacturer of the sheeting for the legend
8—Tens digit of date installed[1]
9—Ones digit of date installed[1]
10—Month installed[1]
11—First 3 digits of year installed[1]
12—Last digit of year installed[1]
13—Name of sign fabricator and physical location of sign shop

1. Only for coding by the Engineer at their discretion.

Code the decal by punching out the following:

- "C" if fabricated by a commercial sign fabricator or "T" if fabricated by the Department or the Texas Department of Criminal Justice,
- month fabricated,
- first three digits of the year fabricated,
- fourth digit of the year fabricated, and
- sheeting and film manufacturers. (Codes for these manufacturers are located on the Department's MPL.)

3.2. **Storage and Handling**. Ship, handle, and store completed sign blanks and completed signs so that corners, edges, and faces are not damaged. Damage to the sign face that is not visible when viewed at a distance of 50 ft., night or day, will be acceptable. Replace unacceptable signs.

Store all finished signs off the ground and in a vertical position until erected. Store finished sheet aluminum substrate signs in a weatherproof building. Extruded aluminum substrate signs may be stored outside.

Stockpile salvageable materials at the location shown on the plans or as directed. Accept ownership and dispose of unsalvageable materials in conformance with federal, state, and local regulations.

3.3. **Cleaning**. Wash completed signs in the fabrication shop using a biodegradable cleaning solution acceptable to the manufacturers of the sheeting, colored transparent film, and screen ink to remove grease, oil, dirt, smears, streaks, finger marks, and other foreign material. Wash again before final inspection after erection.

3.4. **Installation**. Install signs as shown on the plans or as directed.

3.5. **Replacement**. Remove the existing signs from the existing or replaced supports and replace with new signs, including mounting hardware, as shown on the plans. At the Engineer's discretion, existing galvanized mounting hardware can be reused if it was not damaged during removal of existing sign.

3.6. **Documentation**. Provide a notarized original of the project-specific Signing Material Statement (Form 2273), from the sign fabricator, along with attached copies of pertinent material certifications for verification of compliance.

4. MEASUREMENT

Signs installed or replaced will be measured by the square foot of the sign face.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Aluminum Signs," or "Replacing Existing Aluminum Signs," of the type specified.

5.1. **Installation**. This price is full compensation for furnishing and installing new signs and hardware; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams, and stiffeners; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; and materials, equipment, labor, tools, and incidentals.

5.2. **Replacement**. This price is full compensation for furnishing and installing new aluminum signs and hardware; reusing existing hardware (when applicable); removal of existing signs; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams, and stiffeners; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; salvaging and disposing of unsalvageable materials; and materials, equipment, labor, tools, and incidentals.

Item 644
Small Roadside Sign Assemblies

1. DESCRIPTION

1.1. **Installation**. Furnish, fabricate, and erect small roadside sign assemblies or bridge-mounted clearance sign assemblies consisting of the signs, sign supports, foundations (when required), and associated mounting hardware.

1.2. **Relocation**. Relocate existing small roadside sign assemblies or bridge-mounted clearance sign assemblies and furnish and fabricate material as required.

1.3. **Removal**. Remove existing small roadside sign assemblies or bridge-mounted clearance sign assemblies.

2. MATERIALS

Furnish all materials unless otherwise shown on the plans. Furnish only new materials. Furnish and fabricate materials in accordance with the following Items and as shown on the plans.

- Item 421, “Hydraulic Cement Concrete”
- Item 440, “Reinforcement for Concrete”
- Item 441, “Steel Structures”
- Item 442, “Metal for Structures”
- Item 445, “Galvanizing”
- Item 636, “Signs”
- Item 656, “Foundations for Traffic Control Devices”

Use galvanized steel, stainless steel, dichromate sealed aluminum, or other materials shown on the plans for pipe, bolts, nuts, washers, lock washers, screws, and other sign assembly hardware. When dissimilar metals are used, select or insulate metals to prevent corrosion.

3. CONSTRUCTION

Construct foundations in accordance with Item 656. Plumb sign supports. Do not spring or rake posts to secure proper alignment. Use established safety practices when working near underground or overhead utilities. Consult the appropriate utility company before beginning work.

3.1. **Fabrication**. Fabricate sign supports in accordance with Item 441. Ensure all components fit properly.

Verify the length of each post for each sign before fabrication to meet field conditions and sign-mounting heights shown on the plans.

Hot-dip galvanize fabricated parts in accordance with Item 445. Punch or drill any holes in steel parts or members before galvanizing. Repair galvanizing for any steel part or member damaged during assembly, transit, or erection, or for any steel part or member welded, when permitted, after galvanizing. Perform all galvanizing repairs in accordance with Section 445.3.4., “Repairs.”

3.2. **Installation**. Locate and install sign supports as shown on the plans, unless directed to shift the sign supports within design guidelines to secure a more desirable location or avoid conflict with utilities and underground appurtenances. Stake sign support locations for verification by the Engineer.

Install stub posts of the type, spacing, orientation, and projection shown on the plans. Remove and replace posts damaged during installation at the Contractor's expense.

Connect the upper post sections to the stub post sections as shown on the plans. Torque connection bolts as shown on the plans.

Attach signs to supports in conformance with the plans and pertinent Items.

3.3. **Relocation**. Reuse the existing signs as required unless otherwise shown on the plans. Furnish and install new stub posts in new foundations for relocated sign assemblies. Erect the new supports on the new stub posts and attach the existing signs to the supports in conformance with the plans and pertinent Items. Remove existing foundations to be abandoned in accordance with Section 644.3.4., "Removal."

3.4. **Removal**. Remove abandoned concrete foundations to 2 ft. below finished grade unless otherwise shown on the plans. Cut off and remove steel protruding from the remaining concrete. Backfill the remaining hole with material equal in composition and density to the surrounding area. Replace any surfacing with like material to equivalent condition.

3.5. **Handling and Storage**. Handle and store existing signs or portions of signs removed so they are not damaged. Store all signs to be reused off the ground and in a vertical position until erected. Prevent any damage to the various sign assembly components. Replace any portion of the sign damaged by the Contractor designated for reuse or salvage, including messages removed.

Store all new signs off the ground and in a vertical position until erected. Store new sheet aluminum substrate signs in a weatherproof building. Extruded aluminum substrate signs may be stored outdoors.

Stockpile all removed sign components that will be reused or become the property of the Department at designated locations. Accept ownership of unsalvageable materials and dispose of them in conformance with federal, state, and local regulations.

3.6. **Cleaning**. Wash the entire sign after installation using a biodegradable cleaning solution acceptable to the sign face materials manufacturer to remove dirt, grease, oil smears, streaks, finger marks, and other foreign materials.

4. MEASUREMENT

This Item will be measured as each small roadside assembly or bridge-mounted clearance sign assembly installed, removed, or relocated.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Install Small Roadside Sign Assemblies" of the type specified, "Install Bridge-Mounted Clearance Sign Assemblies" of the type specified, "Relocate Small Roadside Sign Assemblies" of the type specified, "Relocate Bridge-Mounted Clearance Sign Assemblies" of the type specified, "Remove Small Roadside Sign Assemblies," or "Remove Bridge-Mounted Clearance Sign Assemblies."

5.1. **Installation**. This price is full compensation for furnishing, fabricating, galvanizing, and erecting the supports; constructing foundations, including concrete (when required); furnishing complete signs, including sign connections and all hardware; attaching the signs to the supports; preparing and cleaning the signs; and materials, equipment, labor, tools, and incidentals.

5.2. **Relocation**. This price is full compensation for removing existing sign assemblies and related materials; furnishing and installing new stub posts and new sign supports; constructing foundations, including concrete

(when required); new hardware; reinstallation of signs; preparing and cleaning the signs; salvaging; disposal of unsalvageable materials; removing existing foundations, backfilling, and surface placement; and materials, equipment, labor, tools, and incidentals.

5.3. **Removal**. This price is full compensation for removing existing sign assemblies and related materials; salvaging; disposal of unsalvageable materials; removing existing foundations, backfilling, and surface placement; and materials, equipment, labor, tools, and incidentals.

Item 658
Delineator and Object Marker Assemblies

1. DESCRIPTION

- **Installation**. Install delineator or object marker assembly.
- **Removal**. Remove delineator or object marker assembly.
- **Replacement**. Remove existing delineator or object marker assembly and replace with new delineator or object marker assembly.

2. MATERIALS

Furnish only new materials as shown on the plans unless otherwise directed. The Engineer will sample in accordance with Tex-725-I or Tex-737-I.

2.1. **Delineator and Object Marker Assemblies**. Fabricate in accordance with the following.

- DMS-8600, "Delineators, Object Markers, and Barrier Reflectors"
- DMS-4400, "Flexible Delineator and Object Marker Posts (Embedded and Surface-Mount Types)"

2.2. **Wing Channel Post**. Furnish material of the size shown on the plans. Supply a notarized original of Form D-9-USA-1 (Department Form 1818) with supporting mill test report certifying that the base metal is in accordance with the following.

- ASTM A1011, SS Grade 50
- ASTM A499

Galvanize material in accordance with Item 445, "Galvanizing."

3. CONSTRUCTION

3.1. **Installation**. Locate delineators, object markers, and barrier reflectors as shown on the plans or as directed and install in conformance with the manufacturer's recommendations.

Install winged channel post and flexible delineator posts to allow the reflector units and reflectorized panels to be installed at the specified height and orientation. Align post as shown or as directed.

Drive post plumb using a driving cap to prevent visible cross-section dimension distortion. Drill or drive a pilot hole when post cannot be driven without visibly distorting the cross-section dimension. Backfill pilot holes thoroughly by tamping in 6-in. lifts to grade.

Repair damaged galvanizing in accordance with Section 445.3.4., "Repairs." Install reflector units on wing channel posts after the posts have been erected.

3.2. **Removal**. Remove post assemblies without damaging materials, and salvage when indicated on the plans. Remove post to a minimum of 6 in. below finished grade. Stockpile salvaged materials at the location shown on the plans or as directed. Accept ownership of unsalvageable materials and dispose of them in conformance with federal, state, and local requirements.

3.3. **Replacement**. Remove existing delineator or object marker assembly in accordance with Section 658.3.2., "Removal," and replace with new delineator or object marker assembly in accordance with Section 658.3.1., "Installation."

4. MEASUREMENT

Installation will be measured by each delineator or object marker assembly installed, removed, or replaced.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Install Delineator Assemblies," "Install Object Marker Assemblies," "Install High Speed/High Impact Assemblies," "Replace Delineator Assemblies," or "Replace Object Marker Assemblies" of the types and colors specified, and for "Remove Delineator or Object Marker Assemblies."

5.1. **Installation**. This price is full compensation for furnishing and fabricating when required; installing and mounting the delineator or object marker assemblies, including posts, adhesive or pads for surface mount assemblies, back plates, reflector units, fastening plates, brackets, bolts, nuts, and washers; and materials, equipment, labor, tools, and incidentals.

5.2. **Removal**. This price is full compensation for removal and disposal of delineator and object marker assemblies and for materials, equipment, labor, tools, and incidentals.

5.3. **Replacement**. This price is full compensation for removal and disposal of existing delineator and object marker assemblies; furnishing, installing, and mounting new delineator or object marker assemblies, including posts, adhesive or pads for surface mount assemblies, back plates, reflector units, fastening plates, brackets, bolts, nuts, and washers; and materials, equipment, labor, tools, and incidentals.

Item 666
Retroreflectorized Pavement Markings

1. DESCRIPTION

Furnish and place retroreflectorized or non-retroreflectorized (shadow) pavement markings.

2. MATERIALS

2.1. **Type I Marking Materials (Thermoplastic)**. Furnish in accordance with DMS-8220, "Hot Applied Thermoplastic."

2.2. **Type II Marking Materials (Traffic Paint)**. Furnish in accordance with DMS-8200, "Traffic Paint."

2.3. **Type III Marking Materials (Multipolymer)**. Furnish in accordance with DMS-8230, "Multipolymer Pavement Markings."

2.4. **Glass Traffic Beads**. For Type I, Type II, and Type III pavement markings, furnish drop-on glass beads in accordance with DMS-8290, "Glass Traffic Beads," to meet the specified retroreflective performance requirements for all permanent, longitudinal pavement markings.

2.5. **Labeling**. To sample material, use clearly marked containers that indicate material type, color, mass, manufacturer, and batch number.

3. EQUIPMENT

3.1. **General Requirements**. Use pavement marking equipment that:

- is maintained in satisfactory condition;
- meets or exceeds the requirements of the National Board of Fire Underwriters and the Texas Railroad Commission for this application;
- applies beads by an automatic bead dispenser attached to the pavement marking equipment such that the beads are dispensed uniformly and almost instantly upon the marking as the marking is being applied to the road surface. The bead dispenser must have an automatic cut-off control, synchronized with the cut-off of the pavement marking equipment;
- has an automatic cut-off device with manual operating capabilities to provide clean marking with square ends;
- can produce the types and shapes of profiles specified; and
- can provide continuous mixing and agitation of the pavement marking material. The use of pans, aprons, or similar appliances that the die overruns will not be permitted for longitudinal striping applications exceeding a project length of 2,000 ft., unless otherwise approved.

When placing multipolymer pavement markings (MPM), use equipment designed for pavement preparation and the application of selected type of MPM material.

Provide a handheld thermometer capable of measuring the temperature between 300°F and 450°F to measure the temperature of marking material in the field, when applying Type I material.

3.1.1. **Measuring Retroreflectivity**. Use a mobile retroreflectometer approved by the Materials and Tests Division and certified by the Texas A&M Transportation Institute (TTI) Mobile Retroreflectometer Certification Program.

Use a portable retroreflectometer that:

- uses 30-meter geometry and meets the requirements described in ASTM E1710;
- has either an internal Global Positioning System (GPS) or the ability to be linked with an external GPS with a minimum location accuracy of 16.5 ft., in accordance with the Circular Error Probability (CEP) method (CEP is the radius of the circle with its origin at a known position that encompasses 50% of the readings returned from the GPS instrument); and
- can record and export the GPS location and retroreflectivity reading for each measurement.

3.2. **Material Placement Requirements**. Use equipment that can place:

- a minimum length of 30,000 ft. for 6-in. solid or broken non-profile markings per working day at the specified thickness, unless otherwise approved;
- a minimum length of 15,000 ft. of solid or broken profile pavement markings per working day at the specified thickness;
- linear non-profile markings up to 8 in. wide in a single pass;
- non-profile pavement markings other than solid or broken lines at an approved production rate;
- a centerline and no-passing barrier-line configuration (consisting of one broken line and two solid lines simultaneously) to the alignment, spacing, and thickness for non-profile pavement markings shown on the plans;
- solid and broken lines simultaneously;
- white line from both sides;
- lines with clean edges, reasonably square ends, uniform width with a tolerance of ±1/8 in., and uniform thickness;
- skip lines between 10 and 10.5 ft., a stripe-to-gap ratio of 10 to 30, and a stripe-gap cycle between 39.5 ft. and 40.5 ft., automatically; and
- beads uniformly and almost instantly on the marking as the marking is applied.

For Type I markings, equipment must be capable of providing uniform heating of striping materials to temperatures exceeding 390°F (199°C). Ensure that the material is not heated to a temperature above the maximum temperature recommended by the manufacturer.

For Type I markings, equipment must be capable of maintaining the thermoplastic striping material in a plastic state in all mixing and conveying parts, including the line dispensing device, until applied.

4. CONSTRUCTION

Place markings before opening to traffic unless short-term or work zone markings are allowed.

4.1. **General**. Obtain approval for the sequence of work and estimated daily production. Minimize interference to roadway operations when placing markings on roadways open to traffic. Use traffic control as shown on the plans or as approved. Protect all markings placed under open-traffic conditions from traffic damage and disfigurement. Replace markings when more than 5% of the markings are damaged or disfigured.

Establish guides to mark the lateral location of pavement markings as shown on the plans or as directed and have guide locations verified. Use material for guides that will not leave a permanent mark on the roadway.

Apply markings on completely dry pavement that passes the following tests.

- **Type I Marking Application**. Place a sample of Type I marking material on a piece of tarpaper placed on the pavement. Allow the material to cool to ambient temperature, then inspect the underside of the tarpaper in contact with the pavement. Pavement will be considered dry if there is no condensation on the tarpaper.
- **Type II and Type III Marking Application**. Place a 1-sq. ft. piece of clear plastic on the pavement and weigh down the edges. The pavement is considered dry if, when inspected after 15 min., no condensation has occurred on the underside of the plastic.

Apply markings:

- using personnel skilled and experienced in installation of pavement markings;
- that meet the requirements of Tex-828-B;
- that meet minimum retroreflectivity requirements;
- using widths and colors shown on the plans;
- at locations shown on the plans;
- in proper alignment with the guides without deviating from the alignment more than 1 in. per 200 ft. of roadway or more than 2 in. maximum;
- without abrupt deviations;
- free of blisters and with no more than 5% holes or voids (percent by area);
- with uniform cross-section, density, and thickness;
- with clean and reasonably square ends; and
- that are retroreflectorized with drop-on glass beads.

Remove all applied markings that are not in alignment or sequence as shown on the plans or in accordance with the specifications at the Contractor's expense, in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers," except for measurement and payment.

4.2. **Spot Striping**. Perform spot striping on a callout basis with a minimum callout quantity as shown on the plans.

4.3. **Surface Preparation**. Prepare surfaces in accordance with this Section unless otherwise shown on the plans.

4.3.1. **Surface Cleaning for Pavement Marking Applications on New Asphalt Surfaces with No Existing Pavement Markings and for Retracing of Existing Pavement Markings on All Surfaces**. Use air blast or broom to clean the pavement surface to remove loose material unless otherwise shown on the plans. A sealer for Type I markings is not required unless otherwise shown on the plans. If cleaning is needed beyond what is specified, Engineer can use force account to compensate for the extra effort. This is mainly applied when the pavement is covered with thick layer of dirt or mud or there is grass growing on the pavement.

4.3.2. **Surface Cleaning for All Concrete Surfaces and Asphalt Surfaces Only When Specified in the Plans (Excludes New Asphalt Surfaces with No Existing Pavement Markings and Retracing)**. Clean surfaces in accordance with Item 678, "Pavement Surface Preparation for Markings," to remove curing membrane, dirt, grease, existing loose and flaking construction markings, and other forms of contamination.

4.3.3. **Sealer for Type I Markings**. Apply a pavement sealer when shown on the plans. Pavement sealers are recommended for old asphalt surfaces (more than 3 yr. old) and for all concrete surfaces before placing Type I markings on locations that do not have existing markings. The pavement sealer may be either a Type II marking or an acrylic or epoxy sealer as recommended by the Type I marking manufacturer, unless otherwise shown on the plans. Follow the manufacturer's directions for application of acrylic or epoxy sealers. Clean the surface of sealer that becomes dirty after placement by washing or in accordance with Section 666.4.3.1., "Surface Cleaning for Pavement Marking Applications on New Asphalt Surfaces with No Existing Pavement Markings and for Retracing of Existing Pavement Markings on All Surfaces," as directed.

Place the sealer in the same configuration and color (unless clear) as the Type I markings unless otherwise shown on the plans.

4.4. **Application**. Apply markings during favorable weather unless otherwise directed. If markings are placed at Contractor option when inclement weather is impending and the markings are damaged by subsequent precipitation, the Contractor is responsible for all required replacement costs.

4.4.1. **Type I Markings**. Place all Type I markings after the sealer cures. Apply within the temperature limits recommended by the material manufacturer. Flush the spray head if spray application operations cease for 5 min. or longer, by spraying marking material into a pan or similar container until the material being applied is at the recommended temperature.

Apply on clean, dry pavement passing the moisture test in accordance with Section 666.4.1., "General," and with a surface temperature above 50°F when measured in accordance with Tex-829-B.

The Engineer will measure thickness of markings in accordance with Tex-854-B.

4.4.1.1. **Non-Profile Pavement Markings**. Apply Type I non-profile markings with a minimum thickness of:

- 0.100 in. (100 mils) for new markings and retracing water-based markings on surface treatments involving Item 316, "Seal Coat,"
- 0.060 in. (60 mils) for retracing on thermoplastic pavement markings, or
- 0.090 in. (90 mils) for all other Type I markings.

4.4.1.2. **Profile Pavement Markings**. Apply Type I profile markings with a minimum thickness of 0.090 in. (90 mils) for the longitudinal stripe portion.

In addition, at a longitudinal spacing shown on the plans, the markings must be profiled in a vertical manner such that the profile is transverse to the longitudinal marking direction. The profile must not be less than 0.30 in. (300 mils) nor greater than 0.41 in. (410 mils) in height when measured from the normal top surface plane of the base marking to the top of the raised profile marking. The transverse width of the profile must not be less than 5.25 in. and the longitudinal width not less than 2 in., when measured at the top surface plane of the profile bar. The profile may be either a one or two transverse bar profile. When the two transverse bar profile is used, the spacing between the bases of the profile bars must not exceed 0.50 in. The above dimensions for transverse bars are for 6-in. wide longitudinal marking.

The raised profile markings must be uniform in size, appearance, and spacing. When profile markings are applied in a two-step process, the raised profile markings must be applied first and then the stripe applied over them. The raised profile markings in a two-step process may be circular in shape. The circular profile markings must be uniform in diameter and the diameter must not be less than 5.25 in. The height of the apex must not be less than 0.30 in. (300 mils) nor greater than 0.41 in. (410 mils) when measured from the normal top surface of the base marking to the top of the raised profile marking.

4.4.1.3. **Type I All-Weather Pavement Markings**. Apply Type I all-weather markings to at least 100-mil film thickness.

4.4.2. **Type II Markings**. Apply on surfaces with a minimum surface temperature of 50°F when measured in accordance with Tex-829-B. Apply at least 30 gal. per mile on concrete and asphalt surfaces and at least 33 gal. per mile on surface treatments for a solid 6-in. line. Adjust application rates proportionally for other widths. When Type II markings are used as a sealer for Type I markings, apply at least 22-1/2 gal. per mile using Type II drop-on beads.

Apply Type II all-weather markings to at least 25-mil wet film thickness.

4.4.3. **Type III Markings**. Apply in conformance with the manufacturer's recommendations.

4.4.4. **Bead Coverage and Embedment**. Provide a uniform distribution of beads across the surface of the stripe with 40–60% bead embedment.

4.4.5. **Durability**. Provide markings that do not lose more than 5% of the striping material in any 1-ft. section of stripe during their performance period in accordance with Section 666.4.8., "Performance Period." Measure the durability in accordance with ASTM D913.

4.5. **Retroreflectivity Requirements**. Retroreflectivity requirements are not required for Contracts with less than 20,000 total ft. of longitudinal pavement markings, callout work, black shadow markings, or work zone pavement markings. Retroreflectivity requirements are for dry conditions unless otherwise specified.

4.5.1. **Type I Markings**. All Type I markings, including profile markings, must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline, no-passing barrier line, and lane line markings.

- **White Markings (ASTM E1710)**. 250 millicandelas per square meter per lux (mcd/m^2/lx).
- **Yellow Markings (ASTM E1710)**. 175 mcd/m^2/lx.

Collect retroreflectivity measurement for markings applied on pavement surface other than seal coat after 10 days but not later than 30 days from the time of application. For markings applied on seal coat, measure retroreflectivity after 3 days but not later than 10 days from the time of application.

4.5.2. **Type I High-Performance Markings**. Type I high-performance markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline, no-passing barrier line, and lane line markings when measured any time after 30 days but not later than 60 days from the time of application.

- **White Markings (ASTM E1710)**. 400 mcd/m^2/lx.
- **Yellow Markings (ASTM E1710)**. 250 mcd/m^2/lx.

4.5.3. **Type I All-Weather Markings**. Type I all-weather markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline, no-passing barrier line, and lane line markings when measured any time after 30 days but not later than 60 days from the time of application.

- **White Markings Dry (ASTM E1710)**. 400 mcd/m^2/lx.
- **Yellow Markings Dry (ASTM E1710)**. 250 mcd/m^2/lx.
- **White Markings Wet Continuous (ASTM E2832)**. 150 mcd/m^2/lx.
- **Yellow Markings Wet Continuous (ASTM E2832)**. 125 mcd/m^2/lx.

4.5.4. **Type II Markings**. Type II markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline, no-passing barrier line, and lane line, markings.

- **White Markings**. 175 mcd/m^2/lx.
- **Yellow Markings**. 125 mcd/m^2/lx.

Collect retroreflectivity measurement for markings applied on pavement surface other than seal coat after 10 days but not later than 30 days from the time of application. For markings applied on seal coat, measure retroreflectivity after 3 days but not later than 10 days from the time of application.

4.5.5. **Type II All-Weather Markings**. Meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline, no-passing barrier line, and lane line markings.

- **White Markings Dry (ASTM E1710)**. 250 mcd/m^2/lx.
- **Yellow Markings Dry (ASTM E1710)**. 150 mcd/m^2/lx.
- **White Markings Wet Continuous (ASTM E2832)**. 100 mcd/m^2/lx.
- **Yellow Markings Wet Continuous (ASTM E2832)**. 75 mcd/m^2/lx.

Collect retroreflectivity measurement for markings applied on pavement surface other than seal coat after 10 days but not later than 30 days from the time of application. For markings applied on seal coat, measure the retroreflectivity after 3 days but not later than 10 days from the time of application.

4.5.6. **Type III Markings**. Type III markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline, no-passing barrier line, and lane line markings when measured any time after 30 days but not later than 60 days from the time of application.

- **White Markings**. 400 mcd/m^2/lx.
- **Yellow Markings**. 250 mcd/m^2/lx.

4.5.7. **Type III All-Weather Markings**. Type III all-weather markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline, no-passing barrier line, and lane line markings when measured any time after 30 days but not later than 60 days from the time of application.

- **White Markings Dry (ASTM 1710)**. 400 mcd/m^2/lx.
- **Yellow Markings Dry (ASTM 1710)**. 250 mcd/m^2/lx.
- **White Markings Wet Continuous (ASTM 2832)**. 150 mcd/m^2/lx.
- **Yellow Markings Wet Continuous (ASTM 2832)**. 125 mcd/m^2/lx.

4.6. **Retroreflectivity Measurements**. Use a mobile retroreflectometer to measure the retroreflectivity of markings for Contracts with more than 50,000 total ft. of longitudinal pavement markings, unless otherwise shown on the plans. For Contracts between 20,000 and 50,000 total ft. of longitudinal pavement markings, mobile or portable retroreflectometers may be used at the Contractor's discretion. Coordinate with and obtain authorization from the Engineer before starting any retroreflectivity data collection.

Use a portable retroreflectometer for measuring the wet continuous retroreflectivity in accordance with ASTM E2832. Notify the Department when wet retroreflectivity measurements are to be taken. The Department will observe the wet retroreflectivity readings.

4.6.1. **Mobile Retroreflectometer Measurements**. Provide mobile measurement averages for every 0.1 mi. unless otherwise specified or approved. Take measurements on each section of roadway for each series of markings (e.g., edgeline, center skip line, and each line of a double line) and for each direction of traffic flow. Measure each line in both directions for centerlines on two-way roadways (i.e., measure both double solid lines in both directions and measure all center skip lines in both directions). Furnish measurements in accordance with Item 667, "Mobile Retroreflectivity Data Collection for Pavement Markings," unless otherwise approved. The Engineer may require a field comparison check using a calibrated portable retroreflectometer for verification and to ensure accuracy. Use all equipment in conformance with the manufacturer's recommendations and directions. Inform the Engineer and TTI at least 24 hr. before taking any measurements.

A marking meets the retroreflectivity requirements if:

- the combined average retroreflectivity measurement for a 1-mi. segment meets the minimum retroreflectivity values specified and no more than 30% of the retroreflectivity measurement values are below the minimum retroreflectivity requirements value within that 1-mi. segment; or
- the combined average retroreflectivity measurement for a 1-mi. segment does not meet the minimum retroreflectivity values specified, but no more than 20% of the retroreflectivity measurements within that 1-mi. segment are below the minimum retroreflectivity requirement.

The 1-mi. segment will start from the beginning of the data collection and end after a mile's worth of measurements have been taken. Each subsequent mile of measurements will be a new segment. Centerlines with two stripes (either solid or broken) will result in 2 mi. of data for each mile segment. Each centerline stripe must be tested for compliance as a stand-alone stripe.

Restripe at the Contractor's expense if the markings fail retroreflectivity requirements. Take retroreflectivity measurements of all restriped markings following the time interval allowed based on the type of marking and the pavement surface for the latest application.

For all Type I markings, if the restripe application does not meet minimum retroreflectivity requirements or the initial stripe combined with the restripe exceeds 0.180 in. (180 mils), the Engineer may require:

- removal of all existing markings,
- a new application as initially specified, and
- a repeat of the application process until minimum retroreflectivity requirements are met.

For all Type III markings, if the first application does not meet minimum retroreflectivity requirements, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

4.6.2. **Portable Retroreflectometer Measurements**. For non-all-weather markings, provide portable measurement averages for every 1.0 mi. unless otherwise specified or approved. Using a portable reflectometer, take at least 20 measurements for each 1-mi. section of roadway for each series of markings (e.g., edgeline, center skip line, and each line of a double line) and direction of traffic flow. Measure each line in both directions for centerlines on two-way roadways (i.e., measure both double solid lines in both directions and measure all center skip lines in both directions). The spacing between each measurement must be at least 100 ft. The Engineer may decrease the mileage frequency for measurements if the previous measurements provide satisfactory results. The Engineer may resume the original number of measurements if concerns arise.

For all-weather markings, take at least three measurements for each series of markings (e.g., edgeline, center skip line, and each line of a double line) and direction of traffic flow and average the three measurements for each marking. The spacing between each measurement must be at least 100 ft. If the average of the three measurements taken on an individual marking falls below the minimum acceptable retroreflectivity value, take at least six additional measurements on that individual marking and average them. These six additional measurements must also be spaced at least 100 ft. apart. If the average of these six measurements falls below the minimum acceptable retroreflectivity value, the marking does not meet the performance requirements.

Restripe at the Contractor's expense if the averages of these measurements fail. Retake portable retroreflectometer measurements of all restriped markings following the time interval allowed based on the type of marking and the pavement surface for the latest application.

4.7. **Traffic Control**. Provide traffic control, as required, when taking portable retroreflectivity measurements after marking application. For the minimum traffic control requirements on low-volume roadways (as shown on the plans), refer to "Temporary Road Closure" in Part 6 of the TMUTCD. For all other roadways, the minimum traffic control requirements will be as shown on the Traffic Control Plan (TCP) standard sheets TCP (3-1) and TCP (3-2). The lead vehicle will not be required on divided highways. The TCP and traffic control devices must meet the requirements listed in Item 502, "Barricades, Signs, and Traffic Handling." Time restrictions that apply during striping application will also apply during the retroreflectivity inspections, except when using the mobile retroreflectometer, unless otherwise shown on the plans or approved.

4.8. **Performance Period**. All longitudinal markings must meet the minimum retroreflectivity requirements within the timeframe specified. All markings must meet all other performance requirements in accordance with this Item for at least 30 calendar days after installation. Unless otherwise directed, remove pavement markings that fail to meet requirements and replace them at the Contractor's expense. Replace failing markings within 30 days of notification. All replacement markings must also meet all requirements in accordance with this Item for at least 30 calendar days after installation.

4. MEASUREMENT

This Item will be measured by the foot; by each word, symbol, or shape; or by any other unit shown on the plans. Each stripe will be measured separately.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

Acrylic or epoxy sealer, or Type II markings when used as a sealer for Type I markings, will be measured by the foot; by each word, symbol, or shape; or by any other unit shown on the plans.

Profile pavement markings will be measured as a marking consisting of both the pavement marking stripe and the raised profile, regardless of the installation method used.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pavement Sealer" of the size specified; "Pavement Sealer (Call Out)" of the size specified; "Retroreflectorized Pavement Markings" of the type, color, shape, width, size, and thickness specified; "Non-Retroreflectorized Shadow Pavement Markings" of the type, width, size, and thickness specified; "Type I High Performance Pavement Markings" of the color, width, size, and thickness specified; "All-Weather Pavement Markings" of the type, color, shape, width, and thickness specified; "Pavement Marking (Call Out)" of the type, color, width, size, and thickness specified; or "Retroreflectorized Profile Pavement Markings" of the color, shape, size, and width specified.

This price is full compensation for application of pavement markings, materials, equipment, labor, tools, and incidentals.

Surface cleaning for all concrete surfaces and asphalt surfaces only when shown on the plans (excludes new asphalt surfaces with no existing pavement markings and retracing) will be paid for under Item 678. Surface cleaning for pavement marking applications on new asphalt surfaces with no existing pavement markings and for retracing of existing pavement markings on all surfaces will not be paid for directly, but will be subsidiary to this Item. If cleaning is needed beyond regular brooming and blowing compressed air, the Engineer may use force account to compensate for the extra effort. This is mainly applied when the pavement is covered with a thick layer of dirt or mud or grass is growing on the pavement.

Surface preparation of any surface where pavement markings are being retraced, except for sealing, will not be paid for directly, but will be subsidiary to this Item.

If the Engineer requires that markings be placed in inclement weather, repair or replacement of markings damaged by the inclement weather will be paid for in addition to the original plans quantity.

Item 672
Raised Pavement Markers

1. DESCRIPTION

Furnish and install raised pavement markers (RPMs).

2. MATERIALS

2.1. **Markers**. Furnish RPMs in accordance with the following.

- **Reflectorized Pavement Markers**. DMS-4200, "Pavement Markers (Reflectorized)," Types I-A, I-C, I-R, II-A-A, II-C-C, and II-C- R
- **Traffic Buttons**. DMS-4300, "Traffic Buttons," W, Y, and B. Round or oval unless otherwise shown on the plans
- **Plowable Reflectorized Pavement Markers**. DMS-4210, "Snowplowable Pavement Markers," Types I-A, I-C, I-R, II-A-A, II-C-C, and II-C- R

The following are descriptions for each type of RPM.

- **Type I-A**. The approach face must retroreflect amber light. The body, other than the retroreflective face, must be yellow.
- **Type I-C**. The approach face must retroreflect white light. The body, other than the retroreflective face, must be white or silver-white.
- **Type I-R**. The trailing face must retroreflect red light. The body, other than the retroreflective face, must be white or silver-white, except for I-R plowable markers, which may be black.
- **Type II-A-A**. The two retroreflective faces (approach and trailing) must retroreflect amber light. The body, other than the retroreflective faces, must be yellow.
- **Type II-C-R**. Contains two retroreflective faces with an approach face that must retroreflect white light and a trailing face that must retroreflect red light. The body, other than the retroreflective faces, must be white or silver-white.
- **Type II-C-C**. Contain two retroreflective faces (approach and trailing) that retroreflect white light. The body, other than the retroreflective face, must be white or silver-white.
- **Type W**. Must have a white body and no reflective faces.
- **Type Y**. Must have a yellow body and no reflective faces.
- **Type B**. Must have a black body and no reflective faces.

2.2. **Adhesives**. Furnish adhesives in accordance with the following.

- DMS-6100, "Epoxies and Adhesives," Type II—Traffic Marker Adhesives
- DMS-6130, "Bituminous Adhesive for Pavement Markers"

The Contractor may propose alternate adhesive materials for consideration and approval.

2.3. **Sampling**. The Engineer will sample in accordance with Tex-729-I.

3. CONSTRUCTION

Remove existing RPMs in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers," except for measurement and payment. Furnish RPMs for each class from the same manufacturer. Prepare all surfaces in accordance with Item 678, "Pavement Surface Preparation for Markings," when shown on the

plans. Ensure the bond surfaces are free of dirt, curing compound, grease, oil, moisture, loose or unsound pavement markings, and any other material that would adversely affect the adhesive bond.

Establish pavement marking guides to mark the lateral location of RPMs as shown on the plans and as directed. Do not make permanent marks on the roadway for the guides.

Place RPMs in proper alignment with the guides. Acceptable placement deviations are shown on the plans.

If necessary, remove and replace RPMs placed out of alignment or sequence, as shown on the plans or in accordance with this Item, at the Contractor's expense in accordance with Item 677 (except for measurement and payment).

Use the following adhesive materials for placement of reflectorized pavement markers and traffic buttons, unless otherwise shown on the plans:

- standard or flexible bituminous adhesive for applications on bituminous pavements, and
- epoxy adhesive or flexible bituminous adhesive for applications on hydraulic cement concrete pavements.

Use epoxy adhesive for plowable reflectorized pavement markers.

Apply enough adhesives to:

- ensure that 100% of the bonding area of RPMs is in contact with the adhesive, and
- ensure that RPMs, except for plowable markers, are seated on a continuous layer of adhesive and not in contact with the pavement surface.

Apply adhesives in conformance with manufacturer's recommendations unless otherwise required by this Article. Apply bituminous adhesive only when pavement temperature and RPM temperature are 40°F or higher. Do not heat bituminous adhesive above 400°F. Machine agitate bituminous adhesive continuously before application to ensure even heat distribution.

Machine-mix epoxy adhesive. Apply epoxy adhesive only when pavement temperature is 50°F or higher.

Furnish RPMs free of rust, scale, dirt, oil, grease, moisture, and contaminants that might adversely affect the adhesive bond.

Place RPMs immediately after the adhesive is applied and ensure proper bonding. Do not use adhesives or any other material that impairs the functional retroreflectivity of the RPMs.

All RPMs must meet performance requirements for at least 30 calendar days after installation.

Replace all missing, broken, or non-reflective RPMs. Visual evaluations will be used for these determinations. Upon request, the Engineer will allow a Contractor representative to accompany the Engineer on these evaluations.

The Engineer may exclude RPMs from the replacement provisions of the performance, provided the Engineer determines the failure is a result of causes other than defective material or inadequate installation procedures. Examples of outside causes are extreme wear at intersections, damage by snow or ice removal, and pavement failure.

Replace all missing or non-reflective RPMs identified during the performance period within 30 days after notification. The end of the performance period does not relieve the Contractor from the performance deficiencies requiring corrective action identified during the performance period.

4. MEASUREMENT

This Item will be measured by each RPM.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Reflectorized Pavement Marker," "Traffic Button," or "Plowable Reflectorized Pavement Marker" of the types specified. This price is full compensation for removing existing markers; furnishing and installing RPMs; and materials, equipment, labor, tools, and incidentals.

No additional payment will be made for replacement of RPMs failing to meet the performance requirements.

Item 677
Eliminating Existing Pavement Markings and Markers

1. DESCRIPTION

Eliminate existing pavement markings and raised pavement markers (RPMs).

2. MATERIALS

Furnish surface treatment materials in accordance with the following Items.

- Item 300, “Asphalts, Oils, and Emulsions”
- Item 302, “Aggregates for Surface Treatments”
- Item 315, “Fog Seal”
- Item 316, “Seal Coat”

Use approved patching materials for repairing damaged surfaces.

Use a commercial abrasive blasting medium capable of producing the specified surface cleanliness. Use potable water when water is required.

3. EQUIPMENT

Furnish and maintain equipment in good working condition. Use moisture and oil traps in air compression equipment to remove all contaminants from the blasting air and prevent the deposition of moisture, oil, or other contaminants on the roadway surface.

4. CONSTRUCTION

Eliminate existing pavement markings and markers on both concrete and asphaltic surfaces such that color and texture contrast of the removed area and surrounding pavement surface will be held to a minimum. Remove all markings and markers with minimal damage to the roadway to the satisfaction of the Engineer. Repair damage to asphaltic surfaces such as spalling and shelling greater than 1/8 in. deep resulting from the removal of pavement markings and markers. Dispose of markers in conformance with federal, state, and local regulations. Use any of the following methods unless otherwise shown on the plans. Refer to the *Pavement Marking Handbook* for additional information on removal types and best practices.

4.1. **Surface Treatment Method**. Apply surface treatment material at the rates shown on the plans, or as directed. Place a surface treatment at least 2 ft. wide to cover the existing marking. Place a surface treatment, thin overlay, or microsurfacing at least one lane in width in areas where directional changes of traffic are involved or other areas as directed.

4.2. **Burn Method**. Use an approved burning method. For thermoplastic pavement markings or prefabricated pavement markings, heat may be applied to remove the bulk of the marking material before blast cleaning. When using heat, avoid spalling pavement surfaces. Ensure the burning heads are not left in one place too long to prevent pavement damage. Sweeping or light blast cleaning may be used to remove minor residue.

4.3. **Blasting Method**. Use a blasting method such as high-pressure water blasting, abrasive blasting, water abrasive blasting, shot blasting, slurry blasting, water-injected abrasive blasting, or brush blasting as approved. Use high-pressure water blasting for removal of pavement markings for lane shifts on concrete surfaces.

4.4. **Mechanical Method**. Use any mechanical method except grinding. Do not use flail milling on grooved concrete or porous asphalt.

4.5. **Corrective Actions**. Whenever removed markings on asphalt surfaces continue to simulate pavement markings to an extent determined by the Engineer to cause driver confusion, apply a fog seal or slurry at least 2 ft. wide over the area where pavement markings were removed as approved.

5. MEASUREMENT

This Item will be measured by each word, symbol, or shape eliminated; by the foot of marking eliminated; or by any other unit shown on the plans.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Eliminating Existing Pavement Markings and Markers" of the type and width as applicable. This price is full compensation for the elimination method used and materials, equipment, tools, labor, and incidentals. Removal of RPMs will not be paid for directly, but will be subsidiary to pertinent Items.

Item 678
Pavement Surface Preparation for Markings

1. DESCRIPTION

Prepare pavement surface areas before placement of pavement markings and raised pavement markers (RPMs). Item 677, "Eliminating Existing Pavement Markings and Markers," governs removal of existing markings.

2. MATERIALS

When abrasive blasting is used, use a commercial abrasive blasting medium capable of producing the specified surface cleanliness. Use potable water when water is required.

3. EQUIPMENT

Furnish and maintain equipment in good working condition. Use moisture and oil traps in air compression equipment to remove all contaminants from the blasting air and prevent the deposition of moisture, oil, or other contaminants on the roadway surface.

4. CONSTRUCTION

Prepare enough pavement surface for the pavement markings or RPMs shown on the plans. Remove all contamination and loose material. Avoid damaging the pavement surface. Remove loose and flaking material when existing pavement markings are present. Approved pavement surface preparation methods are sweeping, air blasting, flail milling, and blasting methods in accordance with Section 677.4.3., "Blasting Method," unless otherwise shown on the plans.

Air blast concrete pavement surfaces, in addition to the above, after the removal of contamination or existing material and just before placing the stripe. Perform air blasting using a compressor capable of generating compressed air at a minimum of 150 cu. ft. per minute and 100 psi using 5/16-in. or larger hosing.

Contaminants up to 0.5 sq. in. may remain if they are not removed by the following test, performed just before application of markings.

- **Step 1**. Air blast the surface to be tested, to simulate blasting during application of markings.
- **Step 2**. Firmly press a 10-in. long, 2-in. wide strip of monofilament tape onto the surface, leaving approximately 2 in. free.
- **Step 3**. Grasp the free end and remove the tape with a sharp pull.

5. MEASUREMENT

This Item will be measured by the foot for each width specified; by each word, shape, or symbol; or by any other unit except lump sum.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pavement Surface Preparation for Markings" of the type and width as applicable. This price is full compensation for the cleaning method used, materials, equipment, labor, tools, and incidentals.

Special Provision to Item 506

Temporary Erosion, Sedimentation, and Environmental Controls

For this project, item 506, "Temporary Erosion, Sedimentation, and Environmental Controls," of the standard specifications, is hereby voided and replaced with the following.

1. DESCRIPTION

Install, maintain, and remove erosion, sedimentation, and environmental control measures to prevent or reduce the discharge of pollutants in accordance with the Storm Water Pollution Prevention Plan (SWP3) in the plans and the Texas Pollutant Discharge Elimination System (TPDES) General Permit TXR150000.

2. MATERIALS

Furnish materials in accordance with the following:

- Item 161, "Compost"
- Item 432, "Riprap"
- Item 556, "Pipe Underdrains"

2.1. **Rock Filter Dams**.

2.1.1. **Aggregate**. Furnish aggregate with hardness, durability, cleanliness, and resistance to crumbling, flaking, and eroding acceptable to the Owner. Provide the following:

- Types 1, 2, and 4 Rock Filter Dams. Use 3 to 6 in. aggregate.
- Type 3 Rock Filter Dams. Use 4 to 8 in. aggregate.

2.1.2. **Wire**. Provide minimum 20 gauge galvanized wire for the steel wire mesh and tie wires for Types 2 and 3 rock filter dams. Type 4 dams require:

- a double-twisted, hexagonal weave with a nominal mesh opening of 2-1/2 in. × 3-1/4 in.;
- minimum 0.0866 in. steel wire for netting;
- minimum 0.1063 in. steel wire for selvages and corners; and
- minimum 0.0866 in. for binding or tie wire.

2.1.3. **Sandbag Material**. Furnish sandbags meeting Section 506.2.8., "Sandbags," except that any gradation of aggregate may be used to fill the sandbags.

2.2. **Temporary Pipe Slope Drains**. Provide corrugated metal pipe, polyvinyl chloride (PVC) pipe, flexible tubing, watertight connection bands, grommet materials, prefabricated fittings, and flared entrance sections that conform to the plans. Recycled and other materials meeting these requirements are allowed if approved.

Furnish concrete in accordance with Item 432, "Riprap."

2.3. **Temporary Paved Flumes**. Furnish asphalt concrete, hydraulic cement concrete, or other comparable non-erodible material that conforms to the plans. Provide rock or rubble with a minimum diameter of 6 in. and a maximum volume of 1/2 cu. ft. for the construction of energy dissipaters.

2.4. **Construction Exits**. Provide materials that meet the details shown on the plans and this Section.

2.4.1. **Rock Construction Exit**. Provide crushed aggregate for long- and short-term construction exits. Furnish aggregates that are clean, hard, durable, and free from adherent coatings such as salt, alkali, dirt, clay, loam, shale, soft or flaky materials, and organic and injurious matter. Use 4- to 8-in. aggregate for Type 1. Use 2- to 4-in. aggregate for Type 3.

2.4.2. **Timber Construction Exit**. Furnish No. 2 quality or better railroad ties and timbers for long-term construction exits, free of large and loose knots and treated to control rot. Fasten timbers with nuts and bolts or lag bolts, of at least 1/2 in. diameter, unless otherwise shown on the plans or allowed. Provide plywood or pressed wafer board at least 1/2 in. thick for short-term exits.

2.4.3. **Foundation Course**. Provide a foundation course consisting of flexible base, bituminous concrete, hydraulic cement concrete, or other materials as shown on the plans or directed.

2.5. **Embankment for Erosion Control**. Provide rock, loam, clay, topsoil, or other earth materials that will form a stable embankment to meet the intended use.

2.6. **Pipe**. Provide pipe outlet material in accordance with Item 556, “Pipe Underdrains,” and details shown on the plans.

2.7. **Construction Perimeter Fence**.

2.7.1. **Posts**. Provide essentially straight wood or steel posts that are at least 60 in. long. Furnish soft wood posts with a minimum diameter of 3 in., or use nominal 2 × 4 in. boards. Furnish hardwood posts with a minimum cross-section of 1-1/2 × 1-1/5 in. Furnish T- or L-shaped steel posts with a minimum weight of 0.5 lb. per foot.

2.7.2. **Fence**. Provide orange construction fencing as approved.

2.7.3. **Fence Wire**. Provide 11 gauge or larger galvanized smooth or twisted wire. Provide 16 gauge or larger tie wire.

2.7.4. **Flagging**. Provide brightly-colored flagging that is fade-resistant and at least 3/4 in. wide to provide maximum visibility both day and night.

2.7.5. **Staples**. Provide staples with a crown at least 1/2 in. wide and legs at least 1/2 in. long.

2.7.6. **Used Materials**. Previously used materials meeting the applicable requirements may be used if approved.

2.8. **Sandbags**. Provide sandbag material of polypropylene, polyethylene, or polyamide woven fabric with a minimum unit weight of 4 oz. per square yard, a Mullen burst-strength exceeding 300 psi, and an ultraviolet stability exceeding 70%.

Use natural coarse sand or manufactured sand meeting the gradation given in Table 1 to fill sandbags. Filled sandbags must be 24 to 30 in. long, 16 to 18 in. wide, and 6 to 8 in. thick.

Table 1
Sand Gradation

Sieve #	Retained (% by Weight)
4	Maximum 3%
100	Minimum 80%
200	Minimum 95%

Aggregate may be used instead of sand for situations where sandbags are not adjacent to traffic. The aggregate size shall not exceed 3/8 in.

2.9. **Temporary Sediment Control Fence**. Provide a net-reinforced fence using woven geo-textile fabric. Logos visible to the traveling public will not be allowed.

2.9.1. **Fabric**. Provide fabric materials in accordance with DMS-6230, "Temporary Sediment Control Fence Fabric."

2.9.2. **Posts**. Provide essentially straight wood or steel posts with a minimum length of 48 in., unless otherwise shown on the plans. Furnish soft wood posts at least 3 in. in diameter, or use nominal 2 × 4 in. boards. Furnish hardwood posts with a minimum cross-section of 1-1/2 × 1-1/2 in. Furnish T- or L-shaped steel posts with a minimum weight of 1.3 lb. per foot.

2.9.3. **Net Reinforcement**. Provide net reinforcement of at least 12-1/2 gauge galvanized welded wire mesh, with a maximum opening size of 2 × 4 in., at least 24 in. wide, unless otherwise shown on the plans.

2.9.4. **Staples**. Provide staples with a crown at least 3/4 in. wide and legs 1/2 in. long.

2.9.5. **Used Materials**. Use recycled material meeting the applicable requirements if approved.

2.10. **Biodegradable Erosion Control Logs**.

2.10.1. **Core Material**. Furnish core material that is biodegradable or recyclable. Use compost, mulch, aspen excelsior wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or any other acceptable material unless specifically called out on the plans. Permit no more than 5% of the material to escape from the containment mesh. Furnish compost meeting the requirements of Item 161, "Compost."

2.10.2. **Containment Mesh**. Furnish containment mesh that is 100% biodegradable, photodegradable, or recyclable such as burlap, twine, UV photodegradable plastic, polyester, or any other acceptable material.

Furnish biodegradable or photodegradable containment mesh when log will remain in place as part of a vegetative system.

Furnish recyclable containment mesh for temporary installations.

2.10.3. **Size**. Furnish biodegradable erosion control logs with diameters shown on the plans or as directed. Stuff containment mesh densely so logs do not deform.

3. CONSTRUCTION

3.1. **Contractor Responsibilities**. Implement the Owner's Storm Water Pollution Prevention Plan (SWP3) for the project in accordance with the plans and specifications, TPDES General Permit TXR150000, and as directed by the Owner. Develop and implement an SWP3 for project-specific material supply plants within and outside of the Owner's right of way in accordance with the specific or general storm water permit requirements. Prevent water pollution from storm water associated with construction activity from entering any surface water or private property on or adjacent to the project site.

3.2. **General.**

3.2.1. **Phasing**. Implement control measures in the area to be disturbed before beginning construction, or as directed. Limit the disturbance to the area shown on the plans or as directed. If, in the opinion of the Owner, the Contractor cannot control soil erosion and sedimentation resulting from construction operations, the Owner will limit the disturbed area to that which the Contractor is able to control. Minimize disturbance to vegetation.

3.2.2. **Maintenance**. Immediately correct ineffective control measures. Implement additional controls as directed. Remove excavated material within the time requirements specified in the applicable storm water permit.

3.2.3. **Stabilization**. Stabilize disturbed areas where construction activities will be temporarily stopped in accordance with the applicable storm water permit. Establish a uniform vegetative cover. The project will not be accepted until a 70% density of existing adjacent undisturbed areas is obtained, unless otherwise shown on the plans. When shown on the plans, the Owner may accept the project when adequate controls are in place that will control erosion, sedimentation, and water pollution until sufficient vegetative cover can be established.

3.2.4. **Finished Work**. Upon acceptance of vegetative cover, remove and dispose of all temporary control measures, temporary embankments, bridges, matting, falsework, piling, debris, or other obstructions placed during construction that are not a part of the finished work, or as directed.

3.2.5. **Restricted Activities and Required Precautions**. Do not discharge onto the ground or surface waters any pollutants such as chemicals, raw sewage, fuels, lubricants, coolants, hydraulic fluids, bitumens, or any other petroleum product. Operate and maintain equipment on-site to prevent actual or potential water pollution. Manage, control, and dispose of litter on-site such that no adverse impacts to water quality occur. Prevent dust from creating a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property. Wash out concrete trucks only as described in the TPDES General Permit TXR150000. Utilize appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water (i.e. dewatering). Prevent discharges that would contribute to a violation of Edwards Aquifer Rules, water quality standards, the impairment of a listed water body, or other state or federal law.

3.3. **Installation, Maintenance, and Removal Work**. Perform work in accordance with the SWP3, according to manufacturers' guidelines, and in accordance with the TPDES General Permit TXR150000. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until soil disturbing activities are completed and permanent erosion control features are in place or the disturbed area has been adequately stabilized as determined by the Owner. . If a device ceases to function as intended, repair or replace the device or portions thereof as necessary. Remove sediment, debris, and litter. When approved, sediments may be disposed of within embankments, or in the right of way in areas where the material will not contribute to further siltation. Dispose of removed material in accordance with federal, state, and local regulations.

Remove devices upon approval or as directed. Finish-grade and dress the area upon removal. Stabilize disturbed areas in accordance with the permit, and as shown on the plans or directed. Materials removed are considered consumed by the project. Retain ownership of stockpiled material and remove it from the project when new installations or replacements are no longer required.

3.3.1. **Rock Filter Dams for Erosion Control.** Remove trees, brush, stumps, and other objectionable material that may interfere with the construction of rock filter dams. Place sandbags as a foundation when required or at the Contractor's option.

Place the aggregate to the lines, height, and slopes specified, without undue voids for Types 1, 2, 3, and 5. Place the aggregate on the mesh and then fold the mesh at the upstream side over the aggregate and secure it to itself on the downstream side with wire ties, or hog rings for Types 2 and 3, or as directed. Place rock filter dams perpendicular to the flow of the stream or channel unless otherwise directed. Construct filter dams according to the following criteria unless otherwise shown on the plans:

3.3.1.1. **Type 1 (Non-reinforced)**.

3.3.1.1.1. **Height**. At least 18 in. measured vertically from existing ground to top of filter dam.

3.3.1.1.2. **Top Width**. At least 2 ft.

3.3.1.1.3. **Slopes**. No steeper than 2:1.

3.3.1.2. **Type 2 (Reinforced)**.

3.3.1.2.1. **Height**. At least 18 in. measured vertically from existing ground to top of filter dam.

3.3.1.2.2. **Top Width**. At least 2 ft.

3.3.1.2.3. **Slopes**. No steeper than 2:1.

3.3.1.3. **Type 3 (Reinforced)**.

3.3.1.3.1. **Height**. At least 36 in. measured vertically from existing ground to top of filter dam.

3.3.1.3.2. **Top Width**. At least 2 ft.

3.3.1.3.3. **Slopes**. No steeper than 2:1.

3.3.1.4. **Type 4 (Sack Gabions)**. Unfold sack gabions and smooth out kinks and bends. Connect the sides by lacing in a single loop–double loop pattern on 4- to 5-in. spacing for vertical filling. Pull the end lacing rod at one end until tight, wrap around the end, and twist 4 times. Fill with stone at the filling end, pull the rod tight, cut the wire with approximately 6 in. remaining, and twist wires 4 times.

Place the sack flat in a filling trough, fill with stone, connect sides, and secure ends as described above for horizontal filling.

Lift and place without damaging the gabion. Shape sack gabions to existing contours.

3.3.1.5. **Type 5**. Provide rock filter dams as shown on the plans.

3.3.2. **Temporary Pipe Slope Drains**. Install pipe with a slope as shown on the plans or as directed. Construct embankment for the drainage system in 8-in. lifts to the required elevations. Hand-tamp the soil around and under the entrance section to the top of the embankment as shown on the plans or as directed. Form the top of the embankment or earth dike over the pipe slope drain at least 1 ft. higher than the top of the inlet pipe at all points. Secure the pipe with hold-downs or hold-down grommets spaced a maximum of 10 ft. on center. Construct the energy dissipaters or sediment traps as shown on the plans or as directed. Construct the sediment trap using concrete or rubble riprap in accordance with Item 432, “Riprap,” when designated on the plans.

3.3.3. **Temporary Paved Flumes**. Construct paved flumes as shown on the plans or as directed. Provide excavation and embankment (including compaction of the subgrade) of material to the dimensions shown on the plans unless otherwise indicated. Install a rock or rubble riprap energy dissipater, constructed from the materials specified above, to a minimum depth of 9 in. at the flume outlet to the limits shown on the plans or as directed.

3.3.4. **Construction Exits**. Prevent traffic from crossing or exiting the construction site or moving directly onto a public roadway, alley, sidewalk, parking area, or other right of way areas other than at the location of construction exits when tracking conditions exist. Construct exits for either long- or short-term use.

3.3.4.1. **Long-Term**. Place the exit over a foundation course as required. Grade the foundation course or compacted subgrade to direct runoff from the construction exits to a sediment trap as shown on the plans or as directed. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed.

3.3.4.1.1. **Type 1**. Construct to a depth of at least 8 in. using crushed aggregate as shown on the plans or as directed.

3.3.4.1.2. **Type 2**. Construct using railroad ties and timbers as shown on the plans or as directed.

3.3.4.2. **Short-Term**.

3.3.4.2.1. **Type 3**. Construct using crushed aggregate, plywood, or wafer board. This type of exit may be used for daily operations where long-term exits are not practical.

3.3.4.2.2. **Type 4**. Construct as shown on the plans or as directed.

3.3.5. **Earthwork for Erosion Control**. Perform excavation and embankment operations to minimize erosion and to remove collected sediments from other erosion control devices.

3.3.5.1. **Excavation and Embankment for Erosion Control Features**. Place earth dikes, swales, or combinations of both along the low crown of daily lift placement, or as directed, to prevent runoff spillover. Place swales and dikes at other locations as shown on the plans or as directed to prevent runoff spillover or to divert runoff. Construct cuts with the low end blocked with undisturbed earth to prevent erosion of hillsides. Construct sediment traps at drainage structures in conjunction with other erosion control measures as shown on the plans or as directed.

Create a sediment basin, where required, providing 3,600 cu. ft. of storage per acre drained, or equivalent control measures for drainage locations that serve an area with 10 or more disturbed acres at one time, not including offsite areas.

3.3.5.2. **Excavation of Sediment and Debris**. Remove sediment and debris when accumulation affects the performance of the devices, after a rain, and when directed.

3.3.6. **Construction Perimeter Fence**. Construct, align, and locate fencing as shown on the plans or as directed.

3.3.6.1. **Installation of Posts**. Embed posts 18 in. deep or adequately anchor in rock, with a spacing of 8 to 10 ft.

3.3.6.2. **Wire Attachment**. Attach the top wire to the posts at least 3 ft. from the ground. Attach the lower wire midway between the ground and the top wire.

3.3.6.3. **Flag Attachment**. Attach flagging to both wire strands midway between each post. Use flagging at least 18 in. long. Tie flagging to the wire using a square knot.

3.3.7. **Sandbags for Erosion Control**. Construct a berm or dam of sandbags that will intercept sediment-laden storm water runoff from disturbed areas, create a retention pond, detain sediment, and release water in sheet flow. Fill each bag with sand so that at least the top 6 in. of the bag is unfilled to allow for proper tying of the open end. Place the sandbags with their tied ends in the same direction. Offset subsequent rows of sandbags 1/2 the length of the preceding row. Place a single layer of sandbags downstream as a secondary debris trap. Place additional sandbags as necessary or as directed for supplementary support to berms or dams of sandbags or earth.

3.3.8. **Temporary Sediment-Control Fence**. Provide temporary sediment-control fence near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the fence into erosion-control measures used to control sediment in areas of higher flow. Install the fence as shown on the plans, as specified in this Section, or as directed.

3.3.8.1. **Installation of Posts**. Embed posts at least 18 in. deep, or adequately anchor, if in rock, with a spacing of 6 to 8 ft. and install on a slight angle toward the runoff source.

3.3.8.2. **Fabric Anchoring**. Dig trenches along the uphill side of the fence to anchor 6 to 8 in. of fabric. Provide a minimum trench cross-section of 6 × 6 in. Place the fabric against the side of the trench and align approximately 2 in. of fabric along the bottom in the upstream direction. Backfill the trench, then hand-tamp.

3.3.8.3. **Fabric and Net Reinforcement Attachment**. Attach the reinforcement to wooden posts with staples, or to steel posts with T-clips, in at least 4 places equally spaced unless otherwise shown on the plans. Sewn vertical pockets may be used to attach reinforcement to end posts. Fasten the fabric to the top strand of reinforcement by hog rings or cord every 15 in. or less.

3.3.8.4. **Fabric and Net Splices**. Locate splices at a fence post with a minimum lap of 6 in. attached in at least 6 places equally spaced unless otherwise shown on the plans. Do not locate splices in concentrated flow areas.

Requirements for installation of used temporary sediment-control fence include the following:

- fabric with minimal or no visible signs of biodegradation (weak fibers),
- fabric without excessive patching (more than 1 patch every 15 to 20 ft.),
- posts without bends, and
- backing without holes.

3.3.9. **Biodegradable Erosion Control Logs**. Install biodegradable erosion control logs near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the biodegradable erosion control logs into the erosion measures used to control sediment in areas of higher flow. Install, align, and locate the biodegradable erosion control logs as specified below, as shown in plans or as directed.

Secure biodegradable erosion control logs in a method adequate to prevent displacement as a result of normal rain events, prevent damage to the logs, and to the satisfaction of the Owner such that flow is not allowed under the logs. Temporarily removing and replacing biodegradable erosion logs as to facilitate daily work is allowed at the Contractor's expense.

3.3.10. **Vertical Tracking**. Perform vertical tracking on slopes to temporarily stabilize soil. Provide equipment with a track undercarriage capable of producing a linear soil impression measuring a minimum of 12 in. long × 2 to 4 in. wide × 1/2 to 2 in. deep. Do not exceed 12 in. between track impressions. Install continuous linear track impressions where the 12 in. length impressions are perpendicular to the slope. Vertical tracking is required on projects where soil disturbing activities have occurred unless otherwise approved.

4. MEASUREMENT

4.1. **Rock Filter Dams**. Installation or removal of rock filter dams will be measured by the foot or by the cubic yard. The measured volume will include sandbags, when used.

4.1.1. **Linear Measurement**. When rock filter dams are measured by the foot, measurement will be along the centerline of the top of the dam.

4.1.2. **Volume Measurement**. When rock filter dams are measured by the cubic yard, measurement will be based on the volume of rock computed by the method of average end areas.

4.1.2.1. **Installation**. Measurement will be made in final position.

4.1.2.2. **Removal**. Measurement will be made at the point of removal.

4.2. **Temporary Pipe Slope Drains**. Temporary pipe slope drains will be measured by the foot.

4.3. **Temporary Paved Flumes**. Temporary paved flumes will be measured by the square yard of surface area. The measured area will include the energy dissipater at the flume outlet.

4.4. **Construction Exits**. Construction exits will be measured by the square yard of surface area.

4.5. **Earthwork for Erosion and Sediment Control**.

4.5.1. **Equipment and Labor Measurement**. Equipment and labor used will be measured by the actual number of hours the equipment is operated and the labor is engaged in the work.

4.5.2. **Volume Measurement**.

4.5.2.1. **In Place**.

4.5.2.1.1. **Excavation**. Excavation will be measured by the cubic yard in its original position and the volume computed by the method of average end areas.

4.5.2.1.2. **Embankment**. Embankment will be measured by the cubic yard in its final position by the method of average end areas. The volume of embankment will be determined between:

- the original ground surfaces or the surface upon that the embankment is to be constructed for the feature and
- the lines, grades and slopes of the accepted embankment for the feature.

4.5.2.2. **In Vehicles**. Excavation and embankment quantities will be combined and paid for under "Earthwork (Erosion and Sediment Control, In Vehicle)." Excavation will be measured by the cubic yard in vehicles at the point of removal. Embankment will be measured by the cubic yard in vehicles measured at the point of delivery. Shrinkage or swelling factors will not be considered in determining the calculated quantities.

4.6. **Construction Perimeter Fence**. Construction perimeter fence will be measured by the foot.

4.7. **Sandbags for Erosion Control**. Sandbags will be measured as each sandbag or by the foot along the top of sandbag berms or dams.

4.8. **Temporary Sediment-Control Fence**. Installation or removal of temporary sediment-control fence will be measured by the foot.

4.9. **Biodegradable Erosion Control Logs**. Installation or removal of biodegradable erosion control logs will be measured by the foot along the centerline of the top of the control logs.

4.10. **Vertical Tracking**. Vertical tracking will not be measured or paid for directly but is considered subsidiary to this Item.

5. PAYMENT

The following will not be paid for directly but are subsidiary to pertinent Items:

- erosion-control measures for Contractor project-specific locations (PSLs) inside and outside the right of way (such as construction and haul roads, field offices, equipment and supply areas, plants, and material sources);
- removal of litter, unless a separate pay item is shown on the plans;
- repair to devices and features damaged by Contractor operations;
- added measures and maintenance needed due to negligence, carelessness, lack of maintenance, and failure to install permanent controls;
- removal and reinstallation of devices and features needed for the convenience of the Contractor;
- finish grading and dressing upon removal of the device; and
- minor adjustments including but not limited to plumbing posts, reattaching fabric, minor grading to maintain slopes on an erosion embankment feature, or moving small numbers of sandbags.

Stabilization of disturbed areas will be paid for under pertinent Items.

Furnishing and installing pipe for outfalls associated with sediment traps and ponds will not be paid for directly but is subsidiary to the excavation and embankment under this Item.

5.1. **Rock Filter Dams**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows:

5.1.1. **Installation**. Installation will be paid for as "Rock Filter Dams (Install)" of the type specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

5.1.2. **Removal**. Removal will be paid for as "Rock Filter Dams (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

When the Owner directs that the rock filter dam installation or portions thereof be replaced, payment will be made at the unit price bid for "Rock Filter Dams (Remove)" and for "Rock Filter Dams (Install)" of the type specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

5.2. **Temporary Pipe Slope Drains**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Temporary Pipe Slope Drains" of the size specified. This price is full compensation for furnishing materials, removal and disposal, furnishing and operating equipment, labor, tools, and incidentals.

Removal of temporary pipe slope drains will not be paid for directly but is subsidiary to the installation Item. When the Owner directs that the pipe slope drain installation or portions thereof be replaced, payment will be made at the unit price bid for "Temporary Pipe Slope Drains" of the size specified, which is full compensation for the removal and reinstallation of the pipe drain.

Earthwork required for the pipe slope drain installation, including construction of the sediment trap, will be measured and paid for under "Earthwork for Erosion and Sediment Control."

Riprap concrete or stone, when used as an energy dissipater or as a stabilized sediment trap, will be measured and paid for in accordance with Item 432, "Riprap."

5.3. **Temporary Paved Flumes**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Temporary Paved Flume (Install)" or "Temporary Paved Flume (Remove)." This price is full compensation for furnishing and placing materials, removal and disposal, equipment, labor, tools, and incidentals.

When the Owner directs that the paved flume installation or portions thereof be replaced, payment will be made at the unit prices bid for "Temporary Paved Flume (Remove)" and "Temporary Paved Flume (Install)." These prices are full compensation for the removal and replacement of the paved flume and for equipment, labor, tools, and incidentals.

Earthwork required for the paved flume installation, including construction of a sediment trap, will be measured and paid for under "Earthwork for Erosion and Sediment Control."

5.4. **Construction Exits**. Contractor-required construction exits from off right of way locations or on-right of way PSLs will not be paid for directly but are subsidiary to pertinent Items.

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" for construction exits needed on right of way access to work areas required by the Owner will be paid for at the unit price bid for "Construction Exits (Install)" of the type specified or "Construction Exits (Remove)." This price is full compensation for furnishing and placing materials, excavating, removal and disposal, cleaning vehicles, labor, tools, and incidentals.

When the Owner directs that a construction exit or portion thereof be removed and replaced, payment will be made at the unit prices bid for "Construction Exit (Remove)" and "Construction Exit (Install)" of the type specified. These prices are full compensation for the removal and replacement of the construction exit and for equipment, labor, tools, and incidentals.

Construction of sediment traps used in conjunction with the construction exit will be measured and paid for under "Earthwork for Erosion and Sediment Control."

5.5. **Earthwork for Erosion and Sediment Control**.

5.5.1. **Initial Earthwork for Erosion and Sediment Control**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Excavation (Erosion and Sediment Control, In Place)," "Embankment (Erosion and Sediment Control, In Place)," "Excavation (Erosion and Sediment Control, In Vehicle)," "Embankment (Erosion and Sediment Control, (In Vehicle)," or "Earthwork (Erosion and Sediment Control, In Vehicle)."

This price is full compensation for excavation and embankment including hauling, disposal of material not used elsewhere on the project; embankments including furnishing material from approved sources and construction of erosion-control features; and equipment, labor, tools, and incidentals.

Sprinkling and rolling required by this Item will not be paid for directly, but will be subsidiary to this Item.

5.5.2. **Maintenance Earthwork for Erosion and Sediment Control for Cleaning and Restoring Control Measures**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid under a Contractor Force Account Item from invoice provided to the Owner.

This price is full compensation for excavation, embankment, and re-grading including removal of accumulated sediment in various erosion control installations as directed, hauling, and disposal of material not used elsewhere on the project; excavation for construction of erosion-control features; embankments including furnishing material from approved sources and construction of erosion-control features; and equipment, labor, tools, and incidentals.

Earthwork needed to remove and obliterate erosion-control features will not be paid for directly but is subsidiary to pertinent Items unless otherwise shown on the plans.

Sprinkling and rolling required by this Item will not be paid for directly, but will be subsidiary to this Item.

5.6. **Construction Perimeter Fence**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Construction Perimeter Fence." This price is full compensation for furnishing and placing the fence; digging, fence posts, wire, and flagging; removal and disposal; and materials, equipment, labor, tools, and incidentals.

Removal of construction perimeter fence will be not be paid for directly but is subsidiary to the installation Item. When the Owner directs that the perimeter fence installation or portions thereof be removed and replaced, payment will be made at the unit price bid for "Construction Perimeter Fence," which is full compensation for the removal and reinstallation of the construction perimeter fence.

5.7. **Sandbags for Erosion Control**. Sandbags will be paid for at the unit price bid for "Sandbags for Erosion Control" (of the height specified when measurement is by the foot). This price is full compensation for materials, placing sandbags, removal and disposal, equipment, labor, tools, and incidentals.

Removal of sandbags will not be paid for directly but is subsidiary to the installation Item. When the Owner directs that the sandbag installation or portions thereof be replaced, payment will be made at the unit price bid for "Sandbags for Erosion Control," which is full compensation for the reinstallation of the sandbags.

5.8. **Temporary Sediment-Control Fence**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows:

5.8.1. **Installation**. Installation will be paid for as "Temporary Sediment-Control Fence (Install)." This price is full compensation for furnishing and operating equipment finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

5.8.2. **Removal**. Removal will be paid for as "Temporary Sediment-Control Fence (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

5.9. **Biodegradable Erosion Control Logs**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows:

5.9.1. **Installation**. Installation will be paid for as "Biodegradable Erosion Control Logs (Install)" of the size specified. This price is full compensation for furnishing and operating equipment finish backfill and grading, staking, proper disposal, labor, materials, tools, and incidentals.

5.9.2. **Removal**. Removal will be paid for as "Biodegradable Erosion Control Logs (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

5.10. **Vertical Tracking**. Vertical tracking will not be measured or paid for directly but is considered subsidiary to this Item.

Special Specification 3007
Bonding Course

1. DESCRIPTION

Construct a bonding course using a Tracking-Resistant Asphalt Interlayer (TRAIL) or a Spray Applied Underseal Membrane before the placement of a new hot-mix asphalt concrete pavement.

2. MATERIALS

Furnish asphalt materials in accordance with Article 300.2., "Materials" for one of the following two options:

2.1. **TRAIL**. Furnish asphalt material described as "tack" for typical use in the TRAIL Material Producer List. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use, unless required in conformance with the manufacturer's recommendation for approved TRAIL products on the MPL.

2.2. **Underseal Membrane**. Furnish asphalt material meeting the requirements of Special Specification 3005, "Spray Applied Underseal Membrane." Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use.

Furnish asphalt material for applying tack coat to all miscellaneous contact surfaces when approved by the Engineer:

2.3. **Miscellaneous Tack**. Furnish CSS-1H, SS-1H, EBL, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder in accordance with Item 300, Asphalts, Oils, and Emulsions. Specialized tack coat materials on the MPL for Tracking Resistant Asphalt Interlayer (TRAIL) will be allowed or required when shown on the plans. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use, unless required in conformance with the manufacturer's recommendation for approved TRAIL products on the MPL.

2.4. **Sampling**. The Engineer will obtain at least one sample of the tack coat binder per project per source in accordance with Tex-500-C, Part III, and test it to verify compliance with Item 300. The Engineer will notify the Contractor when the sampling will occur and will witness the collection of the sample from the asphalt distributor immediately before use. Label the can with the corresponding lot and sublot numbers, producer, producer facility location, grade, district, date sampled, all applicable bills of lading (if available), and project information, including highway and control-section-job (CSJ) number. For emulsions, the Engineer may test as often as necessary to ensure the residual of the emulsion is greater than or equal to the specification requirement in Item 300.

3. EQUIPMENT

3.1. **TRAIL**. Provide the equipment recommended by the producer.

3.2. **Underseal Membrane**. Provide in accordance with Special Specification 3005, "Spray Applied Underseal Membrane."

4. CONSTRUCTION

4.1. **Preparation**. Clean the surface before placing the bonding course. Apply bonding course uniformly at the approved rate, unless otherwise directed. The Engineer will set the rate between 0.04 – 0.14 gal. of residual asphalt per square yard of surface area. The Engineer may adjust the application rate, taking into

consideration the existing pavement surface conditions. Prevent splattering of the bonding course when placed adjacent to curb, gutter, and structures,

Apply a thin, uniform tack coat to all miscellaneous contact surfaces of curbs, structures, and joints. Prevent splattering of the tack coat when placed adjacent to curb, gutter, and structures.

4.2. **TRAIL**. Perform the following construction methods when applying a TRAIL for a bonding course:

4.2.2. **Test Strips**. When required by the Engineer, perform a test strip of TRAIL at a location on or near the project as directed. Allow the strip to cure for a maximum of 30 min. Drive over the test strip with equipment used during laid-down construction to simulate the effect of paving equipment. There should be no evidence of tracking or picking up of the TRAIL material on the wheels of the equipment.

4.2.3. **Placement**. Uniformly apply the TRAIL material to all areas where mix will be placed, including joints, at the rate shown on the plans or as directed, within 15°F of the approved temperature, and not above the maximum allowable temperature. Unless otherwise directed, uniformly apply the TRAIL material at a minimum rate specified on the plans. The Engineer will set the application rate between 0.06 – 0.14 gal. per square yard for emulsion TRAIL and the application rate between 0.08 – 0.12 gal. per square yard for hot-applied TRAIL.

4.3. **Underseal Membrane**. Place in accordance with Special Specification 3005, "Spray Applied Underseal Membrane."

4.3.2. **Placement**. Do not allow any loose mixture onto the prepared surface before application of the membrane. Unless otherwise directed, uniformly apply the membrane to all areas where mix will be placed, including joints, at the rate shown on the plans. Unless otherwise directed, uniformly apply the membrane at the minimum rate specified on the plans. The Engineer may adjust the application rate, taking into consideration the existing pavement surface conditions. The Engineer will set the application rate between 0.10 – 0.22 gal. per square yard for underseal membrane.

4.4. **Quality Control**. Stop application if it is not uniform due to streaking, ridging, pooling, or flowing off the roadway surface. Verify equipment condition, operating procedures, application temperature, and material properties. Determine and correct the cause of non-uniform application.

The Engineer may perform independent tests to confirm contractor compliance and may require testing differences or failing results to be resolved before resuming production.

The Engineer may stop the application and require construction of test strips at the Contractor's expense if any of the following occurs:

- non-uniformity of application continues after corrective action;
- evidence of tracking or picking up of the TRAIL;
- in three consecutive shots, application rate differs by more than 0.02 gal. per square yard from the rate directed; or
- any shot differs by more than 0.04 gal. per square yard from the rate directed.

The Engineer will approve the test strip location. The Engineer may require additional test strips until surface treatment application meets specification requirements.

5. MEASUREMENT

5.1. **Volume**. Asphalt material, including all components, will be measured at the applied temperature by strapping the tank before and after road application. The distributor calibrated strap stick will be used for measuring the asphalt level in the distributor asphalt tank. The certified tank chart will be used to determine the beginning gallons and the final gallons in the distributor tank. The quantity to be measured for payment will be the difference between the beginning gallons and the final gallons.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Bonding Course." These prices are full compensation for surface preparation; furnishing, preparing, hauling, Miscellaneous Tack used for all miscellaneous contact surfaces, and placing materials; removing existing pavement markers and excess aggregate; rolling; cleaning up stockpiles; and equipment, labor, tools, and incidentals.

100% SUBMITTAL

DESIGN SPEEDS:

TXDOT ROW:
RM 1431: 55 MPH (SEE NOTE 10)

PRIVATE (CITY OF LAGO VISTA):
DRIVEWAY 01: 15 MPH
DRIVEWAY 02: 20 MPH

AADT:

RM 1431 AT BAR K RANCH ROAD:
2021: 1,816
2022: 4071
2024: 6514

LAGO VISTA
TEXAS

CITY OF LAGO VISTA
SUNSET PARK DRIVEWAY PLANS

21817 RANCH RD, RM1431, LAGO VISTA, TX 78645

PROJECT LIMITS: SUNSET PARK AND RM 1431 LAGO VISTA, TX

CONSISTING OF: REHABILITATION OF EXISTING ROAD, DRIVEWAY CONSTRUCTION, DRIVEWAY CULVERT, SIGNING AND PAVEMENT MARKINGS

PROJECT NO. CC 1378-1-53

CSJ: 1378-01-053

PROJECT LENGTH=1,519.26 FT = 0.288 MI

NOTES:

1. CONTRACTOR SHALL SUBMIT ELECTRONIC RECORD DRAWINGS (PDF AND CAD FORMAT) TO THE CITY WITHIN 30 DAYS OF PROJET COMPLETION. RECORD DRAWINGS SHALL REFLECT ALL ATTENDANT CHANGES, MODIFICATIONS AND DETAILS OF CONSTRUCTION AS BUILT AND INSTALLED, COMPLETED CONSTRUCTION THAT DIFFERS FROM APPROVED DRAWINGS. SETS OF RECORD DRAWINGS WILL BE FURNISHED AS REQUIRED OT THE CITY FOR FUTURE REFERENCE, MAINTENANCE, AND CONSTRUCTION ON THE FACILITY.

2. CONTRACTOR SHALL CALL "ONE CALL" AT 1-800-344-8377 FOR UTILITY LOCATIONS AT LEAST 72 HOURS PRIOR TO ANY WORK IN CITY EASEMENTS OR STREET RIGHT OF WAYS.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING INFRASTRUCTURE DURING CONSTRUCTION.

4. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED PER OSHA REQUIREMENTS.

5. CONTRACTOR SHALL COMPLY WITH THE CITY OF LAGO VISTA NPS ORDINANCE.

6. CONTRACTOR SHALL NOTIFY THE CITY OF LAGO VISTA AT LEAST 48 HOURS BEFORE BEGINNING ANY CONSTRUCTION IN CITY RIGHT OF WAY OR EASEMENT.

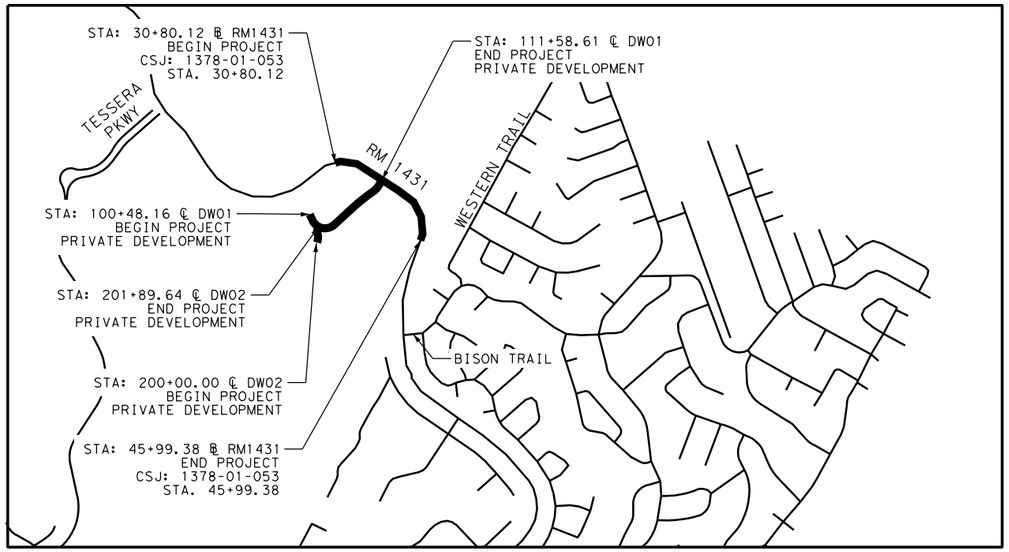
7. CONTRACTOR IS RESPONSBLE IN ACQUIRING ALL PERMITS, TESTS, APPROVALS, AND ACCEPTANCES REQUIRED IN COMPLETION OF PROPOSED IMPROVEMENTS.

8. IF ANY CONSTRUCTION OCCURS IN CITY RIGHT OF WAY, HAS DIRECT OR INDIRECT IMPACT THEREOF, THE CONTRACTOR SHALL SUBMIT SEQUENCE OF CONSTRUCTION TO THE CITY FOR REVIEW.

9. ALL CONSTRUCTION ACTIVITIES SHALL COMPLY WITH THE LATEST EDITION OF THE 'CITY OF LAGO VISTA TECHNICAL CONSTRUCTION STANDARD SPECIFICATIONS AND DETAILS'.

10. THE EXISTING HORIZONTAL ALIGNMENT DATA IS FOR RM 1431 IS FOR INFORMATION PURPOSES ONLY. THE EXISTING HORIZONTAL ALIGNMENT DATA DISPLAYED IS FOR A BEST-FIT CENTERLINE OF RM 1431. THE HORIZONTAL ALIGNMENT WAS CREATED USING AERIAL IMAGERY AND TOPOGRAPHICAL DATA PROVIDED BY THE SURVEY. THE EXISTING HORIZONTAL ALIGNMENT AS SHOWN IS NOT GUARANTEED TO MEET A 55 MPH DESIGN SPEED CRITERIA FOR RM 1431.

11. SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION IN THE SPECIFICATION BOOK 2024 EDITION, SHALL GOVERN ON THIS PROJECT.



VICINITY MAP
(NOT TO SCALE)

CobbFendley

TBPELS ENGINEERING FIRM NO. F-274;
LAND SURVEYING FIRM NO. 10046701
9600 N. MOPAC EXPRESSWAY, SUITE 800
AUSTIN, TEXAS 78759
512.834.9798 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

Texas 811
Know what's below. Call before you dig.

OWNER:

CITY OF LAGO VISTA
5803 THUNDERBIRD ST
LAGO VISTA, TX 78645

CONTACT:
TAYLOR WHICHARD
512-599-4179

ENGINEER:

COBBFENDLEY
9600 N. MOPAC EXPRESSWAY, SUITE 800
AUSTIN, TX 78759

CONTACT:
STANLEY R. FEES, P.E.
512-646-4349

SUBMITTED FOR APPROVAL:

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED
PROFESSIONAL ENGINEER

STANLEY R. FEES, P.E. 4/15/2025
COBBFENDLEY, INC. DATE

APPROVED BY:

CITY OF LAGO VISTA DATE
PUBLIC WORKS DEPARTMENT

RECOMMENDED BY:

TXDOT AREA ENGINEER DATE

RECOMMENDED BY:

TXDOT DISTRICT DESIGN ENGINEER DATE

APPROVED BY:

DIRECTOR OF TRANSPORATION DATE
PLANNING & DEVELOPMENT

NO.	DESCRIPTION	BY:	DATE

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61	DWMB-24 (AUS)

* THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

_____ P.E. _____ DATE

STANLEY R. FEES, P.E.

* = TXDOT STANDARD DETAIL

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED
PROFESSIONAL ENGINEER

4/15/2025

LAGO VISTA
TEXAS

CobbFendley
TBPELS Firm Registration No. F-274
Survey Firm Registration No. 10046700
9600 N. Mopac Expressway, Suite 800
Austin, Texas 78759
512.834.9798| fax 512.834.7727
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SUNSET PARK DRIVEWAY

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PI	SRF	AUS	TRAVIS		422

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NOTES:

1. PROPOSED WORK IS IN BOTH TXDOT RIGHT OF WAY AND PRIVATE PROPERTY OWNED BY CITY OF LAGO VISTA. WORK IN TXDOT ROW INCLUDES DRIVEWAY CONSTRUCTION, DRIVEWAY CULVERT REPLACEMENT, AND RESTRIPING OF FM 1431. WORK IN PRIVATE PROPERTY OWNED BY CITY OF LAGO VISTA INCLUDES ROADWAY CONSTRUCTION AND NEW CULVERT CONSTRUCTION.

0 40 80 160

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED PROFESSIONAL ENGINEER

4/15/2025

LAGO VISTA
TEXAS

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SUNSET PARK DRIVEWAY

PROJECT LAYOUT

SHEET 1 OF 1

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DS: PI	CK: SRF	CONT	SECT	JOB	HIGHWAY
		1378	01	053	RM1431
DW: PI	CK: SRF	DIST	COUNTY		SHEET NO.
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GENERAL NOTES: Version: March 10, 2025

Item	Description	**Rate
**204	**Sprinkling**	
	(Dust)	30 GAL/CY
	(Item 132)	30 GAL/CY
	(Item 247)	30 GAL/CY
**210	**Rolling (Flat Wheel)**	
	(Item 247)	1 HR/200 TON
	(Item 316)	1 HR/6000 SY
**210	**Rolling (Tamping and Heavy Tamping)**	1 HR/200 CY
**210	**Rolling (Lt Pneumatic Tire)**	
	(Item 132)	1 HR/500 CY
	(Item 247)	1 HR/200 TON
	(Item 316 - Seal Coat)	1 HR/6000 SY
	(Item 316 - Two Course)	1 HR/3000 SY
247	**Flexible Base (CMP IN PLC)**	132 LB/CF
310	**Prime Coat**	0.20 GAL/SY
314	**Emulsified Asphalt Treatment (SS-1 or MS-2)**	0.30 GAL/SY
316	**Underseals Asphalts (Multi Option)**	0.20 GAL/SY
	Surface Treatments	
	Seal Coat	
	Grade 4	
	Asphalt	0.38 GAL/SY
	Aggregate	1 CY/120 SY
	Grade 5	
	Asphalt	0.32 GAL/SY
	Aggregate	1 CY/150 SY
	Two Course Surface Treatment	
	Asphalt 1st Application	0.28 GAL/SY
	Asphalt 2nd Application	0.24 GAL/SY
	Aggregate 1st Application Grade 4	1 CY/110 SY
	Aggregate 2nd Application Grade 4	1 CY/130 SY
341, 344	**Dense-Graded Hot-Mix Asphalt and Superpave**	110 LB/SY/IN
3007	**Bonding Course**	0.09 GAL/SY

** For Informational Purposes Only

GENERAL
References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed will be free of organic material prior to placing any section of the pavement structure.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Keep the roadway free of debris and sediment caused by construction activities. Dispose of all material in accordance with federal, state, and local regulations. This work is subsidiary.

Damage to existing pipes and SET's due to Contractor operations will be repaired at Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right-of-way, will be as directed. Use of right-of-way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right-of-way but will cooperate in the use of the right-of-way with the city/county and various public utility companies as required.

During evacuation periods for Hurricane events the Contractor will cooperate with Department for the restricting of Lane Closures and arranging for Traffic Control to facilitate Coastal Evacuation Efforts.

ITEM 5 – CONTROL OF THE WORK
Place construction or silt fence 2 ft. inside TxDOT ROW along the Railroad ROW. This work is subsidiary.

Place construction stakes at intervals of no more than 100 ft. This work is subsidiary.

Precast Alternate Proposals.
When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with the latest version of the Department's details, PCA-SUP and PCA-SUB found at https://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm

Thermoplastic Pipe Alternate Proposals
When a reinforced concrete or corrugated metal pipe is included in the plans, a thermoplastic polypropylene pipe alternate may be submitted in a 2-phase process. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Phase 1 submit an official request to TxDOT PM with a summary of proposed locations, max depth of placement for each location, cover depth, and pipe diameters. TxDOT goal is to review and respond within 10 days. Phase 1 approval does not guarantee Phase 2 approval.

Phase 2 submit the following documents with all documents signed and sealed by a licensed Engineer in the state of Texas. 1-Provide a redline or revised set of drainage plans reflecting the revised locations. 2-Provide certification that the use of the alternate pipe and proposed bedding are adequate for the proposed application, depth, etc. 3-Provide a completed thermoplastic pipe installation drawing using the following,

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED PROFESSIONAL ENGINEER
4/15/2025

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SUNSET PARK DRIVEWAY

GENERAL NOTES

SHEET 1 OF 7

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https://ftp.txdot.gov/pub/txdot/brg/thermoplastic-pipe-installation-drawing.pdf
https://ftp.txdot.gov/pub/txdot/brg/thermoplastic-pipe-installation-drawing.dgn

For all uses of thermoplastic pipe as an alternate, furnish, install, and inspect the thermoplastic pipe in accordance with Item 468 or latest thermoplastic pipe special specification at time of letting. Minimum values, such as cover depth, required by the specification, installation drawing, etc. will not be waived. Use granular backfill unless flowable fill or CSB is required by the alternate design. Backfill locations shown in the bid plans using flowable fill or CSB must use the backfill per the bid plans.

ITEM 6 - CONTROL OF MATERIALS
Give a minimum of 1 business day notice for materials, which require inspection at the Plant.

Storage of Material Near Structures
Do not store equipment or flammable material within 100 ft. of bridges, culverts, or near their openings (portals). Flammable materials include all material that is not metal or aluminum.

ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES
Roadway closures during key dates, significant traffic generators, and/or special events are prohibited. See notes for Item 502 for the key dates and/or special events.

Refer to the Environmental Permits, Issues and Commitments (EPIC) plan sheets for additional requirements and permits.

When any abandoned well is encountered, cease construction operations in this area and notify the Engineer who will coordinate the proper plugging procedures. A water well driller licensed in the State of Texas must be used to plug a well.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

Locate aboveground storage tanks kept on-site for construction purposes in a contained area as to not allow any exposure to soils. The containment will be sized to capture 150% of the total capacity of the storage tanks.

Work within a USACE Jurisdictional Area.
Do not initiate activities within a U.S. Army Corps of Engineers (USACE) jurisdictional area that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Obtain written approval from the Engineer for activities not specifically addressed in the plans. Provide a signed sketch and description of the location 60 business days prior to begin work at the location. Complete and return any forms provided by TxDOT. Approval of the work is not guaranteed. Un approved work is not a compensable impact.

Vehicle Idle Restrictions
Within the limits of City of Lago Vista and Travis County, on road vehicles may not idle more than 5 minutes except for following exemptions: vehicle 14,000 pounds or less, vehicles over 14,000 pounds are certified clean ideal as defined by the EPA, or other exemptions as listed in TAC Title 30, Part 1, Chapter 114, Subchapter J, Division 2, 114.517.

Birds and bats may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16 and February 28. Prevent migratory birds from re-nesting between March 1 and September 15. Prevention shall include all areas within 25 ft. of proposed work. All methods used for the removal of old nesting areas and the prevention of re-nesting must be submitted to TxDOT 30 business days prior to begin work. This work is subsidiary.

If active nests are encountered on-site during construction, all construction activity within 25 ft. of the nest must stop. Contact the Engineer to determine how to proceed.

Tree and Brush Trimming and Removal.
Work will be conducted September 16 thru February 28. Work conducted outside this timeframe will require a bird survey.

Upon begin removal operations, all removal work for the project must be completed within 21 calendar days. Completion of removal includes removing from ROW or mulching of all debris.

No extension of time or compensation will be granted for a delay or suspension due to the above bird, bat, and tree/brush requirements.

ITEM 8 – PROSECUTION AND PROGRESS
A CPM schedule in Primavera format and a PSSR is required. Use software fully compatible with Primavera P6. Provide schedule in pdf and format native to Primavera P6 program.

ITEM 105 – REMOVING TREATED AND UNTREATED BASE AND ASPHALT PAVEMENT
Existing typical is based on information available. This typical may not account for all maintenance work such as overlays or pavement repairs. A change in material type or thickness does not warrant additional payment. Payment is full compensation for removing all material to the depth specified.

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STATE OF TEXAS
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SUNSET PARK DRIVEWAY

GENERAL NOTES

SHEET 2 OF 7

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ITEM 110 – EXCAVATION
The Engineer will define unsuitable material.

ITEM 132 – ALL EMBANKMENT
The Engineer will define unsuitable material. Material which the Contractor might deem to be unsuitable due to moisture content will not be considered unsuitable material.

Prior to begin embankment of existing area, correct or replace unstable material to a depth of 6 in. below existing grade. Embankment areas will be inspected prior to beginning work.

Rock or broken concrete produced by the project is allowed in earth embankments. The size of the rock or broken concrete will not exceed the layer thickness requirements in Section 132.3.4., "Compaction Methods." The material will not be placed vertically within 5 ft. of the finished subgrade elevation.

Embankment placed vertically within 5 ft. of the finished subgrade elevation or within the edges of the subgrade and treated with lime, cement, or other calcium-based additives must have a sulfate content less than 3000 ppm. Allow 5 business days for testing. Treatment of sulfate material 3000 ppm to 7000 ppm requires 7 days of mellowing and continuous water curing, in accordance TxDOT guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures (9/2005). Material over 7000 ppm is not allowed.

ITEM 160 - TOPSOIL
Off-site topsoil will have a minimum PI of 25.

No Sandy Loam allowed.

Obtain approval of the actual depth of the topsoil sources for both on-site and off-site sources.

Construct topsoil stockpiles of no more than five (5) feet in height.

It is permissible to use topsoil dikes for erosion control berms within the right-of-way, as directed.

Seed or track slopes within 14 days of placement.

Salvage topsoil from sites of excavation and embankment. Maximum salvage depth is 6 inches.

Windrowing of topsoil obtained from the right-of-way is not allowed.

ITEM 164 – SEEDING FOR EROSION CONTROL
Hydro mulch seeding will be allowed as a substitute for drill seeding if placed October 1 thru January 31. It may only be substituted in areas with a slope less than 1 in. vertical to 12 in. horizontal. It may not be used in the bottom of a ditch or channel. Payment will be made using the existing drill seed item.

ITEM 168 – VEGETATIVE WATERING
Water all areas of project to be seeded or sodded.

Maintain the seedbed in a condition favorable for the growth of grass. Watering can be postponed immediately after a rainfall on the site of ½ inch or greater but will be resumed before the soil dries out. Continue watering until final acceptance.

Vegetative watering rates and quantities are based on ¼ inch of watering per week over a 3-month watering cycle. The actual rates used and paid for will be as directed by the city of Lago Vista and will be based on prevailing weather conditions to maintain the seedbed.

Obtain water at a source that is metered (furnish a current certification of the meter being used) or furnish the manufacturer's specifications showing the tank capacity for each truck used. Notify the Engineer, each day that watering takes place, before watering, so that meter readings or truck counts can be verified.

ITEM 204 – SPRINKLING
Apply dust control to haul roads, construction traffic routes, staging areas, field office areas, material storage areas, parking areas, and stockpiles as directed. If dust control is not being maintained, the Department may cease operations until dust is controlled. This work is subsidiary.

ITEM 216 - PROOF ROLLING
Correct and perform "Proof Rolling" retest at the Contractor's expense, to the satisfaction of the Engineer, when initial "Proof Rolling" yields a failing result.

ITEM 247 - FLEXIBLE BASE
Placing in a single layer is allowed when total thickness of base is 8 in. or less. When placed in multiple layers, compact the bottom and middle layers to at least 95% and 98% of the maximum dry density, respectively. When placed in a single layer or the final layer, compact to at least 100%.

Correction of subgrade soft spots is subsidiary.

Complete per plans the subgrade, ditches, slopes, and drainage structures prior to the placement of base.

Do not use a vibratory roller to compact base placed directly on top of a drainage structure.

ITEM 310 – PRIME COAT
Apply blotter material to all driveways and intersections. This work is subsidiary.

Rolling to ensure penetration is required.

ITEM 320 - EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT
Use of motor grader is allowed for placement of mixtures greater than 10 inches from the riding surface, when hot-mix is used in lieu of flexible base, or as allowed.

Use of motor grader is allowed for placement of non-surface hot-mix on off system (non-state maintained roads) projects when length of placement is 500 ft. or less.

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SUNSET PARK DRIVEWAY

GENERAL NOTES

SHEET 3 OF 7

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ITEMS 341 THRU 348 - HOT-MIX ASPHALT PAVEMENT
Core holes may be filled with an Asphaltic patching material meeting the requirements of DMS-9203 or with SCM meeting requirements of DMS-9202.

Remove and dispose of off the ROW the audible/profile markings, reflectorized markings, and raised markers.

Install transverse butt joints with 50 ft. H: 1 in. V transition from the new ACP to the existing surface. Install a butt joint with 24 in. H: 1 in. V transition from the new ACP to a driveway, pullout or intersection. Saw cut the existing pavement at the butt joints. This work is subsidiary.

Use a device to create a maximum 3H:1V notched wedge joint on all longitudinal joints of 2 in. or greater. This work is subsidiary.

Ensure placement sequence to avoid excess distance of longitudinal joint lap back not to exceed one day's production rates.

Submit any proposed adjustments or changes to a JMF before production of the new JMF.
Tack every layer. Do not dilute tack coat. Apply it evenly through a distributor spray bar.

Provide a minimum transition of 10-ft for intersections, 10-ft for commercial driveways, and 6-ft for residential driveways unless otherwise shown on the plans.

Irregularities will require the replacement of a full lane width using an asphalt paver. Replace the entire sublot if the irregularities are greater than 40% of the sublot area.

Lime or an approved anti-stripping agent must be used when crushed gravel is utilized to meet a SAC "A" requirement.

When using RAP or RAS, include the management methods of processing, stockpiling, and testing the material in the QCP submitted for the project. If RAP and RAS are used in the same mix, the QCP must document that both of these materials have dedicated feeder bins for each recycled material. Blending of RAP and RAS in one feeder bin or in a stockpile is not permitted.

Asphalt content and binder properties of RAP and RAS stockpiles must be documented when recycled asphalt content greater than 20% is utilized.

No RAS is allowed in surface courses.

Department approved warm-mix additives are required for all surface mix applications when RAP is used. Dosage rates will be approved during JMF approval.

The Hamburg Wheel Test will have a minimum rut depth of 3mm except for SMA with HPG or PG 76.

ITEMS 341 - DENSE-GRADED HOT-MIX ASPHALT
Design all Type D mixtures as a surface mix, maximum 15% RAP, and without RAS.

For all mix types, contractor may not use a substitute PG binder for 76-22. When using substitute binders, mold specimens for mix design and production at the temperature required for the substitute binder used to produce the HMA.

The Hamburg Wheel minimum number of passes for PG 64 or lower is reduced to 7,000. The Engineer may accept Hamburg Wheel test results for production and placement if no more than 1 of the 5 most recent tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.

ITEM 467 - SAFETY END TREATMENT
Field adjust pipe end to maintain the necessary slope. Field cutting of pipe end is allowed. Coat all metal field cuts or exposed reinforcement with asphalt paint.

For all Type II SETs, provide riprap apron shown in the cast-in-place standards and precast riprap detail standard. This work is subsidiary.

Cast-in-place or precast will be allowed unless stated otherwise.

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING

Roadway	Limits	Allowable Closure Time
RM 1431	All (1 lane closed)	9 P to 5 A

Daytime or Friday night lane closures will not be allowed unless otherwise shown on the plans. One lane in each direction will remain open at all times for all roadways unless otherwise shown on the plans.

No closures will be allowed on the weekends, business day prior, and business day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend.

No closures will be allowed 1 P.M. to 11 P.M. the Sunday of the Super Bowl.

Time charges will not be suspended during the large and special events listed below. These events are provided in the contract to allow scheduling of work around these lane closure restrictions.

All lanes will be open by noon of the day before the large events listed in below table. No closures will be allowed on Friday and the weekends for projects within 20 miles of these large events:

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SUNSET PARK DRIVEWAY

GENERAL NOTES

SHEET 4 OF 7

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Event	City	Dates
Formula 1 @ COTA	Austin	Annually (See Event Website)
Moto GP @ COTA	Austin	Annually (See Event Website)
ACL Fest	Austin	Annually (See Event Website)
SXSW	Austin	Annually (See Event Website)
ROT Rally	Bastrop	Annually (See Event Website)
UT Football Games	Austin	Annually (See Event Website)
Sales Tax Holiday	All	Annually (See Event Website)
Rodeo Austin	Austin	Annually (See Event Website)

Due to FIFA World Cup 2026, closures will be restricted for the following dates and roadways. Closure restriction period begins 8 PM the day before and ends at 8 AM the day after.

FIFA Houston Roadways: SH 71 east of IH 35 and US 290 east of IH 35.
FIFA Houston Dates: 6/14/26, 6/17/26, 6/20/26, 6/23/26, 6/26/26, 6/29/26, 7/4/26

FIFA Dallas Roadways: IH 35 north of RM 620
FIFA Dallas Dates: 6/14/26, 6/17/26, 6/22/26, 6/25/16, 6/27/26, 6/30/26, 7/3/26, 7/6/26, 7/14/26

All lanes will be open by noon of the day before the special events listed in below table. No closures will be allowed on Friday and the weekends for projects within 10 miles of these special events:

Event	City	Dates
Eaker BBQ Competition	Fredericksburg	March 10, 2024
Sherwood Forest Faire	McDade / Paige	Weekends in March and April
Smithville Jamboree	Smithville	April 4-6, 2024
Two Step Inn	Georgetown	April 20-24, 2024
Wiener Dog Races	Buda	April 27-28, 2024
Founders Day Festival	Dripping Springs	April 26-28, 2024
Red Poppy Festival	Georgetown	April 26-28, 2024
Crawfish Open	Llano	3rd Friday and Saturday in April
Fair and Rodeo	Liberty Hill	May 18, 2023
Founders Day Ceremony	Fredericksburg	2nd Weekend in May
Crawfish Festival	Fredericksburg	Saturday before Memorial Day
Lakefest Boat Races	Marble Falls	June 10-11, 2023
Watermelon Thump	Luling	Last Full Weekend in June
Pie in the Sky	Kyle	Sept 1-2, 2023
Wine and Music Festival	Georgetown	Last Saturday of September
Deer Season Opening Weekend	All Counties in Burnet Area Office	1st Friday and Saturday of Season
Christmas Nights of FBG Lights	Fredericksburg	Nov 21, 2023
Christmas on Mercer	Dripping Springs	Dec 2, 2023
Lady of Guadalupe Procession	Fredericksburg	Dec 12, 2023
Texas State Graduation Fall	San Marcos	TBD
Texas State Graduation Spring	San Marcos	TBD

All the large and special events listed in the above tables occur annually. Coordinate with the Department and review the city/event website to plan around the future events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed.

Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal.

Provide 2-hour notice prior to implementation and immediately upon removal of the closure.

Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

For all roadways: Submit request for traffic detours and full roadway closures 168 hours prior to implementation. Submit request for nighttime work 96 hours to implementation date.

Cancellations of accepted closures (not applicable to full closures or detours) due to weather will not require resubmission in accordance with the above restrictions if the work is completed during the next allowable closure time.

Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify current and future traffic control, if at any time the queue becomes greater than 20 minutes.

Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Cover, relocate, or remove existing small, large, and overhead signs that conflict with traffic control. Cover large and overhead signs to remain using latest standard TS-CD. This work is subsidiary.

Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Place a 28-inch cone, meeting requirements of BC (10) and Ty III barricades, on top of foundations that have protruding studs. This work is subsidiary.

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SUNSET PARK DRIVEWAY

GENERAL NOTES

SHEET 5 OF 7

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Vertical panels used on roadways with speed limit 55 mph or greater must be round in shape or have a self-righting mechanism. The "flat" or "oblong" shaped vertical panels are not allowed.

A series of sequential flashing warning lights, per BC(7), must be installed in a merging taper for long term stationary TCP. This includes all TCP setups, such as those shown on the plans or TCP setups per the standards.

Edge condition treatment types must be in accordance with the TxDOT standard. Installation and removal of a safety slope is subsidiary.

ITEM 503 – PORTABLE CHANGEABLE MESSAGE SIGN
Place PCMS 10 calendar days prior to begin work stating "Road Work Begin Soon, Contact 832-7000 For Info".

Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as "RIGHT LN CLOSED XXX FT".

ITEM 505 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR
The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS
If SW3P plan sheets are not provided, place the control measures as directed.

Install, maintain, remove control measures in areas of the right-of-way utilized by the Contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

Erosion control measures must be initiated immediately in areas where construction activities have ceased and will not resume for a period exceeding 14 calendar days. Vertical track all exposed soil, stockpiles, and slopes. Re-track after each rain event or every 14 days, whichever occurs first. Sheep foot roller is allowed for vertical tracking. This work is subsidiary.

Notify the Engineer within 1 hour of beginning emergency or recent rainfall dewatering. Water located within the ROW that will leave the ROW must appear free of pollutants such as suspended sediment, oil sheen, floating solids, etc. Dirty water must pass thru adequate BMPs prior to leaving the ROW to prevent discharge of dirty water. Bypass pumping of water found in a navigable waterway that enters from outside the ROW and is discharged downstream of the ROW will not require the use of BMPs. Dewatering BMPs will be paid for in conformance with the applicable bid items. However, if the necessary BMP item is not included in the Contract, payment for the BMP will be in accordance with Article 9.7., "Payment

for Extra Work and Force Account Method." The act of dewatering and the equipment used to dewater will not be paid for directly but will be subsidiary to pertinent bid items.

Unless a specific pay item is provided in the plans, the installation of the 6:1 or flatter for RFD side slopes in the safety zone will be subsidiary to pertinent bid items.

Cover small waste containers (100 gallons or less) at all times. This work is subsidiary. Large waste containers (more than 100 gallons) must have a secondary discharge containment system around the container using erosion control logs. Installation of the log for each container location will be paid using existing bid items. Repair, remove, or replace of the log will not be paid. Revisions, repairs, remove or replace of the log during exchange of empty/full containers at the same location will not be paid.

Portable restrooms must be located more than 50 ft. from a waterway. Tie or stake down portable restrooms to prevent tipping due to vandalism or weather. This work is subsidiary.

Provide a designated location for disposal when excess and waste, including waste generated from cleaning of all equipment used for mixing, hauling, and transfer concrete is disposed in the ROW or PSL. Manufactured disposal containers must be metal or a plastic material with minimum 10 mil thickness. Paper, earthen berms, or pits must be lined with minimum 10 mill thickness polyethylene sheeting. Disposal locations must be located a minimum of 50 ft. from a waterway, tree, or sensitive feature. The disposal location must have a minimum height of 6 in. Maintain a minimum 4 in. of freeboard at all times. Disposal locations are not required for cleaning of small hand tools. Hardened concrete waste may be used as embankment if placed in accordance with Item 132.

Dust Control
Stockpiles that will be inactive for greater than 14 days must be treated to contain dust by covering with chemical dust suppressant, soil blanket, vertical tracking, or method other than sprinkling with water. Stockpiles that are actively being used must be treated to contain dust by vertical tracking or a method determined by the Contractor. This work is subsidiary.

Provide designated construction traffic routes when feasible. Construction site traffic must be directed to use designated routes.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES
Triangular slip base must be the clamp style to secure the post to the slip base. Set screw style slip base will not be allowed.

ITEM 658 – DELINEATOR AND OBJECT MARKER ASSEMBLIES
All delineator, reflector, and object marker posts and supports, excluding metal components, must be manufactured in the same color that matches the color of the reflector. Field painting is not allowed.

Flexible posts YFLX and WFLX must be tubular in shape. The "flat" flexible posts are not allowed.

ITEM 666 - RETROREFLECTORIZED PAVEMENT MARKINGS
Notify the Engineer at least 24 hr. before beginning work.

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SUNSET PARK DRIVEWAY

GENERAL NOTES

SHEET 6 OF 7

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All projects, including resurfacing, must increase center-to-center width for center line markings to 18 in. unless the plans or existing is greater than 18 in.

When the raised portion of a profile marking is placed as a separate operation from the pavement marking, the raised portion must be placed first then covered with TY I.

When using black shadow to cover existing stripe apply a non-retroreflective angular abrasive bead drop. The marking color shall be adjusted to resemble the pavement color. If Item 677 is not used prior to placement of black shadow, scrape the top of the marking with a blade or large piece of equipment unless surface is a seal coat. The scraping of the marking is subsidiary.

ITEM 677 - ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS
Dispose of removed materials and debris at locations off the right-of-way.

Elimination using a pavement marking will not be allowed in lieu of methods listed in specification.

The surface treatment method (seal coat) shall be used on surfaces other than concrete.

Remove pavement markings on concrete surfaces by a blasting method. Flail milling will be allowed when total quantity of removal on concrete surfaces is less than 1000 ft.

Strip seal is only method allowed on seal coat surface unless project includes placement of a new surface. If total quantity of removal on a seal coat surface is less than 2000 ft., elimination using a pavement marking is allowed if a test section is approved by the Engineer. Test section shall demonstrate the thermo marking color matches the existing pavement color.

Remove pavement markings outside the limits of the new surface by a blasting method.

Use a TRAIL or a non-retroreflective paint to cover stripe remnants that remain after elimination.

The test requirements for these materials are waived. The paint color shall be adjusted to resemble the existing pavement color. Installation and maintenance is subsidiary.

ITEM 752 – TREE AND BRUSH REMOVAL
Tree and brush removal shall be considered subsidiary to Item 100.

Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush even if Item 752 is not included as a pay item.

Flailing equipment is not allowed. Burning brush is not allowed in urban areas or on ROW. Use hand methods or other means of removal if doing work by mechanical methods is impractical.
Prior to begin tree pruning, send email confirmation to the Engineer that training and demonstration of work methods has been provided to the employees. This work is subsidiary.

Shredded vegetation may be blended, at a rate not to exceed 15 percent by volume, with Item 160 if the maximum dimension is not greater than 2 in.

ITEM 3007 – BONDING COURSE
The minimum application rates are listed in Table BC. Miscellaneous Tack is allowed for use with dense-graded Type B HMA. If a tack bid item is not provided, use bonding course item.

Table BC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Emulsified Asphalt	0.06
TRAIL – Hot Asphalt	0.12
Spray Applied Underseal Membrane	0.10

Table BCS (For Informational Tests)

Material	Target Shear Bond Strength (Tex-249-F psi)
SMA – Stone-Matrix Asphalt	60.0
PFC – Permeable Friction Course	N/A
All Other Materials	40.0

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SUNSET PARK DRIVEWAY

GENERAL NOTES

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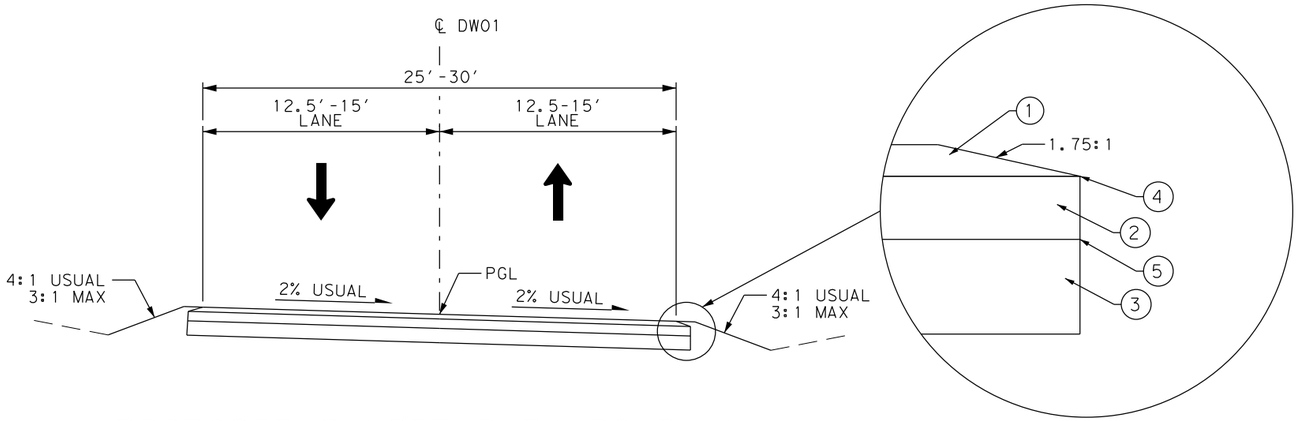

PROPOSED SUNSET PARK ROADWAY

(SEE NOTE 1)

℄ DW01 STA 100+48.16 TO 111+06.80
℄ DW02 STA 201+15.87 TO 201+77.07

PROPOSED SUNSET PARK PAVEMENT DETAIL A

1 - 2" HOT MIX ASPHALT SURFACE TY D PG76-22
2 - 4" HOT MIX ASPHALT BASE TY B PG64-22
3 - 6" FLEXIBLE BASE TY A GR 5
4 - BONDING COURSE (ITEM 3007)
5 - PRIME COAT (MC-30 OR AE-P)(ITEM 310)

NOTES:

1. PAYMENT FOR DRIVEWAY INSTALLATION IN TXDOT ROW IS PER ITEM 530.

2. PAYMENT FOR DRIVEWAY INSTALLATION OUTSIDE OF TXDOT ROW IS PER ITEMS 247, 310, 341, AND 3007 PER THE CITY OF LAGO VISTA BID ITEMS.

NOTES:

1. PROPOSED WORK IS IN BOTH TXDOT RIGHT OF WAY AND PRIVATE PROPERTY OWNED BY CITY OF LAGO VISTA. WORK IN TXDOT ROW INCLUDES DRIVEWAY CONSTRUCTION, DRIVEWAY CULVERT REPLACEMENT, AND RESTRIPING OF RM 1431. WORK IN PRIVATE PROPERTY OWNED BY CITY OF LAGO VISTA INCLUDES ROADWAY CONSTRUCTION AND NEW CULVERT CONSTRUCTION.

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED PROFESSIONAL ENGINEER

4/15/2025

LAGO VISTA
TEXAS

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SUNSET PARK DRIVEWAY

TYPICAL SECTIONS

SHEET 1 OF 2

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		1378	01	053	RM1431
DW: PI	CK: SRF	DIST	COUNTY		SHEET NO.
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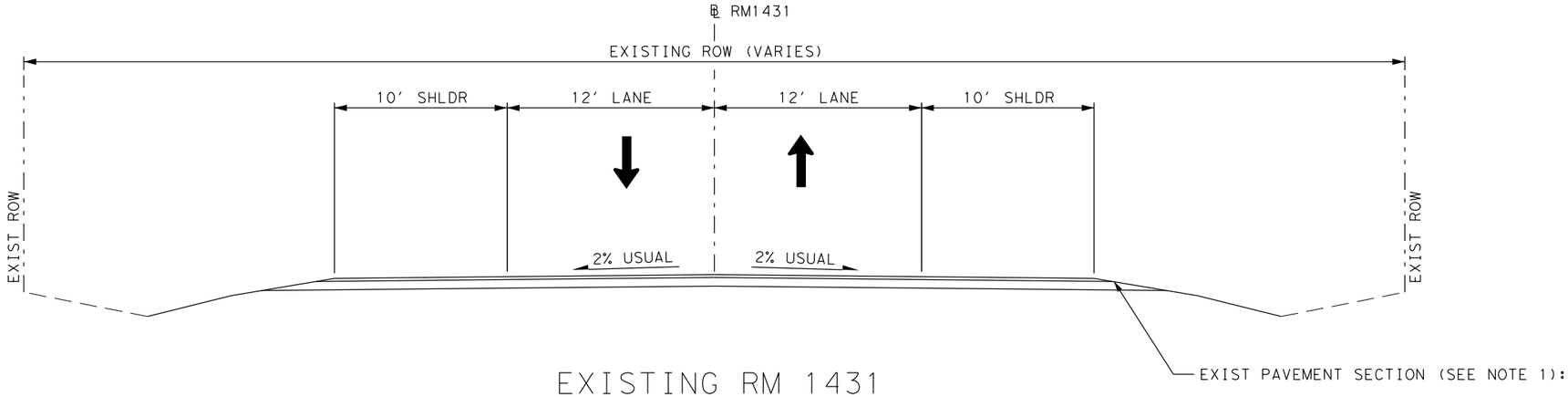
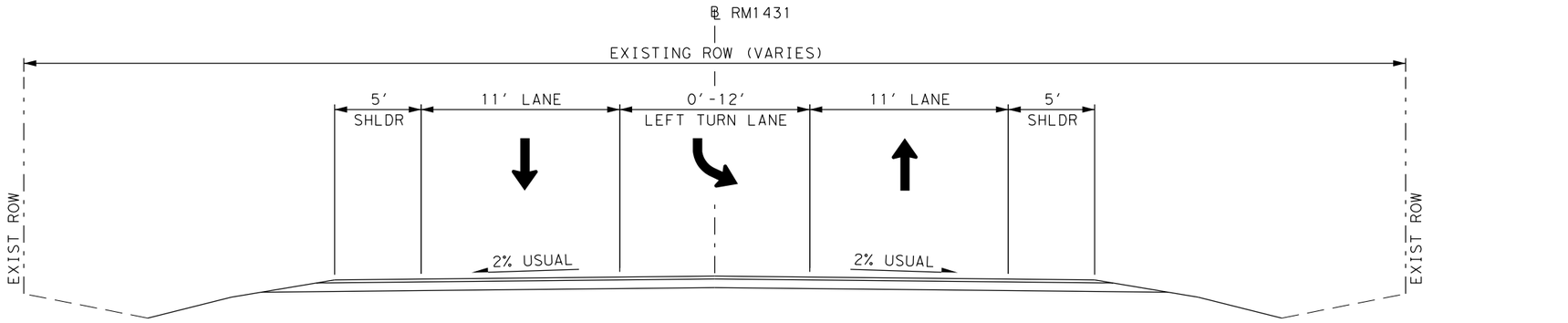


EXISTING RM 1431

℄ RM1431 STA 30+80.12 TO STA 45+99.38



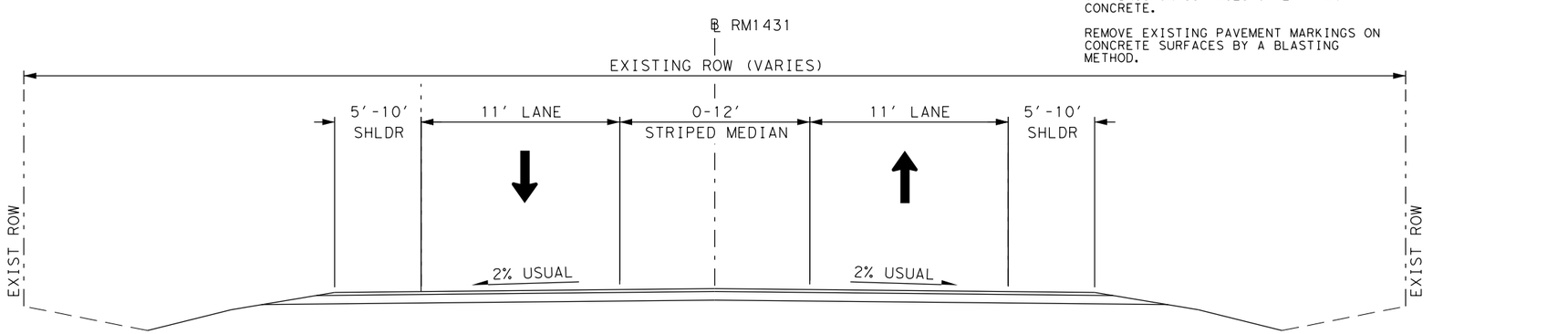
PROPOSED RM 1431

℄ RM1431 STA 36+90.04 TO STA 42+69.38

NOTES:

CONTRACTOR SHALL USE SURFACE TREATMENT METHOD (SEAL COAT) FOR ELIMINATING EXISTING PAVEMENT MARKINGS ON SURFACES OTHER THAN CONCRETE.

REMOVE EXISTING PAVEMENT MARKINGS ON CONCRETE SURFACES BY A BLASTING METHOD.



PROPOSED RM 1431

℄ RM1431 STA 30+80.12 TO STA 36+90.04
℄ RM1431 STA 42+69.38 TO STA 45+99.38

NOTES:

1. EXISTING PAVEMENT SECTION DETERMINED FROM 2006 TXDOT AS-BUILT RECORDS (TXDOT CSJ: 1378-01-026)

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SUNSET PARK DRIVEWAY

TYPICAL SECTIONS

SHEET 2 OF 2

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		AUS	TRAVIS		432

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WORK IN PRIVATE PROPERTY (CITY OF LAGO VISTA)

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	160 7002	164 7002	164 7029	164 7030	168 7001	506 7020	506 7024	506 7039	506 7041
	FURN & PLACE TOPSOIL (4")	BROADCAST SEED (PERM_RURAL_ CLAY)	STRAW/HAY MLCH SEED (TEMP_WARM)	STRAW/HAY MLCH SEED (TEMP_COOL)	VEGETATIVE WATERING	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	SY	MG	SY	SY	LF	LF
EROSION CONTROL LAYOUT SHEET 1 OF 1	4313	4313	4313	4313	80	106	106	1167	1167
PROJECT TOTALS	**4313**	**4313**	**4313**	**4313**	**80**	**106**	**106**	**1167**	**1167**

WORK IN PRIVATE PROPERTY (CITY OF LAGO VISTA)

SUMMARY OF ROADWAY ITEMS

LOCATION	105 7036	110 7001	132 7003	247 7179	310 7013	464 7007	467 7343	341 7003	341 7065	3007 7001	100 7002
	RMV(16") TRT/UNTRT BASE & ASPH PAV	EXCAV (ROADWAY)	EMBANK (FNL)(OC) (TY B)	FL BS (CMP IN PLC)(TY A GR 5) (FNAL POS)	PRIME COAT (MC-30 OR AE-P)	RC PIPE (CL III)(30 IN)	SET (TY II) (30 IN) (CMP) (4: 1) (C)	D-GR HMA TY-B PG64-22 (EXEMPT)	D-GR HMA TY-D PG 76-22 (EXEMPT)	BONDING COURSE	PREPARING ROW
	SY	CY	CY	CY	GAL	LF	EA	TON	TON	GAL	EA
DRIVEWAY 1 PLAN AND PROFILE SHEET 1 OF 2	130	525	145	261	311			342	170	139	5.5
DRIVEWAY 1 PLAN AND PROFILE SHEET 2 OF 2		286	255	269	321	46	2	353	176	144	5.4
DRIVEWAY 2 PLAN AND PROFILE SHEET 1 OF 1		28	3	25	29			32	16	13	
PROJECT TOTALS	**130**	**839**	**403**	**555**	**661**	**46**	**2**	**727**	**362**	**296**	**10.9**

WORK IN PRIVATE PROPERTY (CITY OF LAGO VISTA)

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS	
LOCATION	N/A
	N/A
	N/A
SIGNING AND PAVEMENT MARKING LAYOUTS SHEET 1 OF 2	N/A
SIGNING AND PAVEMENT MARKING LAYOUTS SHEET 2 OF 2	N/A
PROJECT TOTALS	**N/A**

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED
PROFESSIONAL ENGINEER
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LAGO VISTA
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SUNSET PARK DRIVEWAY
SUMMARY OF CITY OF LAGO VISTA QUANTITIES

SHEET 1 OF 1

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		DIST	COUNTY		SHEET NO.
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WORK IN TXDOT ROW

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS

LOCATION	644 7002	658 7003	666 7017	666 7023	666 7035	666 7041	666 7065	666 7175	666 7177	666 7179	666 7184	666 7186	666 7194	666 7213
	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	DEL ASSM (D-SW)SZ 1 (WFLX)(GND)	REFL PAV MRK TY I (W) 8" (DOT)(090MIL)	REFL PAV MRK TY I (W)8"(SLD) (090MIL)	REFL PAV MRK TY I (W)24"(SLD) (090MIL)	REFL PAV MRK TY I (W)(ARROW) (090MIL)	REFL PAV MRK TY I (W)(WORD) (090MIL)	RE PM TY II (W) 6" (SLD)	RE PM TY II (W) 8" (DOT)	RE PM TY II (W) 8" (SLD)	RE PM TY II (W) 24" (SLD)	RE PM TY II (W) (ARROW)	RE PM TY II (W) (WORD)	RE PM TY II (Y) 6" (SLD)
	EA	EA	LF	LF	LF	EA	EA	LF	LF	LF	LF	EA	EA	LF
SIGNING AND PAVEMENT MARKING LAYOUTS SHEET 1 OF 2	1	2		363	21	2	1	1780		363	21	2	1	2832
SIGNING AND PAVEMENT MARKING LAYOUTS SHEET 2 OF 2			151	70			1	1100	151	70			1	1998
PROJECT TOTALS	**1**	**2**	**151**	**433**	**21**	**2**	**2**	**2880**	**151**	**433**	**21**	**2**	**2**	**4830**

WORK IN TXDOT ROW

SUMMARY OF SIGNING AND PAVEMENT MARKING ITEMS

LOCATION	666 7265	666 7269	672 7002	672 7004	677 7001	677 7008	678 7002	678 7004	678 7008	678 7009	678 7015	666 7348
	RE PROFILE PM TY I (W)6"(SLD) (090MIL)	RE PROFILE PM TY I (Y)6"(SLD) (090MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (24")	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (WORD)	PAVEMENT SLER 6"
	LF	LF	EA	EA	LF	LF	LF	LF	LF	EA	EA	LF
SIGNING AND PAVEMENT MARKING LAYOUTS SHEET 1 OF 2	1780	2832	18	144	3886	126	4612	363	21	2	1	575
SIGNING AND PAVEMENT MARKING LAYOUTS SHEET 2 OF 2	1100	1998	4	72	2197	9	3098	70			1	
PROJECT TOTALS	**2880**	**4830**	**22**	**216**	**6083**	**135**	**7710**	**433**	**21**	**2**	**2**	**575**

WORK IN TXDOT ROW

SUMMARY OF TRAFFIC CONTROL ITEMS

LOCATION	502 7001	505 7002	503 7001
	BARRICADES, SIGNS AND TRAFFIC HANDLING	TMA (MOBILE OPERATION)	PORTABLE CHANGEABLE MESSAGE SIGN
	MO	HR	DAY
TRAFFIC CONTROL LAYOUT SHEET 1 OF 1	1		
FM 1431 RESTRIPING		24	
PROJECT LAYOUT SHEET			40
PROJECT TOTALS	**1**	**24**	**40**

WORK IN TXDOT ROW

SUMMARY OF ROADWAY ITEMS

LOCATION	464 7005	467 7328	496 7004	496 7007	530 7010	105 7002
	RC PIPE (CL III)(24 IN)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	REMOV STR (SET)	REMOV STR (PIPE)	DRIVEWAYS (ACP)	RMV(2"-6") TRT/UNTRT BASE & ASPH PAV
	LF	EA	EA	LF	SY	SY
DRIVEWAY 1 PLAN AND PROFILE SHEET 1 OF 2						
DRIVEWAY 1 PLAN AND PROFILE SHEET 2 OF 2	53	2	2	36	125	72
DRIVEWAY 2 PLAN AND PROFILE SHEET 1 OF 1						
PROJECT TOTALS	**53**	**2**	**2**	**36**	**125**	**72**

WORK IN TXDOT ROW

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	160 7002	164 7002	100 7013	100 7015	164 7029	164 7030	506 7039	506 7041
	FURN & PLACE TOPSOIL (4")	BROADCAST SEED (PERM_RURAL_CLAY)	TREE PROTECTION (INSTALL)	TREE PROTECTION (REMOVE)	STRAW/HAY MLCH SEED (TEMP_WARM)	STRAW/HAY MLCH SEED (TEMP_COOL)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	EA	EA	SY	SY	LF	EA
EROSION CONTROL LAYOUT SHEET 1 OF 1	196	196	1	1	196	196	58	58
PROJECT TOTALS	**196**	**196**	1	1	**196**	**196**	58	58

REV	DATE	BY	DIST

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SUNSET PARK DRIVEWAY

SUMMARY OF TXDOT QUANTITIES

SHEET 1 OF 1

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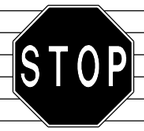
SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
45	1	R1-1		36X36	X		10BWG	1	SA	P	BM	

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

* SIGN TO BE USED FOR PROPOSED FLASHING ROADSIDE BEACON. SIGN IS PAID FOR UNDER ITEM 636-6001 AS PART OF TRAFFIC SIGNAL QUANTITIES. SEE "SOLAR POWERED ROADSIDE FLASHING BEACON DETAIL" SHEET FOR DETAILS.

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Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SHEET 1 OF 1

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REVISIONS		1378	01	053	RM 1431
4-16		DIST	COUNTY		SHE
8-16		AUS	TRAVIS		

PHASE 1: DRIVEWAY CONSTRUCTION

1. INSTALL WARNING SIGNS, BARRICADES, AND OTHER TRAFFIC HANDLING DEVICES AS SHOWN IN THE TRAFFIC CONTROL PLAN DETAILS AND STANDARDS. CONTRACTOR TO MAIN ACCESS TO EXISTING DETENTION POND AT THE SOUTHERN END OF THE SITE AT ALL TIMES FOR MAINTENANCE PURPOSES.

2. INTALL EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN IN EROSION AND SEDIMENTATION CONTROL LAYOUTS.

3. CONSTRUCT FULL DEPTH DW01 AND DW02 DRIVEWAYS INCLUDING DRIVEWAY CULVERT AT RM 1431. WHEN CONSTRUCTING CULVERT, START AT DOWNSTREAM END PRIOR TO CONSTRUCTING UPSTREAM END. FOR CONSTRUCTION OF DRIVEWAY WITHIN CITY OF LAGO VISTA PROPERTY AND OUTSIDE OF TXDOT RIGHT OF WAY, UTILIZE CLOSURES AS SHOWN ON SHEET 13.

4. FOR CONSTRUCTION OF DRIVEWAY CULVERT AND DRIVEWAY DW01 TIE IN TO RM 1431, USE TXDOT STANDARD TCP(2-1)-18.

5. REMOVE EXISTING PAVEMENT AS SHOWN IN THE PLANS.

PHASE 2: RM 1431 RESTRIPING

1. INSTALL WARNING SIGNS, BARRICADES, AND OTHER TRAFFIC HANDLING DEVICES AS SHOWN IN THE TRAFFIC CONTROL PLAN DETAILS AND STANDARDS.

2. REMOVE EXISTING AND INSTALL PERMANENT PAVEMENT MARKINGS ON RM 1431 TO NEW LANE CONFIGURATION AS SHOWN IN THE PLANS. USE TXDOT STANDARD TCP(3-1)-13 AND TCP(3-3)-14. TYPE II PAVEMENT MARKINGS SHALL BE USED AS A SEALER AND INSTALLED AT LEAST 10 DAYS PRIOR TO INSTALLATION OF PERMANENT TYPE I PAVEMENT MARKINGS.

3. REMOVE SW3P, CLEAN UP, PERFORM PUNCH LIST, AND REMOVE ALL TEMPORARY CONSTRUCTION DEVICES AND ITEMS.

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SUNSET PARK DRIVEWAY

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 1 OF 1

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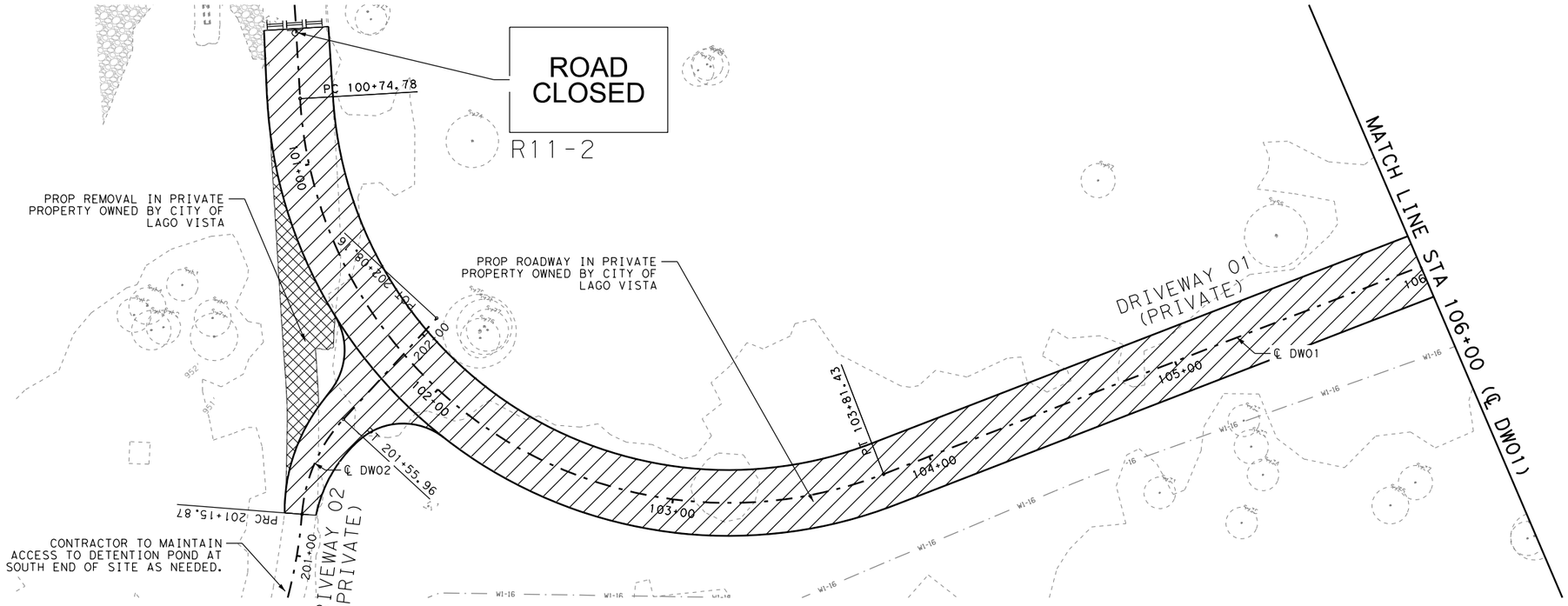

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SUNSET PARK DRIVEWAY

TRAFFIC CONTROL PLAN LAYOUTS

SHEET 1 OF 1

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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5-10 5-21	AUS	TRAVIS		1438

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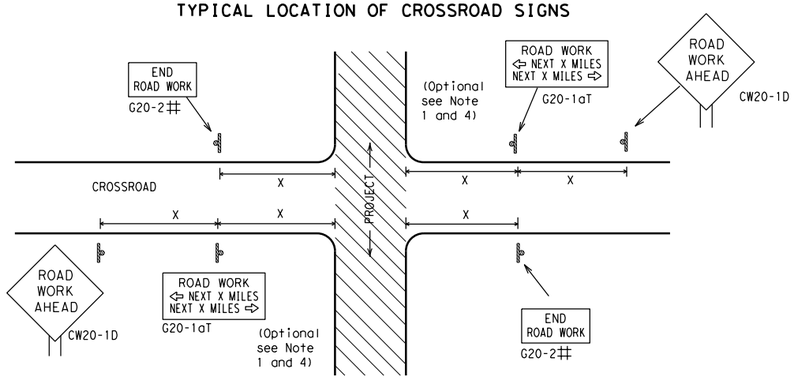
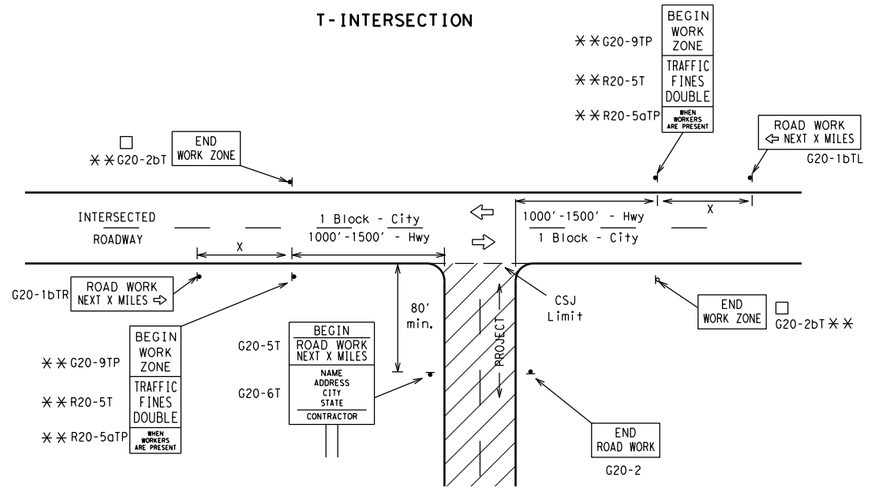
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	*[3]

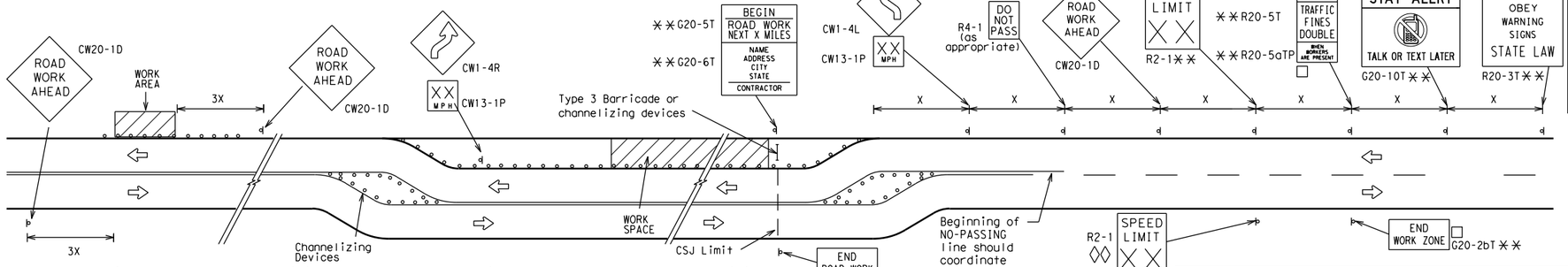
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

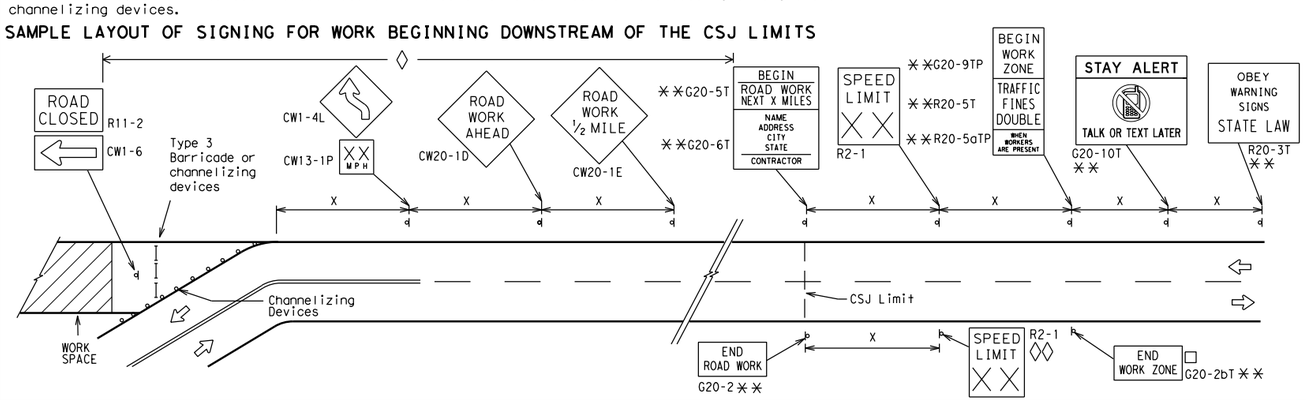
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

□ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND	
⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
9-07 8-14	DIST	COUNTY		SHE
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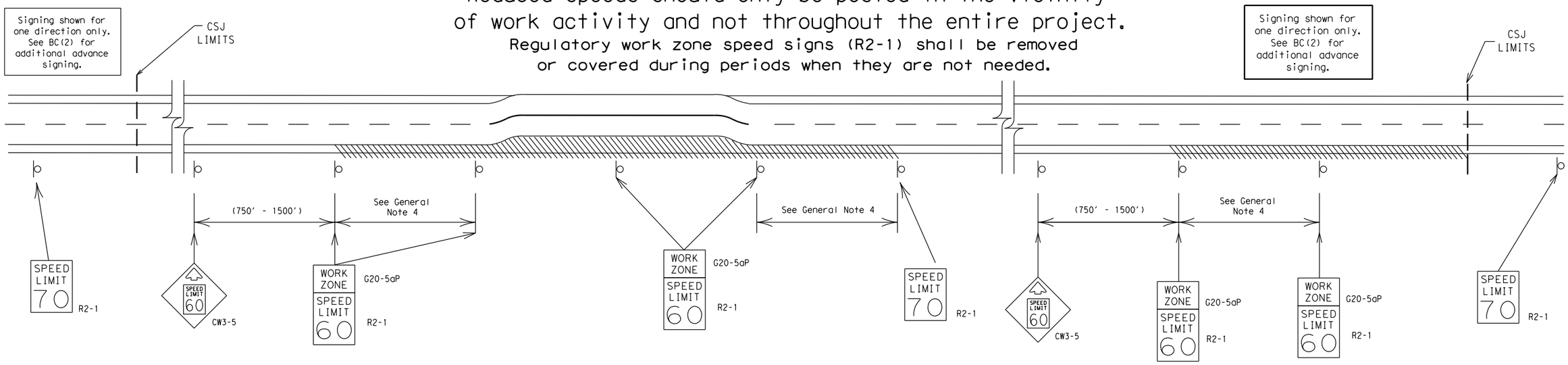
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	1378	01	053	FM1431
	DIST	COUNTY		SHE
	AUS	TRAVIS		440

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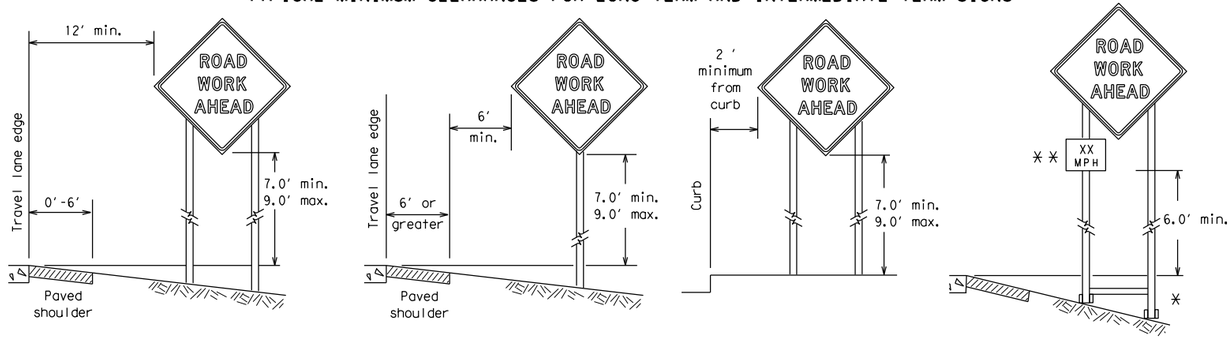
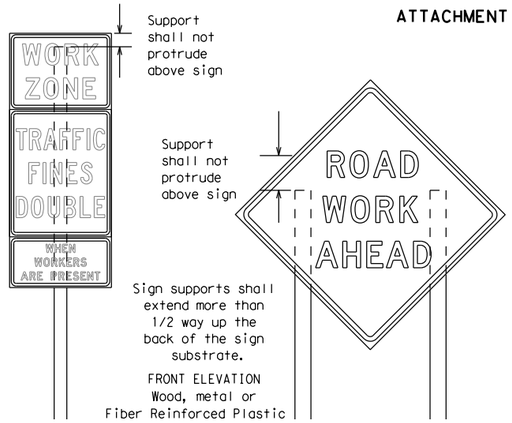
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

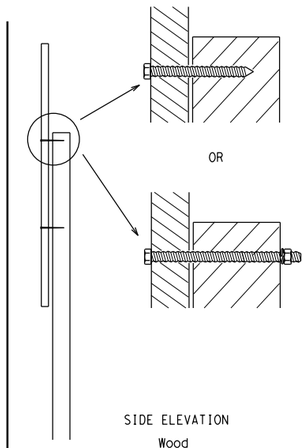


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS





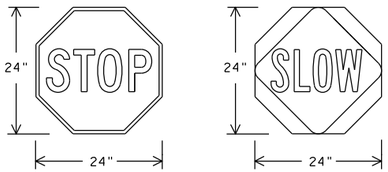
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6′ to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets.The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height,the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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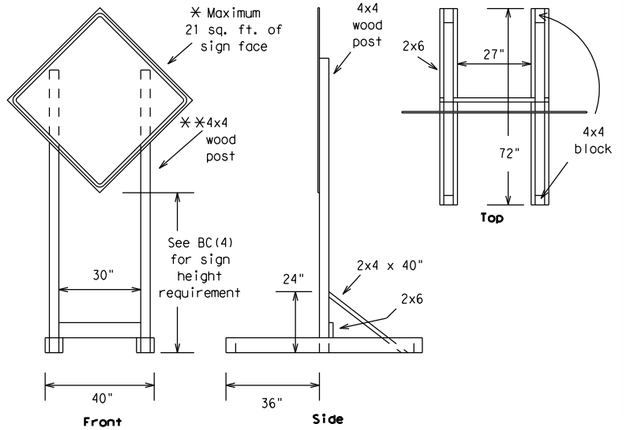
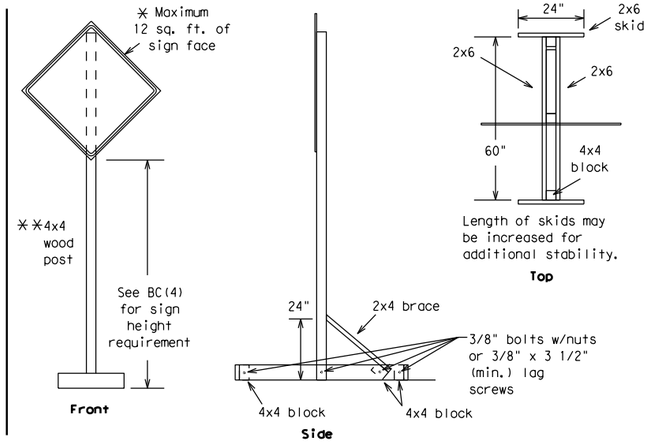
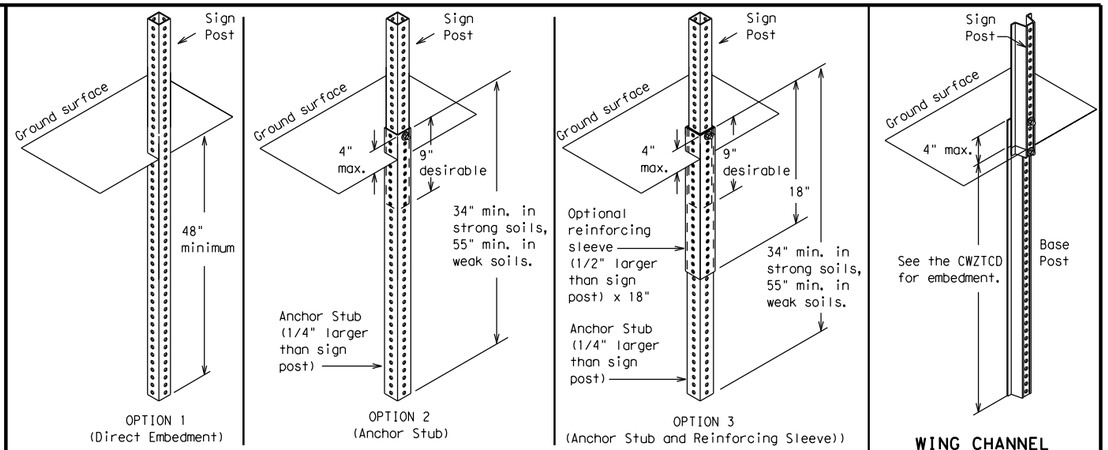




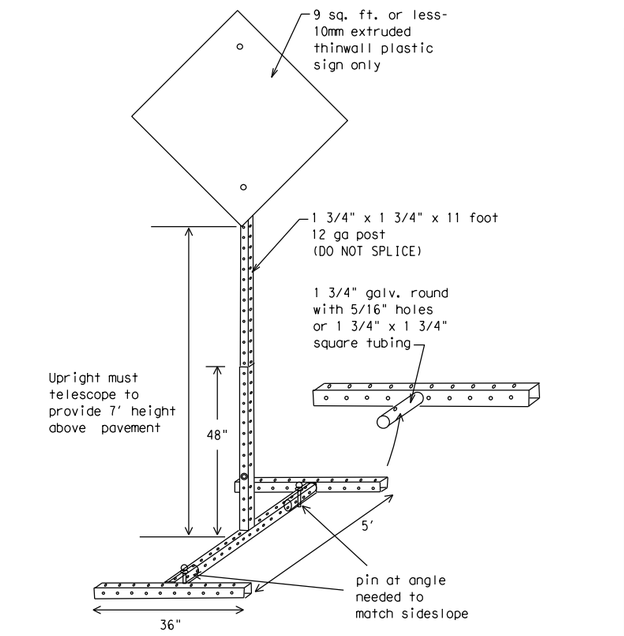
SKID MOUNTED WOOD SIGN SUPPORTS

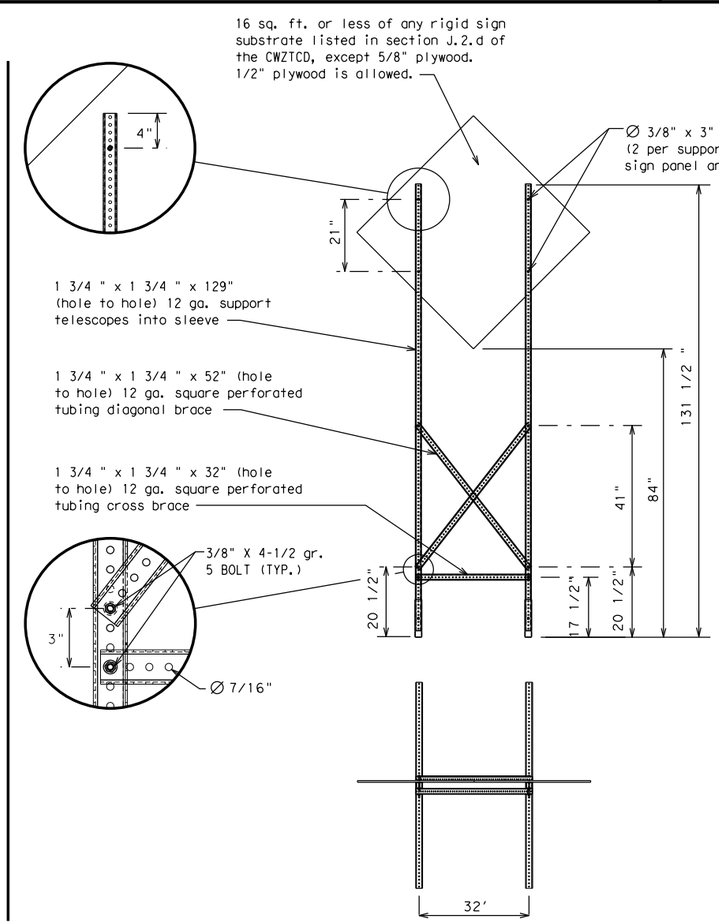
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

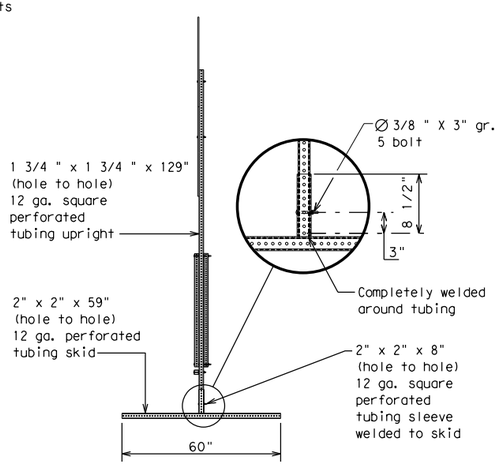


GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

* See BC(4) for definition of "Work Duration."

** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

Roadway designation ≠ IH-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- FRONTAGE ROAD CLOSED
- ROAD CLOSED AT SH XXX
- SHOULDER CLOSED XXX FT
- ROAD CLSD AT FM XXXX
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES CLOSED
- RIGHT X LANES OPEN
- CENTER LANE CLOSED
- DAYTIME LANE CLOSURES
- NIGHT LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- VARIOUS LANES CLOSED
- EXIT XXX CLOSED X MILE
- EXIT CLOSED
- RIGHT LN TO BE CLOSED
- MALL DRIVEWAY CLOSED
- X LANES CLOSED TUE - FRI
- XXXXXXXX BLVD CLOSED

Other Condition List

- ROADWORK XXX FT
- ROAD REPAIRS XXXX FT
- FLAGGER XXXX FT
- LANE NARROWS XXXX FT
- RIGHT LN NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- MERGING TRAFFIC XXXX FT
- CONST TRAFFIC XXX FT
- LOOSE GRAVEL XXXX FT
- UNEVEN LANES XXXX FT
- DETOUR X MILE
- ROUGH ROAD XXXX FT
- ROADWORK PAST SH XXXX
- ROADWORK NEXT FRI-SUN
- BUMP XXXX FT
- US XXX EXIT X MILES
- TRAFFIC SIGNAL XXXX FT
- LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- FORM X LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- WATCH FOR TRUCKS
- EXPECT DELAYS
- EXPECT DELAYS
- PREPARE TO STOP
- REDUCE SPEED XXX FT
- END SHOULDER USE
- USE OTHER ROUTES
- WATCH FOR WORKERS
- STAY IN LANE *

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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REVISIONS	1378	01	053	FM1431
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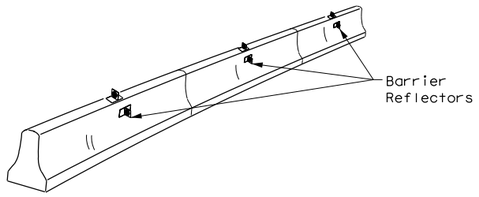
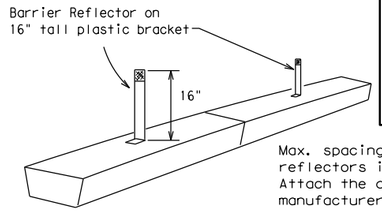
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



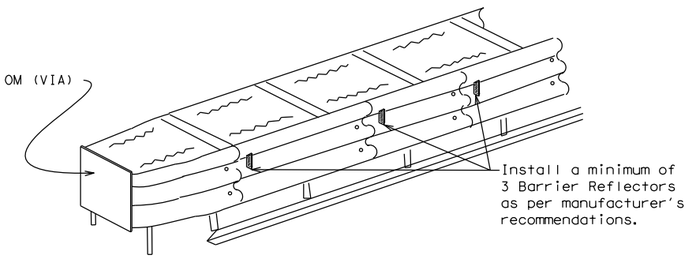
CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.



Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

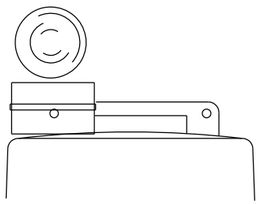
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

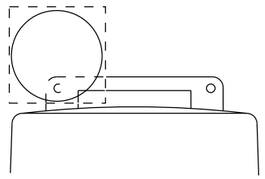
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

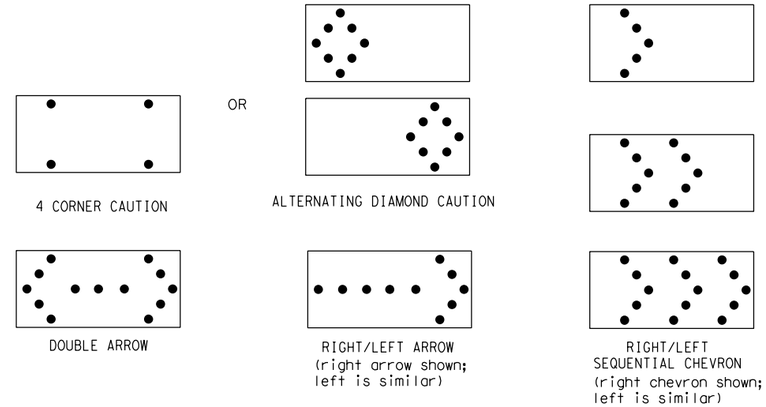
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	1378	01	053	FM1431
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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

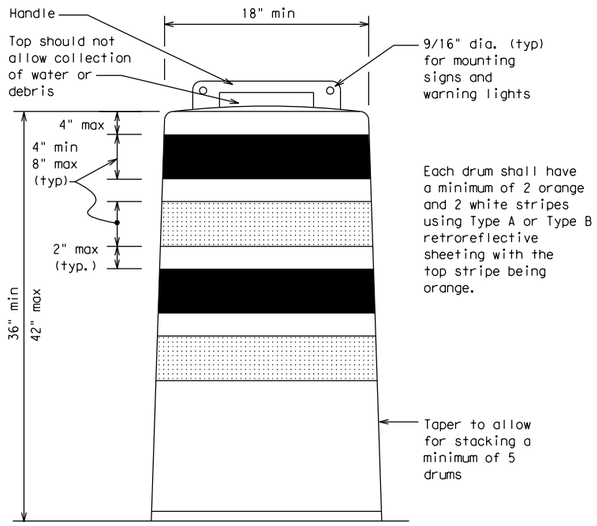
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

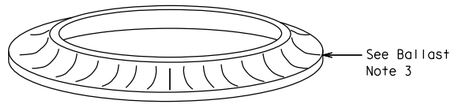
RETROREFLECTIVE SHEETING

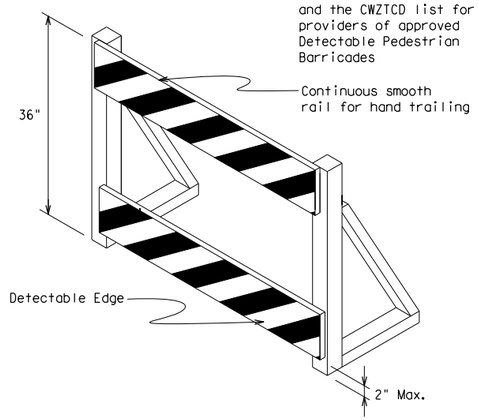
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

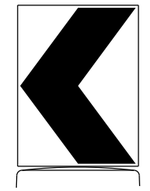




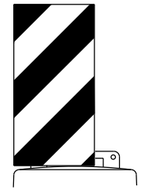


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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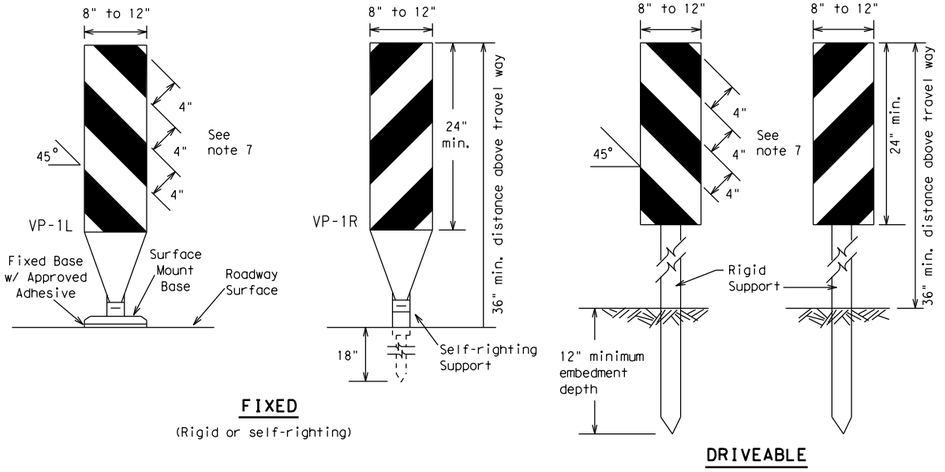
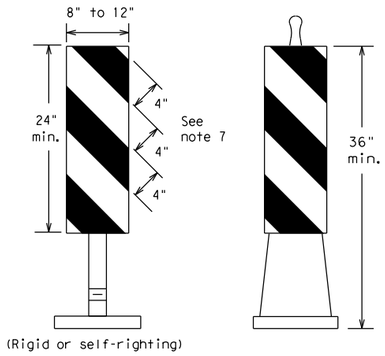


FIXED
(Rigid or self-righting)

DRIVEABLE

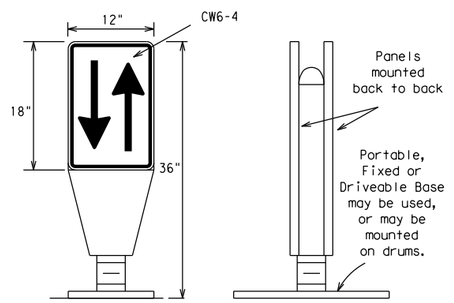


(Rigid or self-righting)

PORTABLE

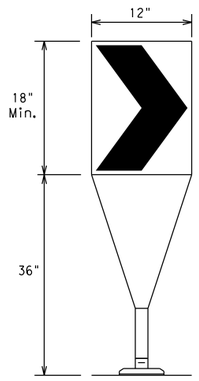
VERTICAL PANELS (VPs)

1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



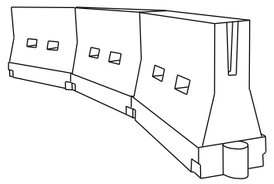
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

Posted Speed	Formula	Minimum Desirable Taper Lengths ✻✻			Suggested Maximum Spacing of Channelizing Devices	
		10′ Offset	11′ Offset	12′ Offset	On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150′	165′	180′	30′	60′
35		205′	225′	245′	35′	70′
40		265′	295′	320′	40′	80′
45	L = WS	450′	495′	540′	45′	90′
50		500′	550′	600′	50′	100′
55		550′	605′	660′	55′	110′
60		600′	660′	720′	60′	120′
65		650′	715′	780′	65′	130′
70		700′	770′	840′	70′	140′
75		750′	825′	900′	75′	150′
80		800′	880′	960′	80′	160′

✻✻Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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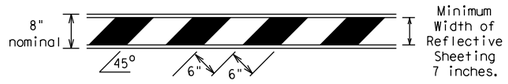
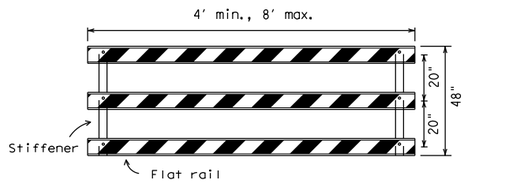
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



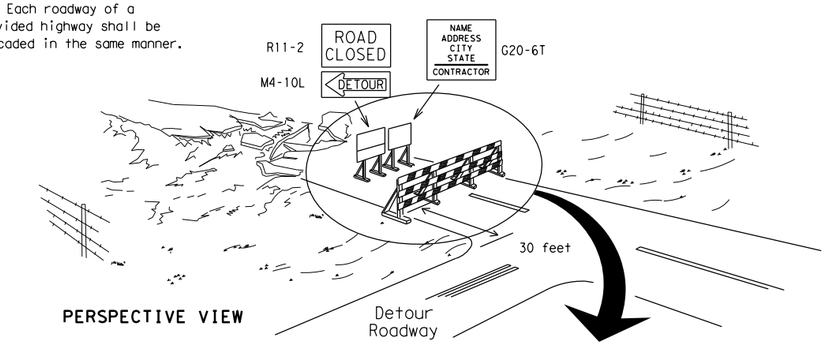
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

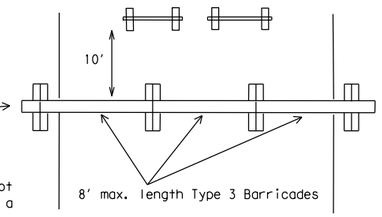
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

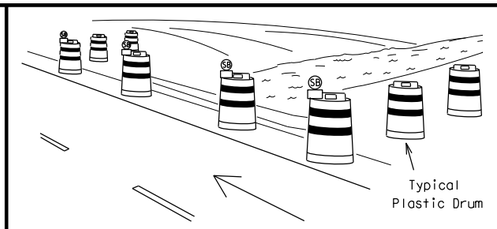
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

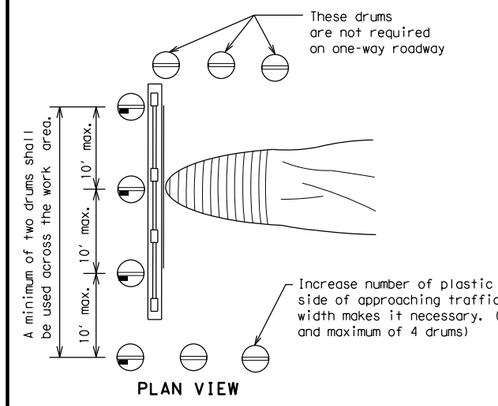
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

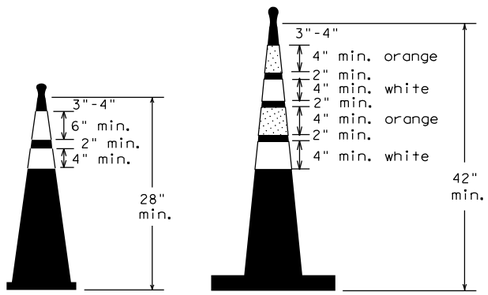
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



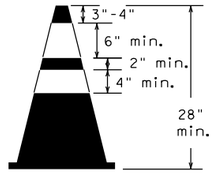
PLAN VIEW

LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

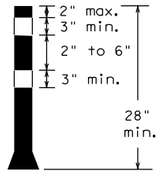
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

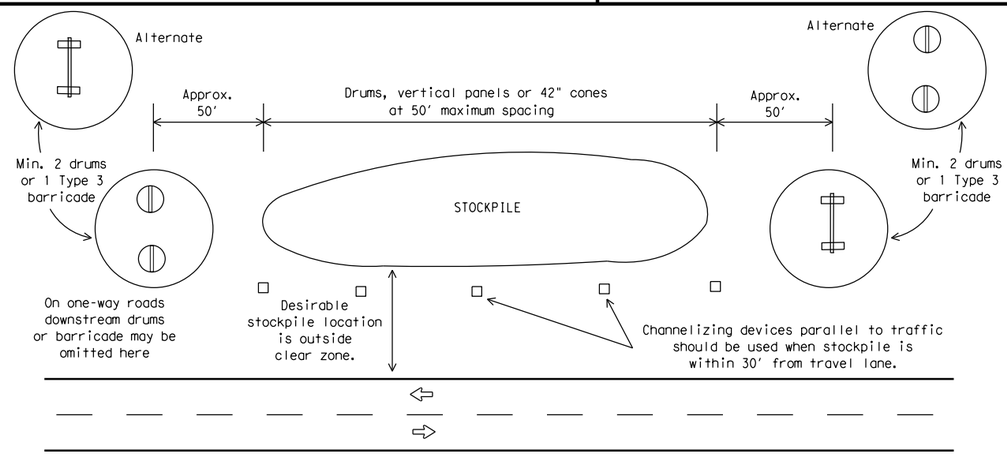


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
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7-13 5-21	AUS	TRAVIS		447

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

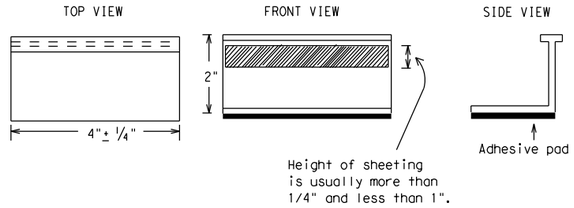
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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11-02 8-14				

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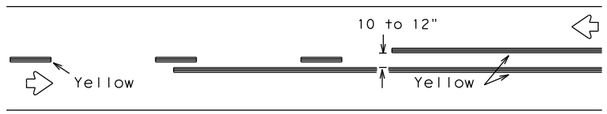
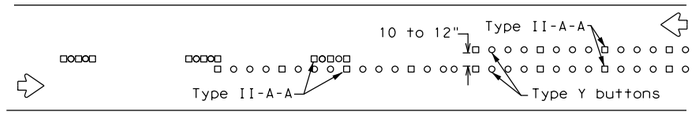
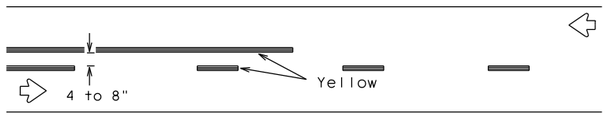
PAVEMENT MARKING PATTERNS



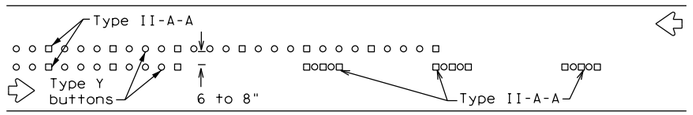
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



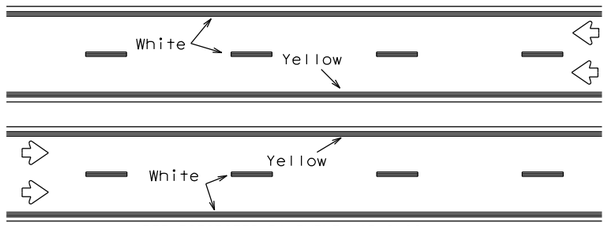
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



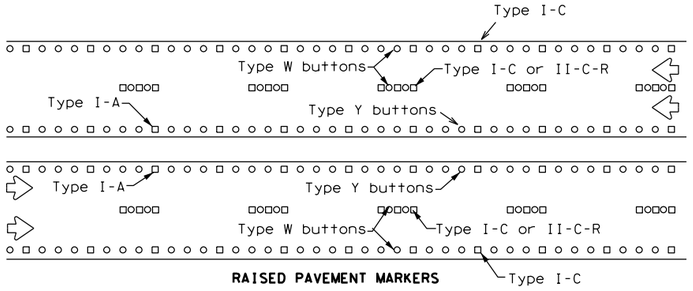
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



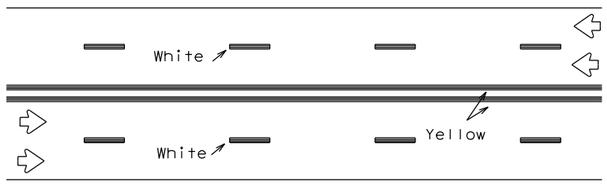
REFLECTORIZED PAVEMENT MARKINGS



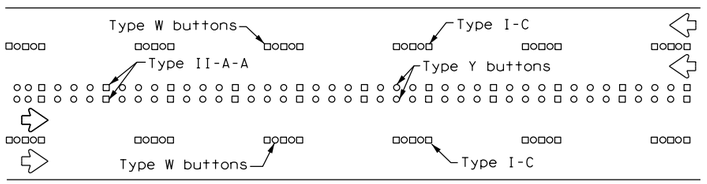
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



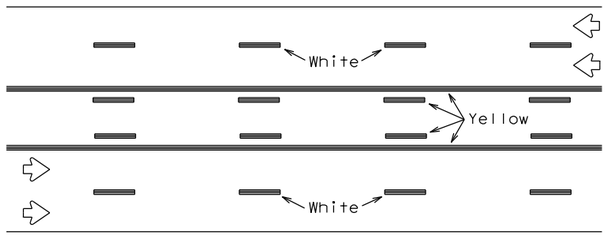
REFLECTORIZED PAVEMENT MARKINGS



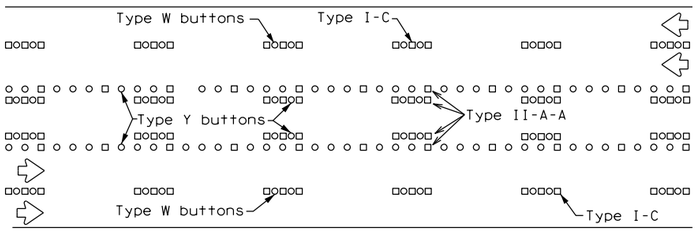
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

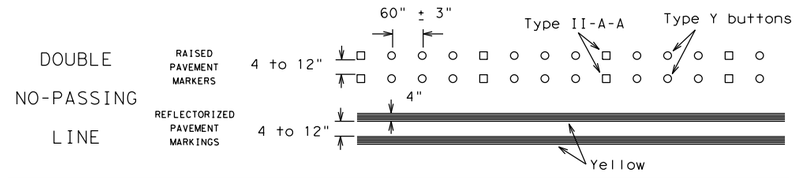
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

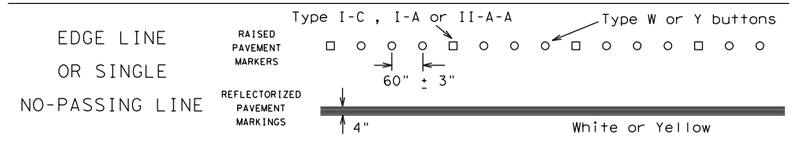
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

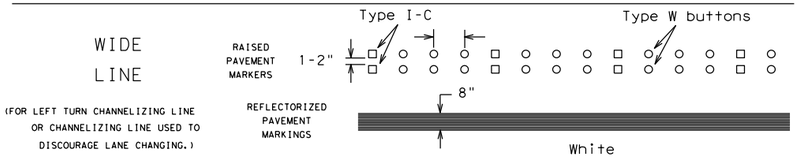


EDGE LINE OR SINGLE NO-PASSING LINE



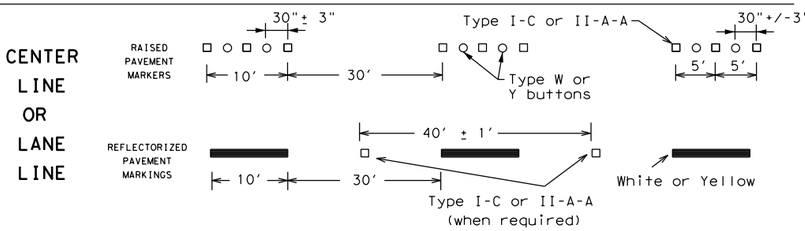
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

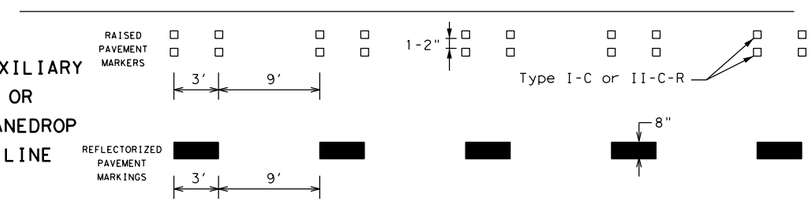


BROKEN LINES

CENTER LINE OR LANE LINE

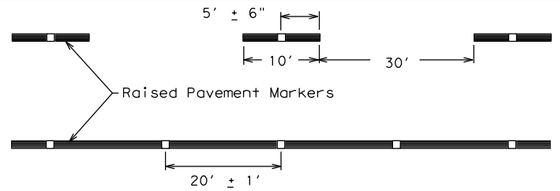


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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	AUS	TRAVIS		449

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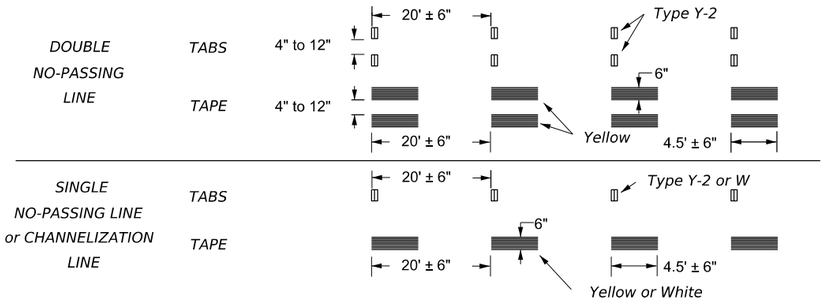
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



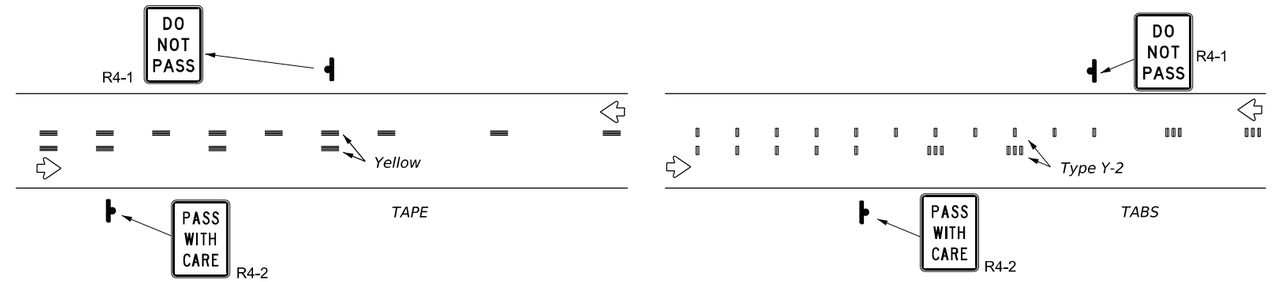
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

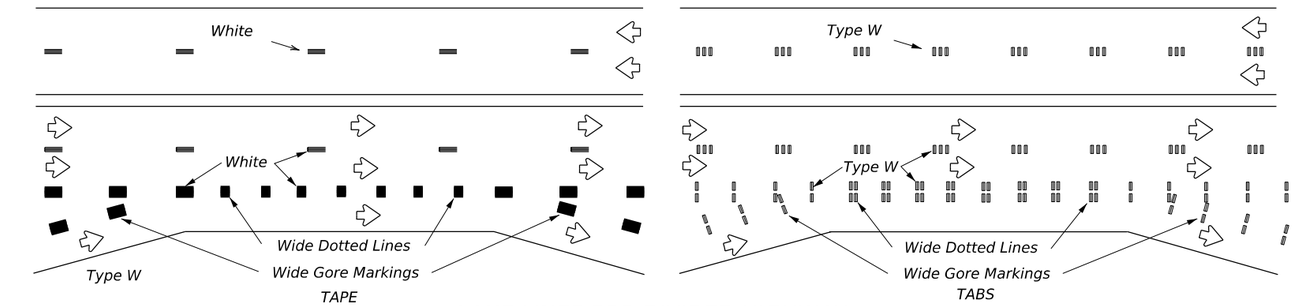
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

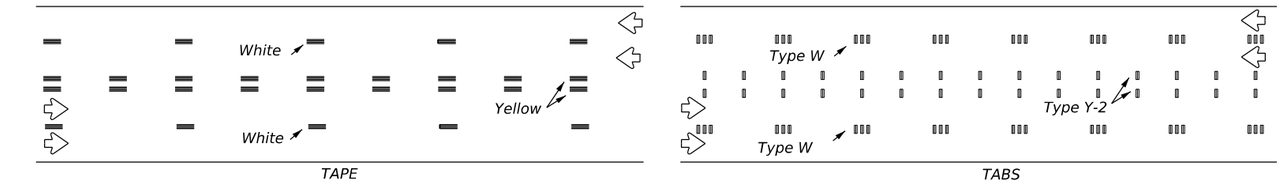
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



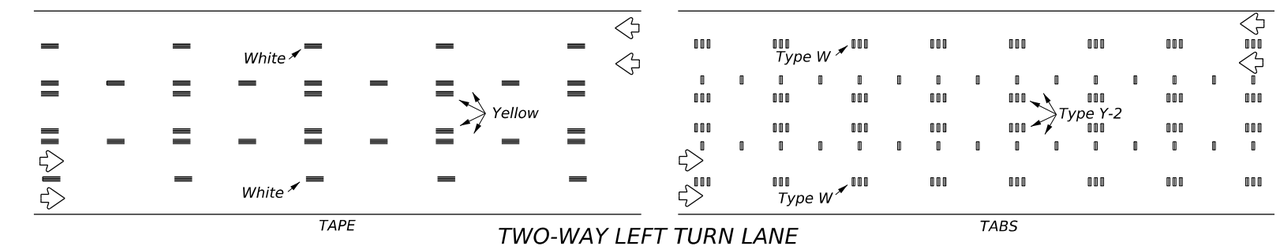
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



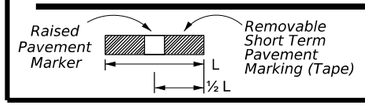
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
2. Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

1. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

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REVISIONS 4-92 7-13 1-97 2-23 3-03	1378	01	053	FM1431
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	AUS	TRAVIS		450

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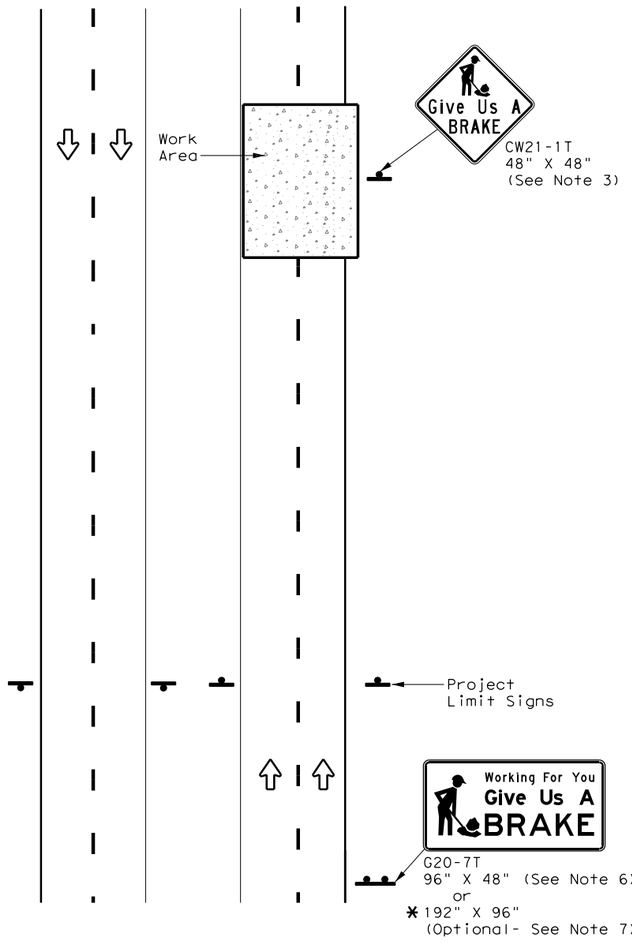
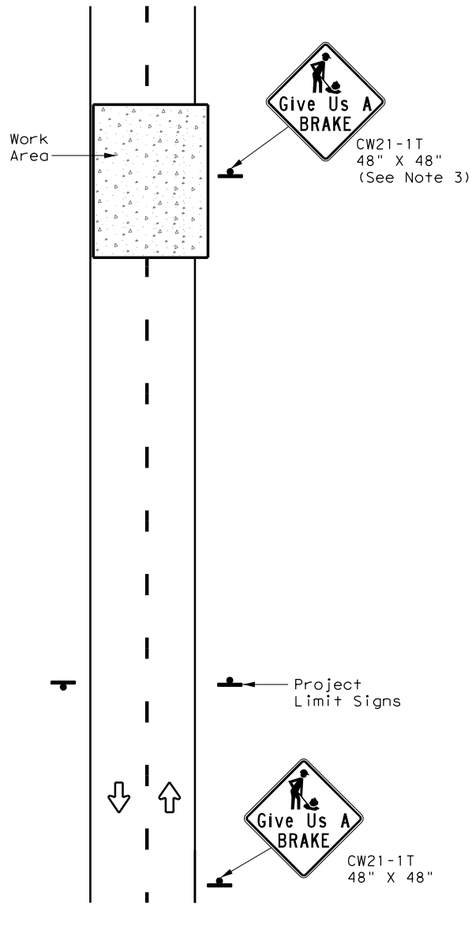


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation — Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
6-96 5-98 7-13	DIST	COUNTY		SHE
8-96 3-03	AUS	TRAVIS		451

116

DATE: 4/14/2025 7:15:00 PM
FILE: ...\10_STANDARDS\TCP\wzbrk-13.dgn

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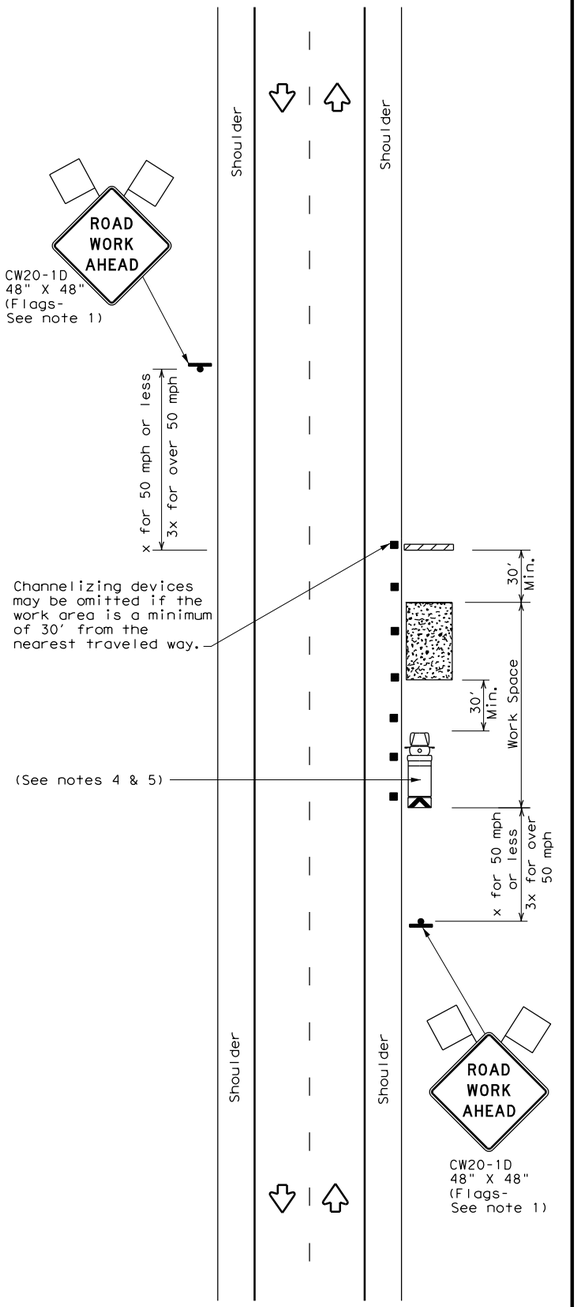
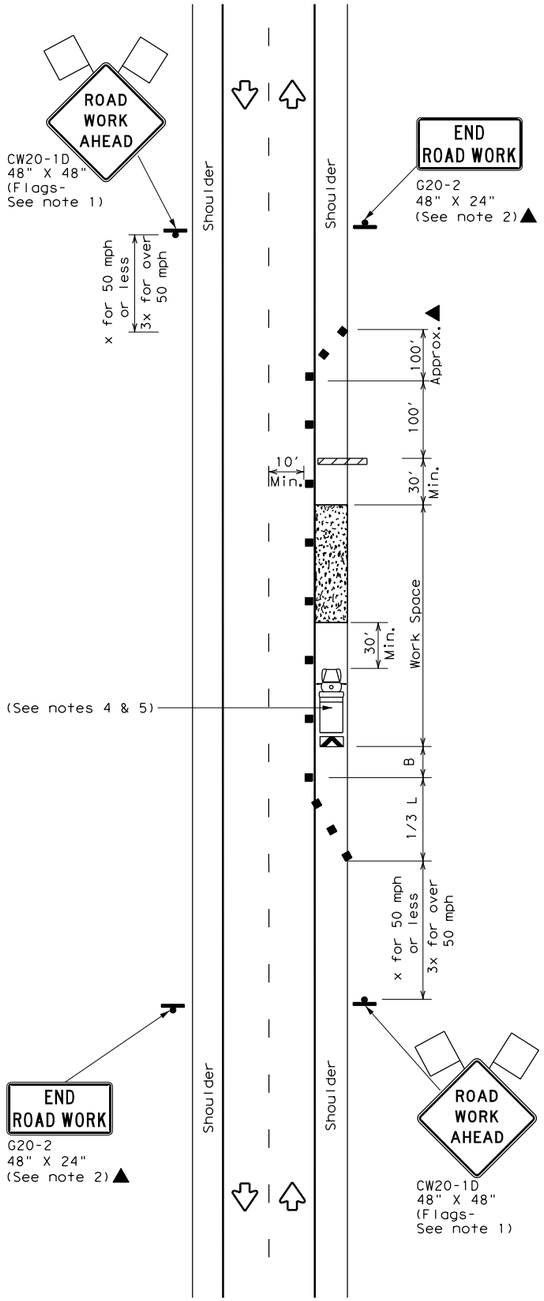


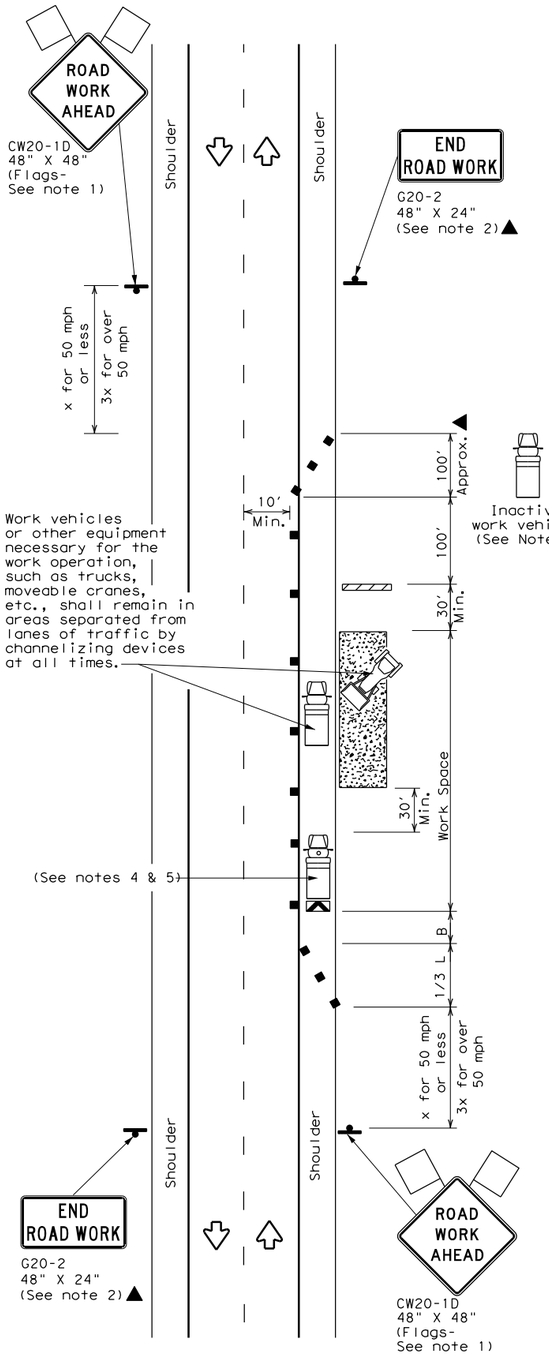
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	1378	01	053	FM1431
	DIST	COUNTY		SHEET
	AUS	TRAVIS		452

161

DATE: 4/14/2025 7:15:04 PM
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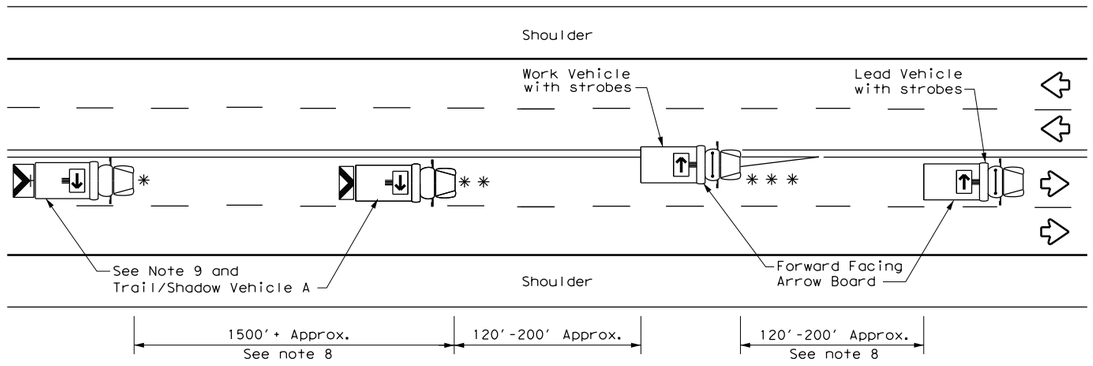
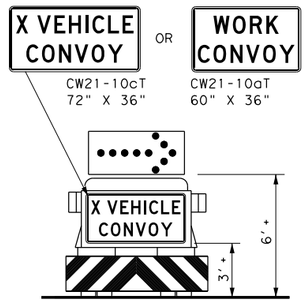


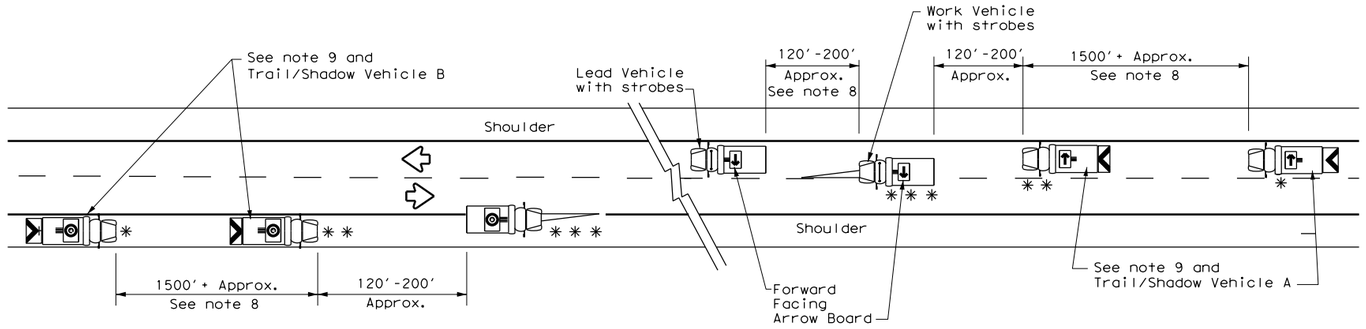
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

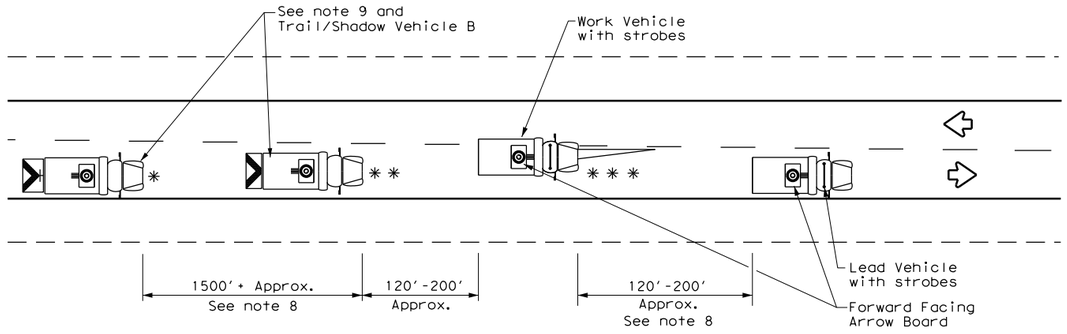


WORK ON SHOULDER

WORK ON TRAVEL LANE

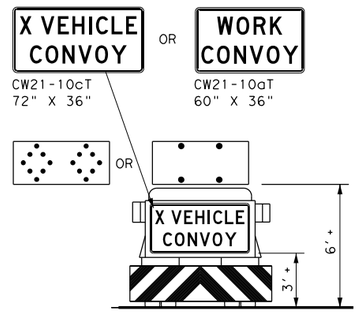
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

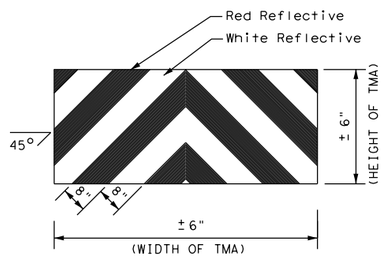
with Flashing Arrow Board in CAUTION display

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
* *	Shadow Vehicle		
* * *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
2-94 4-98	DIST	COUNTY		SHEET
8-95 7-13	AUS	TRAVIS		453
1-97				

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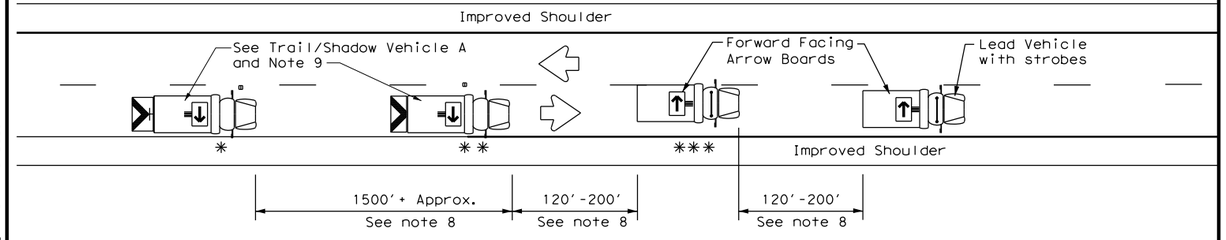
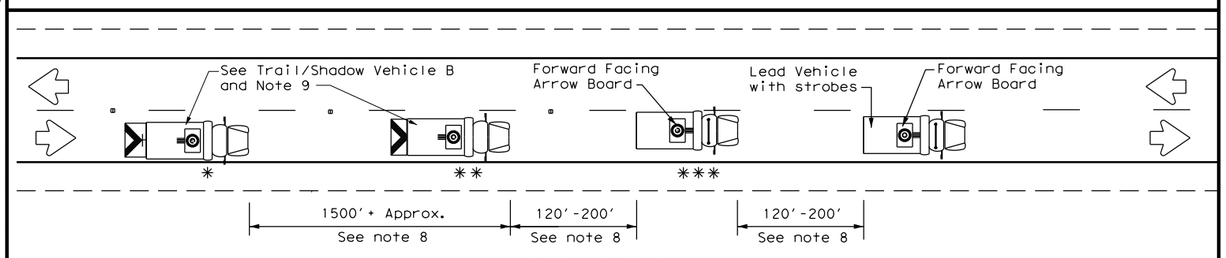


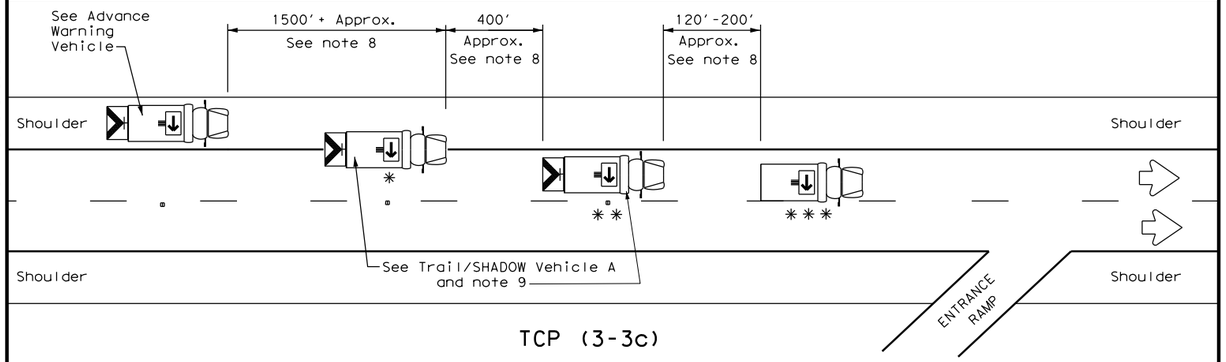
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



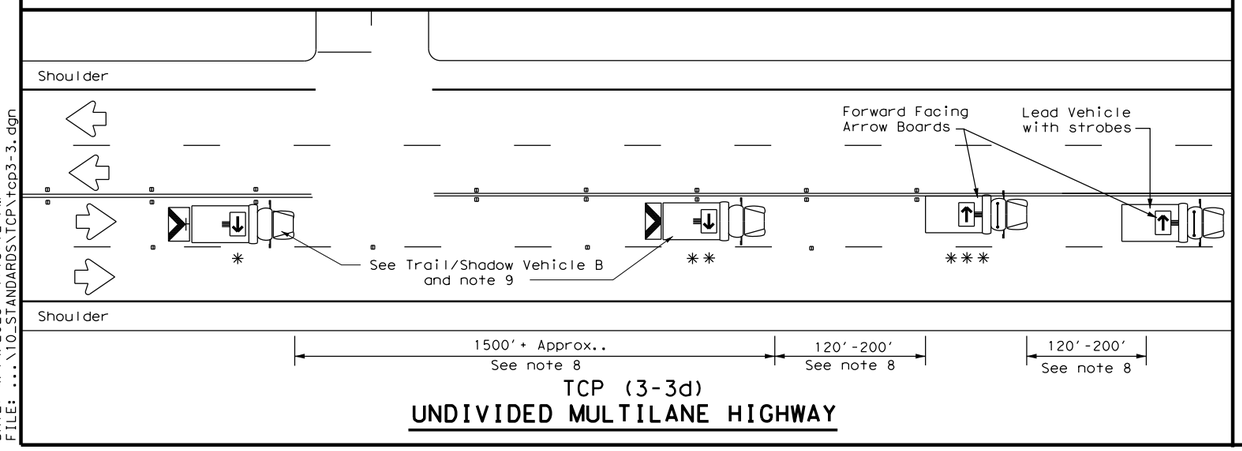
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



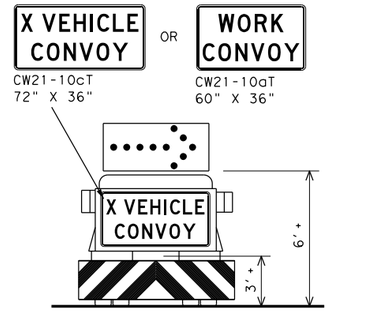
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



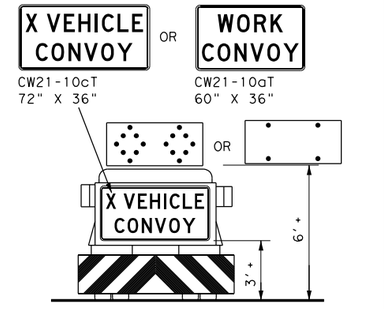
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



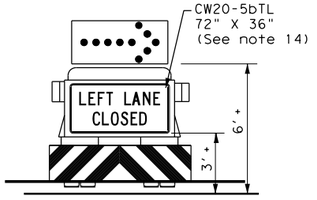
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

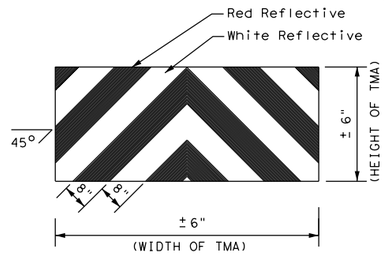


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
2-94 4-98	DIST	COUNTY		SHE
8-95 7-13	AUS	TRAVIS		454
1-97 7-14				

177

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LEGEND

- LIMITS OF CONSTRUCTION
- SF SEDIMENT CONTROL FENCE
- SEEDING AND TOPSOIL AREA
- CONSTRUCTION EXIT/SCE

NOTES:

1. NO CONSTRUCTION EXIT ALLOWED ON THIS DRIVEWAY. THIS DRIVEWAY TO BE USED FOR ENTRANCE ONLY. CONSTRUCTION EXIT SHALL BE DONE AT THE OTHER DRIVEWAY NORTH OF THE SITE. VEHICLES EXITING CONSTRUCTION SITE MUST UTILIZE CONSTRUCTION EXIT NEAR STA 100+00 (BL DW01)

2. PROPOSED WORK IS IN BOTH TXDOT RIGHT OF WAY AND PRIVATE PROPERTY OWNED BY CITY OF LAGO VISTA. WORK IN TXDOT ROW INCLUDES DRIVEWAY CONSTRUCTION, DRIVEWAY CULVERT REPLACEMENT, AND RESTRIPING OF RM 1431. WORK IN PRIVATE PROPERTY OWNED BY CITY OF LAGO VISTA INCLUDES ROADWAY CONSTRUCTION AND NEW CULVERT CONSTRUCTION.

0 25 50

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED
PROFESSIONAL ENGINEER
4/15/2025

LAGO VISTA
TEXAS

CobbFendley
TBPELS Firm Registration No. F-274
Survey Firm Registration No. 10046700
9600 N. Mopac Expressway, Suite 800
Austin, Texas 78759
512.834.9798| fax 512.834.7727
www.cobbfendley.com

SUNSET PARK DRIVEWAY

TEMPORARY EROSION AND SEDIMENTATION CONTROL

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
DS: PI	CK: CMW	1378	01	053	RM1431
		DIST	COUNTY		SHEET
DW: PI	CK: CMW	AUS	TRAVIS		

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DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☐ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

   A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

   B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.
3.
4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	RM 1431
12-12-2011 (DS)	DIST	COUNTY		SHE
05-07-14 ADDED NOTE SECTION IV.	AUS	TRAVIS		3
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				

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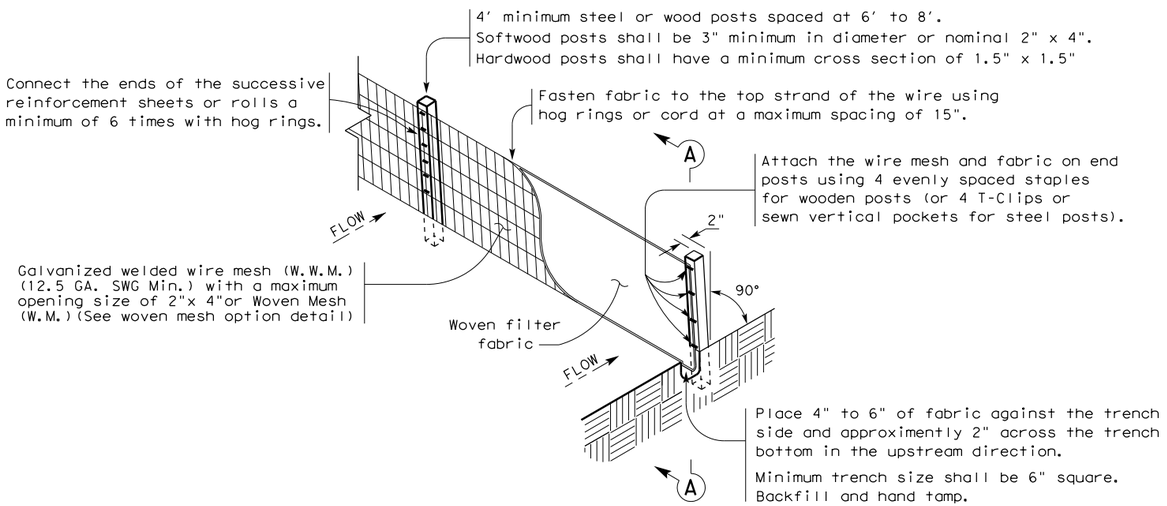
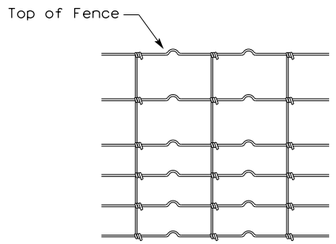
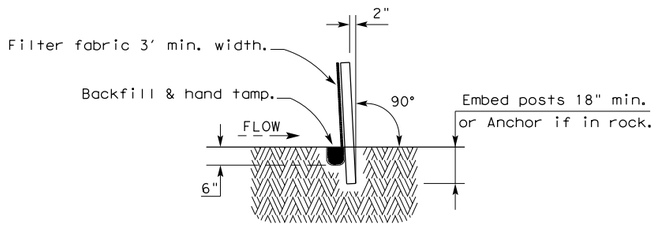


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

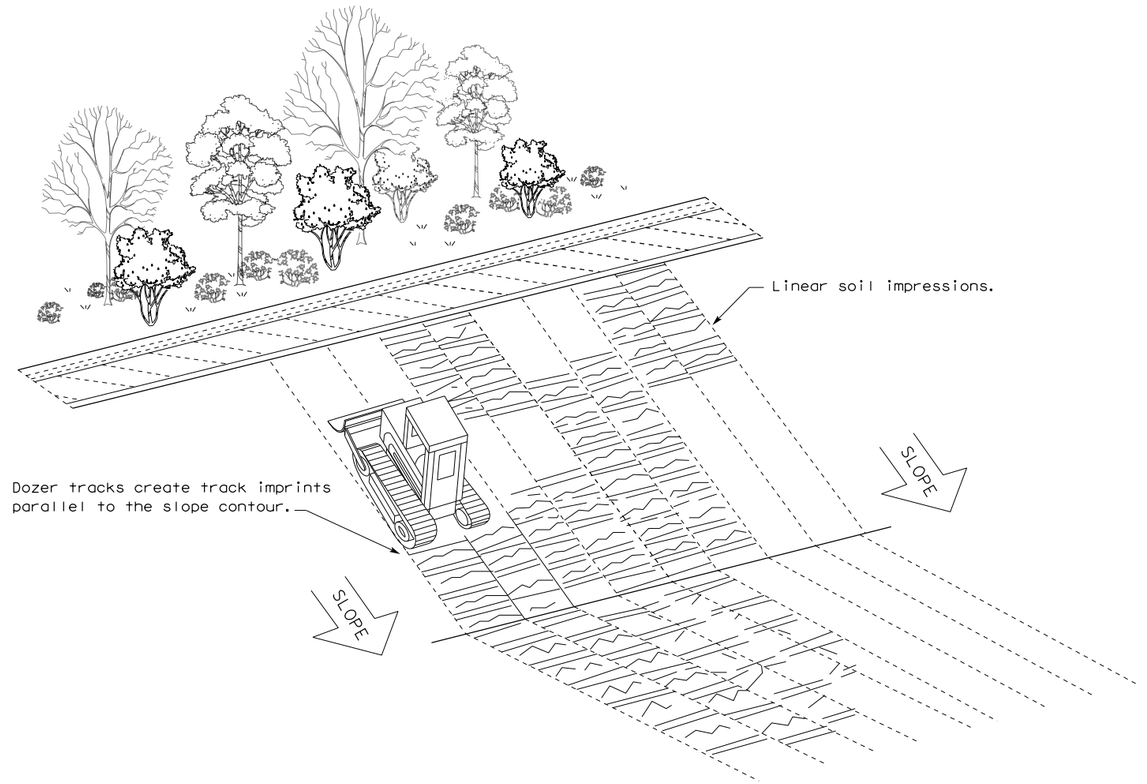
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	1378	01	053		FM1431		
	DIST	COUNTY				SHEET	
	AUS	TRAVIS				3	457

4DATE 2025
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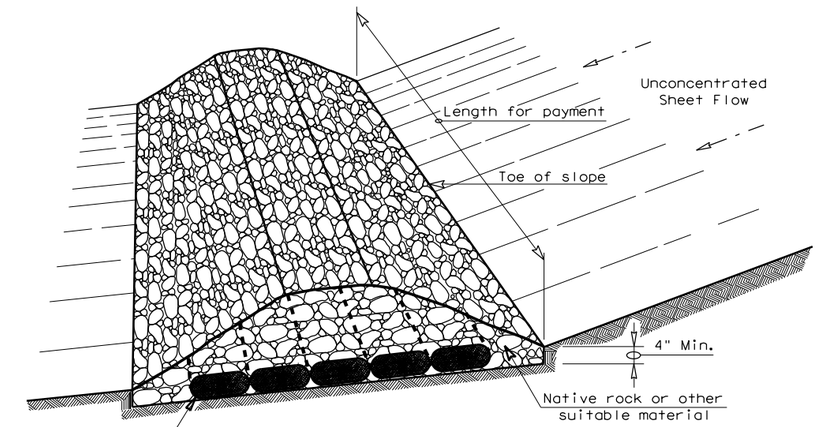
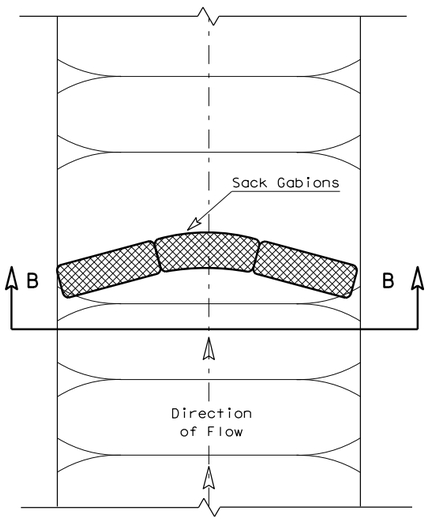
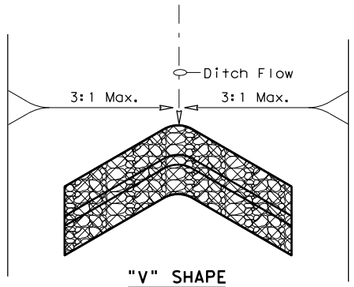


FILTER DAM AT TOE OF SLOPE

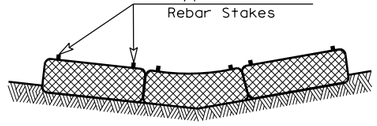
RFD1



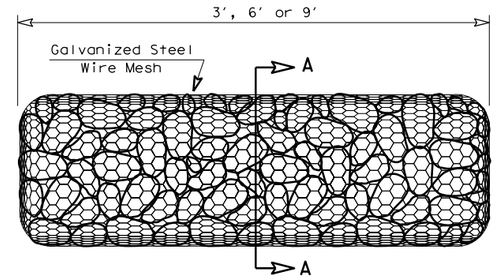
PLAN VIEW



"V" SHAPE PLAN VIEW

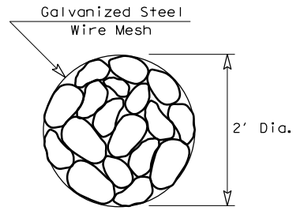


SECTION B-B

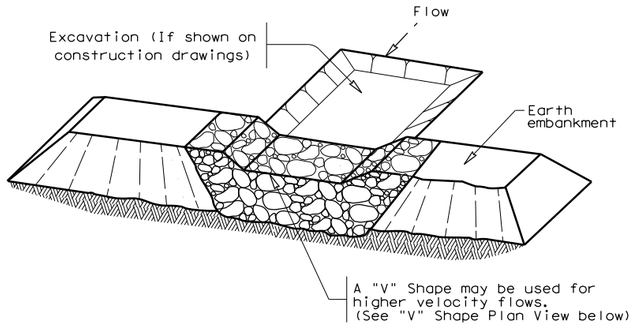


TYPE 4 (SACK GABIONS)

RFD4

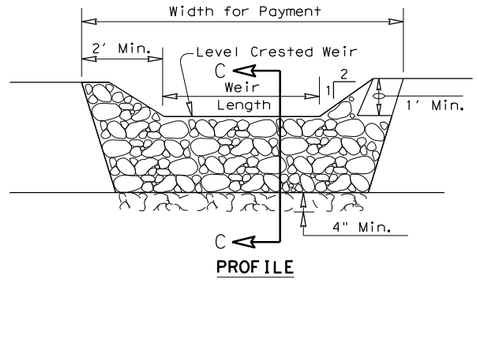


SECTION A-A

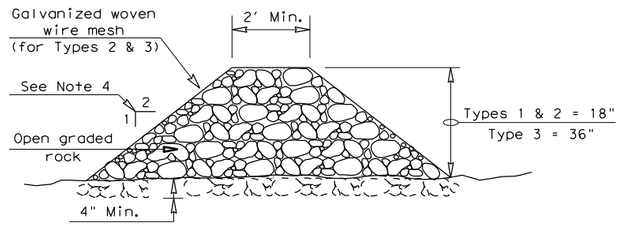


FILTER DAM AT SEDIMENT TRAP

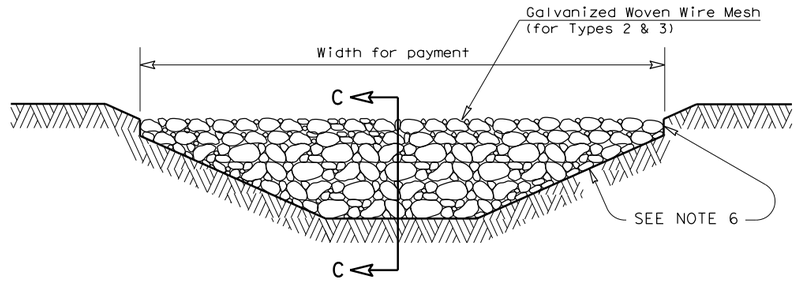
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
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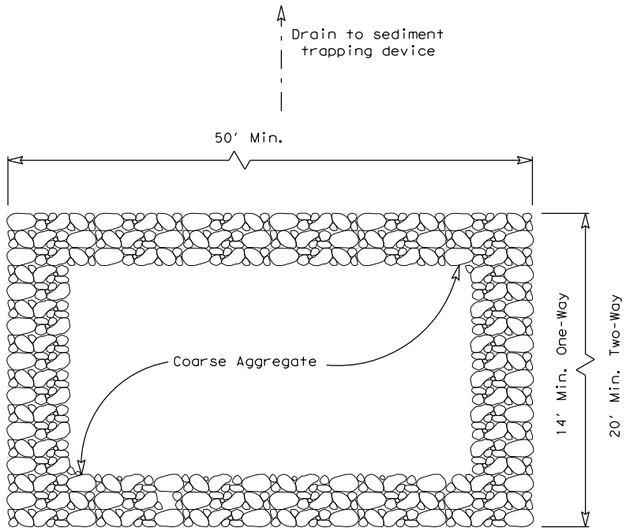
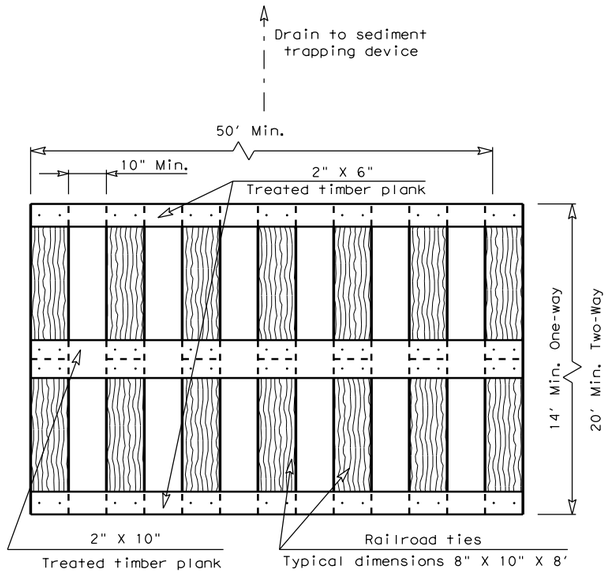
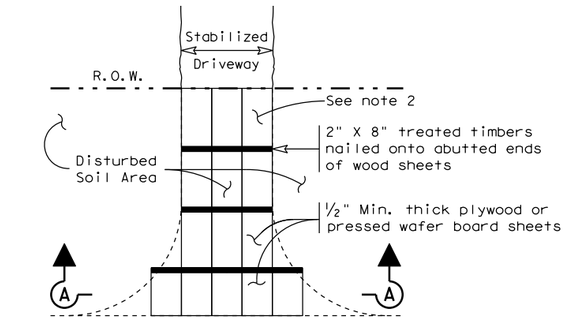


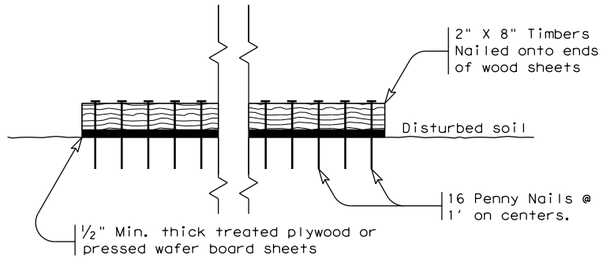
PLAN VIEW



PLAN VIEW



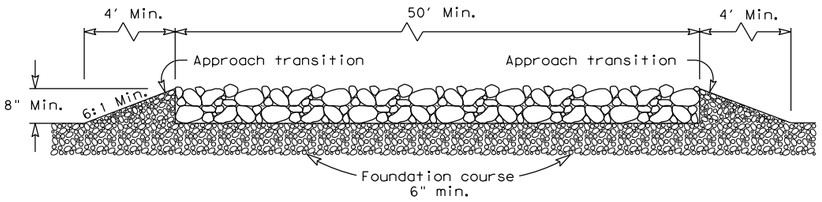
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

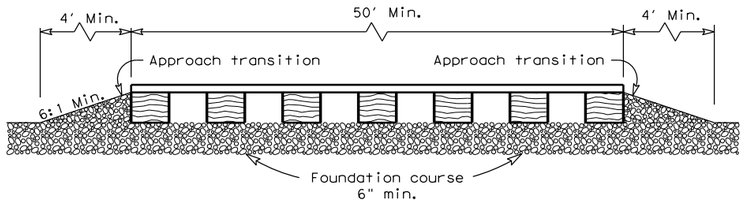
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
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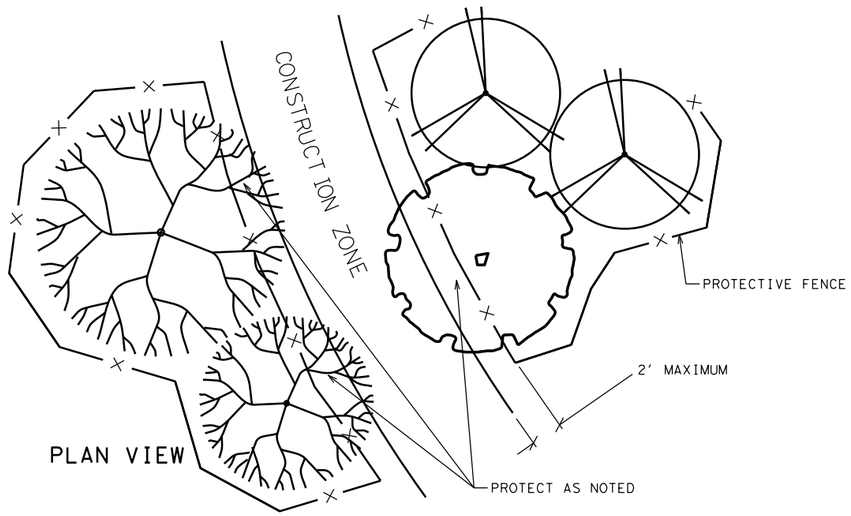
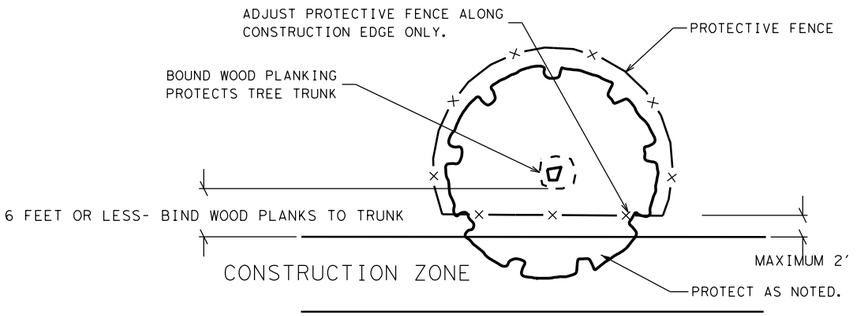
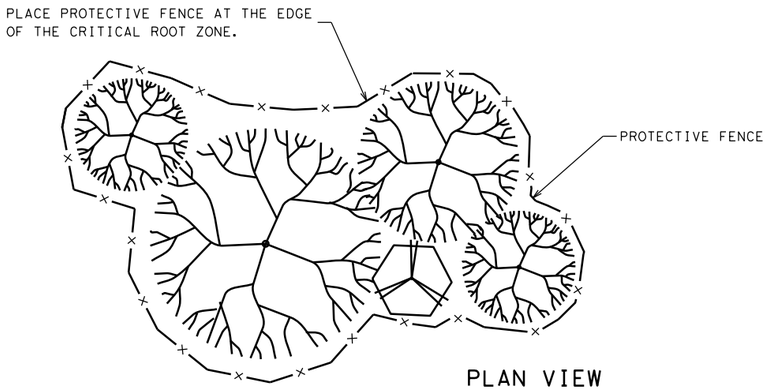


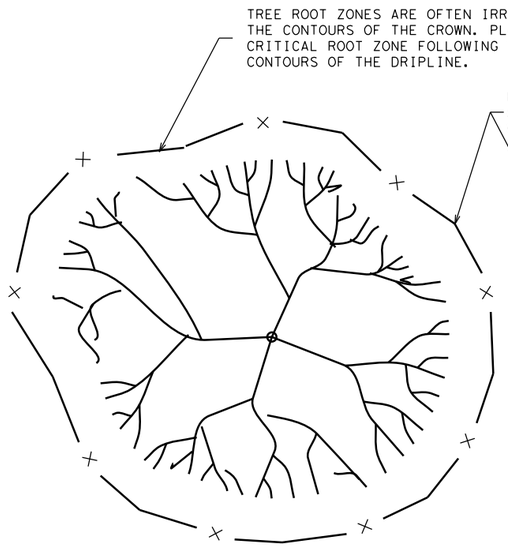
LINEAR CONSTRUCTION THROUGH STAND OF TREES

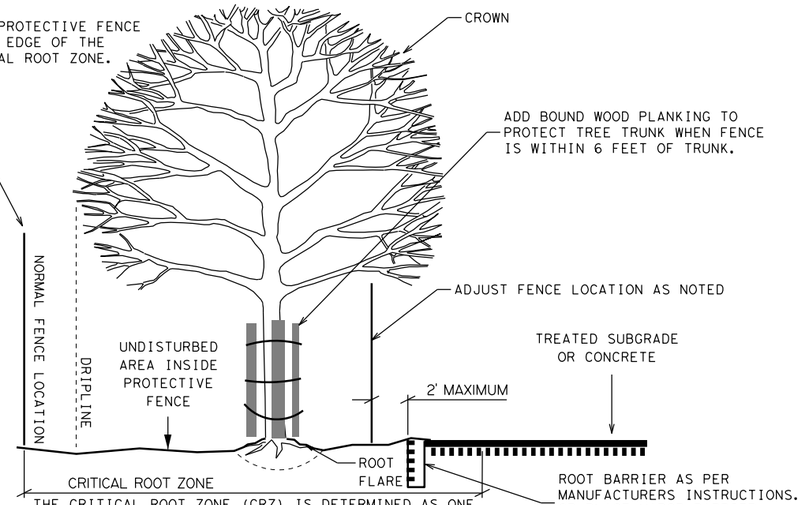


PLAN VIEW
PAVING UNDER TREES



TYPICAL TREE GROUPING PROTECTION





THE CRITICAL ROOT ZONE (CRZ) IS DETERMINED AS ONE (1) FOOT RADIUS FROM TRUNK FOR EACH CALIPER INCH (DIAMETER) OF TRUNK
EXAMPLE: THE CRZ FOR A 6 INCH CALIPER TREE WOULD EXTEND 6 FEET FROM THE TRUNK IN ALL DIRECTIONS

TYPICAL TREE PROTECTION

NOTES:

CRITICAL ROOT ZONE IS 1 FT. AWAY FROM TREE TRUNK FOR EVERY 1 IN. OF TREE DIAMETER MEASURED AT 4 FT. HEIGHT.

WATER TREES EVERY 2 WEEKS WITH A MINIMUM OF 100 GALLONS PER TREE.

SPRAY TREE WITH WATER TO REMOVE CONSTRUCTION DUST WHEN DIRECTED.

CONSTRUCTION FENCE SHALL BE 4 FT. TALL.

DO NOT PERFORM WORK OR STORE EQUIPMENT WITHIN PROTECTED AREA.

COVER THE CRITICAL ROOT ZONE BETWEEN THE PROTECTED AREA AND THE CONSTRUCTION ZONE WITH 4 IN. OF MULCH

PERFORM TREE TRIMMING AND WOUND REPAIR PER STANDARD SPECIFICATIONS.

DAMAGED AND EXPOSED ROOTS SHALL BE TRIMMED AND TREATED PER STANDARD SPECIFICATIONS. BACKFILL EXPOSED ROOTS WITH TOPSOIL WITHIN 24 HOURS OF EXPOSURE.

PLACE PLASTIC UNDER CONCRETE PLACED IN THE CRITICAL ROOT ZONE.

PLACE A ROOT BARRIER IN THE CRITICAL ROOT ZONE AT THE EDGE OF TREATED SUBGRADE TO THE DEPTH OF THE SUBGRADE.

ALL WORK IS SUBSIDIARY TO BID ITEM.

Texas Department of Transportation | Austin District Standard

TREE PROTECTION DETAILS

TPD-19(AUS)

©TxDOT 2023

REVISIONS
06/16: SHEET CREATED
04/19: APPROVED

CONT	SECT	JOB	HIGHWAY
1378	01	053	FM1431
DIST	COUNTY		SHEET
AUS	TRAVIS		3 460

DATE: 4/14/2025 7:16:04 PM
FILE: ...\10_STANDARDS\ESC\tpd-19.dgn

℄ FM1431

Beginning chain FM1431 description
Feature: Road_Centerline

Point FM14311 N 10,152,914.52 E 3,035,402.84 Sta 10+00.00

Course from FM14311 to PC FM1431_3 S 31° 26′ 40.97" E Dist 274.92

		Curve Data				
Curve FM1431_3						
P.I. Station		22+06.74	N	10,151,885.00	E	3,036,032.37
Delta	=	100° 43′ 01.91" (LT)				
Degree	=	7° 25′ 18.24"				
Tangent	=	931.82				
Length	=	1,357.06				
Radius	=	772.00				
External	=	438.07				
Long Chord	=	1,188.96				
Mid. Ord.	=	279.48				
P.C. Station		12+74.92	N	10,152,679.98	E	3,035,546.26
P.T. Station		26+31.98	N	10,152,510.46	E	3,036,723.07
C.C.			N	10,153,082.71	E	3,036,204.89
Back	= S 31° 26′ 40.97" E					
Ahead	= N 47° 50′ 17.12" E					
Chord Bear	= S 81° 48′ 11.92" E					

Course from PT FM1431_3 to PC FM1431_6 N 47° 50′ 17.12" E Dist 92.94

		Curve Data				
Curve FM1431_6						
P.I. Station		31+27.10	N	10,152,842.81	E	3,037,090.09
Delta	=	75° 19′ 57.01" (RT)				
Degree	=	10° 59′ 50.17"				
Tangent	=	402.18				
Length	=	685.01				
Radius	=	521.00				
External	=	137.17				
Long Chord	=	636.73				
Mid. Ord.	=	108.58				
P.C. Station		27+24.92	N	10,152,572.85	E	3,036,791.97
P.T. Station		34+09.93	N	10,152,622.76	E	3,037,426.73
C.C.			N	10,152,186.66	E	3,037,141.68
Back	= N 47° 50′ 17.12" E					
Ahead	= S 56° 49′ 45.87" E					
Chord Bear	= N 85° 30′ 15.63" E					

Course from PT FM1431_6 to PC FM1431_9 S 56° 49′ 45.87" E Dist 254.82

		Curve Data				
Curve FM1431_9						
P.I. Station		42+85.73	N	10,152,143.58	E	3,038,159.82
Delta	=	73° 52′ 16.86" (RT)				
Degree	=	6° 56′ 11.53"				
Tangent	=	620.98				
Length	=	1,064.96				
Radius	=	826.00				
External	=	207.39				
Long Chord	=	992.72				
Mid. Ord.	=	165.77				
P.C. Station		36+64.75	N	10,152,483.34	E	3,037,640.03
P.T. Station		47+29.71	N	10,151,549.86	E	3,037,977.83
C.C.			N	10,151,791.94	E	3,037,188.10
Back	= S 56° 49′ 45.87" E					
Ahead	= S 17° 02′ 30.99" W					
Chord Bear	= S 19° 53′ 37.44" E					

Course from PT FM1431_9 to FM143111 S 17° 02′ 30.99" W Dist 208.73

Point FM143111 N 10,151,350.29 E 3,037,916.66 Sta 49+38.44

Ending chain FM1431 description

NOTES:

1. THE EXISTING HORIZONTAL ALIGNMENT DATA IS FOR INFORMATION PURPOSES ONLY.

2. EXISTING HORIZONTAL ALIGNMENT DATA DISPLAYED IS FOR A BEST-FIT CENTERLINE OF FM 1431. THE HORIZONTAL ALIGNMENT WAS CREATED USING AERIAL IMAGERY AND TOPOGRAPHICAL DATA PROVIDED BY THE SURVEY.

3. THE EXISTING HORIZONTAL ALIGNMENT AS SHOWN IS NOT GUARANTEED TO MEET A 55 MPH DESIGN SPEED CRITERIA FOR FM 1431.

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED PROFESSIONAL ENGINEER
4/15/2025

LAGO VISTA
TEXAS

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Survey Firm Registration No. 10046700
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SUNSET PARK DRIVEWAY

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 2

© 2023		CONT	SECT	JOB	HIGHWAY
DS: RN	CK: AC	1378	01	053	FM1431
DW: RN	CK: AC	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		

DATE: 4/14/2025 7:16:11 PM
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℄ DW01

Beginning chain DW01 description
Feature: Road_Centerline

Point DW011 N 10,152,083.08 E 3,036,774.94 Sta 100+00.00

Course from DW011 to PC DW01_3 S 24° 40′ 42.49" E Dist 74.78

Curve Data

Curve DW01_3						
P.I. Station		102+98.26	N	10,151,812.06	E	3,036,899.47
Delta	=	107° 47′ 14.57" (LT)				
Degree	=	35° 09′ 02.83"				
Tangent	=	223.48				
Length	=	306.64				
Radius	=	163.00				
External	=	113.61				
Long Chord	=	263.38				
Mid. Ord.	=	66.95				
P.C. Station		100+74.78	N	10,152,015.12	E	3,036,806.16
P.T. Station		103+81.43	N	10,151,962.94	E	3,037,064.32
C.C.			N	10,152,083.18	E	3,036,954.27
Back	= S 24° 40′ 42.48" E					
Ahead	= N 47° 32′ 02.94" E					
Chord Bear	= S 78° 34′ 19.77" E					

Course from PT DW01_3 to PC DW01_6 N 47° 32′ 02.94" E Dist 327.75

Curve Data

Curve DW01_6						
P.I. Station		108+28.74	N	10,152,264.94	E	3,037,394.30
Delta	=	7° 36′ 02.49" (RT)				
Degree	=	3° 10′ 59.16"				
Tangent	=	119.57				
Length	=	238.78				
Radius	=	1,800.00				
External	=	3.97				
Long Chord	=	238.61				
Mid. Ord.	=	3.96				
P.C. Station		107+09.17	N	10,152,184.22	E	3,037,306.10
P.T. Station		109+47.96	N	10,152,333.29	E	3,037,492.40
C.C.			N	10,150,856.39	E	3,038,521.37
Back	= N 47° 32′ 02.94" E					
Ahead	= N 55° 08′ 05.43" E					
Chord Bear	= N 51° 20′ 04.19" E					

Course from PT DW01_6 to PC DW01_9 N 55° 08′ 05.43" E Dist 25.52

Curve Data

Curve DW01_9						
P.I. Station		110+28.55	N	10,152,379.36	E	3,037,558.53
Delta	=	24° 50′ 42.52" (LT)				
Degree	=	22° 55′ 05.92"				
Tangent	=	55.07				
Length	=	108.41				
Radius	=	250.00				
External	=	5.99				
Long Chord	=	107.56				
Mid. Ord.	=	5.85				
P.C. Station		109+73.48	N	10,152,347.88	E	3,037,513.34
P.T. Station		110+81.88	N	10,152,426.91	E	3,037,586.30
C.C.			N	10,152,553.01	E	3,037,370.43
Back	= N 55° 08′ 05.43" E					
Ahead	= N 30° 17′ 22.91" E					
Chord Bear	= N 42° 42′ 44.17" E					

Course from PT DW01_9 to DW0111 N 30° 17′ 22.91" E Dist 122.27

Point DW0111 N 10,152,532.49 E 3,037,647.97 Sta 112+04.16

Ending chain DW01 description

℄ DW02

Beginning chain DW02 description
Feature: Road_Centerline

Curve Data

Curve DW02_1						
P.I. Station		200+60.15	N	10,151,810.87	E	3,036,881.72
Delta	=	37° 56′ 07.26" (LT)				
Degree	=	32° 44′ 25.60"				
Tangent	=	60.15				
Length	=	115.87				
Radius	=	175.00				
External	=	10.05				
Long Chord	=	113.76				
Mid. Ord.	=	9.50				
P.C. Station		200+00.00	N	10,151,754.72	E	3,036,860.14
P.T. Station		201+15.87	N	10,151,868.41	E	3,036,864.23
C.C.			N	10,151,817.51	E	3,036,696.79
Back	= N 21° 01′ 34.62" E					
Ahead	= N 16° 54′ 32.64" W					
Chord Bear	= N 2° 03′ 30.99" E					

Curve Data

Curve DW02_2						
P.I. Station		201+36.69	N	10,151,888.34	E	3,036,858.17
Delta	=	38° 17′ 00.92" (RT)				
Degree	=	95° 29′ 34.68"				
Tangent	=	20.83				
Length	=	40.09				
Radius	=	60.00				
External	=	3.51				
Long Chord	=	39.35				
Mid. Ord.	=	3.32				
P.C. Station		201+15.87	N	10,151,868.41	E	3,036,864.23
P.T. Station		201+55.96	N	10,151,907.73	E	3,036,865.76
C.C.			N	10,151,885.86	E	3,036,921.63
Back	= N 16° 54′ 32.64" W					
Ahead	= N 21° 22′ 28.28" E					
Chord Bear	= N 2° 13′ 57.82" E					

Course from PT DW02_2 to DW024 N 21° 22′ 28.28" E Dist 47.55

Point DW024 N 10,151,952.01 E 3,036,883.09 Sta 202+03.51

Ending chain DW02 description

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HORIZONTAL ALIGNMENT DATA

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DSI: RN	CK: AC	CONT	SECT	JOB	HIGHWAY
		1378	01	053	FM1431
DW: RN	CK: AC	DIST	COUNTY		SHEET NO.
		AUS	TRAVIS		462

DATE: 4/14/2025 7:16:13 PM
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℄ DW01

Beginning profile DW01_PGL description:
Feature: Road_Centerline

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	100+48.16	957.36				
VPC		102+00.00	947.49	-6.50	K = 38.1		
VPI	2	103+00.00	940.99		200.00	100.00	100.00
VPT		104+00.00	939.74	-1.25			
VPC		110+58.14	931.50	-1.25	K = 10.0		
Low Point		110+70.65	931.42				
VPI	3	110+80.00	931.23		43.72	21.86	21.86
VPT		111+01.86	931.91	3.12			
VPC		111+29.23	932.76	3.12	K = 3.6		
VPI	4	111+31.23	932.83		4.00	2.00	2.00
VPT		111+33.23	932.91	4.22			
VPI	5	111+35.39	933.00	4.22			

Ending profile DW01_PGL description

℄ DW02

Feature: Road_Centerline

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	201+15.87	945.34				
VPC		201+35.00	946.62	6.71	K = 7.5 SSD = 182.1		
VPI	2	201+50.00	947.63		30.00	15.00	15.00
VPT		201+65.00	948.04	2.74			
VPI	3	201+77.07	948.37	2.74			

Ending profile DW02_PGL description

EXISTING VERTICAL CURVE DATA FROM RECORD PLANS
CSJ: 1378-1-1, YEAR: 1952

VPI	HPC	HPT	HPC	HPT	ELEV	G1	G2	L	e	K
TxDOT (STA)	TxDOT (STA)	TxDOT (STA)	LAGO VISTA (STA)	LAGO VISTA (STA)						
525+22.5	521+11.3	528+06.8	-	34+09.93	994.63	-4.10	-8.90	300.0	1.8	62.5
536+75	532+48.6	539+93.8	36+64.75	-	935.88	14.50	1.50	360.0	5.9	27.7

REV	DATE	BY	DIST

STATE OF TEXAS
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SUNSET PARK DRIVEWAY

VERTICAL ALIGNMENT DATA

SHEET 1 OF 1

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
RN	AC	1378	01	053	FM1431
DW:	CK:	DIST	COUNTY		SHEET
RN	AC	AUS	TRAVIS		

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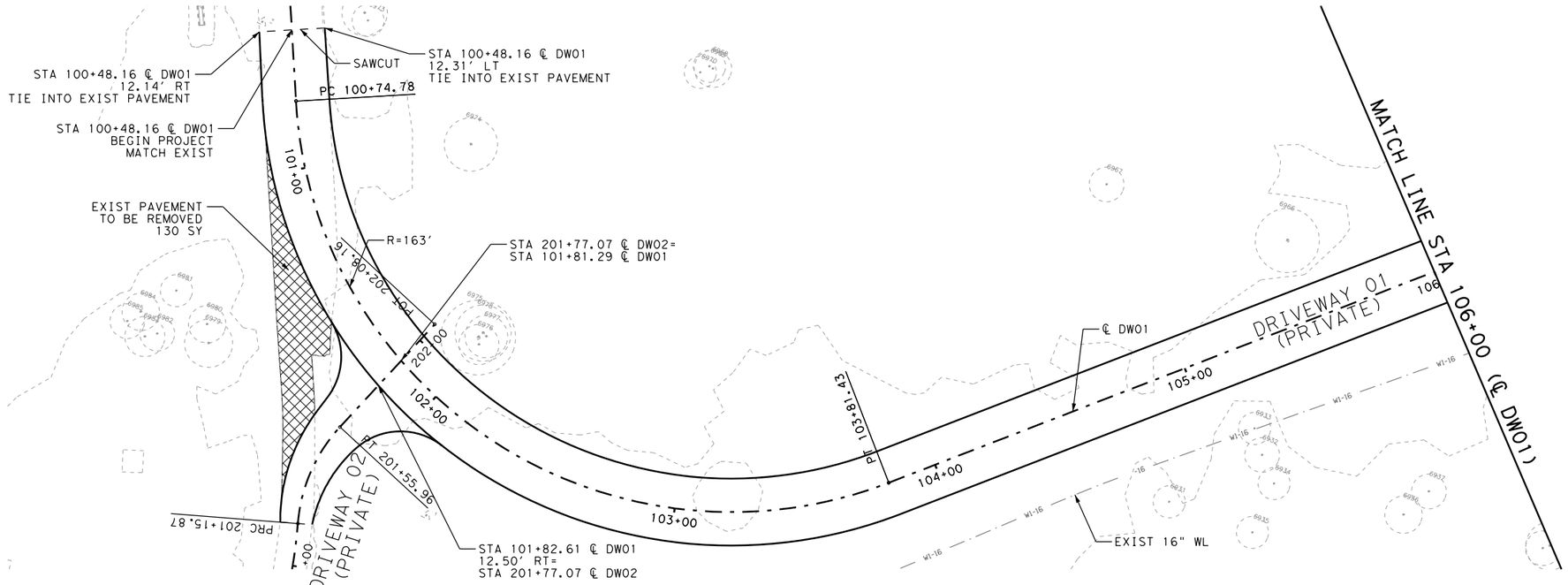

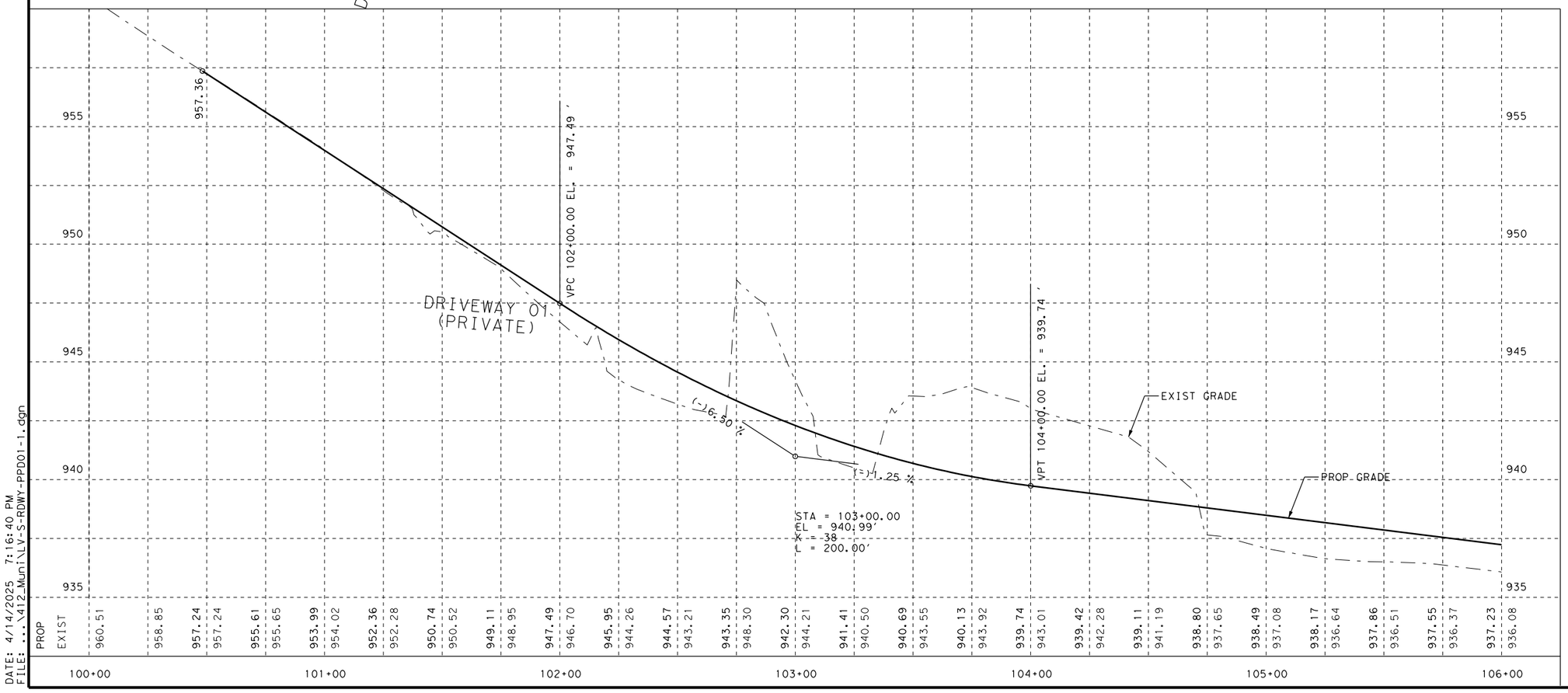

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REV	DATE	BY	DIST

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SUNSET PARK DRIVEWAY

DRIVEWAY PLAN AND PROFILE
DRIVEWAY 1

SHEET 1 OF 2

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		1378	01	053	FM1431
DW: RN	CK: AC	DIST	COUNTY		SHEET
		AUS	TRAVIS		464

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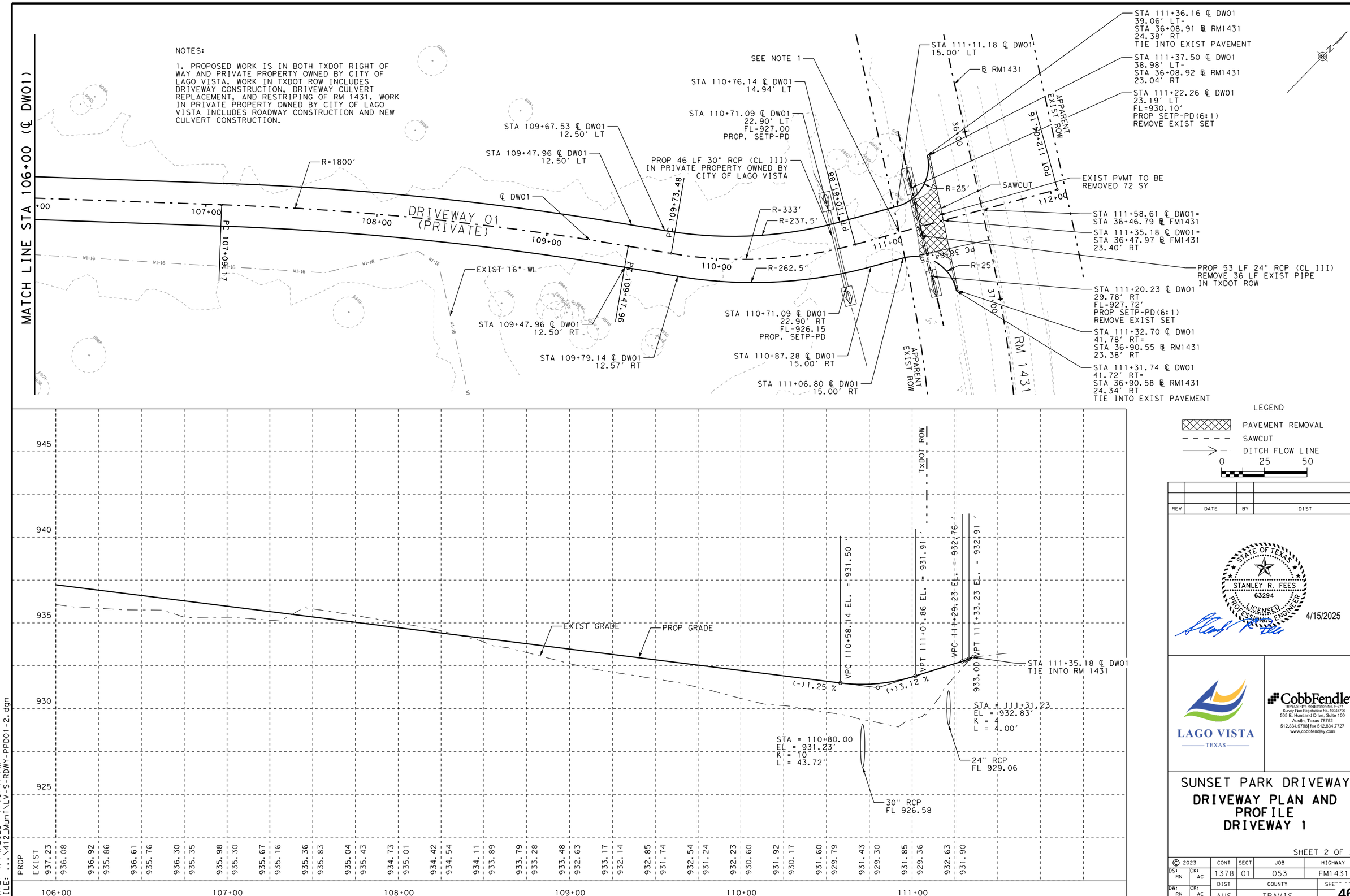

REV	DATE	BY	DIST

STATE OF TEXAS
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4/15/2025

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SUNSET PARK DRIVEWAY

DRIVEWAY PLAN AND PROFILE DRIVEWAY 1

SHEET 2 OF 2

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DS: RN	CK: AC	CONT	SECT	JOB	HIGHWAY
		1378	01	053	FM1431
DW: RN	CK: AC	DIST		COUNTY	SHEET
		AUS		TRAVIS	

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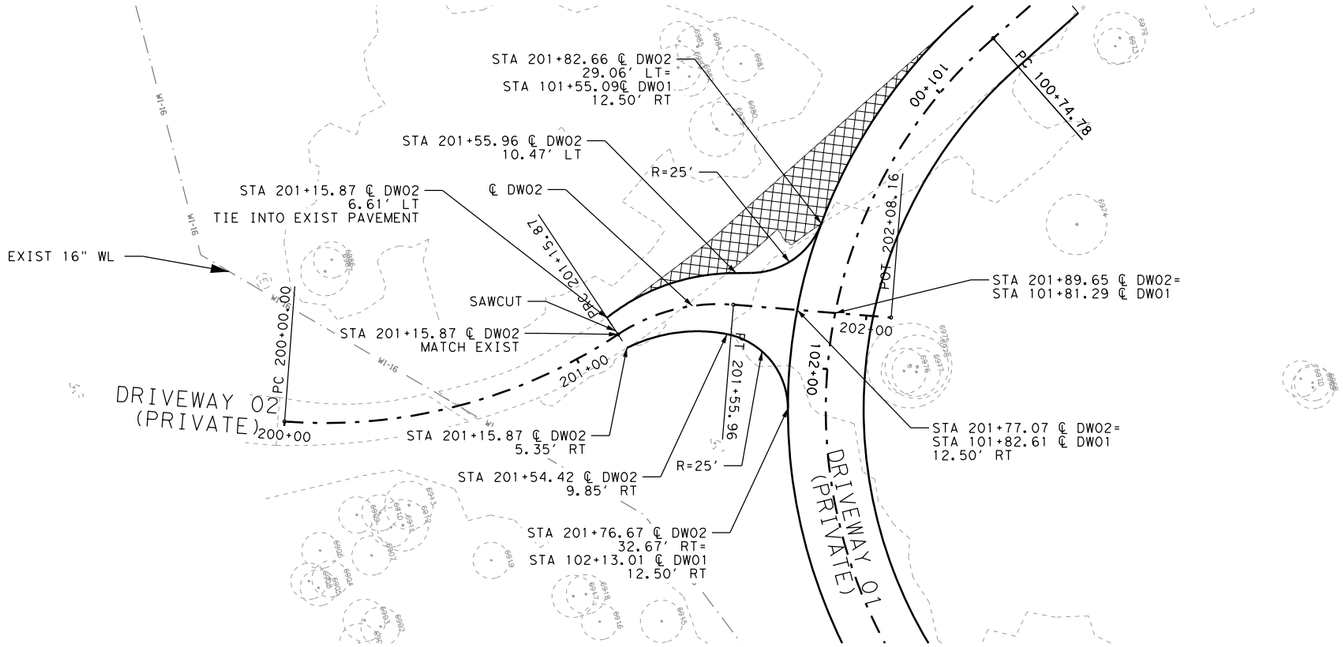

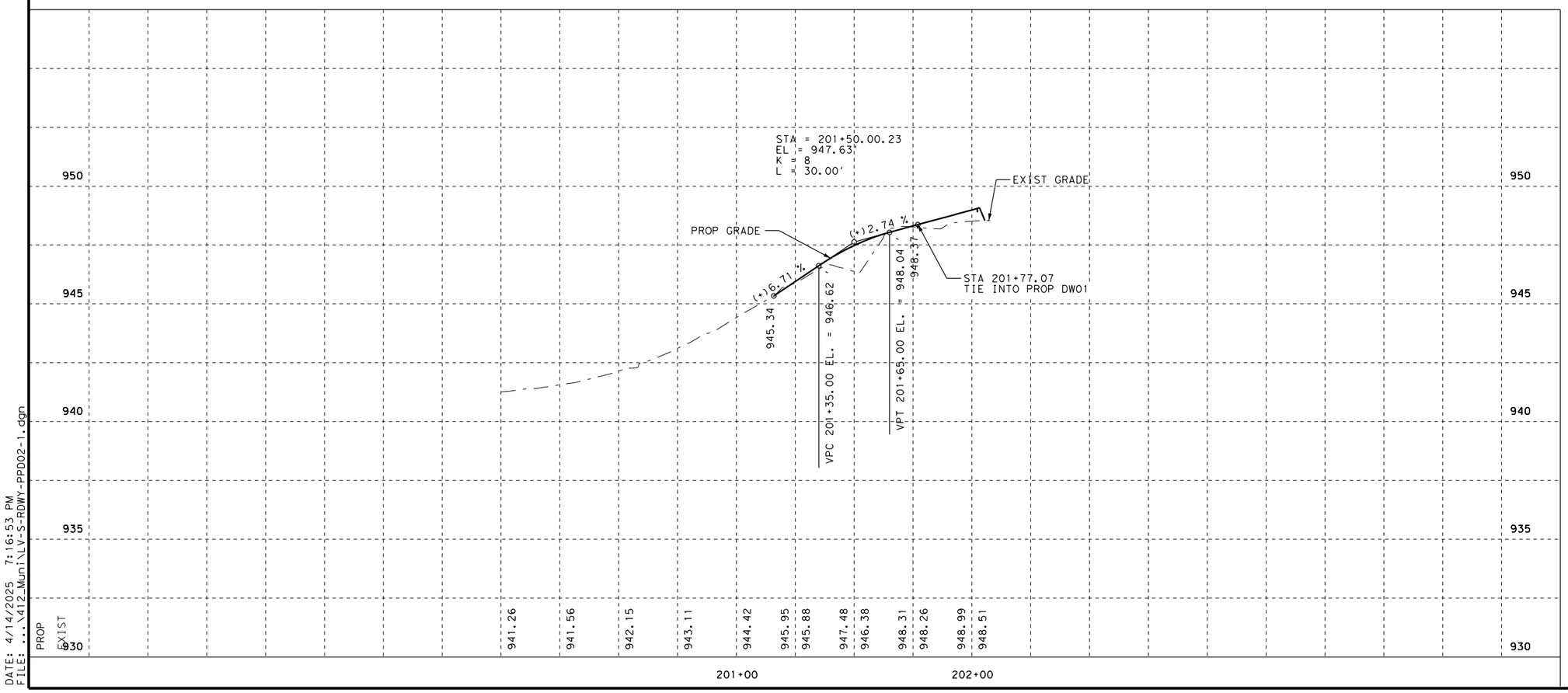

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REV	DATE	BY	DIST

STATE OF TEXAS
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4/15/2025

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SUNSET PARK DRIVEWAY
DRIVEWAY PLAN AND PROFILE DRIVEWAY 2

SHEET 1 OF 1

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CONT	SECT	JOB	HIGHWAY
1378	01	053	FM1431
DIST	COUNTY		SHEET
AUS	TRAVIS		

DES: RN CK: AC
DW: RN CK: AC

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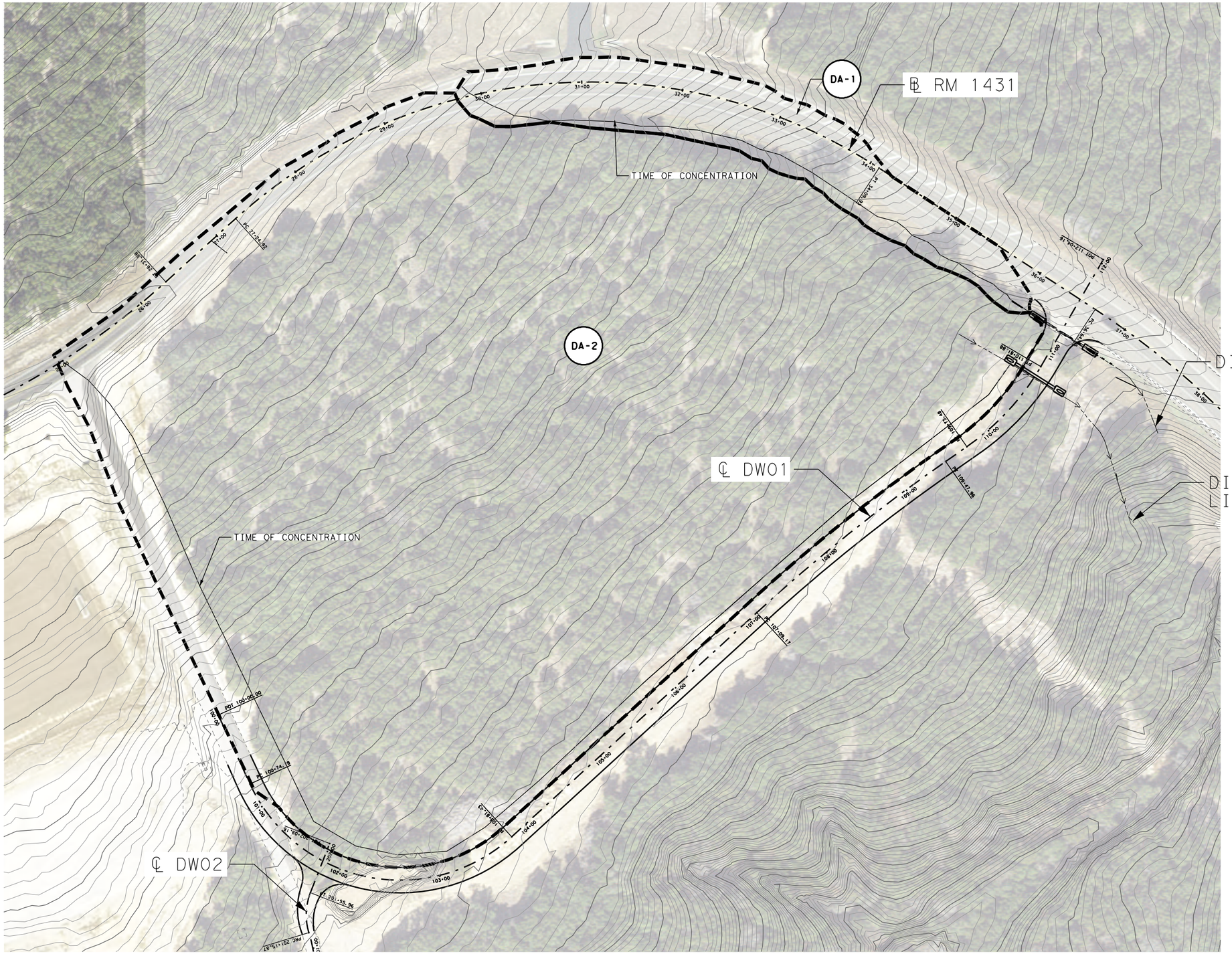

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NOTE:
CALCULATED FLOWS ARE BASED ON ATLAS 14 PRECIPITATION DETERMINED FROM THE EBDLKUP-2019-vc6.2.10.xlsm PUSBLISHED BY TxDOT.

0 50 100

DRAINAGE AREA ID	DRAINAGE AREA (AC)	IMPERVIOUS COVER AREA (AC)	PERVIOUS COVER AREA (AC)	RUNOFF COEFFICIENTS C (IMP. COVER)	C (PERV. COVER)	C (COMP.)	Tc Actual (MIN)	Tc Used (MIN)	5-YR (IN/HR)	10-YR (IN/HR)	100-YR (IN/HR)	5-YR (CFS)	10-YR (CFS)	100-YR (CFS)
DA-1	0.84	0.54	0.30	0.90	0.30	0.69	5.04	10.00	6.16	7.42	11.95	3.56	4.29	6.91
DA-2	10.11	0.49	9.63	0.90	0.45	0.47	9.48	10.00	6.16	7.42	11.95	29.41	35.39	57.03

REV	DATE	BY	DIST

STATE OF TEXAS
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4/15/2025

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SUNSET PARK DRIVEWAY

DRAINAGE AREA MAP

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
DSI: PI	CK: SRF	1378	01	053	FM1431
DW: PI	CK: SRF	DIST	COUNTY		SHEET
		AUS	TRAVIS		

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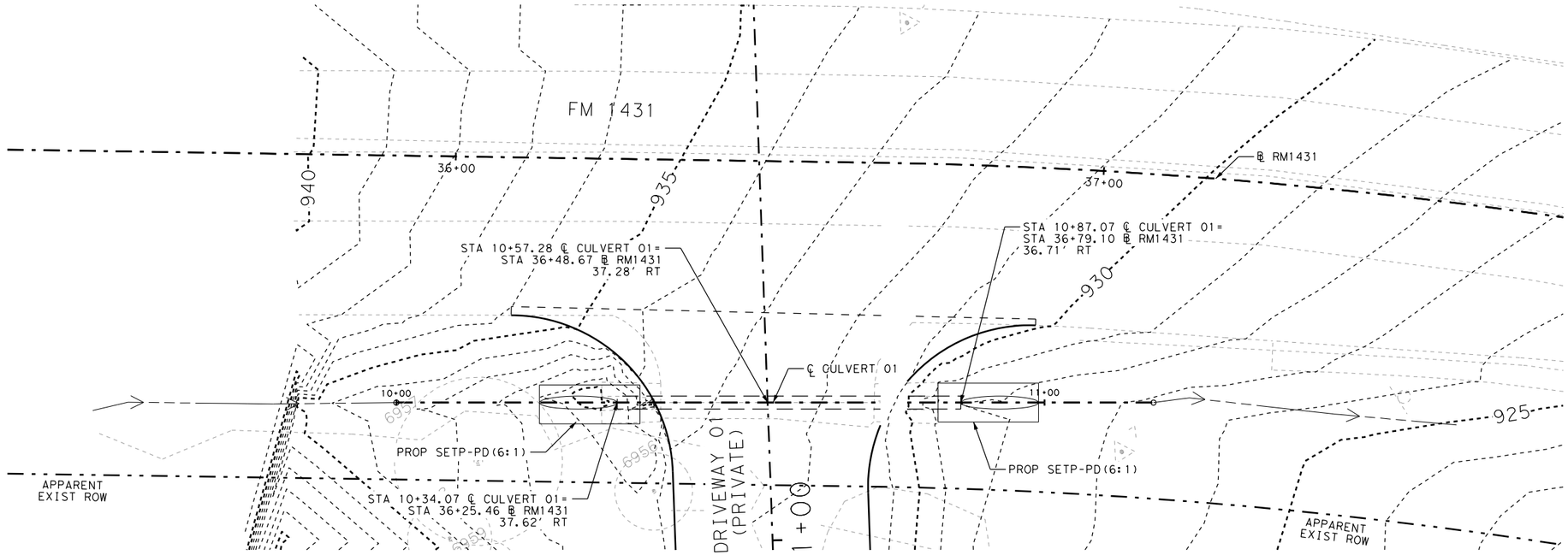


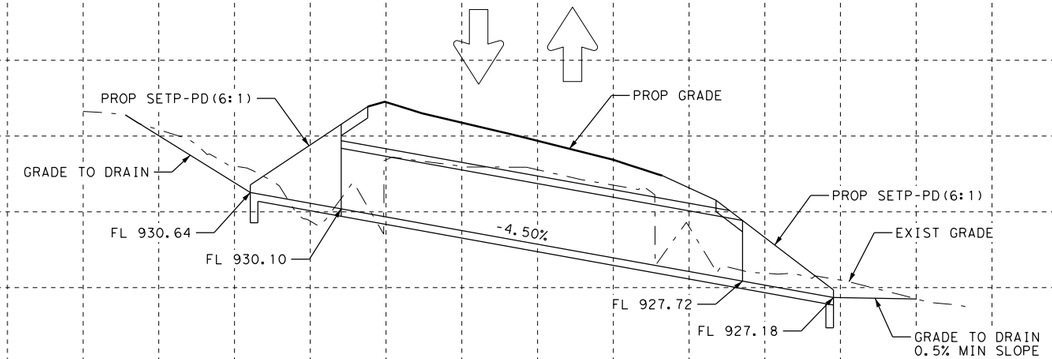
LEGEND

DITCH FLOW LINE

NOTES:

1. CONTRACTOR TO VERIFY LOCATION AND DEPTH OF ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. EXCAVATE WITH CAUTION.

2. CONTRACTOR TO BACKFILL EACH SIDE OF THE PROPOSED CULVERT WITH CEMENT STABILIZED BACKFILL UP TO THE BOTTOM OF THE PROPOSED 4" TY B PER THE TYPICAL SECTION. REFER TO TYPICAL SECTION SHEETS FOR PROPOSED PAVEMENT SECTION, SUBSIDIARY TO ITEM 467.



CULVERT NO. 1
STA. 36+48.67
PROP 53 LF-24" RCP CL III
W/ SETP-PD(6:1) US/DS

HORIZ. 0 10 20

VERT. 0 2.5 5

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED
PROFESSIONAL ENGINEER
4/15/2025

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Survey Firm Registration No. 10046700
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Austin, Texas 78752
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SUNSET PARK DRIVEWAY

CULVERT LAYOUT

CULVERT NO. 1 - STA. 36+48.67

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
DS: RN	CK: AC	1378	01	053	FM1431
		DIST	COUNTY		SHEET
DW: RN	CK: AC	AUS	TRAVIS		468

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PROP
EXIST

940 935 930 925 920

10+00 10+50 11+00

HY-8 Culvert Analysis Report

Table 1 - Project Headwater Table

Crossing Name	Culvert Name	Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	HW / D (ft)	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Outlet Velocity (ft/s)
DW-1	Culvert 1	100-YR	6.91	6.91	931.54	1.43	0.0*	0.72	0.49	0.93	0.53	10.47

* Full Flow Headwater elevation is below inlet invert.

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 2 - Summary of Culvert Flows at crossing: DW-1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
930.85	5-YR	3.56	3.56	0.00	1
930.97	10-YR	4.29	4.29	0.00	1
931.41	100-YR	6.91	6.91	0.00	1
932.51	Overtopping	20.93	20.93	0.00	Overtopping

Rating Curve Plot for crossing: DW-1

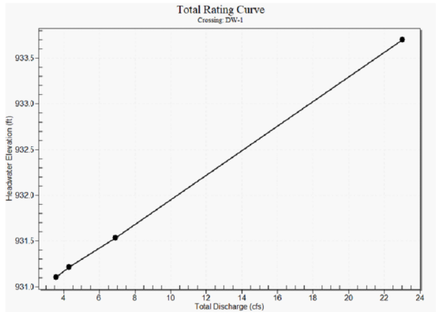


Table 3 - Culvert Summary Table: Culvert 1

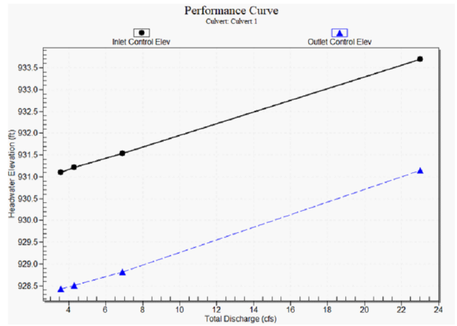
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	HW / D (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
5-YR	3.56	3.56	931.10	1.00	0.0*	0.50	1-S2n	0.35	0.66	0.39	0.35	9.49	4.79
10-YR	4.29	4.29	931.21	1.11	0.0*	0.55	1-S2n	0.39	0.73	0.44	0.38	9.58	5.02
100-YR	6.91	6.91	931.54	1.43	0.0*	0.72	1-S2n	0.49	0.93	0.57	0.45	10.47	5.65
Overtopping	20.73	19.02	933.70	3.60	1.04	1.80	5-S2n	0.89	1.65	1.01	0.68	13.49	7.64

* Full Flow Headwater elevation is below inlet invert.

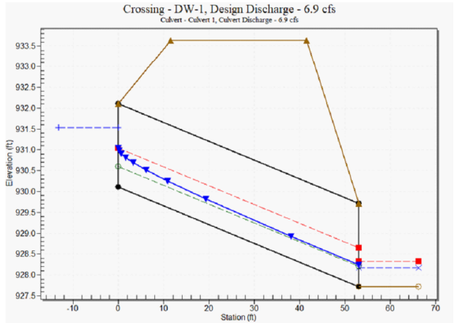
Culvert Barrel Data

Culvert Barrel Type: Straight Culvert
Inlet Elevation(invert): 930.10 ft
Outlet Elevation (invert): 927.72 ft
Culvert Length: 53.05 ft
Culvert Slope: 0.04 ft/ft

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 930.10 ft
Outlet Station: 53.00 ft
Outlet Elevation: 927.72 ft
Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular
Barrel Diameter: 2.00 ft
Barrel Material: Concrete
Embedment: 0.00 in
Barrel Manning's n: 0.0120
Culvert Type: Straight
Inlet Configuration: Square Edge with Headwall
Inlet Depression: None

Tailwater Channel Data for Crossing: DW-1

Tailwater Channel Option: Triangular Channel
a_side Slope (H:V): 6.00 (_:1)
Channel Slope: 0.07 ft/ft
Channel Manning's n: 0.0250
Channel Invert Elevation: 927.72 ft

Table 4 - Downstream Channel Rating Curve (crossing: DW-1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
3.56	928.07	0.35	4.79	1.47	2.01
4.29	928.10	0.38	5.02	1.58	2.03
6.91	928.17	0.45	5.65	1.89	2.10

Roadway Data for crossing: DW-1

Roadway Profile Shape: Constant Roadway Elevation
Crest Length: 36.60 ft
Crest Elevation: 933.63 ft
Roadway Surface: Paved
Roadway Top Width: 30.00 ft

THE MAXIMUM ALLOWABLE HEADWATER ELEVATION THAT HAS NO IMPACT TO TxDOT ROW OR SURROUNDING PRIVATE PROPOERTIES HAS BEEN CALCULATED AS 531.80.

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED
PROFESSIONAL ENGINEER
4/15/2025

LAGO VISTA
TEXAS

CobbFendley
TBPELS Firm Registration No. F-274
Survey Firm Registration No. 10046700

SUNSET PARK DRIVEWAY

CULVERT CALCULATIONS

SHEET 1 OF 1

© 2023		CONT	SECT	JOB	HIGHWAY
DSI:	CK:	1378	01	053	-
DW:	CK:	DIST	COUNTY		SHEET
		AUS	TRAVIS		469

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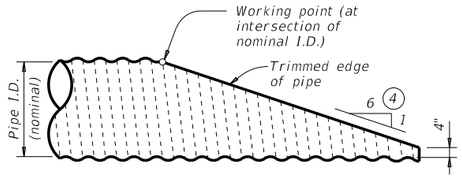
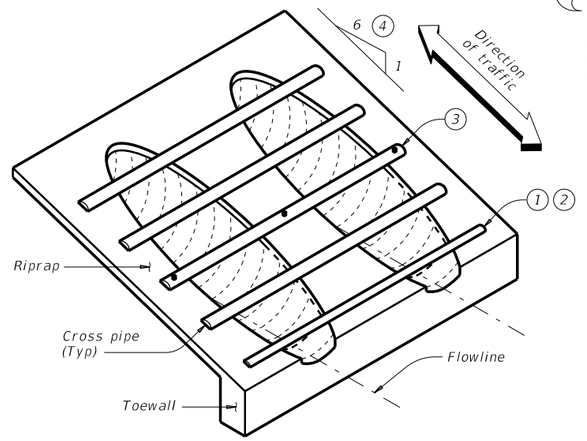


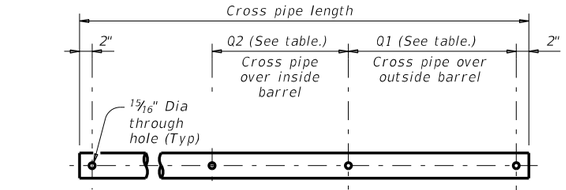
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

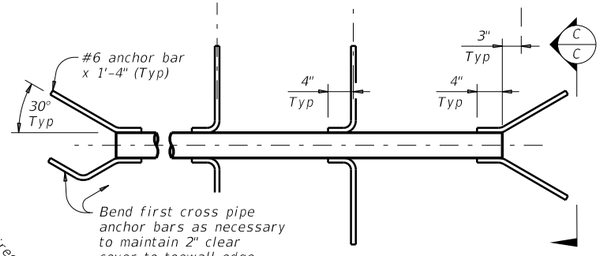
(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



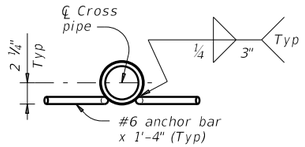
ISOMETRIC VIEW OF TYPICAL INSTALLATION



PIPE WITH BOLTED ANCHOR

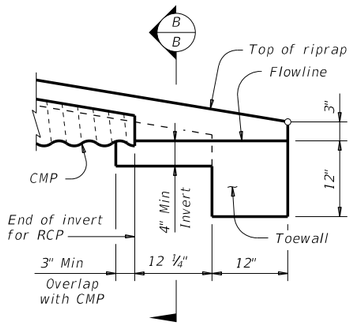


PIPE WITH ANCHOR BARS



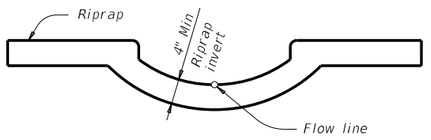
SECTION C-C

CROSS PIPE DETAILS



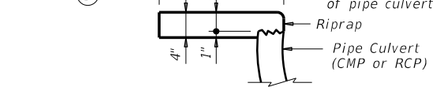
DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)

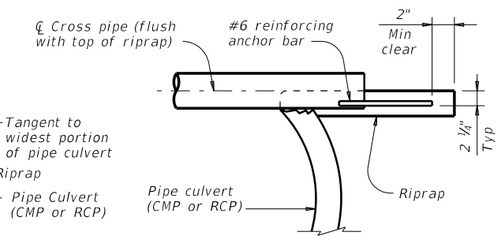


SECTION B-B

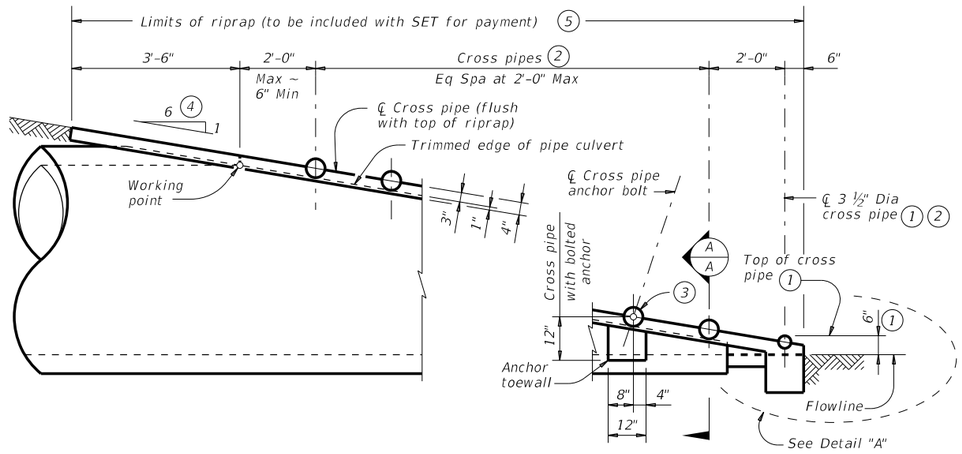
(Cross pipes not shown for clarity.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

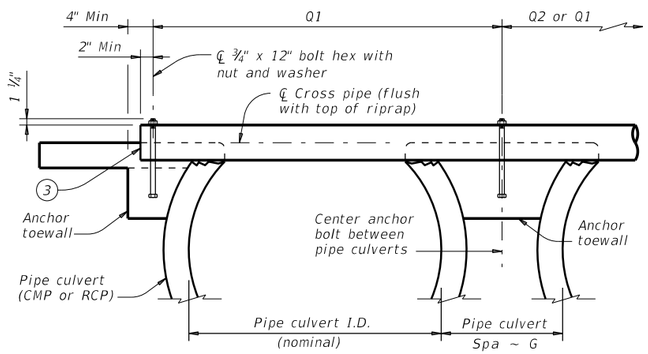


SHOWING CROSS PIPE WITH ANCHOR BAR



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' – 9"	N/A	2' – 1"	1' – 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' – 11"	N/A	2' – 5"	2' – 2"		
18"	0.8	1' – 2"	N/A	2' – 10"	2' – 8"		
21"	0.9	1' – 4"	N/A	3' – 2"	3' – 1"		
24"	0.9	1' – 7"	N/A	3' – 6"	3' – 7"		
27"	1.0	1' – 8"	N/A	3' – 10"	3' – 11"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
30"	1.1	1' – 10"	N/A	4' – 2"	4' – 4"	2 or more pipe culverts	
33"	1.2	1' – 11"	4' – 2"	4' – 5"	4' – 8"	All pipe culverts	
36"	1.3	2' – 1"	4' – 5"	4' – 9"	5' – 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' – 4"	4' – 11"	5' – 5"	5' – 10"		
48"	1.7	2' – 7"	5' – 5"	6' – 0"	6' – 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' – 0"	5' – 11"	6' – 9"	7' – 6"		
60"	2.2	3' – 3"	6' – 5"	7' – 4"	8' – 3"		
66"	2.4	3' – 3"	6' – 11"	7' – 10"	8' – 9"		
72"	2.7	3' – 4"	7' – 5"	8' – 5"	9' – 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 72" DIA
PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
	DIST	COUNTY		SHT
	AUS	TRAVIS		470

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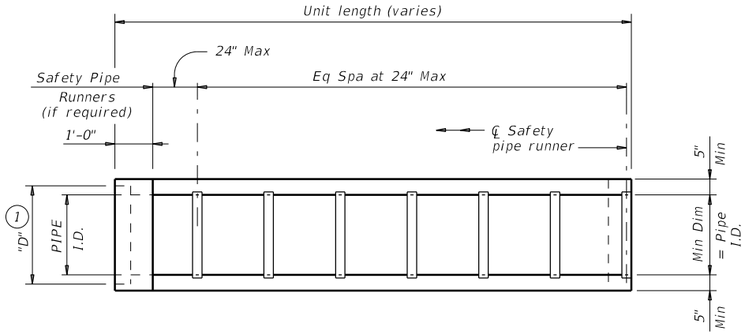
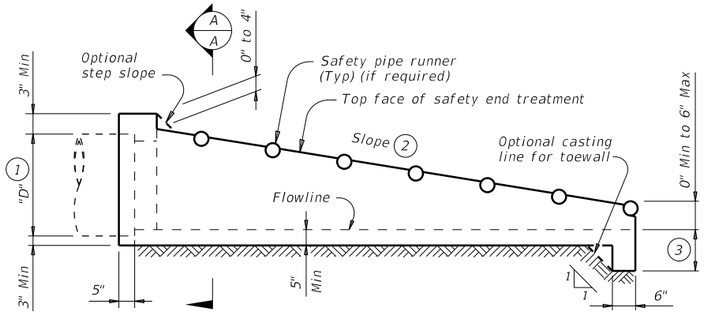


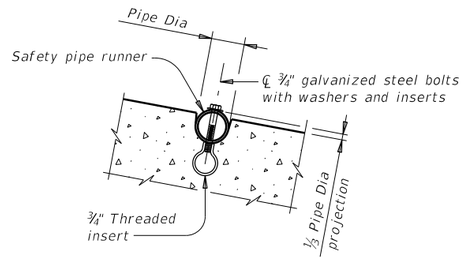
PLAN

(Showing bell end connection.)



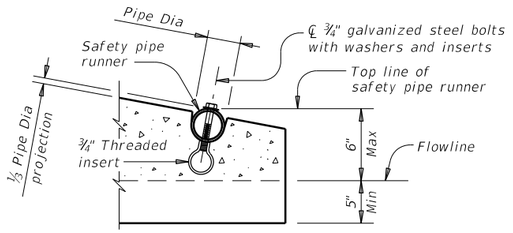
LONGITUDINAL ELEVATION

(Showing bell end connection.)

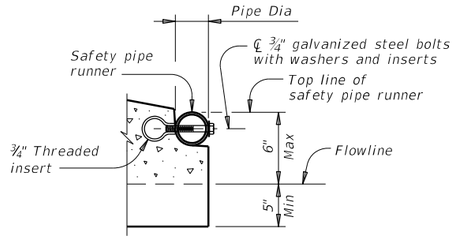


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



OPTION A



OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' – 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' – 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' – 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' – 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' – 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' – 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	2.7"	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" – D12 x D12 or 5"x5" – D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

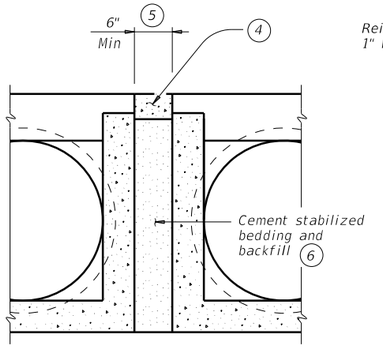
At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

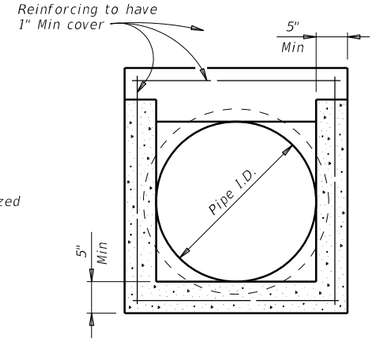
Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

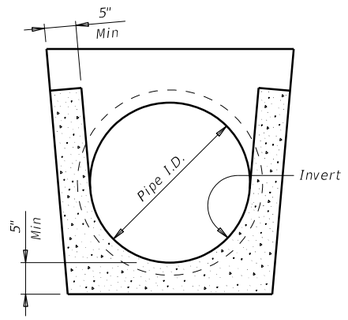
Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.



MULTIPLE PIPE INSTALLATION

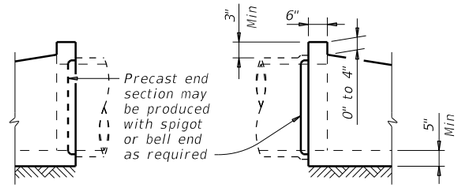


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
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	DIST	COUNTY		SHT
	AUS	TRAVIS		471

DATE: 4/14/2025 7:18:38 PM
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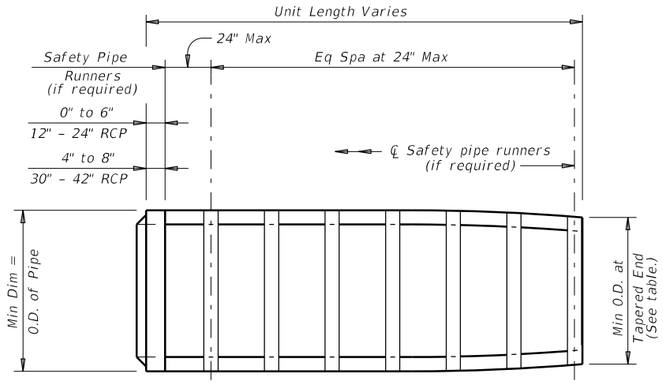
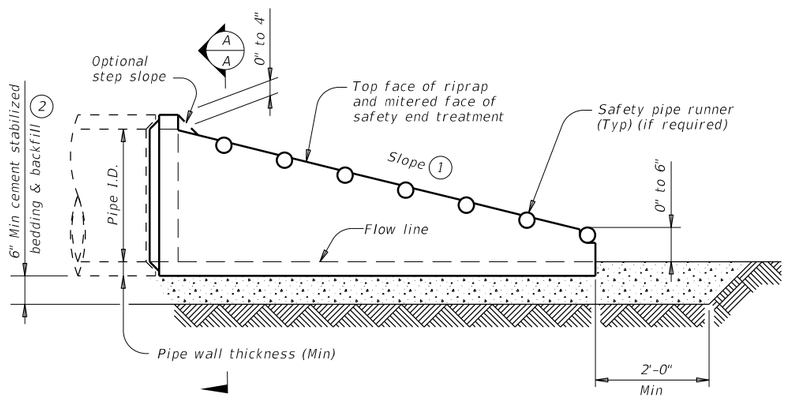


PLAN VIEW – 12" THRU 24"

(Showing spigot end connection.)



LONGITUDINAL ELEVATION - 12" THRU 24"

(Showing spigot end connection.)

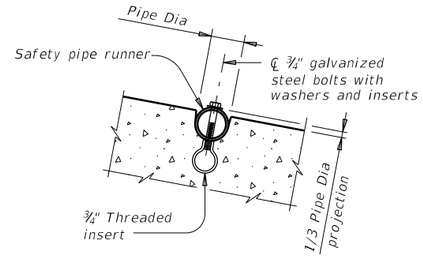
(1) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(2) Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(3) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(4) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(5) Safety pipe runners are required for multiple pipe culverts with more than two pipes.



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4'–0"	No	(5)	3" STD	3.500"	3.068"
15"	2 ¼"	19 ½"	19"	0.07 Circ.	6:1	5'–8"	No	(5)	3" STD	3.500"	3.068"
18"	2 ½"	23"	21 ½"	0.07 Circ.	6:1	7'–3"	No	(5)	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10'–6"	No	(5)	3" STD	3.500"	3.068"
30"	3 ½"	37"	31"	0.18 Circ.	6:1	12'–1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15'–4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	51"	41 ½"	0.23 Ellip.	6:1	18'–7"	Yes	Yes	4" STD	4.500"	4.026"

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".

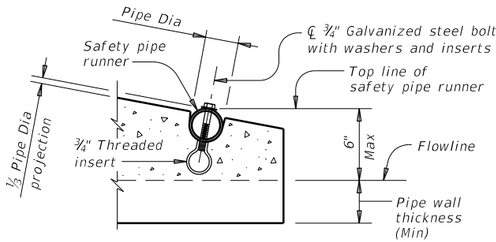
When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.

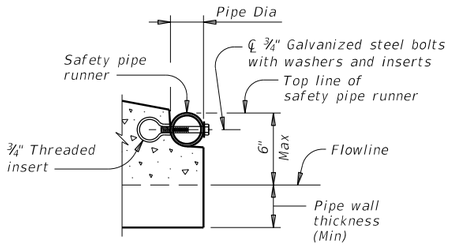
Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.

Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.



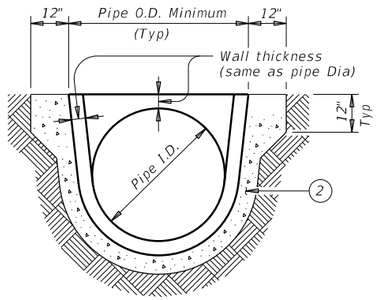
OPTION A



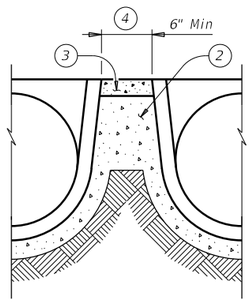
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



SECTION A-A



MULTIPLE PIPE INSTALLATION

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-RP

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
	DIST	COUNTY		SHT
	AUS	TRAVIS		472

DATE: 4/14/2025 7:18:41 PM
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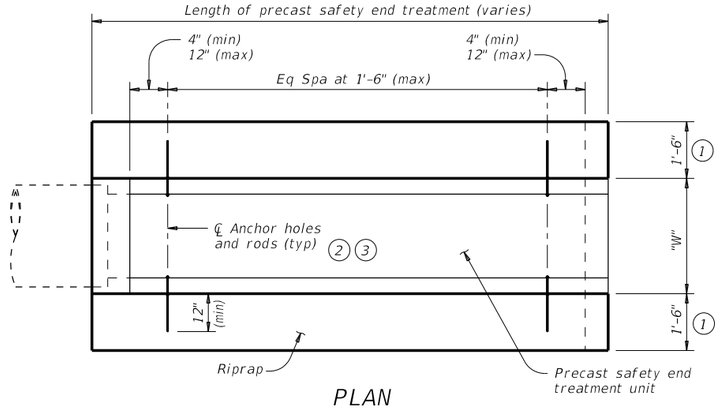
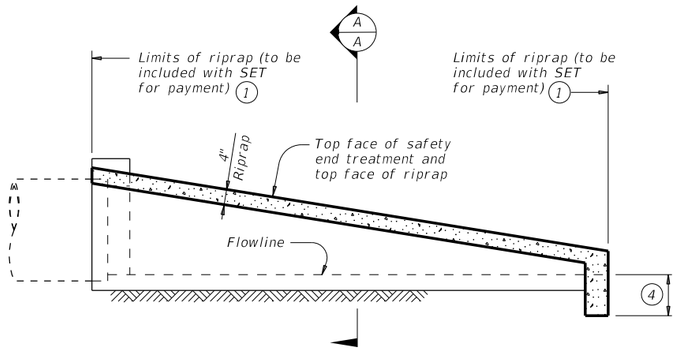
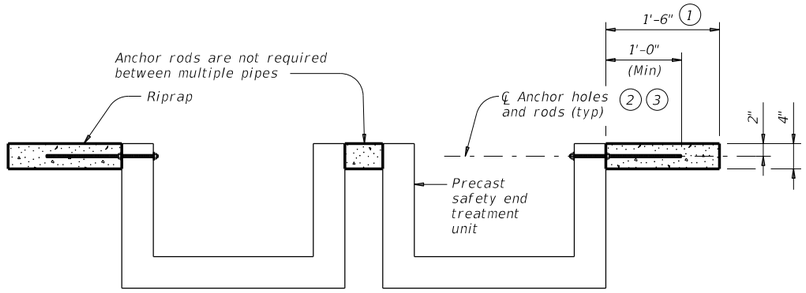


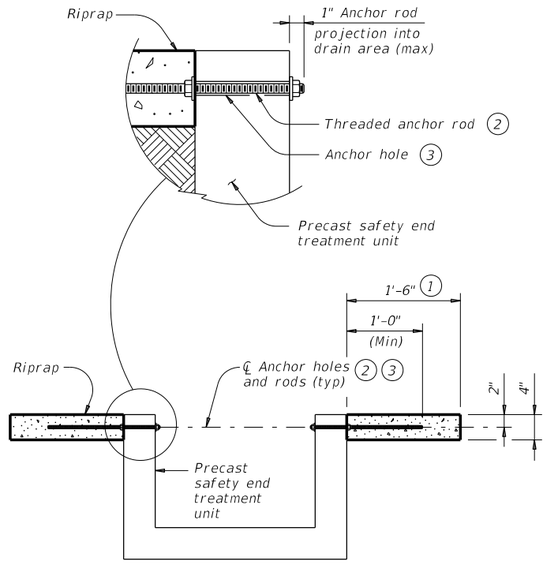
PLAN



LONGITUDINAL ELEVATION



MULTIPLE PIPE INSTALLATION



SINGLE PIPE INSTALLATION

SECTION A-A

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) 5

Nominal Culvert (Pipe) I.D.	PSET-SC and PSET-SP Standards				PSET-RC and PSET-RP Standards			
	Unit Width "W"	Side Slope			Unit Width "W"	Side Slope		
		3:1	4:1	6:1		3:1	4:1	6:1
12"	23.0"	0.1	0.2	0.2	16.0"	0.1	0.1	0.2
15"	26.5"	0.2	0.2	0.3	19.5"	0.1	0.2	0.2
18"	30.0"	0.2	0.2	0.3	23.0"	0.2	0.2	0.3
24"	37.0"	0.3	0.3	0.5	30.0"	0.2	0.3	0.4
30"	44.5"	0.3	0.4	0.6	37.0"	0.3	0.3	0.5
36"	51.5"	0.4	0.5	0.7	44.0"	0.3	0.4	0.6
42"	58.5"	0.5	0.6	0.8	51.0"	0.4	0.5	0.7

(1) Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap." When riprap is cast integrally with the precast safety end treatment, this dimension is 1'-0" minimum.

(2) 1#2" Dia ASTM A307 Gr A threaded anchor rod with 2 nuts and 2 washers. Galvanize all components in accordance with Item 445, "Galvanizing." Repair galvanizing that is damaged during transport or construction in accordance with the specifications.

(3) 3#4" through holes in walls of safety end treatment for riprap anchor rods may be drilled with rotary (coring or masonry) type drilling equipment or may be formed. Do not use percussive (star) type drilling equipment. If holes are drilled, patch spalls in the inside face of the wall exceeding 1#2" from the holes.

(4) Provide riprap toe wall when dimension is shown elsewhere in the plans or when field conditions require a toe wall.

(5) Quantities shown are for one end of one reinforced concrete pipe culvert. For multiple pipe culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only. Quantities are based on the minimum unit lengths shown on the Precast Saftey End Treatment (SET) standard sheets.

MATERIAL NOTES:

Provide Class "B" riprap in accordance with Item 432, "Riprap."
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. The anchor rods shown are always required.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment."
Refer to PSET-SC or PSET-SP standard sheets for details of square safety end treatments not shown. Refer to PSET-RC or PSET-RP standard sheets for details of round safety end treatments not shown.
For precast units with integrally cast riprap, substitute reinforcing steel in the amount on 0.26 in./ft. minimum for the threaded anchor rods shown. When requested, submit sealed engineering drawings for approval prior to construction. Shop drawings will not be required. Note that a proprietary precast unit with integral riprap is available from L&R Precast Concrete Works, Inc. (956) 583-6293 or www.lrprecast.com.
Payment for riprap and toewalls is included in the price bid for each safety end treatment.

These riprap details are only applicable when notes that require placement of riprap with precast safety end treatments are shown elsewhere in the plans.

Precast units with integrally cast riprap are permitted unless noted otherwise on the plans.

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT
TYPE II
RIPRAP DETAILS

PSET-RR

FILE:	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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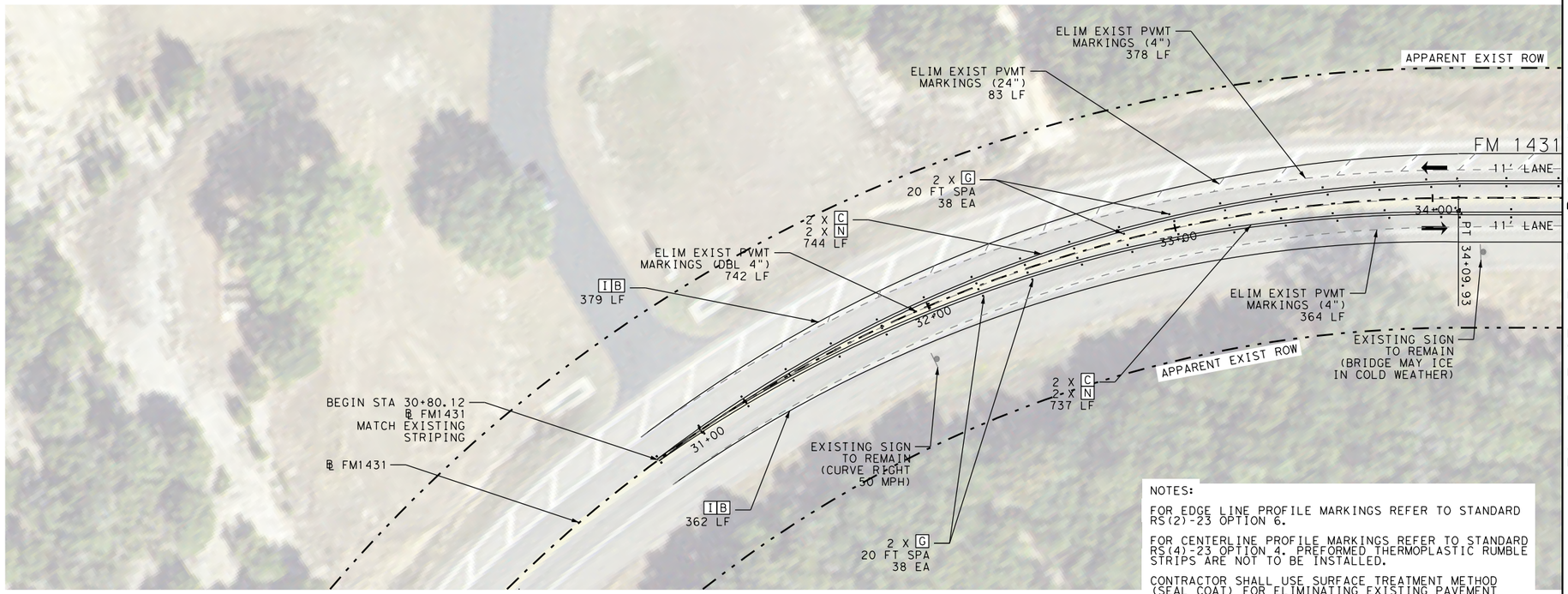
	DIST	COUNTY		SHT
	AUS	TRAVIS		473



NOTES:

FOR EDGE LINE PROFILE MARKINGS REFER TO STANDARD RS(2)-23 OPTION 6.

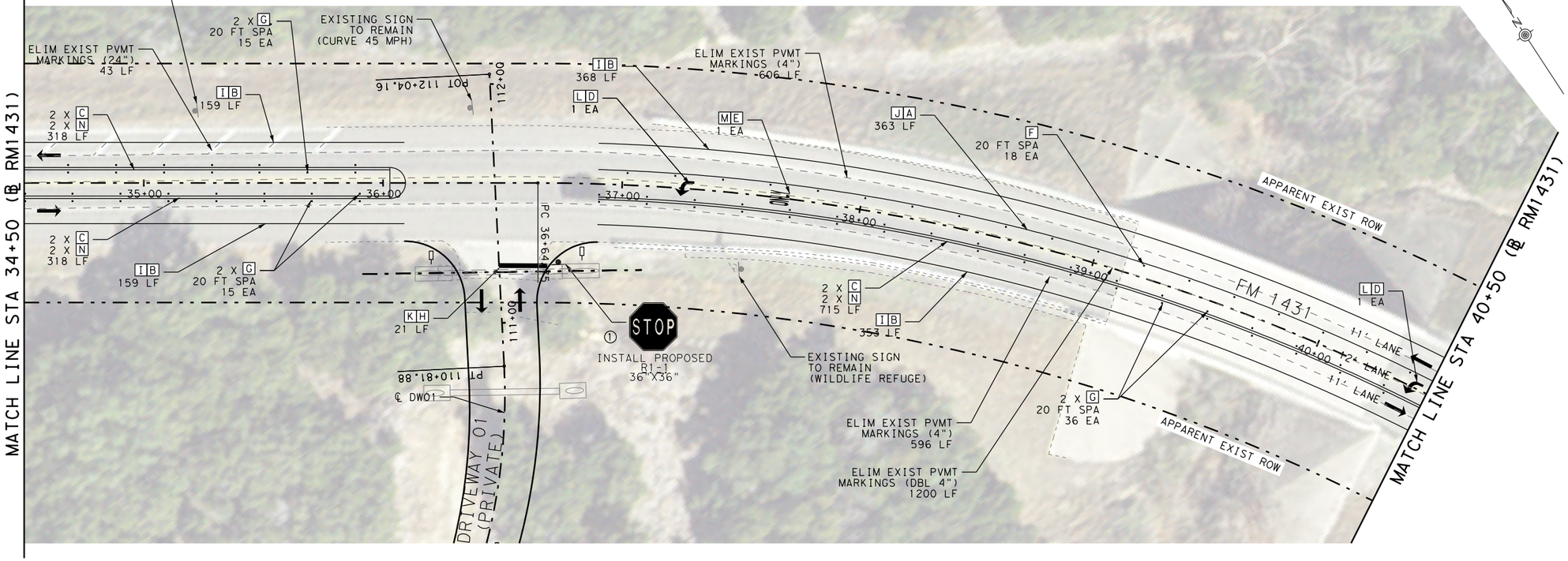
FOR CENTERLINE PROFILE MARKINGS REFER TO STANDARD RS(4)-23 OPTION 4. PREFORMED THERMOPLASTIC RUMBLE STRIPS ARE NOT TO BE INSTALLED.

CONTRACTOR SHALL USE SURFACE TREATMENT METHOD (SEAL COAT) FOR ELIMINATING EXISTING PAVEMENT MARKINGS ON SURFACES OTHER THAN CONCRETE

REMOVE EXISTING PAVEMENT MARKINGS ON CONCRETE SURFACES BY A BLASTING METHOD.

LEGEND

- A REFL PAV MRK TY I (W)8"(SLD)(090MIL)
- B RE PROFILE PM TY I(W)6"(SLD)(90MIL)
- C RE PROFILE PM TY I(Y)6"(SLD)(90MIL)
- D REFL PAV MRK TY I (W)(ARROW)(090MIL)
- E REFL PAV MRK TY I (W)(WORD)(90MIL)
- F REFL PAV MRKR TY I-C
- G REFL PAV MRKR TY II-A-A
- H REFL PAV MRKR TY I (W)24"(SLD)(090MIL)
- I REFL PAV MRK TY II (W)6" (SLD)
- J REFL PAV MRK TY II (W)8" (SLD)
- K REFL PAV MRK TY II (W)24" (SLD)
- L REFL PAV MRK TY II (W) (ARROW)
- M REFL PAV MRK TY II (W) (WORD)
- N REFL PAV MRK TY II (Y)6" (SLD)
- O REFL PAV MRK TY I (W)8" (DOT)(090MIL)
- P REFL PAV MRK TY II (W)8" (DOT)
- EXIST SIGN POST
- PROPOSED SIGN POST
- (#) PROPOSED SMALL SIGN
- DEL ASSM (D-SW)SZ 1(WFLX)(GND)



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REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED PROFESSIONAL ENGINEER
4/15/2025

LAGO VISTA TEXAS

CobbFendley
TBPELS Firm Registration No. F-274
Survey Firm Registration No. 10046700
505 E. Huntland Drive, Suite 100
Austin, Texas 78752
512.834.9798| fax 512.834.7727
www.cobbfendley.com

SUNSET PARK DRIVEWAY

SIGNING AND PAVEMENT MARKING LAYOUTS

SHEET 1 OF 2

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CONT	SECT	JOB	HIGHWAY
1378	01	053	FM1431
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		474

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DWn: RN CKn: AC

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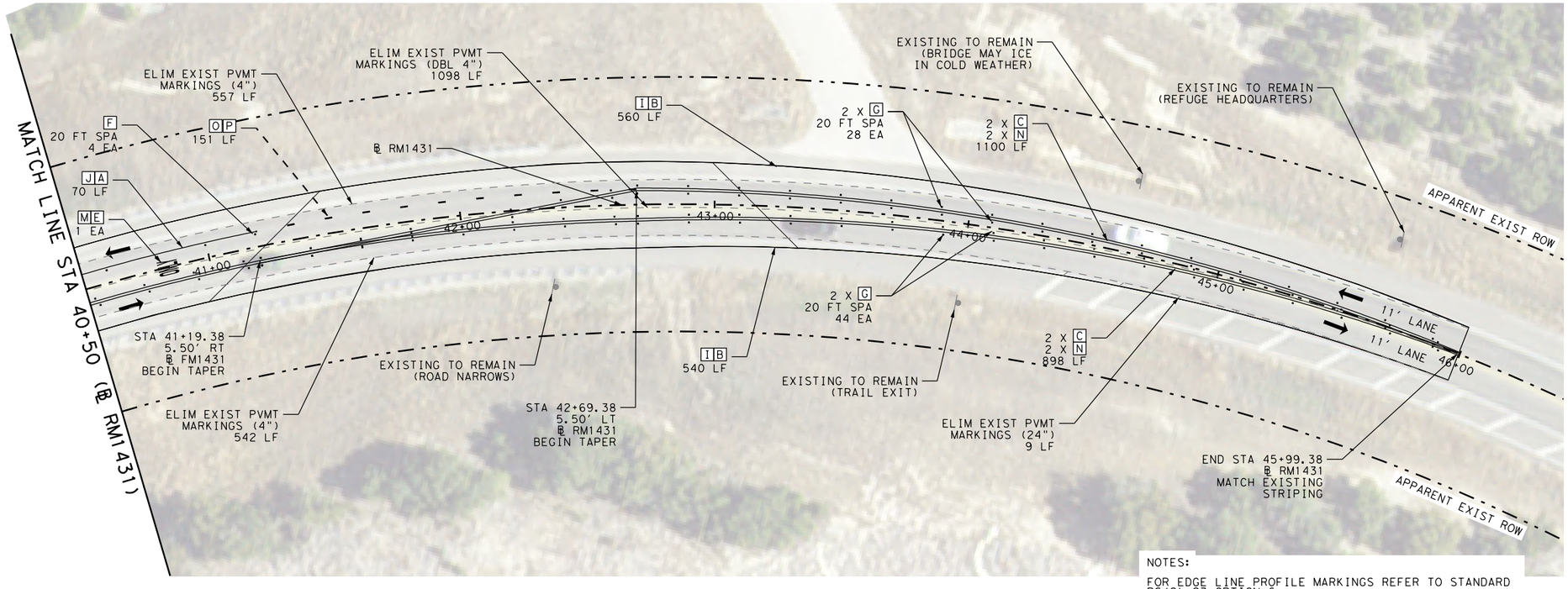

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REMOVE EXISTING PAVEMENT MARKINGS ON CONCRETE SURFACES BY A BLASTING METHOD.

LEGEND

- [A] REFL PAV MRK TY I (W)8"(SLD)(090MIL)
- [B] RE PROFILE PM TY I(W)6"(SLD)(90MIL)
- [C] RE PROFILE PM TY I(Y)6"(SLD)(90MIL)
- [D] REFL PAV MRK TY I (W)(ARROW)(090MIL)
- [E] REFL PAV MRK TY I (W)(WORD)(90MIL)
- [F] REFL PAV MRKR TY I-C
- [G] REFL PAV MRKR TY II-A-A
- [H] REFL PAV MRKR TY I (W)24"(SLD)(090MIL)
- [I] REFL PAV MRK TY II (W)6" (SLD)
- [J] REFL PAV MRK TY II (W)8" (SLD)
- [K] REFL PAV MRK TY II (W)24" (SLD)
- [L] REFL PAV MRK TY II (W) (ARROW)
- [M] REFL PAV MRK TY II (W) (WORD)
- [N] REFL PAV MRK TY II (Y)6" (SLD)
- [O] REFL PAV MRK TY I (W)8" (DOT)(090MIL)
- [P] REFL PAV MRK TY II (W)8" (DOT)
- EXIST SIGN POST
- PROPOSED SIGN POST
- (#) PROPOSED SMALL SIGN
- DEL ASSM (D-SW)SZ 1(WFLX)(GND)

0 25 50

REV	DATE	BY	DIST

STATE OF TEXAS
STANLEY R. FEES
63294
LICENSED PROFESSIONAL ENGINEER
4/15/2025

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SUNSET PARK DRIVEWAY

SIGNING AND PAVEMENT MARKING LAYOUTS

SHEET 2 OF 2

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DS:	CK:	CONT	SECT	JOB	HIGHWAY
RN	AC	1378	01	053	FM1431
DW:	CK:	DIST	COUNTY		SHEET NO.
RN	AC	AUS	TRAVIS		475

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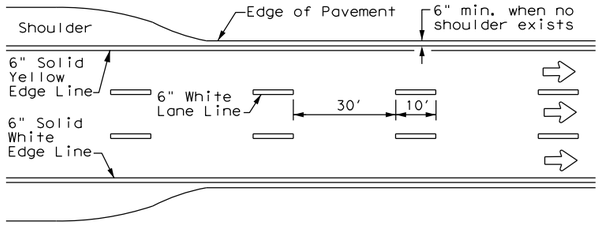
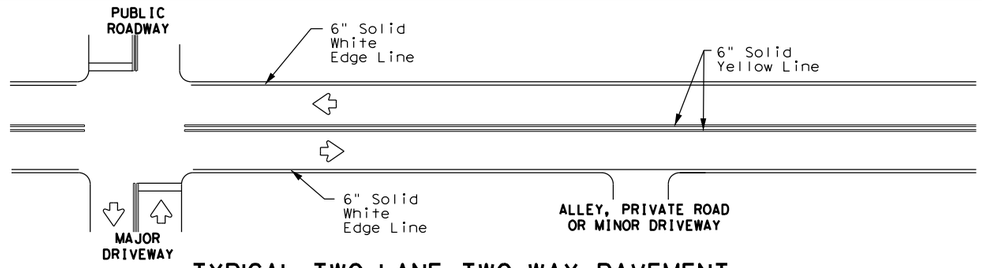
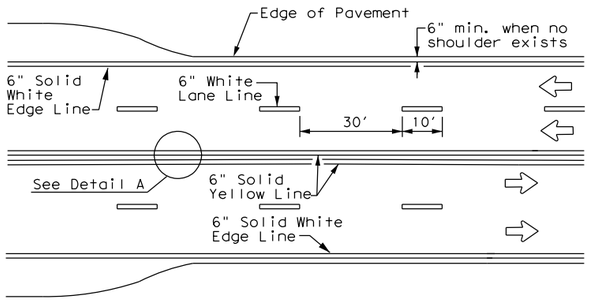
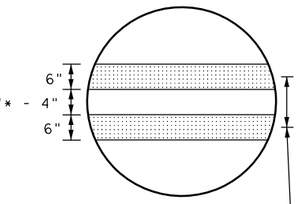


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS





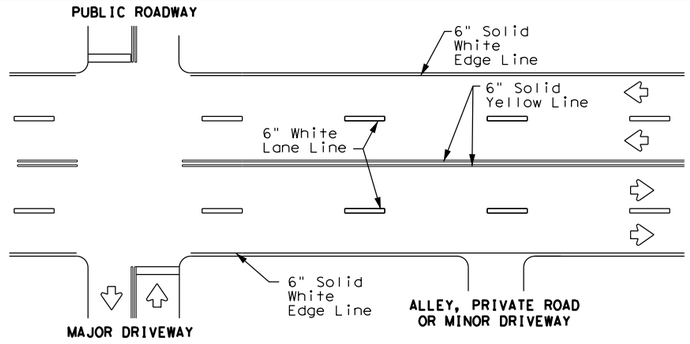
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

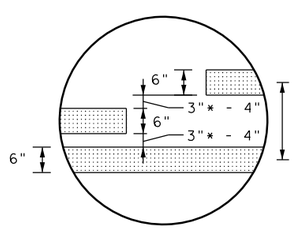
* 2" minimum for restripe projects when approved by the Engineer.

** 8" minimum for restripe projects when approved by the Engineer.



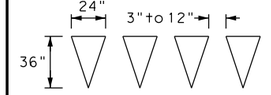
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



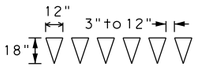
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.

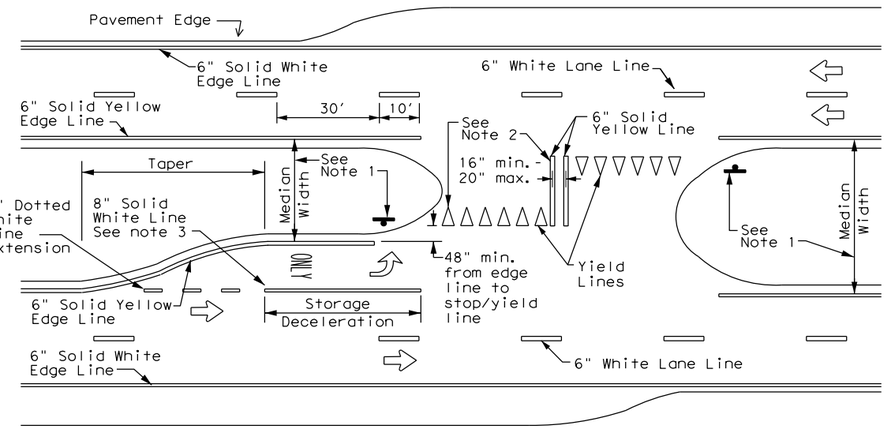


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



For posted speed on road being marked equal to or less than 40 MPH.



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

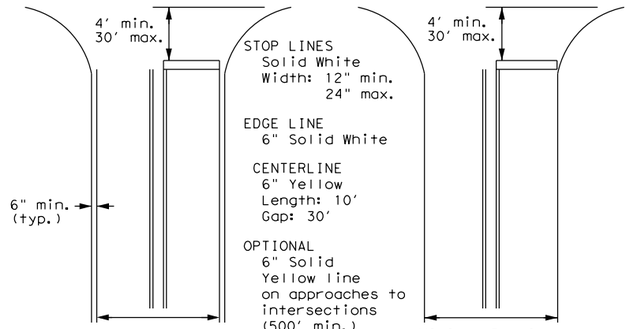
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20	1378	01	053	FM1431
8-95 3-03 12-22	DIST	COUNTY		SHE
5-00 2-12	AUS	TRAVIS		476

22A

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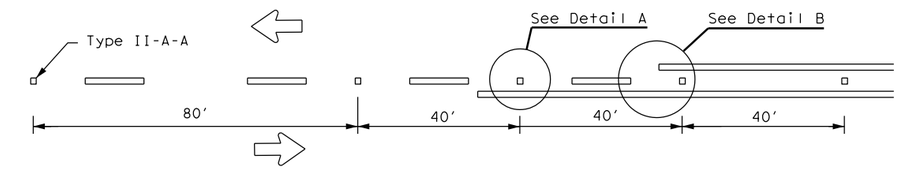
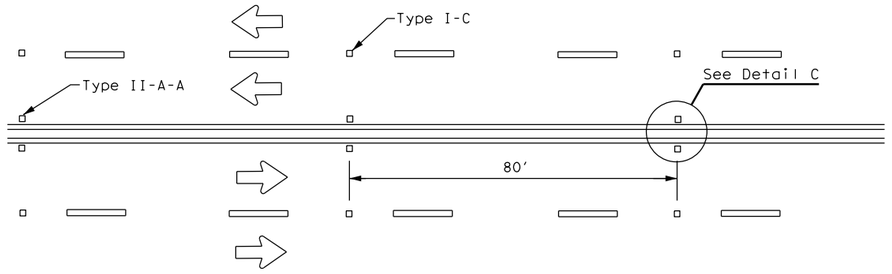
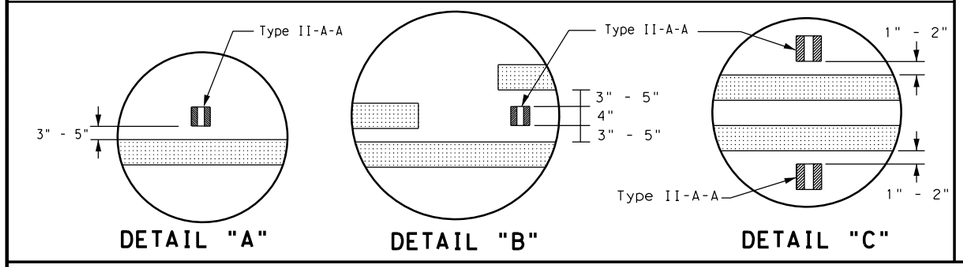
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

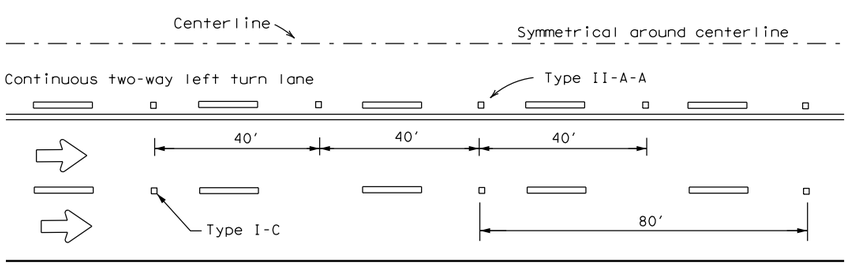


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

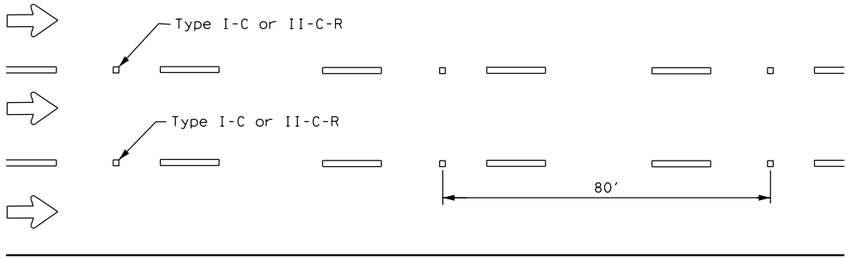


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



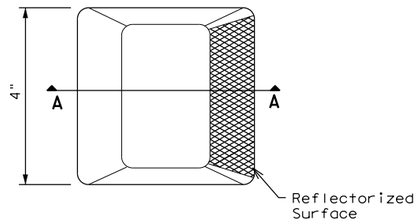
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

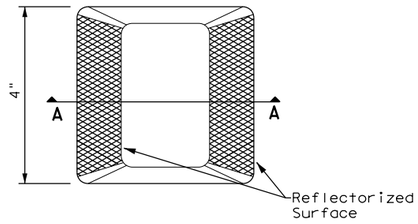
See Note 3.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

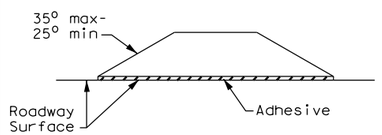
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

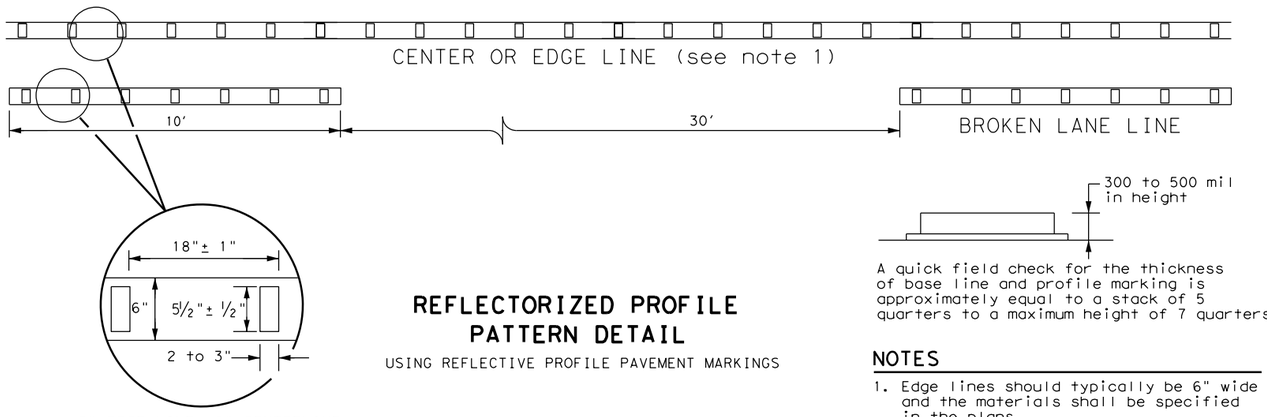


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
4-77 8-00 6-20	DIST	COUNTY		SHEET
4-92 2-10 12-22	AUS	TRAVIS		477
5-00 2-12				

22B

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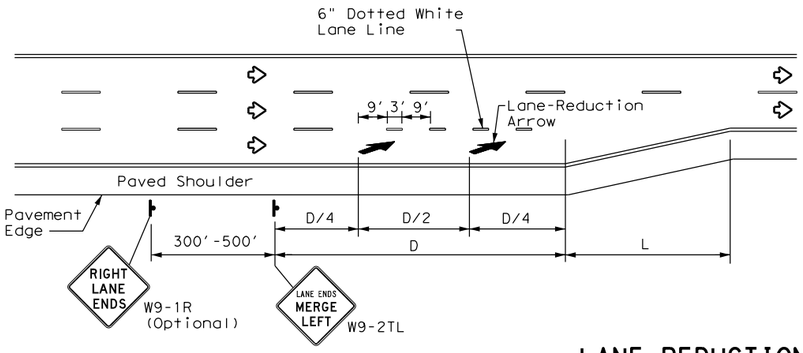
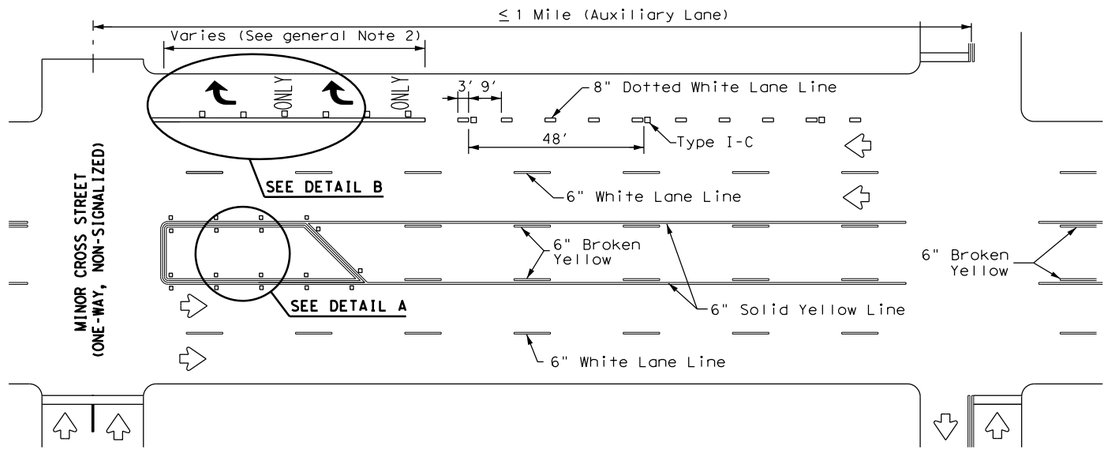


LANE REDUCTION

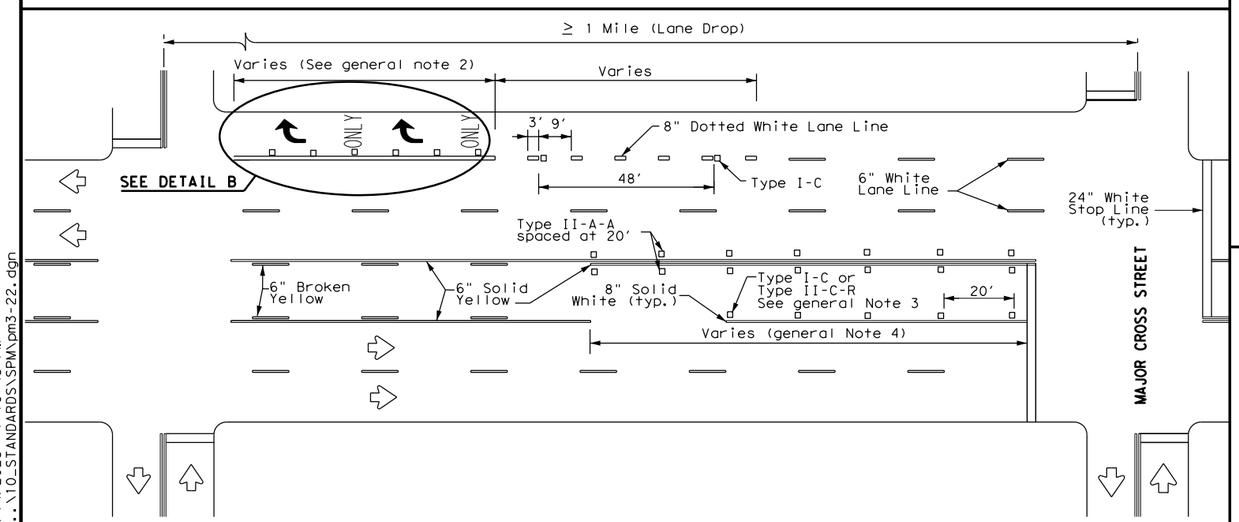
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

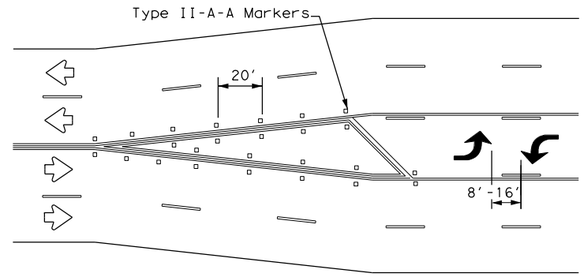
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

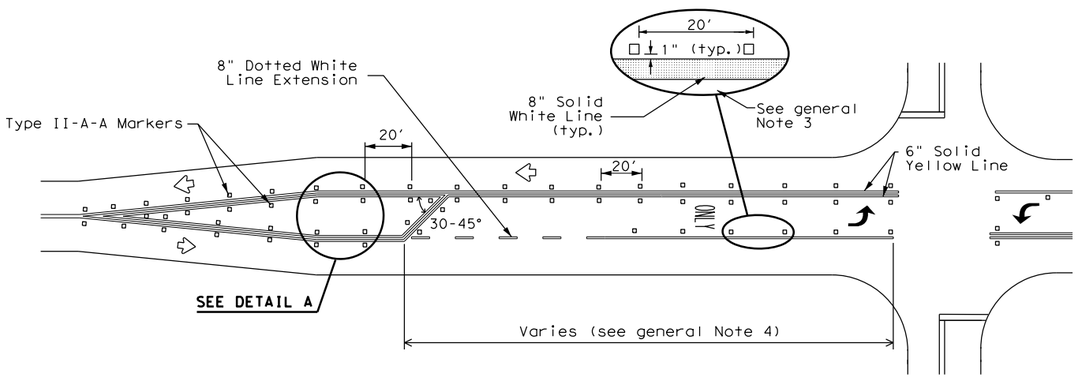
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

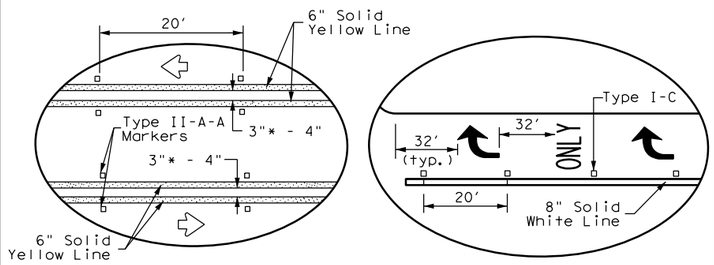
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	1378	01	053	FM1431
	DIST	COUNTY		SHEET
	AUS	TRAVIS		478

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

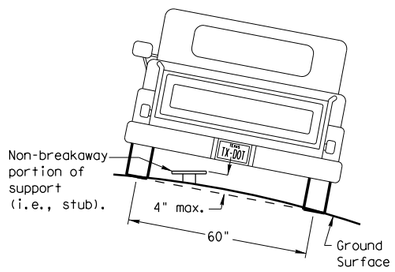
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

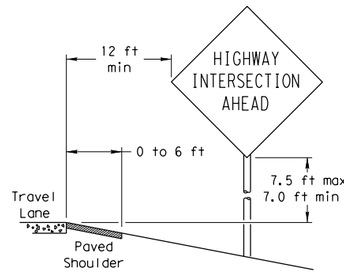
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

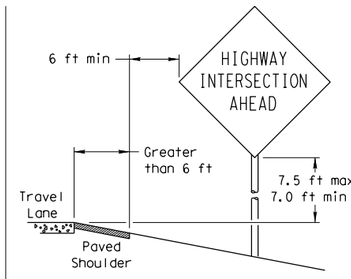
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

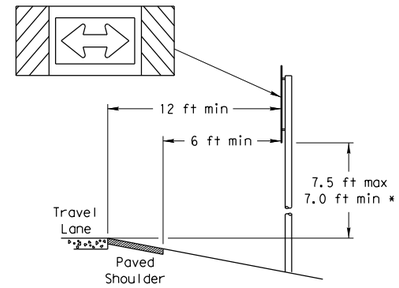
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



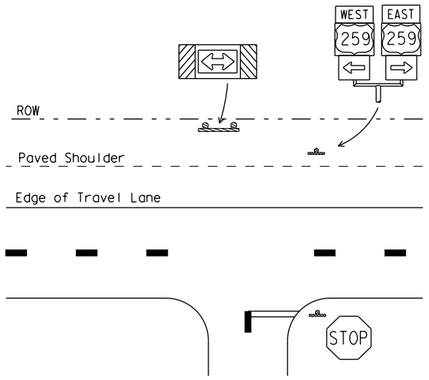
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

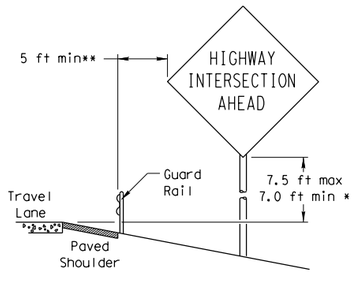
T-INTERSECTION



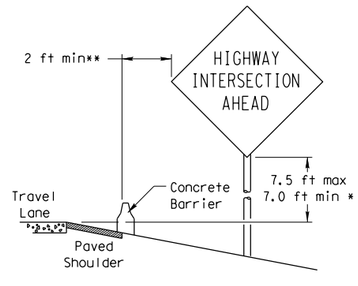
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



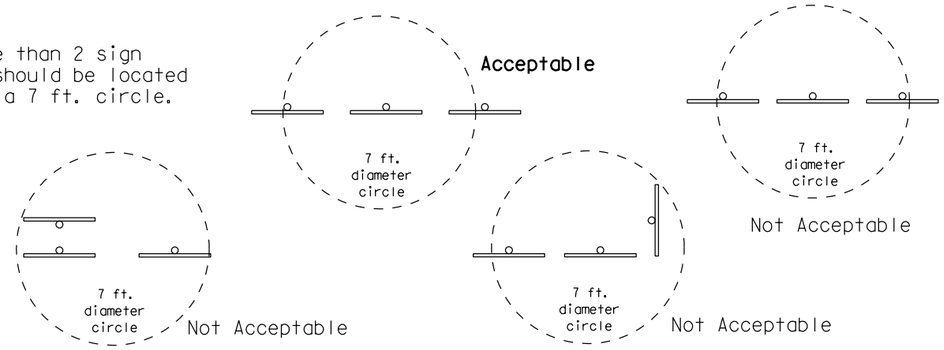
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

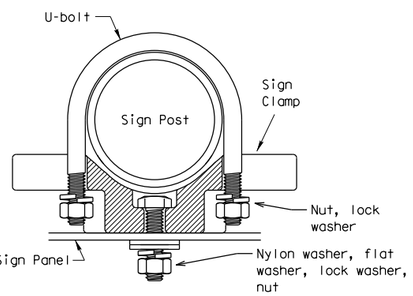
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

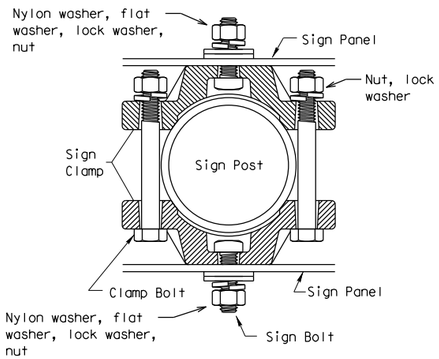


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

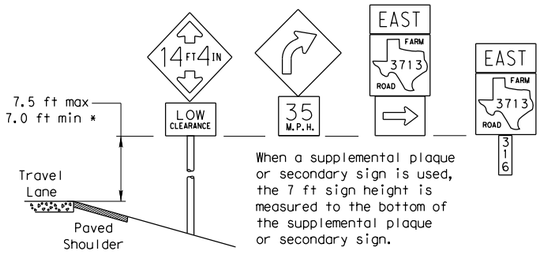
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



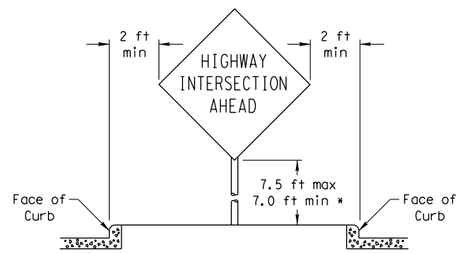
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



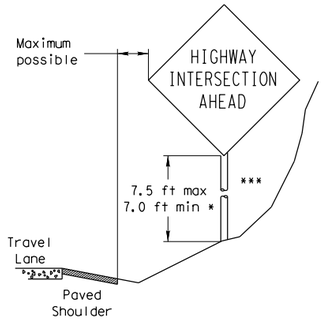
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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9-08 REVISIONS

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CONT	SECT	JOB	HIGHWAY
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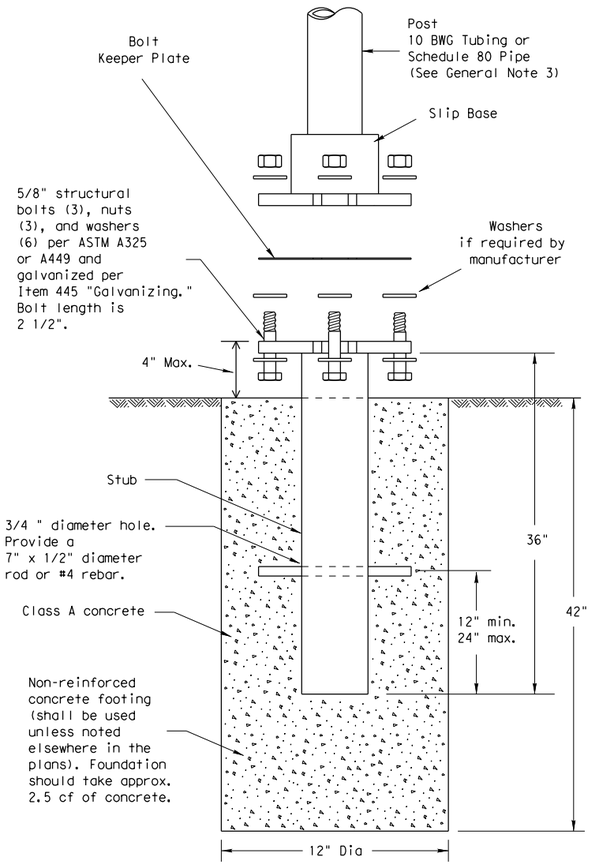
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

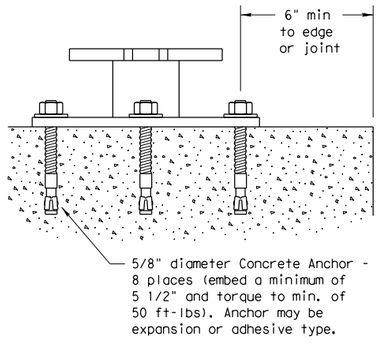
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
1378	01	053	FM1431

DIST	COUNTY	SHEET
AUS	TRAVIS	480

26B

DATE: 4/14/2025 7:19:51 PM
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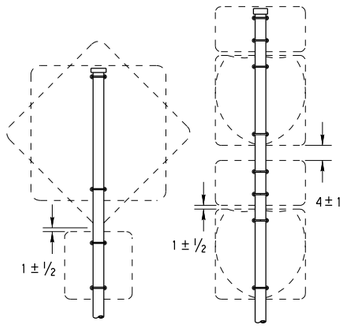
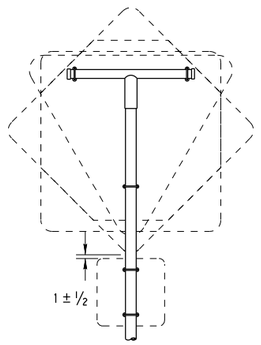


SM RD SGN ASSM TY XXXXX(1)XX(P)



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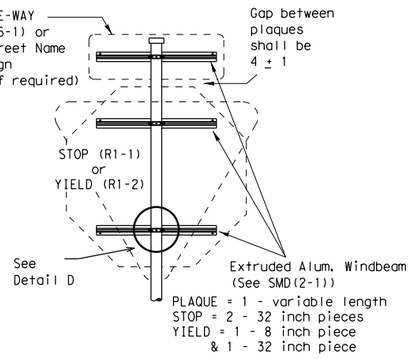
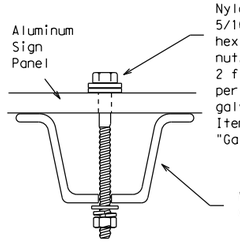
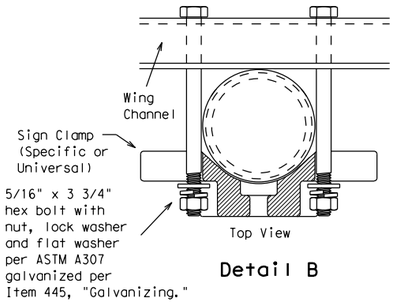


SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



Detail A



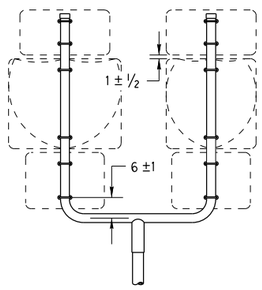
Detail B

GENERAL NOTES:

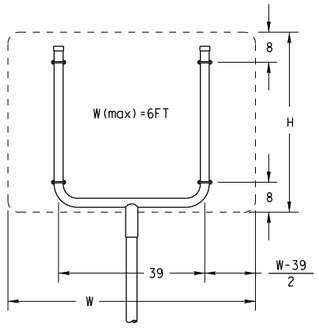
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



SM RD SGN ASSM TY XXXXX(1)XX(U)



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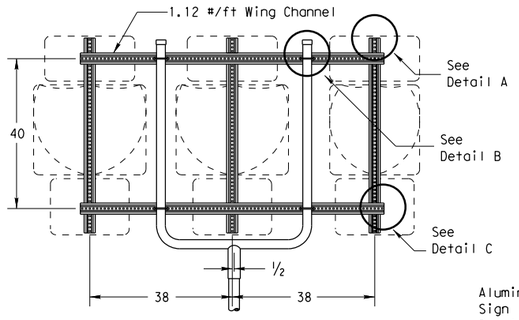
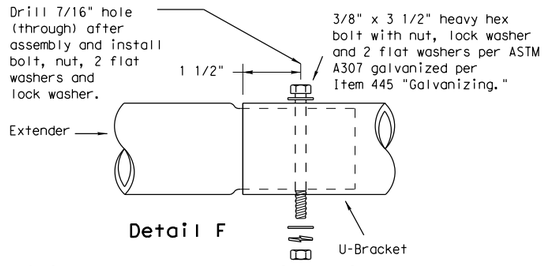
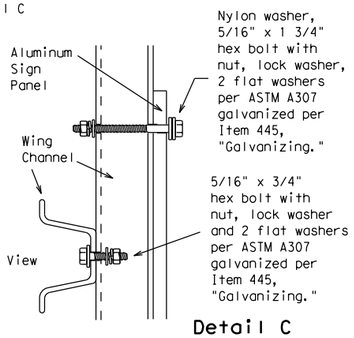


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

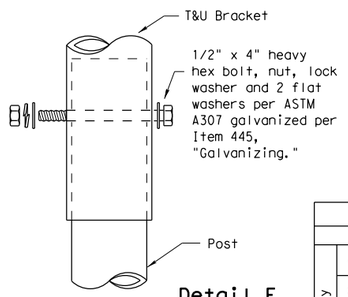


Detail F

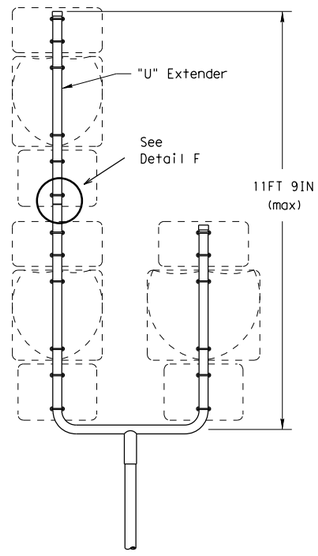
Splices shall only be allowed behind the sign substrate.



Detail C



Detail E



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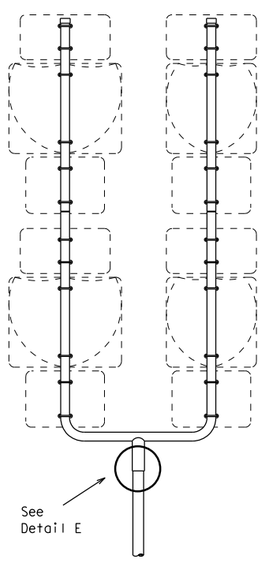

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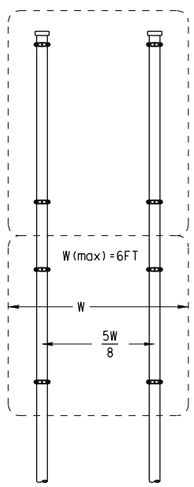
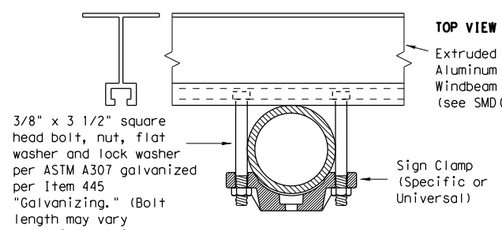
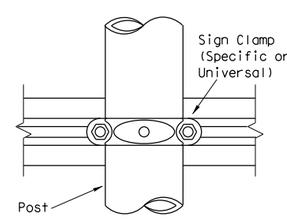


SM RD SGN ASSYM TY XXXXX(2)XX(P)

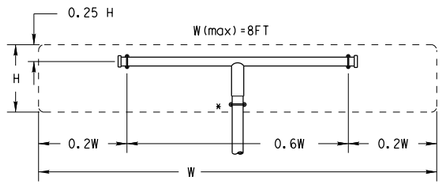
SIDE VIEW



Detail D



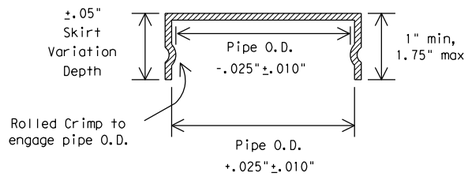
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	1378	01	053	FM1431
	DIST	COUNTY		SHE
	AUS	TRAVIS		481

26C

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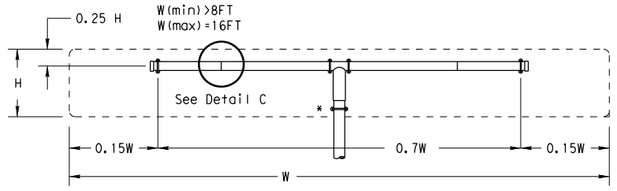
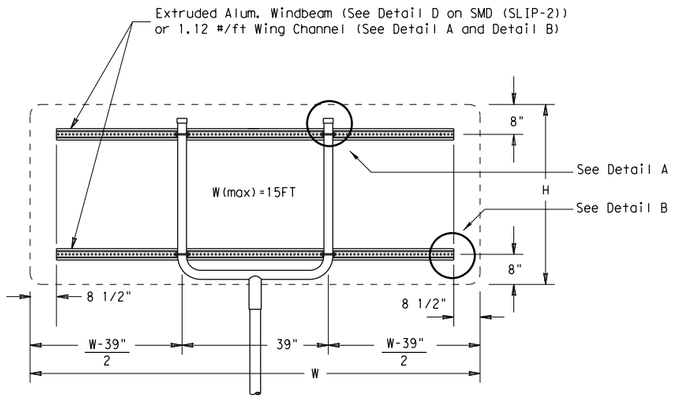
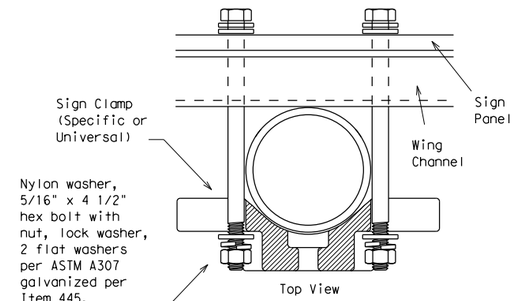


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

(* - See Note 12)



SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



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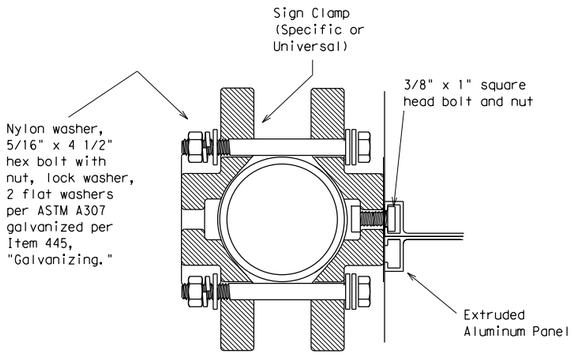
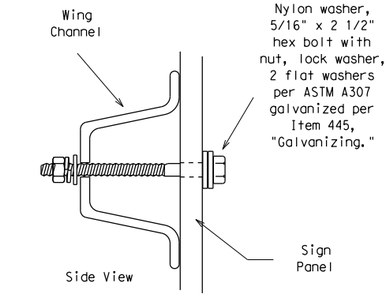
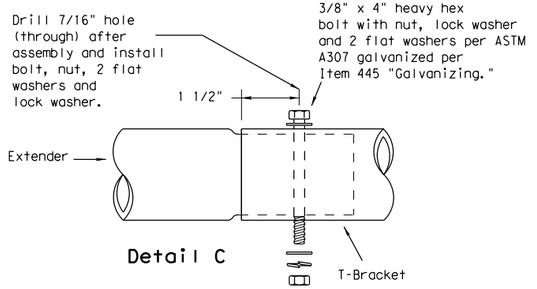


Detail D

EXTRUDED ALUMINUM SIGN WITH T BRACKET

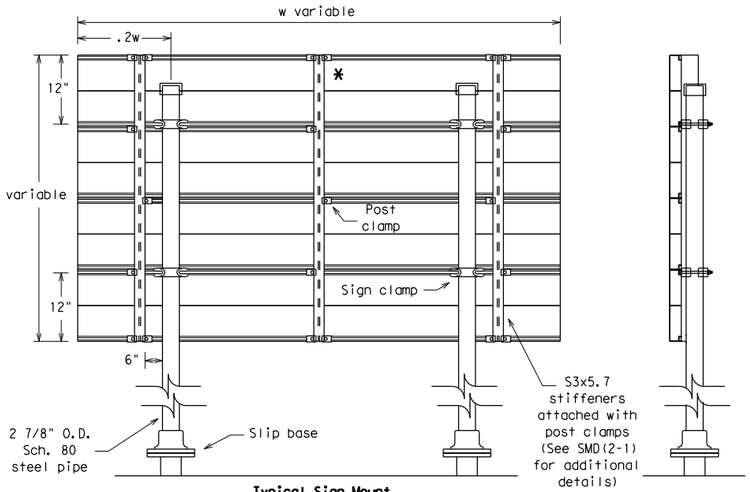


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

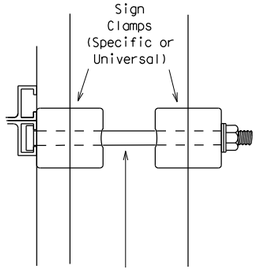


Typical Sign Mount

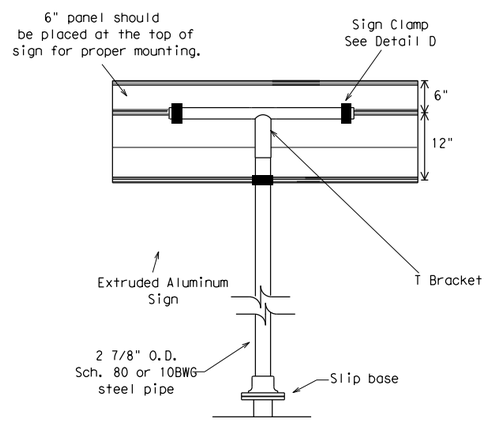
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

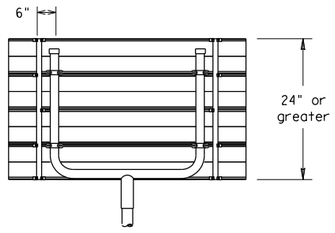
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS

9-08

CONT	SECT	JOB	HIGHWAY
1378	01	053	FM1431

DIST	COUNTY	SHE
AUS	TRAVIS	

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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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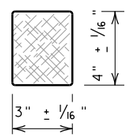
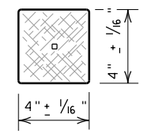
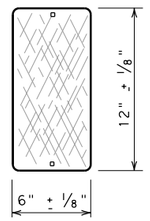
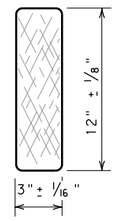
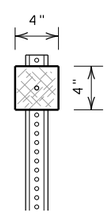
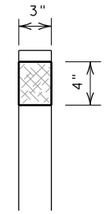
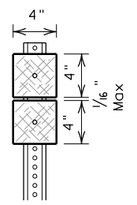
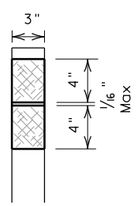
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

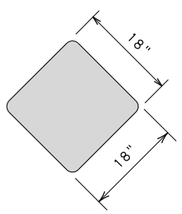
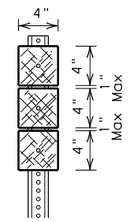
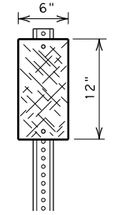
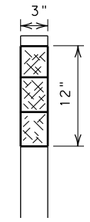
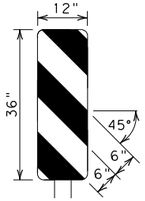
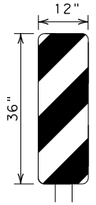
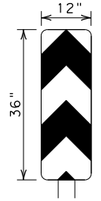
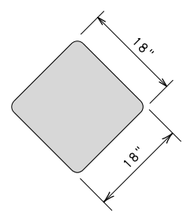
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

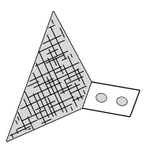
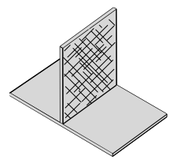
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

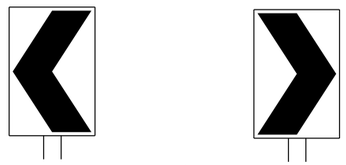
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	1378	01	053	RM 1431
10-09 3-15	DIST	COUNTY		SHE
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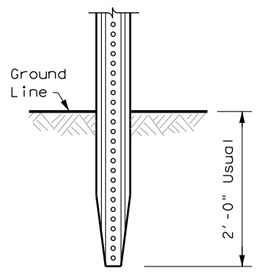
POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

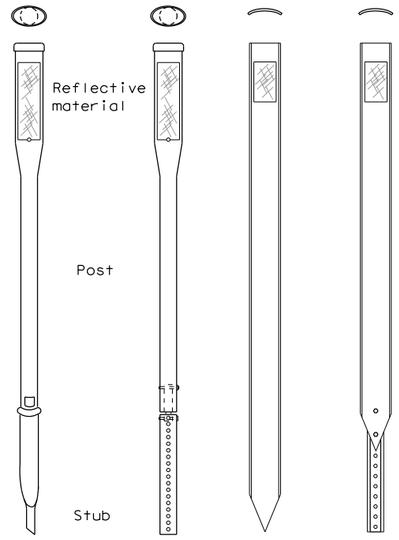


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

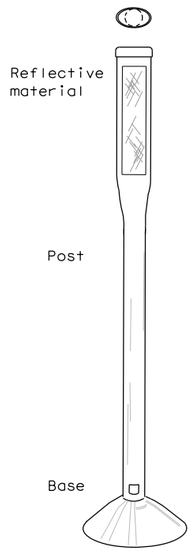
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



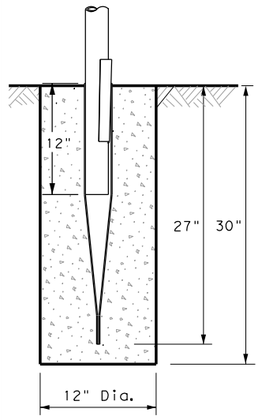
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

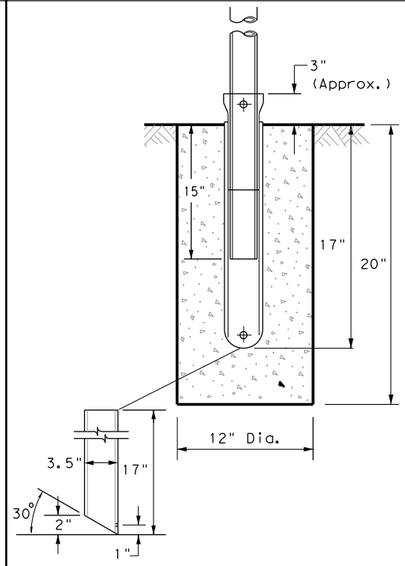
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

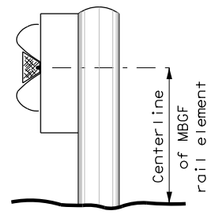
NOTE

1. Install per manufacturer's recommendations.

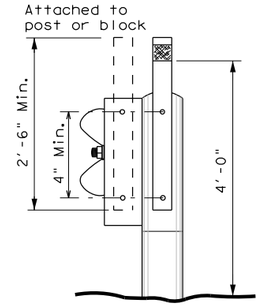
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

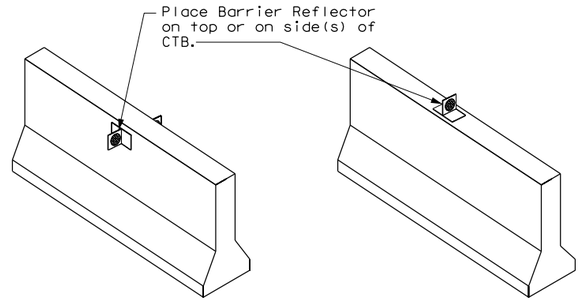
GF1



GF2



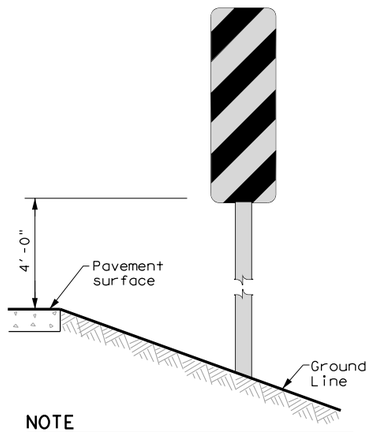
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

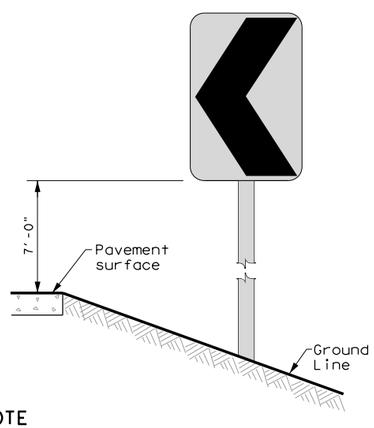
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

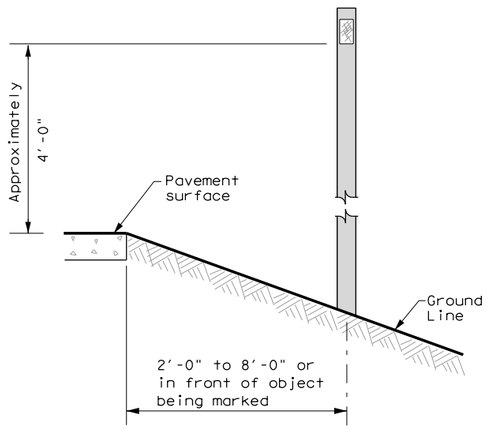
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
10-09 3-15	DIST	COUNTY		SHE
4-10 7-20	AUS	TRAVIS		

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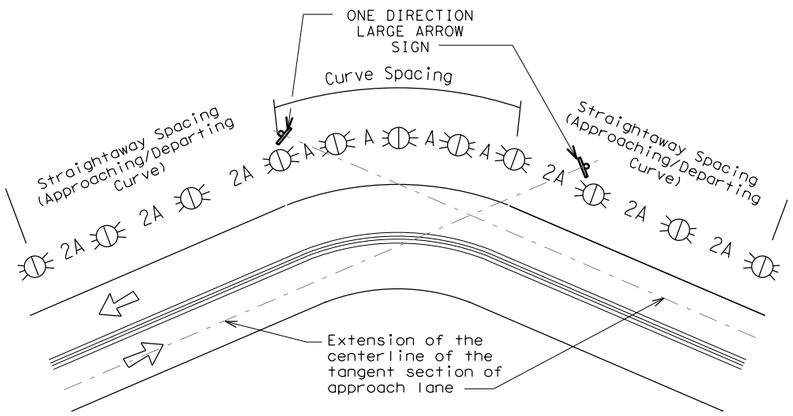
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

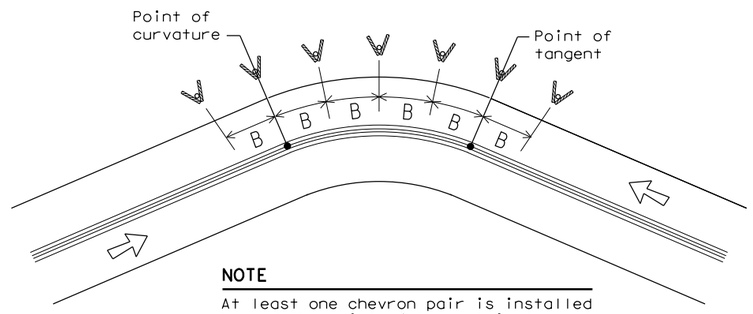
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	——
2	2865	160	320	——
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
3-15 8-15	DIST	COUNTY		SHE
8-15 7-20	AUS	TRAVIS		

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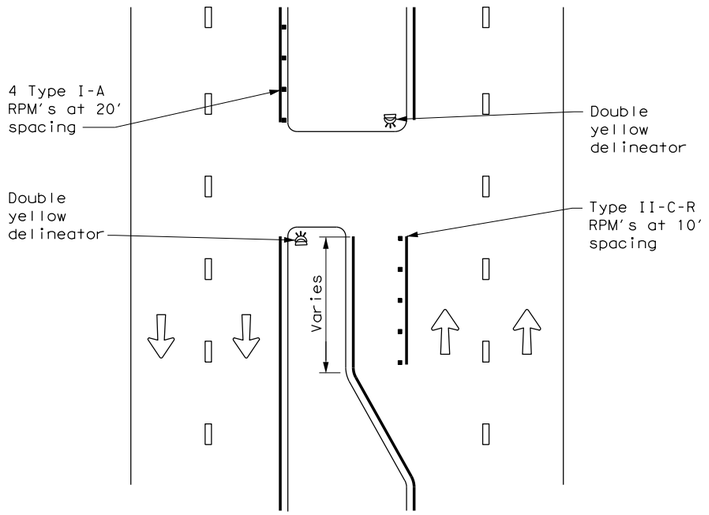
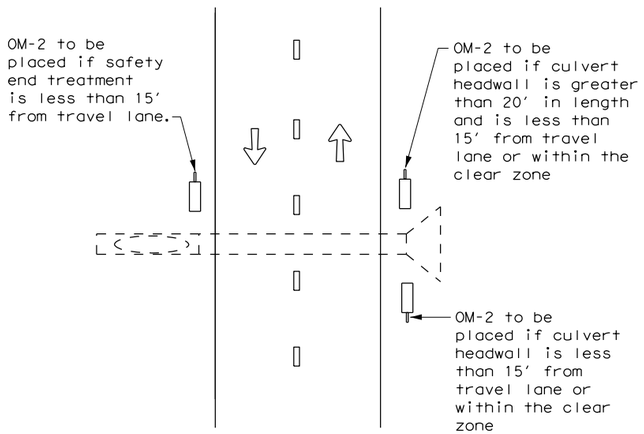
CROSSOVERS



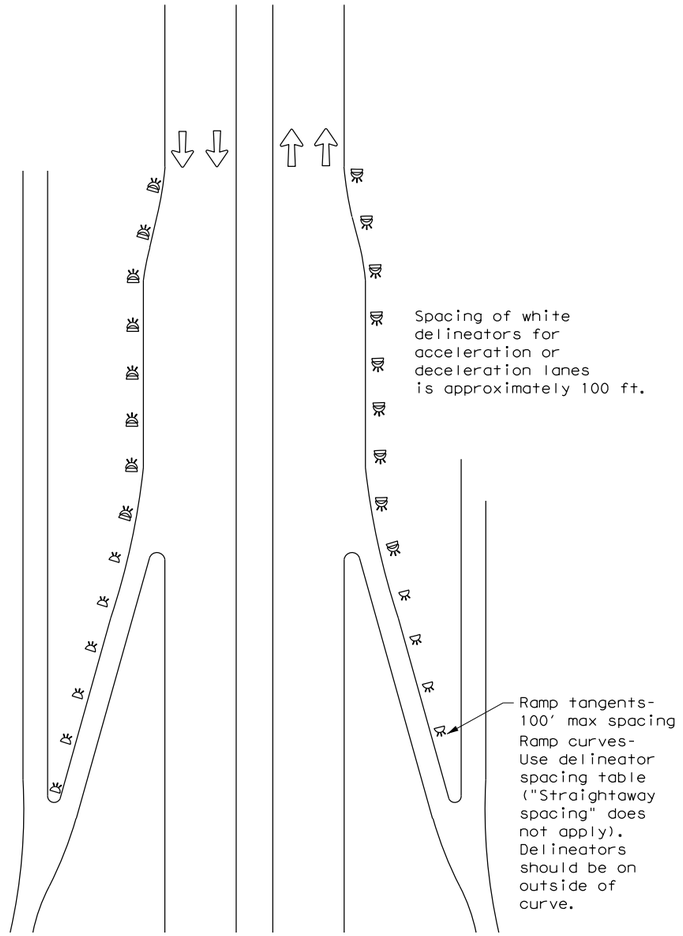
DETAIL 1

FOR CULVERTS WITHOUT MBGF



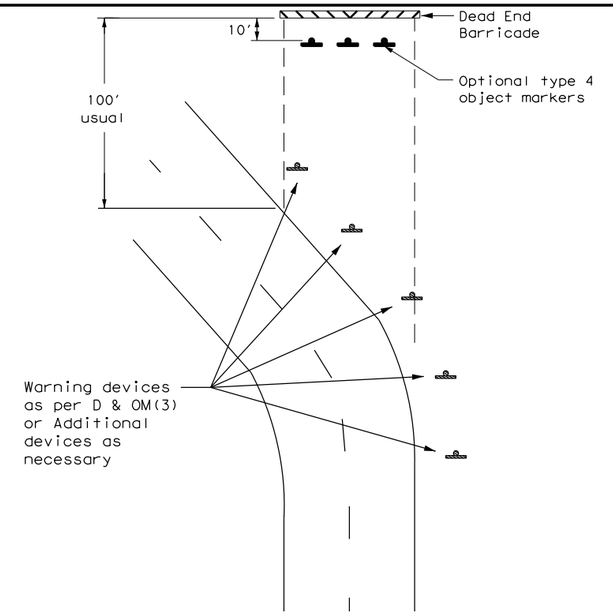
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



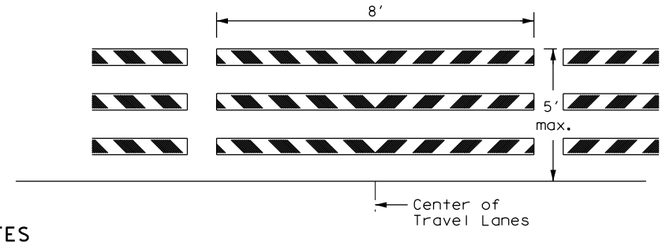
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

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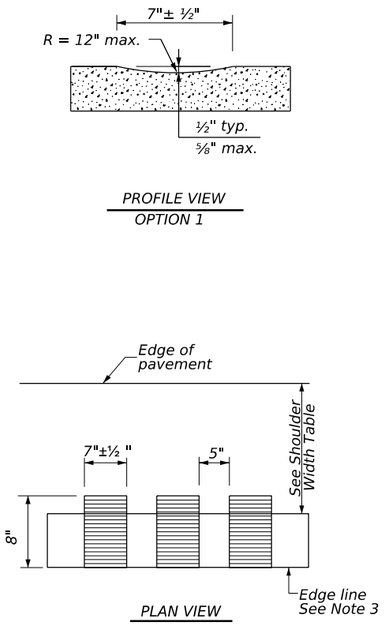
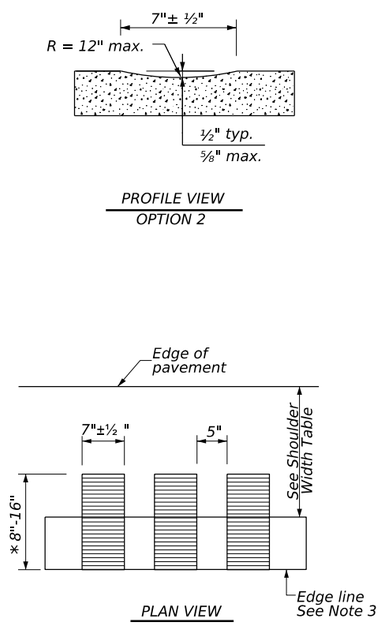


CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



∗ This distance may vary based on width of shoulder

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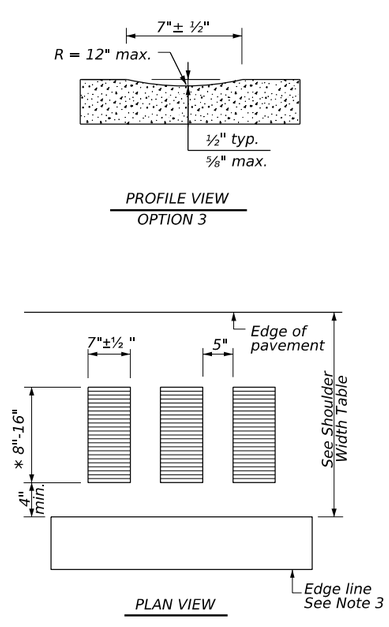

∗ This distance may vary based on width of shoulder

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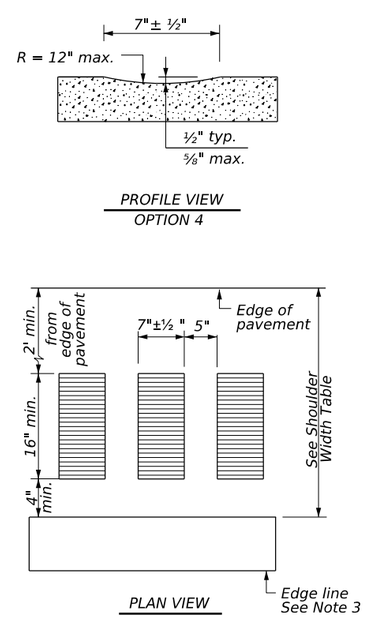

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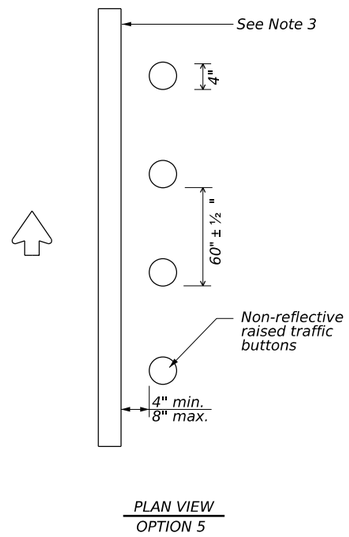
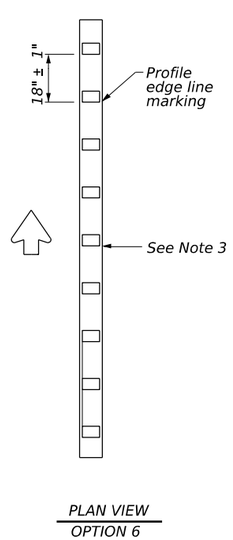
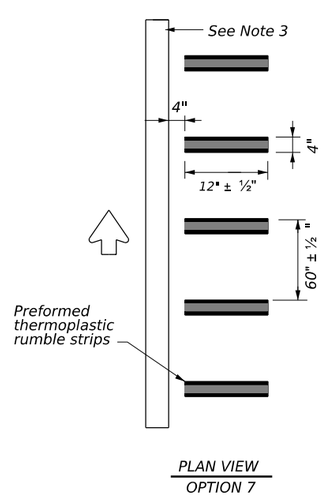


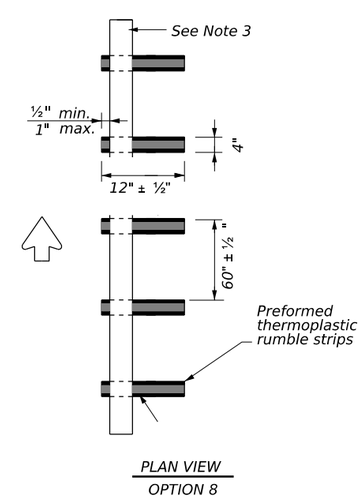
RAISED EDGE LINE (Rumble Strips)



PROFILE EDGE LINE MARKINGS (Rumble Strips)



PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)



PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5, 6 or 8	Option 1, 2, 3 5, 6 or 7	Option 2, 4, 5 6 or 7

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edgeline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble strip.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(2)-23

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© TxDOT	January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS		1378	01	053	FM1431
10-13 1-23		DIST	COUNTY		SHI
		AUS	TRAVIS		

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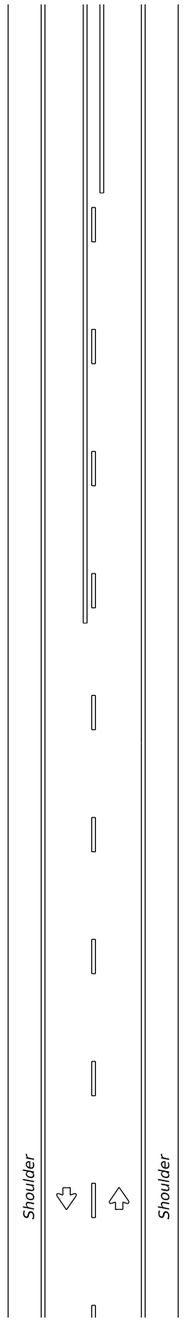
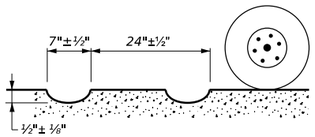
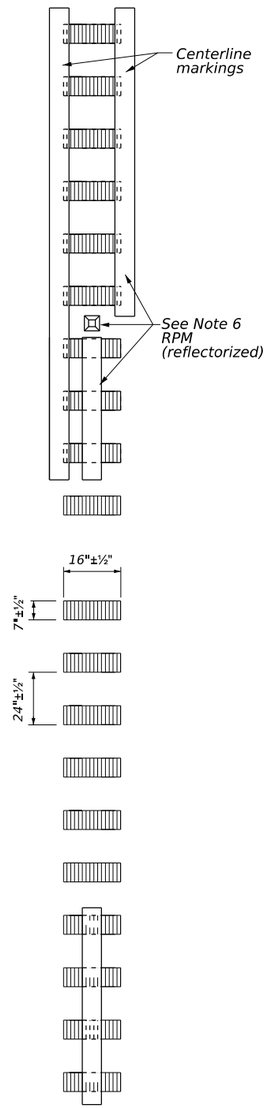
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

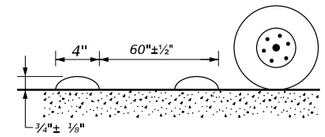


PROFILE VIEW

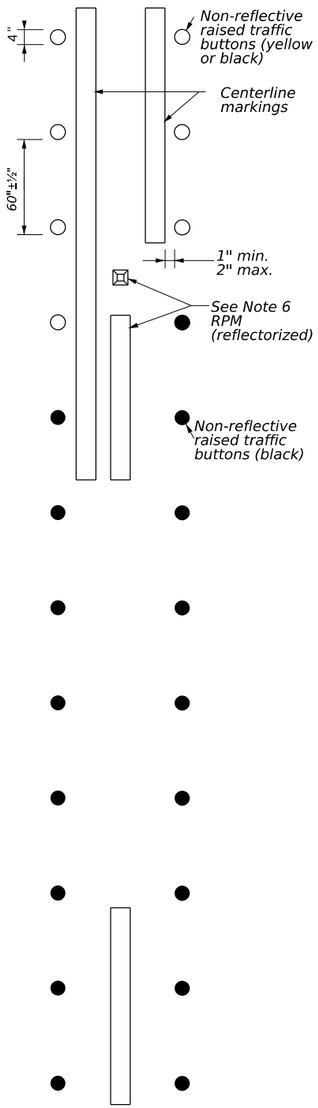


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

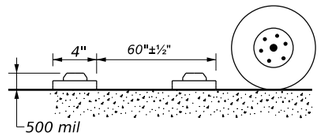


PROFILE VIEW

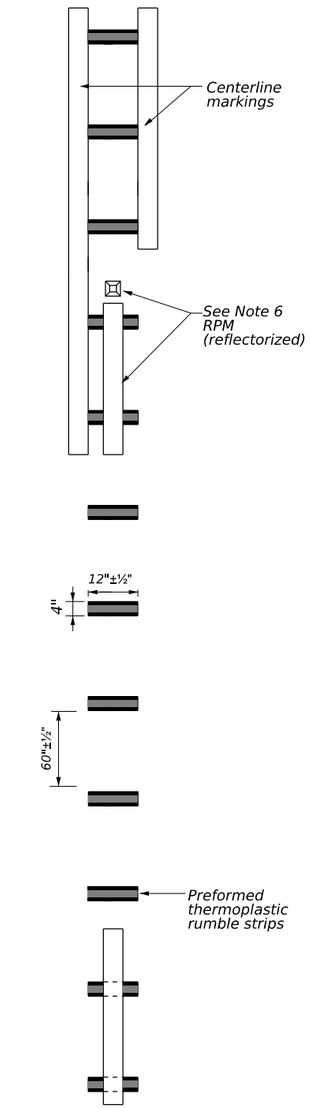


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

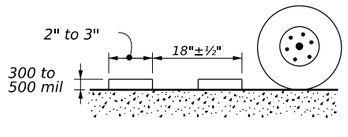


PROFILE VIEW

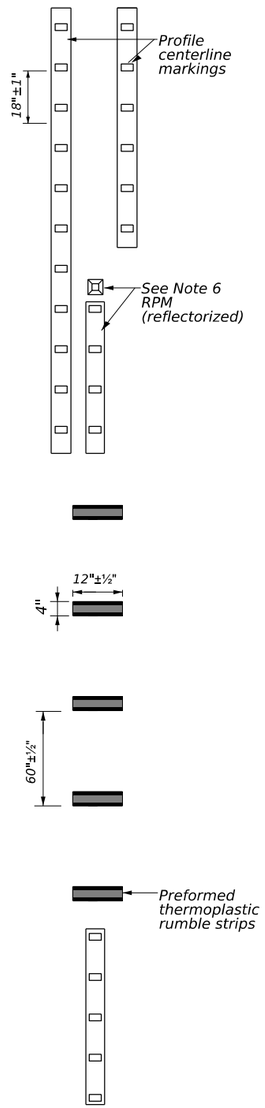


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

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10-13	DIST	COUNTY		SHEET
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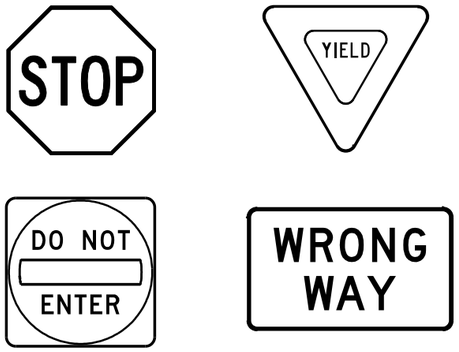
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

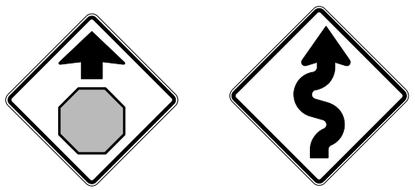
ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

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12-03 7-13	DIST	COUNTY		SHEET
9-08	AUS	TRAVIS		489

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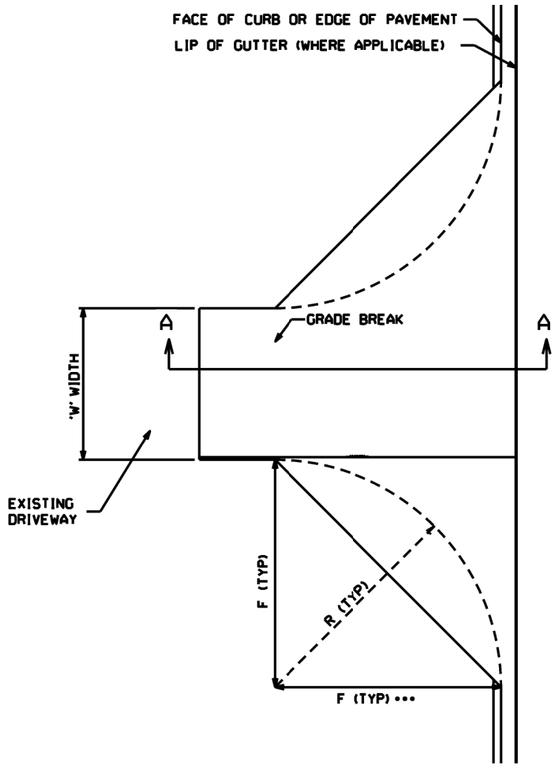


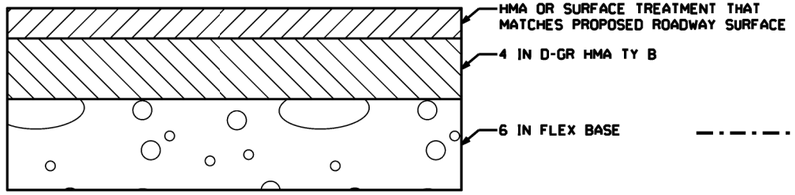
DRIVEWAY PLAN

FLARE OR RADIUS	FARM/RANCH	RESIDENTIAL	COMMERCIAL
"F" OR "R" (FT)	25	25	25

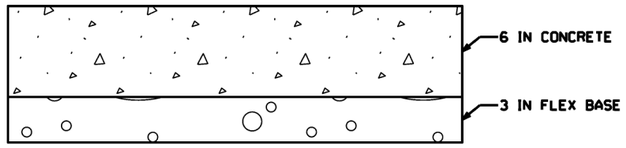
THESE ARE STANDARD DIMENSIONS UNLESS OTHERWISE SHOWN ELSEWHERE ON THE PLANS.

FLARES ARE TYPICALLY USED FOR SUBURBAN/URBAN (CURBED) ROADWAYS. RADII ARE TYPICALLY USED FOR RURAL OR UNCURBED ROADWAYS.

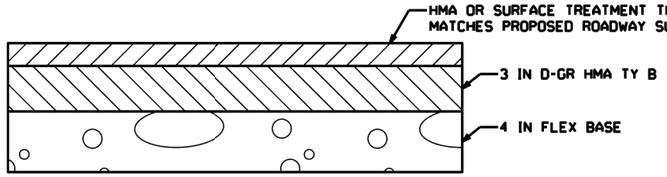
••• THIS 'F' DIMENSION MAY BE REDUCED TO KEEP WORK WITHIN THE ROW.



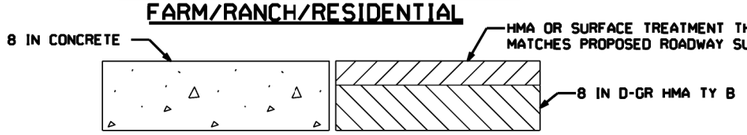
HMA OR SURFACE TREATEMENT - COMMERCIAL



CONCRETE - ALL DRIVEWAY TYPES

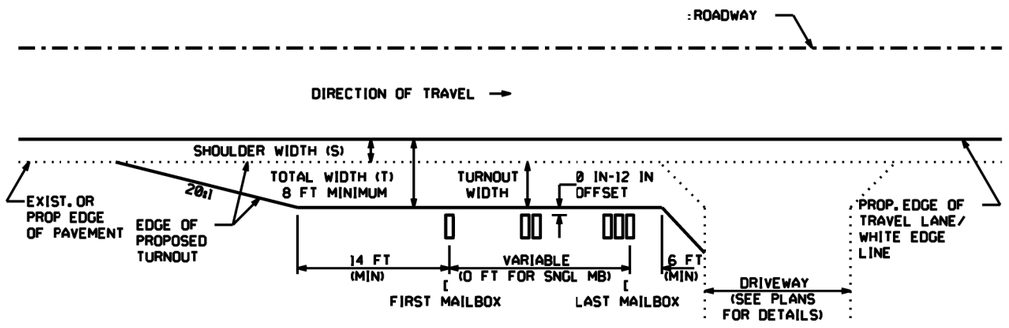


HMA OR SURFACE TREATMENT - FARM/RANCH/RESIDENTIAL

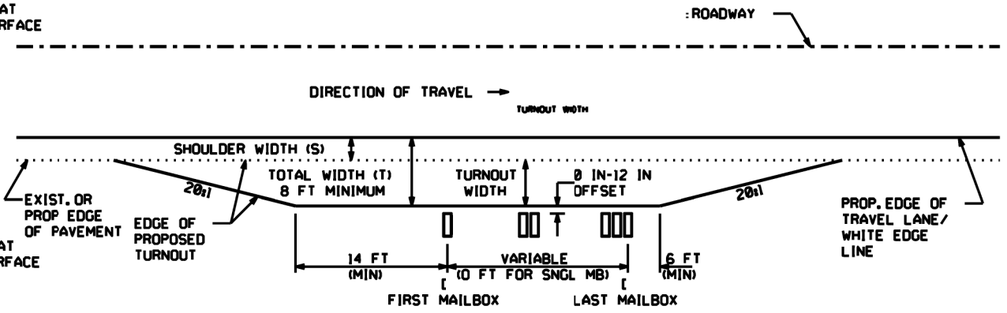


FAST TRACK ACP (TYPE 3) OR CONCRETE

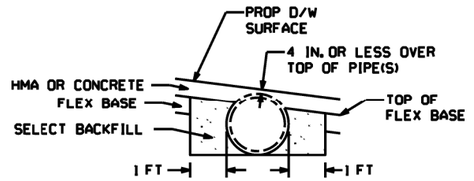
DRIVEWAY AND TURNOUT TYPICAL SECTIONS



MAILBOX TURNOUT PLAN WITH DRIVEWAY

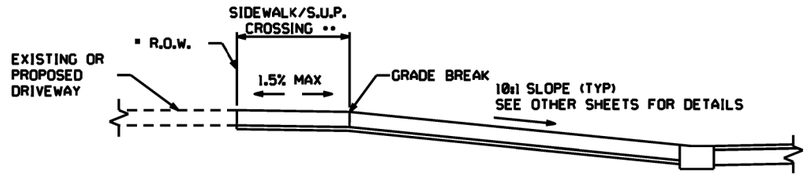


MAILBOX TURNOUT PLAN WITHOUT DRIVEWAY



THIN PIPE COVER DRIVEWAY

•FOR USE WHEN TOP OF PIPE(S) TO D/W SURFACE IS 4 IN. OR LESS
••ONLY ONE PIPE SHOWN FOR CLARITY
•••SELECT BACKFILL MUST BE FLOWABLE FILL, CEMENT TREATED BASE, OR ANY CLASS OF CONCRETE AS DIRECTED BY THE ENGINEER. TO BE PAID USING EXISTING BID ITEMS.



• ACTUAL TIE-IN SHOWN ELSEWHERE IN PLANS OR AS DIRECTED

DRIVEWAY WITH GUTTER SECTION A-A

ENSURE GRADE BREAK DOES NOT EXCEED 8% UNLESS OTHERWISE DIRECTED. PROVIDE ABSOLUTE MINIMUM SIDEWALK CROSSING WIDTH OF 4' FOR DRIVEWAYS WIDTH OF 20' OR LESS

•• LOCATE SIDEWALK CROSSING TO ALIGN WITH ADJACENT SIDEWALK; SIDEWALK/S.U.P. WIDTH AND LOCATION SHOWN ELSEWHERE ON THE PLANS.

GENERAL NOTES

PROVIDE EXPANSION 20 FT C-C FOR WIDTH OR LENGTH OVER 25 FT. EXPANSION JOINT PER AUS STANDARD FOR SIDEWALK (MCPSWMD).

REINFORCEMENT WILL BE IN ACCORDANCE WITH ITEM 432.3.1 USING NO. 3 OR NO. 4 BARS.

FIBER REINFORCEMENT IS NOT ALLOWED. CLASS A CONCRETE IS ALLOWED TO USE COARSE AGGREGATE GRADES 1-8.

IN LIEU OF PFC OR TOM, SURFACE MUST BE 1.5" D-GR HMA TY D. IF SURFACE IS A MULTIPLE COURSE SURFACE TREATEMENT, ALL COURSES MUST BE PLACED ON DRIVEWAY. SURFACE HMA IS PG 76-22. NON SURFACE HMA IS PG 64-22 AND MAY BE BLADE LAID.

FURNISH BASE MEETING THE REQUIREMENTS FOR ANY TYPE OR GRADE IN ACCORDANCE WITH ITEM 247. BASE COMPRESSIVE STRENGTHS ARE WAIVED.

THE BASE UNDER THE CONCRETE MAY BE REPLACED WITH CONCRETE AT A RATIO OF 3 INCHES OF BASE EQUALS 2 INCHES OF CONCRETE.

FAST TRACK DRIVEWAYS MUST BE CLOSED, CONSTRUCTED, AND REOPENED WITHIN 24 HOURS.

IF ROOTS ARE ENCOUNTERED VERIFY WITH THE ENGINEER PRIOR TO ACCOMMODATING OR REMOVING 2 IN. DIAMETER OR LARGER ROOTS. ROOT REMOVAL MUST BE IN ACCORDANCE WITH ITEM 752.4.2. ROOTS MAY REMAIN IN THE BASE. FOR IMPROVEMENTS WITHIN 6 IN. OF A ROOT, THE CONCRETE THICKNESS MAY BE REDUCED BY 1 IN. AND THE BASE INCREASED BY 1 IN. TO MINIMIZE IMPACTS TO THE ROOTS. ADJUST BASE AND SURFACE PROFILE TO PROVIDE A 1 IN. BASE CUSHION AROUND THE ROOTS. THE SURFACE PROFILE MAY BE ADJUSTED TO THE EXTENT ALLOWED BY ADA. THIS WORK IS SUBSIDIARY.

Texas Department of Transportation | Austin District Standard

DRIVEWAYS AND MAILBOX TURNOUTS

DWMB-24 (AUS)

©TxDOT 5 YEARS	CONT	SECT	JOB	HIGHWAY
REVISIONS	1378	01	053	FM1431
01/16: SHEET CREATED 04/19: APPROVED 11/20: TABLE REVISED, GN ADDED, PLAN & PROFILE MODIFIED 01/22: ADDED TURNOUT INFO 01/24: THIN PIPE DETAIL REVISED	DIST	COUNTY		SHEET
	AUS	TRAVIS		490

DATE: 4/14/2025 7:20:41 PM
DATE: $DATE$ $TIME$
FILE: $FILE$

AGENDA ITEM NO. 7b

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Eric DeLaCruz, Finance

SUBJECT: Discussion and possible action regarding the award of RFQ 25-06 for Engineering Design of WTP#3 Upgrade to 6.0 MGD, to Walker Partners; and authorizing the City Manager to negotiate and execute an agreement for such services.

BACKGROUND: The City published a Request for Qualifications for Engineering Design of Water Treatment Plant #3 (WTP3) Upgrade to 6.0 MGD on March 27, 2025, with a closing date May 1, 2025 at 1:00 PM CST. The selected firm will be tasked with expanding the plants capacity. That same firm will be responsible for engineering design, obtaining necessary permits from the Texas Commission on Environmental Quality (TCEQ), bidding the project, and construction management.

FINDINGS: There were 7 firms that submitted a proposal: Baxter &Woodman, Enprotec / Hibbs & Todd, Oller Engineering, Schaumburg & Polk, TRC, WTC, and Walker Partners. A scoring committee was created to score the proposers which consisted of City Staff, and Councilor Saum. Walker Partners achieved the highest average scoring based on the grading criteria. For professional services, the City is required to award and negotiate contract to the most highly qualified provider. City Staff recommends awarding RFQ 25-06 to Walker Partners and authorize the City Manager to negotiate and execute an agreement for such services.

FINANCIAL IMPACT: The Engineering Design for WTP Upgrade is budgeted in the CIP using CO Bonds.

ATTACHMENTS:
RFQ 25-06 Scoring Sheet Summary.pdf
RFQ 25-06 Evaluation Scoring Sheet VIctor Manzano.pdf
RFQ 25-06 Evaluation Scoring Sheet Councilor Saum.pdf
Copy of RFQ 25-06 Evaluation Scoring Sheet Curtis Jeffrey.pdf
RFQ 25-06 Evaluation Scoring Sheet Eric De La Cruz.pdf
3-00938 - Lago Vista - SOQ_WTP Imp_AJM.pdf

RFQ 25-06 WTP Upgrade
RFQ Evaluation Scoring Sheet

Reviewer	Firms						
	B&W	EHT	Oller	Schaumburg Polk Inc	TRC	Walker Partners	WTC
Eric De La Cruz	61	72	46	85	47	88	45
Victor Manzano	60	64	45	75	47	96	34
Curtis Jeffrey	70	80	43	73	55	100	65
Councillor Shane Saum	96	88	78	79	88	84	81
Average Score	**72**	**76**	**53**	**78**	**59**	**92**	**56**

Scores in Order

Place	Firm	Combined Average Score
1	Walker Partners	92
2	Schaumburg & Polk, Inc.	78
3	Enprotec / Hibbs & Todd, Inc.	76
4	BAXTER & WOODMAN, INC.	72
5	TRC	59
6	WTC	56
7	Oller Engineering, INC.	53

RFQ 25-06 WTP Upgrade
RFQ Evaluation Scoring Sheet

Reviewer: _____

Evaluation Criteria		Max Points	Firms						
			B&W	EHT	Oller	Schaumburg Polk Inc	TRC	Walker Partners	WTC
Qualifications		30	25	22	23	23	23	28	20
Experience (Broad)		20	17	18	18	15	15	18	10
Experience (Regional)		10	10	2	2	5	7	10	2
Trident Experience		10	8	2	2	2	2	10	2
References		30	0	20	0	30	0	30	0
Sub Total (References Not Included)			60	44	45	45	47	66	34
Total		**100**	**60**	**64**	**45**	**75**	**47**	**96**	**34**

RFQ 25-06 WTP Upgrade
RFQ Evaluation Scoring Sheet

Reviewer: ____Shane_____

Evaluation Criteria		Max Points	Firms						
			B&W	EHT	Oller	Schaumburg Polk Inc	TRC	Walker Partners	WTC
Qualifications		30	29	28	26	26	28	25	27
Experience (Broad)		20	18	17	15	16	18	14	16
Experience (Regional)		10	10	9	7	6	8	10	7
Trident Experience		10	10	6	5	5	6	10	5
References		30	29	28	25	26	28	25	26
Reference Names									
Sub Total (References Not Included)			67	60	53	53	60	59	55
Total		**100**	**96**	**88**	**78**	**79**	**88**	**84**	**81**

RFQ 25-06 WTP Upgrade
RFQ Evaluation Scoring Sheet

Reviewer: _____Curtis Jefferey _____

Evaluation Criteria		Max Points	Firms						
			B&W	EHT	Oller	Schaumburg Polk Inc	TRC	Walker Partners	WTC
Qualifications		30	30	30	30	20	30	30	30
Experience (Broad)		20	20	20	10	20	20	20	20
Experience (Regional)		10	10	5	3	3	5	10	10
Trident Experience		10	10	5	0	0	0	10	5
References		30	0	20	0	30	0	30	0
Reference Names			No Callback	Missouri City	No Callback	City of Gladewater	Granite Shoals	Lakeway MUD	No Callback
Sub Total (References Not Included)			70	60	43	43	55	70	65
Total		**100**	**70**	**80**	**43**	**73**	**55**	**100**	**65**

RFQ 25-06 WTP Upgrade
RFQ Evaluation Scoring Sheet

Reviewer: ___Eric De La Cruz_____

Evaluation Criteria		Max Points	Firms						
[redacted]			B&W	EHT	Oller	Schaumburg Polk Inc	TRC	Walker Partners	WTC
Qualifications		30	23	25	25	24	25	23	26
Experience (Broad)		20	18	18	15	15	13	15	12
Experience (Regional)		10	10	6	5	9	6	10	5
Trident Experience		10	10	3	1	7	3	10	2
References		30	0	20	0	30	0	30	0
Sub Total (References Not Included)			61	52	46	55	47	58	45
Total		**100**	**61**	**72**	**46**	**85**	**47**	**88**	**45**

CITY OF
LAGO VISTA
TEXAS







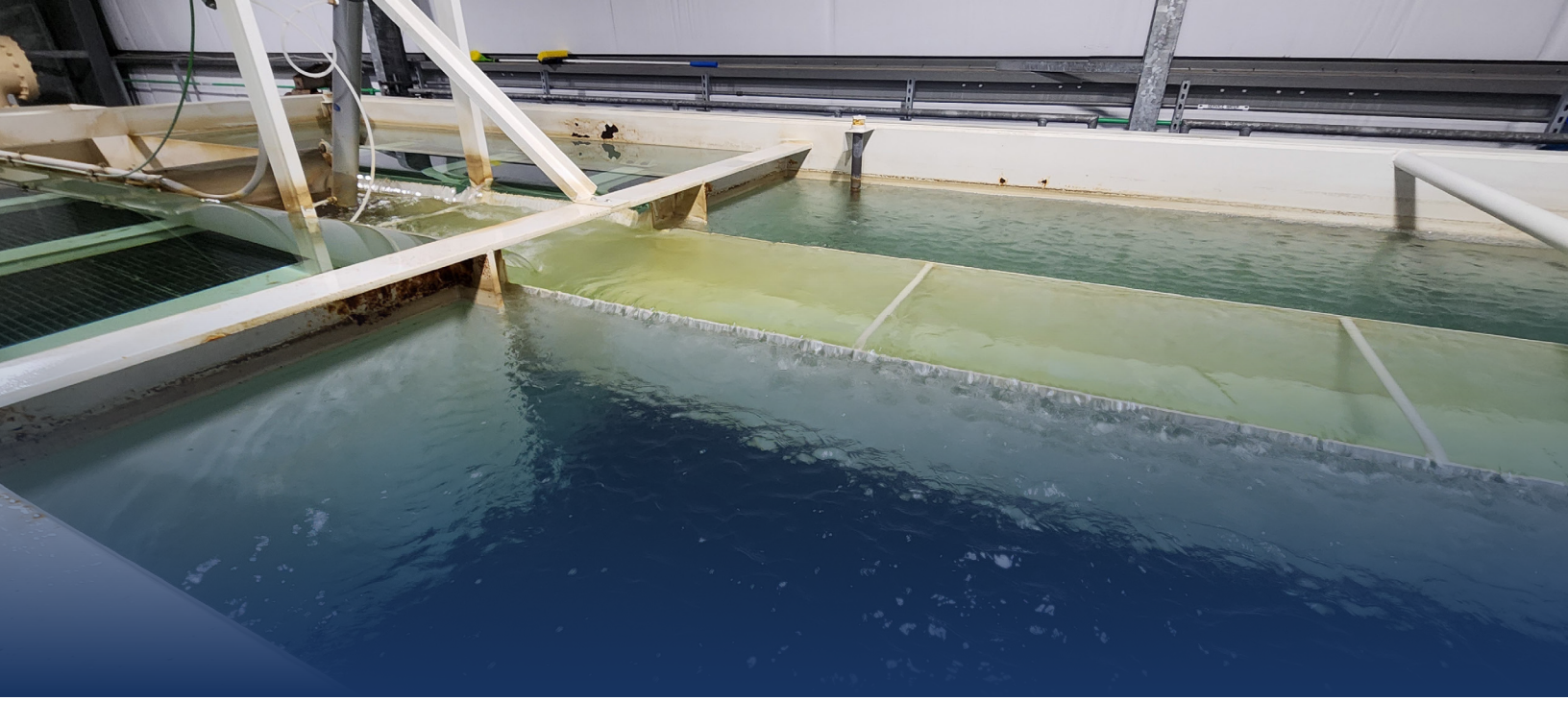
CITY OF LAGO VISTA

Engineering Design of WTP #3 Upgrade to 6.0 MGD
RFQ Number: 25-06

Statement of Qualifications • May 1, 2025

Walker Partners

TBPE Registration No. 8053
TBPLS Registration No. 10032500



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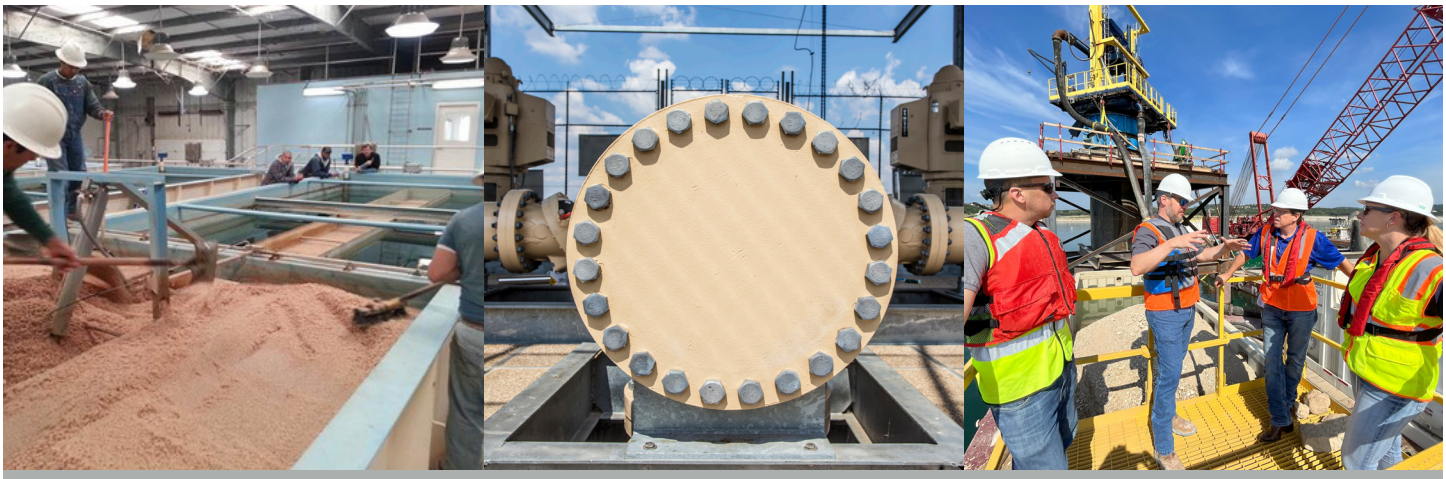


Your proposed Project Manager, Jason Christensen visits some of the 10+ projects he has designed on Lake Travis over the last 24 years.

Walker Partners

6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730

May 1, 2025

City of Lago Vista
5803 Thunderbird Street
Lago Vista, TX 78645

RE: RFQ No. 25-06 - Engineering Design of WTP #3 Upgrade to 6.0 MGD

Dear Selection Committee:

Managing a water system in Central Texas has become increasingly complex due to multiple factors including rising demand, drought, aging infrastructure, limited water supply, workforce shortages, escalating costs, and complex regulations. In response, the City has taken a proactive approach by investing in strategic capital improvement projects to strengthen and expand its water infrastructure.

The proposed project will expand the City's Water Treatment Plant #3 (WTP #3) and associated pump stations from 2 to 6 million gallons per day (MGD). While technologies like floating intakes and Microfloc Trident package treatment units are common on Lake Travis, they remain relatively uncommon across the State, making specialized experience with these systems essential.

Walker Partners is uniquely qualified to deliver this project. Our senior engineers have designed 113 MGD of treatment capacity and nearly 200 MGD of raw water pumping capacity on Lake Travis. Project Manager Jason Christensen and Principal Aaron Archer have direct experience with the existing floating intake and were involved in preliminary design of WTP #3 in 2013. We are confident that our depth of experience on Lake Travis will bring meaningful value to the City in the following ways:

COST EFFECTIVE, Seamless Design with NO Learning Curve

Our team's recent design of all key components for this Project means our expertise and familiarity with the intricacies of this Project are unparalleled. By selecting our team, the City will benefit from our comprehensive understanding of the engineering and permitting requirements, ensuring a best-value design that is delivered both efficiently and accurately.

INNOVATIVE SOLUTIONS to Minimize Risk and Cost

Our Team will implement straightforward, proven solutions while also exploring innovative strategy design to reduce risk, shorten schedule, and lower costs for the City. By combining trusted methods with forward-thinking approaches, we will deliver cost-effective, technically sound solutions that prioritize both operability and long-term reliability.

EXPERIENCED LEADERSHIP You Can Trust

Unlike many competitors, our locally-based leadership team, led by Project Manager Jason Christensen, consists of technical experts with specialized knowledge in the key elements of this project. We do not delegate critical design work to engineers in other cities or states. Our hands-on, in-depth expertise ensures real-time communication and collaboration, driving the project forward efficiently with prompt responses and minimizing unnecessary design iterations – ultimately saving the City both time and money while improving quality.

We share your passion and commitment to the success of this Project and pledge to provide you with our Team's best talents on this Project. Thank you for considering Walker Partners, and please feel encouraged to contact Jason (512-382-0021 / jchristensen@walkerpartners.com) if you have any questions about our proposal or need additional information to support your selection process.

Sincerely,

Jason Christensen, PE
Project Manager

Aaron Archer, PE
Project Principal

1 | COMPANY PROFILE

CITY OF LAGO VISTA

RFQ NO. 25-06

COMPANY PROFILE

FIRM OVERVIEW

Walker Partners was founded with a clear vision: to build lasting partnerships by delivering high-quality engineering solutions through the expertise of top-tier professionals. Since our inception 20 years ago, that vision has guided our growth and success.

Rooted in a commitment to quality and client satisfaction, Walker Partners has expanded to five locations across Texas - Austin, Waco, Bryan/College Station, Killeen, and Fort Worth. Today, our team is 100 strong and includes 33 Professional Engineers, 3 Registered Professional Land Surveyors, 4 survey crews, and 10 Resident Project Representatives. We're also supported by a talented group of CAD technicians, Engineers-in-Training, Administrative Professionals, and Accountants who work collaboratively to deliver exceptional service and results.

At Walker Partners, we believe that great projects start with great people - and we're proud to offer the City of Lago Vista an experienced, responsive, and fully committed team to support the City in the following ways.

BUILDING YOUR LEGACY

As a Texas-based, Texas-owned firm we are committed to strengthening the communities that we call home. Our seasoned engineers and surveyors help find the **RIGHT solution for your community to prosper now and for future generations.**

It's easy to showcase the marquee projects, but we believe the real backbone of a city lies in the essential infrastructure happening behind the scenes. They lay a foundation so that you can keep moving forward, keep building ahead. **As you anticipate the needs of your community, we're here as your "extension of staff."**

COST EFFECTIVE DESIGNS

With rising costs and tight budgets, our recent experience designing all key project components positions us to deliver a cost-effective, accurate solution for the City.

INNOVATIVE SOLUTIONS

We prioritize innovation by exploring forward-thinking strategies that reduce risk, save time, and cut costs - while grounding our approach in proven methods to ensure reliable, long-term performance.

EXPERIENCED LEADERSHIP

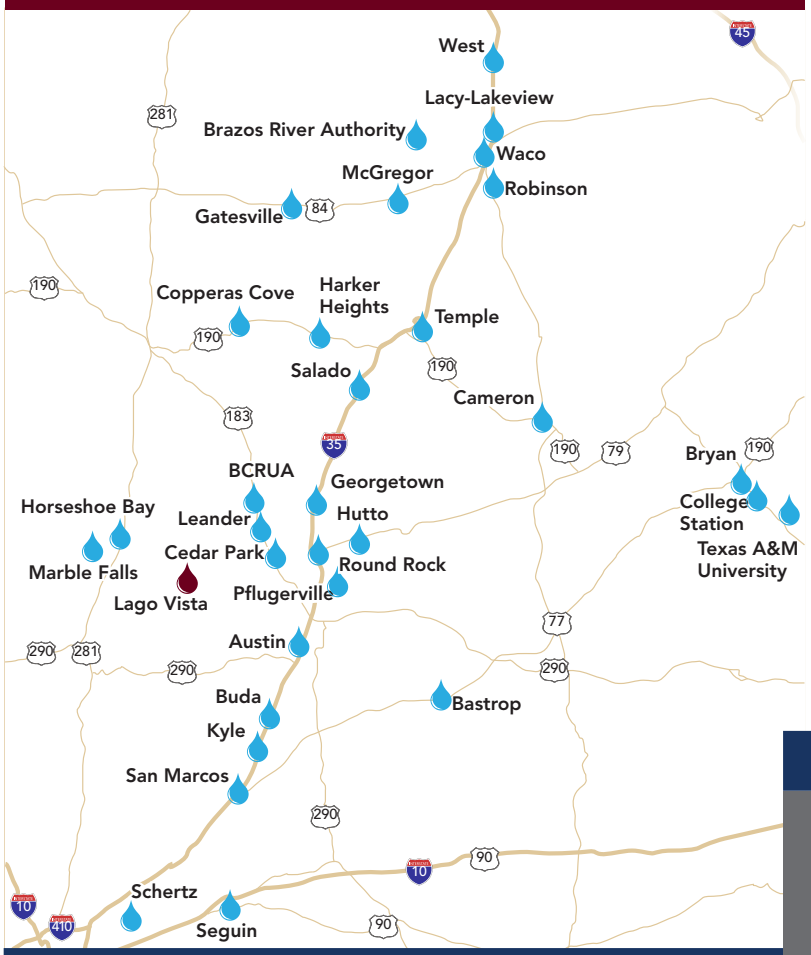
Our locally based experts stay directly involved in every detail - no outsourcing, no delays. This streamlined, collaborative approach keeps the project moving efficiently and cost-effectively.



"Brushy Creek Regional Utility Authority has partnered with Walker Partners to tackle the next step in our regional project for the Cities of Cedar Park, Round Rock, and Leander. Their staff knows how to communicate with and balance the needs of BCRUA partner cities, and has the experience and professional integrity necessary to deliver the best quality and value for the utility."

— Tom Gallier, Former General Manager
Brushy Creek Regional Utility Authority

DECADES OF PROVEN EXPERIENCE AROUND CENTRAL TEXAS



OUR RELEVANT PROJECT EXPERIENCE

Providing reliable water service is the foundation of every successful and growing community. Water providers must balance serving existing customers while responsibly planning for future growth.

Our Team has played a key role in helping many municipalities, water supply corporations, and regional water providers around Central Texas to responsibly plan, expand, repair, rehabilitate and maintain their infrastructure. We are proud of the work that we do.

This map shows a sampling of the communities and entities for which we have successfully studied, planned, designed, and/or provided construction administration for important water resource projects. A majority of these entities have trusted us as their partner for many years to find the RIGHT solution at the RIGHT value for their specific needs.

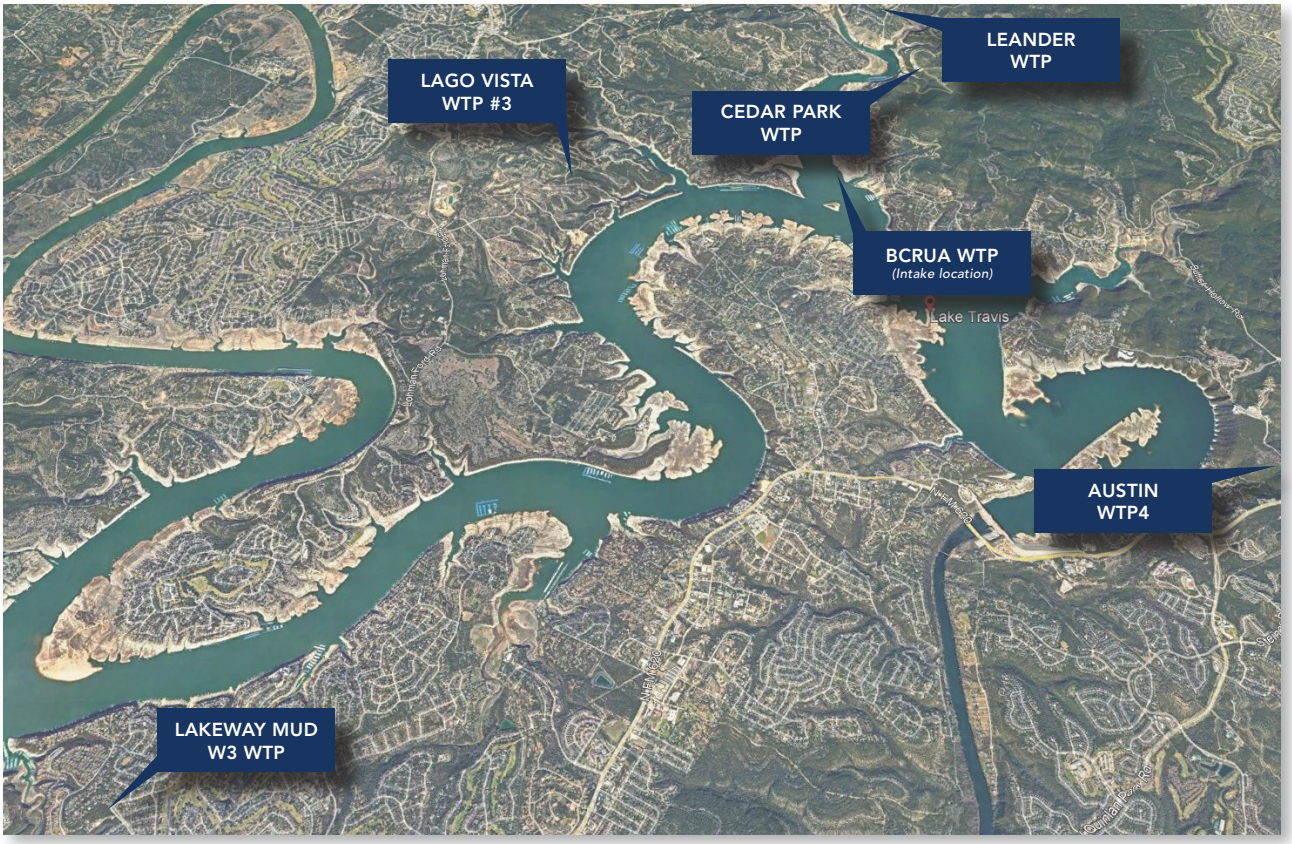
		PUMP STATIONS		PIPELINES			WTP	STORAGE TANKS	ADDITIONAL SERVICES			
OWNER	PROJECT	CAPACITY (MGD)	FLOATING INTAKE	DIAMETER (IN)	LENGTH (MILES)	TUNNEL/TRENCHLESS	WATER TREATMENT PLANT DESIGN	CAPACITY (MG)	SURVEY/EASEMENT ACQUISITION	PUBLIC ENGAGEMENT	COST ESTIMATING	PERMITTING
City of Cedar Park, TX	WTP Improvements	26	✓	33	4		✓	26	✓	✓	✓	✓
Brushy Creek Regional Utility Authority, TX	Phase 2 Water System	145		78-96	2.0	✓	✓	6.0	✓	✓	✓	✓
Brushy Creek Regional Utility Authority, TX	Phase 1 Water System	42	✓	36-78	5.0	✓	✓	2.0	✓		✓	✓
Cities of Cedar Park & Leander, TX	Drought Contingency Project	30	✓	42	1.0	✓			✓	✓	✓	✓
Lakeway MUD, TX	Phase 2A WTP Expansion			16	0.1		✓	7.9			✓	✓
Brazos River Authority, TX	Belhouse Drought Preparedness	33		48	6.5	✓		0.25	✓	✓	✓	✓
City of Leander, TX	Hero Way West EST and Water Lines			16-24	4.1	✓		1.25	✓	✓	✓	✓
Schertz Seguin LGC, TX	Water System Improvements, Phase 1			16-20	7	✓	✓	2 & 5.6	✓	✓	✓	✓
Schertz Seguin LGC, TX	Water System Improvements, Phase 2	8		36	17.8	✓	✓	2.0	✓	✓	✓	✓
Alliance Regional Water Authority, TX	Phase 1B WTP and Segment E	20.5		36	8.5	✓	✓	2.0	✓	✓	✓	✓
Alliance Regional Water Authority, TX**	Phase 1A Segment A	8		24	2.0	✓			✓		✓	✓
Brushy Creek MUD, TX**	Brushy Creek Water Facility	8		24	7.0	✓	✓	8.0	✓	✓	✓	✓
Salado WSC, TX	Sanctuary & Spring Creek Pump Stations	6		18	2			1.1	✓	✓	✓	✓
City of Georgetown, TX	Berry Creek Interceptor			36-48	4.5	✓			✓	✓	✓	✓
City of Waco, TX	Riverside WTP to Gholson GST Transmission Main & PS	20		30	4.1	✓			✓	✓	✓	✓
City of Waco, TX	Pressure Planes 4 & 6 Water System Improvements			24	3.3	✓			✓		✓	✓
City of West, TX**	West to Waco Water Transmission Main	1		16	11.0	✓			✓	✓	✓	✓
City of West, TX	Elevated Storage Tank, Well, Pump Station, WTP Imp.			12			✓	0.15	✓	✓	✓	✓
City of Hewitt, TX	Water Well, GST, and Pump Station	4.3		24				1.0	✓	✓	✓	✓
City of Robinson, TX	Water Treatment Plant Improvements and EST			13			✓	1.0	✓	✓	✓	✓

** Completed by key team members while at a previous firm

EXPERIENCE ON LAKE TRAVIS

Experience matters – especially when it directly aligns with a project's specific requirements. Our key team members have worked on most of the major WTPs on Lake Travis as shown on the map below. Many of these systems, such as Cedar Park and Lakeway MUD, utilize treatment and conveyance systems identical to WTP #3. This depth of experience benefits the City in the following ways.

1. **ACCELERATED PROJECT DELIVERY** *through rapid identification of optimal design approaches.*
2. **ENHANCED DESIGN QUALITY** *through applied knowledge from past projects.*
3. **ECONOMICAL PROJECT DELIVERY** *resulting from efficient work planning that minimizes rework.*
4. **STREAMLINED PERMITTING** *that anticipates and addresses regulatory issues.*













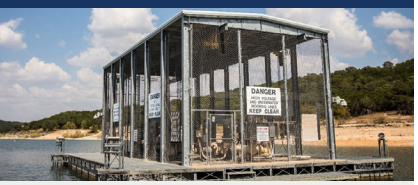
WATER TREATMENT PLANT UPGRADES

CLIENT CONTACT
Kenneth Wheeler, PE
Assistant Director of Public Works - Utilities
512.401.5584

CONSTRUCTION COST
$20M (multiple projects)

COMPLETION DATE
2007 - ongoing

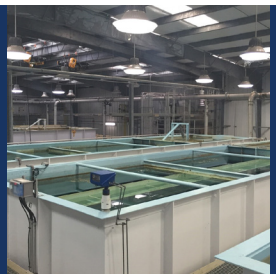
RELEVANCE TO LAGO VISTA



- Extensive design experience with Trident Microfloc units
- Raw water and finished water pumping improvements
- Water treatment optimization to meet regulatory requirements



Upgrades to the high service pump station have increased reliability and mitigated surge impacts.



Multiple improvements projects have increased capacity to 26 MGD using 10 Trident units.

CITY OF CEDAR PARK
Cedar Park, TX

Proposed Project Manager, Jason Christensen, and Project Principal, Aaron Archer, have designed multiple construction projects to incrementally increase the capacity and reliability of the Cedar Park WTP over the last 20 years. **These projects have included improvements to the floating raw water intake and piping, improvements to the Trident package treatment units (including replacement of AC media, replacement of air piping, recoating, rerating, etc.), improvements to chemical feed systems, upgrades to the water recovery system, metal building rehabilitations, and clearwell and high service pump station improvements.**

Due to ongoing drought conditions, Jason and Aaron also designed a new 30 MGD floating intake and one mile underwater pipeline that provides a drought contingency solution thereby reducing vulnerability to drought conditions in Lake Travis. This emergency raw water supply system is currently being recommissioned in response to ongoing drought conditions.

To support all of these projects, our key staff have also provided survey, easement acquisition support and expert witness testimony services as well as transient analysis, disinfection byproduct formation potential studies, corrosion studies, zebra mussel control, water modeling, permitting, and bid and construction phase services. **Walker Partners is continuing to support the City of Cedar Park through expansions to the BCRUA system (Cedar Park is part of a three city partnership in this system) and additional treatment upgrades and rehabilitation activities at the WTP.**



PHASE 2 WATER TREATMENT PLANT EXPANSION

CLIENT CONTACT
Earl Foster, MBA
General Manager
512.261.6222 x140

CONSTRUCTION COST
$13.9M (estimated)

COMPLETION DATE
2027



Significant improvements are being made to the water recovery facilities to accommodate increased backwash flows.



Two new Trident Microfloc trains are being added to increase treatment capacity.

LAKEWAY MUNICIPAL UTILITY DISTRICT

Lakeway, TX

Similar to Lago Vista and Cedar Park, Lakeway MUD operates a floating raw water intake and package WTP utilizing Trident Microfloc units. The WTP also includes a much older solids contact clarifier that is used seldomly due to high maintenance requirements. Lakeway MUD retained Walker Partners to assist in the expansion of the WTP including the addition of two new Trident units to increase capacity to 7.86 MGD. The project also contemplates the future addition of another Trident Microfloc train to increase the rated capacity of the WTP to 10.48 MGD.

A major challenge for this expansion is handling the increased backwash flows from the new treatment units. The existing backwash facilities are too small to handle the increased flows from clarifier flushes and filter backwashing. After carefully studying the project requirements and existing infrastructure, Walker Partners developed an innovative approach to repurpose the existing solids contact clarifier to supplement the existing recovery water return facilities thereby eliminating the need to construct an additional recovery water storage tank. All flushing, backwash waste, and filter-to-waste water will be directed to one of the existing recovery tanks. Recovery water will be pumped from this tank to the repurposed solids contact clarifier for additional treatment with the clarified effluent being pumped to the head of the plant. Sludge from the recovery tank and solids contact clarifier will be sent to the other existing recovery tank for disposal. **These improvements will save significant money by repurposing existing equipment in lieu of constructing new infrastructure on a site with space limitations.**

The project also includes the construction of a new fabricated metal building to accommodate the new Trident units as well as chemical feed system, site piping, and pumping improvements and coordination with Pedernales Electric Cooperative.

RELEVANCE TO LAGO VISTA



- Use of Trident Microfloc treatment technology
- Innovative solutions to minimize costs associated with water recovery facilities
- Identical permitting requirements and PEC coordination



PHASES 1 & 2 REGIONAL WATER SYSTEM

CLIENT CONTACT
Sam Roberts, PE
General Manager
512.799.4526

CONSTRUCTION COST
$400M (multiple projects)

COMPLETION DATE
2020 - 2028 (multiple projects)



The 9,000 LF, 12 ft diameter intake tunnel conveys water from the Phase 2 intake to the 145 MGD pump station.



Walker Partner has designed the last three WTP expansions for BCRUA increasing capacity to 64 MGD.

BRUSHY CREEK REGIONAL UTILITY AUTHORITY

Lake Travis, TX

BCRUA is a multi-phase comprehensive water supply system developed by Cedar Park, Round Rock, and Leander. **Walker Partners has designed multiple projects for BCRUA totaling over $400 million with Jason Christensen serving as the Engineer of Record for most of these projects.**

The cornerstone of these projects is the Phase 2 Raw Water Delivery System consisting of a multi-level deep intake in Lake Travis, 12,000 LF of deep tunnels, and a 145 MGD pump station. The pump station includes complex hydraulic and control design to convey water to three different WTPs. Construction of the Phase 2 project will be completed in Spring 2027 at a cost of $225 million and will replace the **40 MGD floating intake** also designed by Walker Partners as a temporary pumping solution.

Walker Partners has also designed three expansions to the WTP in Cedar Park to increase capacity from 17 MGD to 64 MGD. The WTP expansion projects have included upgrades and improvements to associated systems including raw water storage, chemical feed systems, disinfection, clearwell storage, and high service pumping. In addition to design phase services, Walker Partners also provided bid and construction phase support including construction observation services with our in-house resident project representatives (RPRs). Considerable stakeholder coordination, public involvement, and state, local, and federal permitting was also completed on time to avoid schedule slippage of these critical projects.

RELEVANCE TO LAGO VISTA



- Extensive coordination with city officials, stakeholders, and regulatory agencies
- Floating raw water intake design
- On time, under budget delivery of multiple water projects in close proximity to Lago Vista



WATER SYSTEM IMPROVEMENTS

CLIENT CONTACT
Andrew McBride
General Manager
832.386.2567

CONSTRUCTION COST
$60M (Guadalupe projects)

COMPLETION DATE
2025 (multiple projects)



Vertical turbine high service pump station.



Our Team designed the plant to be expanded with minimal construction impacts.

SCHERTZ SEGUIN LOCAL GOVERNMENT CORPORATION

Gonzales and Guadalupe, TX

At the turn of the twenty-first century, the Cities of Schertz and Seguin were facing the challenge of a rapidly growing population plagued by inadequate water supplies. In the spirit of regionalism and cooperation, the two Cities formed the Schertz Seguin Local Government Corporation (SSLGC) to solve the water shortage problem together in a more cost-effective way. SSLGC is a regional wholesale water supply system. SSLGC selected Walker Partners to guide them through planning and designing the expansion of their initial water well field system in Gonzales County and future water supply in Guadalupe County as well as treating and transporting water for San Antonio Water System (SAWS).

In Phase 1 of this system expansion, Walker Partners designed four (4) 1,500 gpm Carrizo groundwater wells and 30,000 linear feet (LF) of collection pipelines in Gonzales County to increase well field production to 20,000 acre-feet annually. **The water treatment facility was also expanded from a capacity of 12 to 24 MGD.** To satisfy peak conditions, Walker Partners also designed additional storage facilities including a 4.6 million gallon (MG) storage tank, two (2) - 2 MG storage tanks, and a 2 MG surge tank.

Walker Partners subsequently designed a new 14 MGD treatment facility as well as a new **26 MGD booster pump facility with two (2) 2,500 HP pumps** to transport water for SAWS through existing SSLGC pipelines. New cathodic protection was also installed on 120,000 LF of 30" and 42" pipelines designed by others.

For Phase 2, Walker Partners designed the Guadalupe well field treatment and transmission system. This project is under construction and funded by a $66M loan under the Texas Water Development Board SWIFT program. The well field consists of eight (8) 500 gpm wells (in both the Carrizo and Wilcox Aquifers) and a new well collection system tied to a **new 6 MGD water treatment plant.** The project includes 99,000 LF of new 36-inch pipeline from 150 psi to 250 psi to transport additional water to the I-35 corridor.

RELEVANCE TO LAGO VISTA



- The SSLGC Guadalupe WTP is similar in size (6 MGD expandable to 10 MGD)
- Similar to the Lago Vista WTP, SSLGC treatment units are in a building so air movement is important for moisture and corrosion control
- Solids removal is designed for vacuum trucks

2 | PROJECT TEAM

CITY OF LAGO VISTA

RFQ NO. 25-06

PROJECT TEAM

We've assembled an exceptional team of highly qualified professionals who bring a deep bench of technical expertise and hands-on experience to the table. Our Team is committed to providing responsive, solutions-focused service and maintaining clear, proactive communication throughout the project to ensure alignment with the City's goals and expectations.

Many of our key personnel have worked extensively with the City of Lago Vista and surrounding communities, forging strong, lasting relationships built on trust, consistent performance, and a proven track record of excellence. These longstanding connections underscore our commitment to understanding local priorities and delivering results that align with your vision.

The organizational chart below highlights the key personnel who will lead this project. The following section provides a summary overview of our team and the Appendix includes detailed resumes for each team member to further demonstrate the depth and relevance of their experience.

WHAT SETS THE WALKER PARTNERS TEAM APART?

- Specialized expertise in Trident package treatment units around Lake Travis.
- In-depth knowledge of floating raw water intakes, vertical turbine pumps, and marine-grade electrical conductor design.
- Experts in TCEQ permitting including CT study updates and capacity variances.
- Experience designing cost-effective recovery water handling solutions to minimize costs and improve operations.
- No learning curve - leveraging institutional knowledge for a best-value design.

POINT OF CONTACT

Jason Christensen, PE | Project Manager
jchristensen@walkerpartners.com

Walker Partners, LLC
6504 Bridge Point Parkway, Ste. 200
Austin, TX 78730
512.382.0021

OUR TEAM

[1] **Walker Partners, LLC**
[2] **McKim & Creed, Inc.**
[3] **Encotech Engineering Consultants, Inc.**
[4] **FGMA, Inc.**
[5] **Holt Engineering, Inc.**

CITY OF LAGO VISTA TEXAS

PROJECT MANAGER
Jason Christensen, PE [1]

PROJECT PRINCIPAL
Aaron Archer, PE [1]

QA /QC
Roger Noack, PE [1]

WTP EXPANSION
Joe Jenkins, PE [1]

PUMPING DESIGN
Justin Scarth, PE [1]

PERMITTING
David Smith, PE, CFM [1]

SUPPORT TEAM

GEOTECHNICAL
Travis Bryant, PE [5]

ELECTRICAL / I&C
Brian Pearce, PE [2]

SITE CIVIL
Jared Niermann, PE [1]

STRUCTURAL
Rachel Maldomado, PE [3]

CONSTRUCTION ADMINISTRATION
Jason Christensen, PE [1]

ARCHITECTURAL
Jaime Paloma, AIA [4]

RESIDENT PROJECT REPRESENTATION
Matt Rudloff [1]

SURVEYING
Marty Polk, RPLS [1]

COST ESTIMATING
Joerg Moser [1]

PROJECT MANAGER'S EXPERIENCE

JASON CHRISTENSEN, PE

Project Manager



24 YRS EXPERIENCE ON LAKE TRAVIS

+

$500M PROJECT TOTAL CONSTRUCTED COST

"I am committed to delivering exceptional service and technically sound solutions to the City of Lago Vista - on time, on budget, and always with the City's vision at the forefront."

In addition to partnering with the City of Lago Vista on the 2016 WWTP expansion, Jason's recent experience on similar projects and understanding of your system will provide Lago Vista innovative, cost-saving solutions and on-time delivery. Jason has consistently demonstrated the ability to deliver complicated projects by taking ownership of the project, providing practical engineering solutions, and effectively communicating with the Client throughout the life of the project. The project list below summarizes some of Jason's extensive experience.



- 2007 WTP Improvements
- 2013 WTP Improvements
- 2016 WTP Improvements
- WTP Capacity Re-Rate
- Drought Contingency Project



- Phase 1B Capacity Re-Rate
- Phase 1C WTP Expansion
- Phase 1D WTP Expansion
- Phase 2 Raw Water Delivery System
- Phase 2A WTP Expansion
- Zebra Mussel Control



- 2016 WWTP Improvements
- TLAP Renewal



- Phase 2 WTP Expansion
- Zebra Mussel Control

SUBCONSULTANTS

The subconsultants that are an integral part of our Team are shown below. **The City of Lago Vista will greatly benefit from this Team because we have successfully worked together on several large projects.** We trust each other, respect each others capabilities, and know how to seamlessly communicate and share information and documents. No learning curve or "getting to know you" phase is necessary with our Team. We are already fully integrated and engaged on your Project.





Walker Partners and Encotech are working together on a City of Austin Project to upgrade a dewatering building for expansion and to repair and mitigate corrosion which includes new roofing and building walls.



Walker Partners, Encotech and FGMA are working as a team to upgrade and expand the City of Gatesville Stillhouse Hollow WWTP. This includes the replacement of a pump station and associated electrical building and equipment.



Working with Walker Partners, McKim and Creed is upgrading and standardizing the BCRUA SCADA System.

McKIM&CREED
ENGINEERS SURVEYORS PLANNERS

McKim and Creed's specialties include instrumentation and controls and electrical engineering and design services for the energy, transportation, federal, land development, water and building markets.

ENCOTECH
We shape the world you live in.

Encotech Engineering Consultants is a boutique engineering firm specializing in Structural, Mechanical, Electrical, and Plumbing Engineering, Commissioning, and Third-party QA/QC services.

fgma

FGMA is a leading planner and designer of facilities for municipal and public safety clients. FGMA's qualifications include a depth of consulting and design experience including space utilization, existing conditions evaluations, additions, renovations, adaptive reuse projects and new construction.

HOLT ENGINEERING, INC.
Geotechnical Engineering & Materials Testing

Holt Engineering is fully qualified to provide geotechnical engineering and materials testing and inspection services.

3 | PROJECT APPROACH

CITY OF LAGO VISTA

RFQ NO. 25-06

PROJECT APPROACH

PROJECT UNDERSTANDING

WTP #3 utilizes a Microfloc Trident high-rate, contact clarification-filtration package treatment unit, which is a conventional treatment process condensed into a modular steel tank. These package treatment units have a factory rated capacity of 2 MGD. Other major components of the treatment system include a raw water intake barge (RWIB) on Lake Travis; approximately 5,000 linear feet (LF) 18-inch HDPE raw water (RW) transmission main from the lake to the WTP site; 28,000 gallon RW head tank; chemical feed facilities; filtered water transfer pump station; two nominal 240,000 gallon clearwells; finished water (FW) high service pump station; approximately 9,500 LF 12-inch FW transmission main from the WTP site to Lohman Ford Rd.; backwash system comprised of low pressure air (LPA) blowers and a backwash pump station; solids handling facilities including a 300,000 gallon backwash water lagoon and decant pump station; and emergency generator. Chemical storage and metering facilities include aluminum chlorohydrate (ACH) and polymer for coagulation, and gas chlorine and liquid ammonium sulfate (LAS) for disinfection. The WTP also has a copper sulfate feed system for algae control, which is not used.

The following sections and the Site Plan Drawing below (Figure 1) describe the major components of the proposed expansion, as well as other proposed improvements and alternatives.

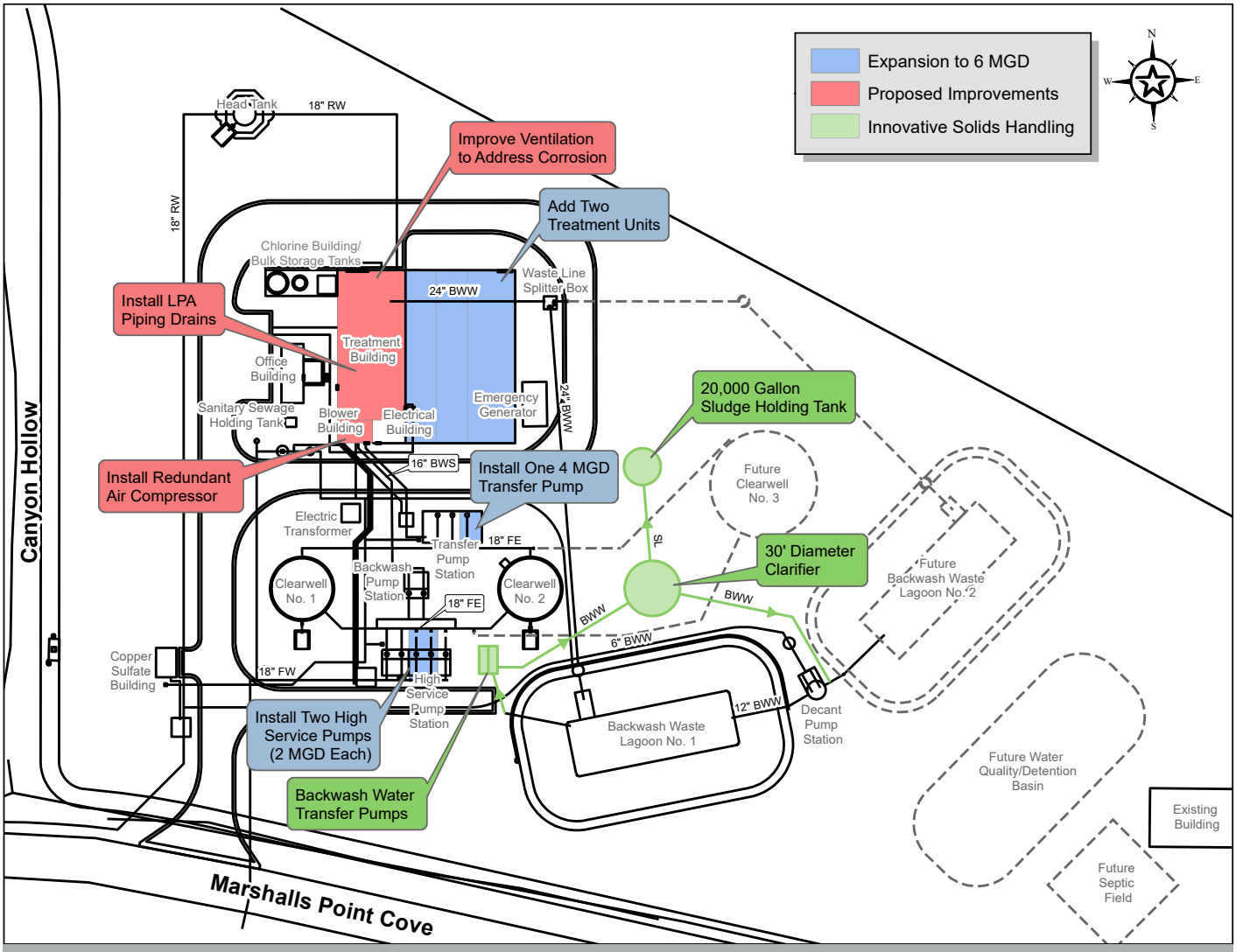


FIGURE 1 - PROPOSED SITE PLAN

WATER TREATMENT PLANT #3 EXPANSION

WTP #3 has a present capacity of 2 MGD, but the current site layout and facilities readily enable incremental expansions up to 8 MGD. An expansion to 6 MGD at the WTP site would generally consist of:

- Eastward extension of the existing treatment building to facilitate installation of two package treatment units,
- Replacement of the static mixer in the treatment building to reduce headloss and maintain plant hydraulics,
- Installation of one, 4 MGD transfer pump into an existing slot in the wet well, and
- Installation of two, 2 MGD high service pumps at existing tees on the suction header.

These pump additions will provide a firm capacity of 6 MGD at both pump stations to match the expanded WTP capacity.

The WTP expansion will also necessitate disinfection improvements to maintain acceptable microbial inactivation requirements per TCEQ regulations (reference the concentration time (CT) Study discussion below).

Expansion to 6 MGD may require installing a second emergency generator, depending on electrical loads for new components. Minor upgrades to chemical metering equipment may also be required for an expansion to 6 MGD. However, the existing bulk storage tanks are adequate. Similarly, the remaining facilities on the WTP site are generally sufficient for an expansion to 6 MGD.

Walker Partners recommends continuation of the current treatment process at WTP #3. Package treatment plants provide a familiar, easy to operate and cost-effective technology that reliably treats Lake Travis water. Also, the location of the RWIB near the main channel of the Colorado River delivers stable raw water quality. Conversion to a different treatment technology like low pressure membranes does not make sense or cents at this time.

Key Design Issue	Solutions	Benefits to City	Impact
Backwash Lagoon difficult to operate	Evaluate construction of a small backwash clarifier instead of a second lagoon	Improve solids handling operations; maintain use of existing infrastructure; save site space for future expansions	
Stainless steel corrosion in Treatment Building	Improve building ventilation; evaluate relocation of pre-chlorination injection point to outside building	Prevent further deterioration of stainless steel; improve operator safety; extend lifespan of assets	
Water accumulation in process air systems	Install drains on LPA piping to purge water; consider redundant air compressor; evaluate conversion to electric actuators	Improve operations & reliability; reduce pipe interior corrosion	
CT requirements not achieved at 6 MGD	Evaluate numerous options to enhance disinfection process & implement cost-effective solutions; update CT study & submit to TCEQ in a timely manner	Maintain treatment efficiency & regulatory compliance; prevent schedule delays	
Planning for WTP expansion beyond 6 MGD	Buildout existing Treatment Building in this phase; evaluate approach & timeline for capacity re-rate to 2.6 MGD per treatment unit	Reduce future expansion costs & maximize facility footprint; synchronize capacity with TCEQ redundancy requirements	
Water treatment process selection	Continue with package treatment units for expansion	Maintain operator familiarity & treatment reliability; maximize design schedule; reduce construction costs	
RWIB expansion considerations	Install two additional pumps on barge; evaluate options for future expansion above 6 MGD; consider permanent generator and ATS	Maintain lifespan of existing assets; improve operations during power outages	
RW Transmission Main hydraulics limited	Evaluate system hydraulics for ultimate capacity; install parallel RW main	Reduce future expansion costs; provide redundancy for improved maintenance	
FW Transmission Main too small for WTP expansion	Assess system hydraulics for ultimate capacity; construct new main to replace or parallel existing line	Mitigate system limitations; reduce future expansion costs	

 **Cost Savings**

 **Schedule Control**

 **Operations & Maintenance**

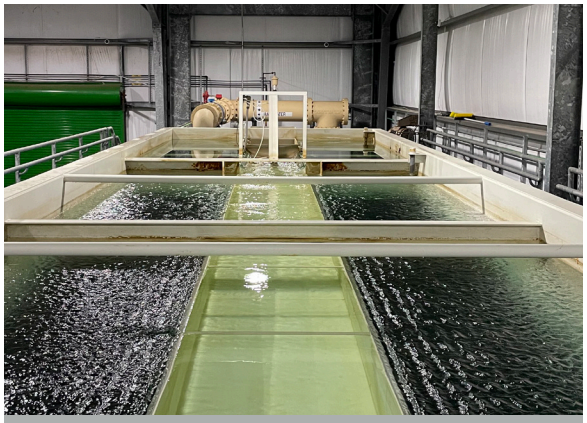
FUTURE WTP EXPANSION CONSIDERATIONS

While expansion of WTP #3 to 6 MGD appears straightforward, Walker Partners understands the importance of looking beyond the next phase to consider future conditions. Available space between the existing paved driveway loop allows for eastward expansion of the treatment building to a footprint that can house a total of at least four package treatment units. Expansion to 6 MGD will require two additional units, but we recommend completing the entire building during this project to ease future installation of a fourth treatment unit.

Trident package treatment units can be re-rated to a capacity of approximately 2.6 MGD by conducting a 30-day, full-scale pilot test and submitting the results to the TCEQ for review and approval. The Walker Partners team has successfully assisted the City of Cedar Park and Lakeway MUD with re-rating the capacity of their Trident treatment plants. Re-rating WTP #3 would provide additional capacity at minimal cost. However, current TCEQ regulations (Chapter 290.42(d)(11)(B)(v)) require surface water treatment plants using gravity filtration that are rated for 7.5 MGD or more to provide a redundant filter. These two factors could significantly impact WTP #3 expansion beyond 6 MGD. Expansion to 8 MGD would trigger the need for a redundant package treatment unit, resulting in five, 2 MGD units to provide design capacity. However, a re-rate to 2.6 MGD per unit would enable a firm capacity of 7.8 MGD with four treatment units installed. If there is space for five treatment units in one building, re-rating could yield a firm capacity of 10.4 MGD. (Installation of five treatment units would likely require relocation of the existing emergency generator to maximize space for treatment building expansion.)

SPOTLIGHT ON RE-RATING

A 30-day pilot test was used to increase the capacity of each Trident treatment unit from 2.0 MGD to 2.6 MGD at the Cedar Park and Lakeway MUD WTPs.



Re-rating the WTP is a smart, low-cost strategy for expanding capacity.

ADDITIONAL WTP #3 PROPOSED IMPROVEMENTS

WTP #3 is relatively new and in generally good condition, but there are portions of the existing plant that should be improved to ensure an effective expansion (Figure 1). Stainless steel piping, electrical panels, and hardware in the treatment building exhibit extensive surface corrosion, which likely results from pre-chlorination off-gassing inside the building. Improving ventilation in the existing and expanded building will help prevent further stainless steel deterioration. Relocating the pre-chlorination injection point to outside the building would alleviate related corrosion issues.

Water accumulation in air piping is a common concern with low pressure and compressed air systems because it can lead to pipe interior corrosion and clogging of instrument tubing on pneumatic valves. Manual or solenoid/timer actuated, small diameter drain outlets could be added at low points on air piping to periodically purge accumulated water. Installation of a redundant air compressor would also improve reliability of the instrument air system. Alternatively, conversion to electric actuators could be evaluated to improve automatic process valve reliability.

The Walker Partners team will deliver effective coordination across engineering disciplines to prevent component conflicts in the existing and expanded WTP. For example, installation of process piping above the main control panel in the treatment building should be mitigated since a pipe leak recently led to a control system shutdown.

ADDITIONAL IMPROVEMENTS

- Improved building ventilation
- Relocate pre-chlorination injection point
- Air piping drain outlets
- Redundant air compressor
- Conversion to electrical actuators
- Install process piping away from control panels

INNOVATIVE SOLIDS HANDLING

WTP #3 processes backwash waste and return with a 300,000 gallon lagoon. While lagoons are relatively common, they can be difficult to operate, and they require significant space. The existing lagoon is large enough to accommodate an 8 MGD WTP, but managing fill/decant and cleaning/maintenance cycles would become more challenging as plant capacity increases. The plant site includes space and piping for a second 300,000 gallon lagoon and construction of the redundant lagoon should occur with an expansion to 6 MGD to provide manageable solids handling. **However, Walker Partners recommends evaluation of an alternative solids handling process to improve operation while maintaining existing infrastructure. Instead of a second lagoon, a much smaller, circular clarifier could be installed to process backwash waste** (Figure 1). Under this scenario, waste streams would continue to flow to the existing lagoon, but flow would be redirected from that point. A small, lift station constructed adjacent to the lagoon would convey a steady stream of backwash waste to a new 30-ft diameter clarifier. Clarified effluent would flow by gravity to the existing decant pump station for transfer of backwash return to the head of the WTP through existing piping. Sludge from the new clarifier would be pumped to a new 20,000 gallon holding tank for easier disposal by trucks. The existing lagoon would remain in service for waste stream storage. This revised treatment scheme would prevent the need for a second lagoon, thereby saving money and preserving site space for future WTP expansions. Jason successfully implemented similar solids handling improvements at the City of Cedar Park WTP, which repurposed an off-line clarifier to process backwash waste and maximize treatment capacity on a congested plant site. Plus, we are currently designing comparable backwash improvements at the Lakeway MUD W-3 WTP.



Jason developed an innovate solids handling approach for the City of Cedar Park to improve the quality of return water while minimizing the cost of new infrastructure.



Improved ventilation and relocation of the pre-chlorination injection point will reduce surface corrosion in the treatment building.

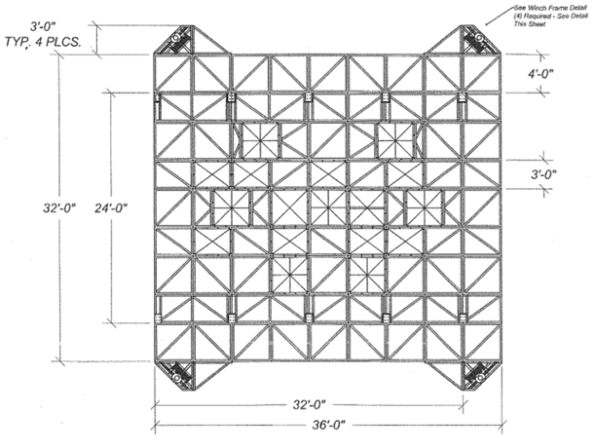
SPOTLIGHT ON SUBMERSIBLE POWER CABLES

Many of the floating intake barges on Lake Travis use multiconductor, submersible cables to carry power between shoreside electrical distribution equipment and pumps on the barge. Often times the cables supplied by the electrical contractor are listed as "submersible", and no one pauses to question "but how deep"? Many of the submersible cables we have investigated carry a UL listing of submergence for 10 meters (33 ft). Beyond this depth the manufacturer does not guarantee the insulation will not become waterlogged or that the cable will maintain its insulation strength.

Testing of the submersible cables in several instances revealed progressive degradation of insulation which if not discovered early may have led to short circuits, loss of pumping capacity, and potentially damaged equipment. Proper selection of submersible cables must take into account the depth of Lake Travis from drought to conservation pool depths and every possibility in between. Any questions as to the suitability or health of existing cables can be answered through nondestructive insulation testing.



Proper power conductors selection is critical to prevent premature degradation.



RW pump selection should contemplate the ultimate capacity of WTP #3 to maximize use of the four platform openings when synchronizing barge and WTP capacities.

FINISHED WATER TRANSMISSION MAIN UPGRADE

Expansion to 6 MGD at WTP #3 will exceed the capacity of the existing 12-inch FW transmission main. Therefore, a parallel or replacement FW main will need to be constructed in unison with the WTP expansion to provide additional transmission capacity. FW main upgrades should be sized to match the planned ultimate capacity of WTP #3.

RAW WATER INTAKE BARGE EXPANSION

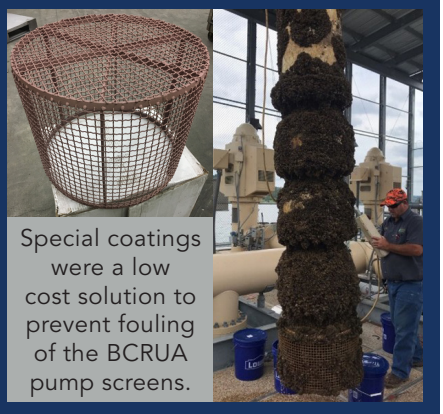
To our knowledge, the existing RWIB includes two, 2 MGD raw water pumps for a firm capacity of 2 MGD to match the current capacity of WTP #3. The pumps discharge into a 16-inch steel helically wrapped flexible hose, which connects to a 24-inch intake pipe installed through an inclined bore from the lakeshore up to the barge electrical building site. From there, the intake pipe connects to the 18-inch HDPE transmission main that conveys raw water to the WTP site. The current barge configuration includes slots for two additional pumps. Installation of two more 2 MGD pumps will provide a firm capacity of 6 MGD to match the WTP #3 expansion. Expanding the RWIB to 6 MGD will also require installation of a second 16-inch discharge hose. Future expansion above 6 MGD will require replacement of the 2 MGD pumps with larger units or modifications to the barge platform and flotation to accommodate five pumps.

The RWIB electrical building site includes provisions to connect a portable rental generator during power outages. For this expansion project, the Walker Partners team will consider a permanent generator and automatic transfer switch at the electrical building site to mitigate major risks related to reliance on rental equipment during electrical disruptions.

An expansion to 6 MGD will likely require additional RW transmission main capacity to sustain acceptable system hydraulics. Water flow greater than 4 MGD through the 18-inch HDPE main will begin to restrict RW pump capacity, particularly during drought conditions when lake levels are low and static head conditions are high. Therefore, construction of a parallel RW main or replacement of the existing main will be needed during this project. Depending on hydraulic evaluation during design, a parallel 18-inch RW line should provide RW system capacity to at least 8 MGD. Installation of a dual pipeline will also provide redundancy for maintenance.

SPOTLIGHT ON ZEBRA MUSSELS

Zebra mussel populations can vary significantly in a reservoir due to many environmental and ecological factors including variations in water flow and temperature, the availability of suitable surfaces for attachment, and food availability. Fortunately, the location of the City's floating intake does not appear to support dense mussel populations. Should zebra mussels become a problem in the future, Walker Partners has experience designing numerous treatment systems including copper ion generation, copper sulfate, sodium permanganate, sodium hypochlorite, and specialized coating systems.



Special coatings were a low cost solution to prevent fouling of the BCRUA pump screens.

TCEQ PLAN REVIEW AND CT STUDY

Expansion of WTP #3 will trigger TCEQ plan review of engineering design drawings and specifications. The TCEQ considers package treatment units as an innovative technology, but they are common across the State, particularly on Lake Travis, and WTP #3 already utilizes the process. Therefore, TCEQ plan review of the expansion project should be straightforward. Walker Partners recommends submitting documents at the completion of 90% design to ensure adequate time for TCEQ plan review and approval.

WTP #3 expansion will require revising the plant's CT Study. The CT Study verifies the effectiveness of the plant's disinfection process for mandated inactivation of Giardia and virus. The 0.5-log Giardia inactivation requirement will not be achieved at 6 MGD. Therefore, **the WTP expansion will need to include improvements to the disinfection process to maintain acceptable microbial removal.** Improvements may include one or a combination of the following options:

- Modification of disinfection zones
- Changes to disinfectant concentrations
- Improved clearwell baffling
- Increased storage volume

Additional FW transmission main capacity will also assist with disinfection compliance. Scenarios to maintain required microbial inactivation will be studied during design and selected alternatives implemented into the WTP expansion. The revised CT Study will be submitted to TCEQ during design and needs to be approved before completion of expansion construction.

SPOTLIGHT ON TRIDENT MICROFLOC MAINTENANCE

Microfloc treatment units have a proven history of success on Lake Travis and are an effective solution for treating low turbidity, high alkalinity waters. Like all treatment equipment, regular maintenance is necessary to ensure reliable performance.

Once the WTP expansion has come online, the City may consider assessing the condition of the existing treatment unit during low flow winter conditions. The following are several routine maintenance activities that could be completed:

1. Inspect the condition of the clarifier beads. After around 10 years of service, the bead exterior surface becomes smooth, decreasing treatment effectiveness.
2. Inspect and replace anodes if necessary.
3. Remove accumulated sediment on the clarifier floor.
4. Inspect the integrity of the clarifier bead hold down screen and internal drain line.
5. Inspect the condition of the air laterals and diffusers and water laterals. The end caps and diffusers frequently fall off the air laterals.
6. Inspect and repair coatings which frequently corrode near the raw water inlet and at air/water interfaces.



Removing old clarifier beads at the Cedar Park WTP.



Lateral removal and rehab.

PROJECT EXECUTION

Jason Christensen has assembled a seasoned team of experts who can anticipate the challenges associated with the project and actively design, coordinate, permit, and manage the project through those challenges to deliver an economical and efficiently operating WTP on-time to effectively serve the City of Lago Vista through several years to come.

Our Team is an alliance of experienced engineers with a long history of successfully delivering important projects similar to this one. Jason will bring the same effective project management strategies that he has previously employed on other successful projects that clients have entrusted to his leadership.

Communication Plan

Promote collaboration and coordination by:

- Progress meetings
- Decision logs
- Weekly internal team meetings
- PM engagement and responsiveness

Quality Control Plan

Prevent errors and identify issues early by:

- Independent reviews for deliverables
- Documented client comments
- Reviews by senior staff
- Project Manager ownership

PROJECT SUCCESS

Production Plan

Plan the work and the work plan by:

- Detailed project scoping
- Realistic schedule development
- Document control
- Subconsultant management

Monitoring Plan

Know if the plan is working and implement concise corrections before it is too late by:

- Monthly progress meetings
- Earned value analysis
- Regular schedule updates

We believe that people are at the core of the project execution process and putting the right people in the right positions result in successful project delivery. Jason's ownership of this process and hands-on approach to implementing the project management plan will ensure project success:

1. Great communication and collaboration that keeps you well-informed and is respectful of your time.
2. A logical, methodical Production Plan which adds value and guides the design Team.
3. A well-executed Quality Control Plan to enhance constructability and to avoid re-work and change orders.
4. Efficient project delivery that meets Lago Vista's schedule and budget requirements.
5. A Monitoring Plan to lead the design Team throughout each phase of the Project and to anticipate project challenges and overcome them with exceptional solutions.

$602M
CONSTRUCTION COST

0.21%
IN CHANGE ORDERS

Over the past five years, Walker Partners has successfully designed more than $602 million in complex, multi-disciplinary infrastructure - **achieving a total change order rate of less than 0.21%, significantly outperforming the industry average of nearly 5.0%.** This outstanding performance is the result of several key factors: rigorous QA/QC protocols, early collaboration with our in-house construction management team to evaluate constructability and biddability during design, and our unmatched experience delivering infrastructure projects in Central Texas.



Minimizing change orders starts with a quality design.

WORK PLAN

Our Team will participate in a series of planning and scoping meetings with City staff to assess the City's needs and determine the best approach for the Project. **We will listen to you and hear your "definition of success" for this Project.** We will then develop a Work Plan tailored specifically to meet your goals, objectives, and budget.

Drawing upon our significant experience of similar projects, and based upon the preliminary scope of work developed by the City of Lago Vista staff, we propose a Work Plan divided into four distinct phases:

Phase 1: Preliminary Engineering

Phase 2: Permitting & Regulatory Review

Phase 3: Final Design, Construction Documents, & Bidding

Phase 4: Construction & Project Close-out






PRELIMINARY ENGINEERING

ACTIVITIES
- Data collection & review
- Field reconnaissance
- Existing WTP & RWIB condition analysis
- Geotechnical & SUE investigation planning
- Architectural, Structural, Electrical, I&C assessments
- Expansion alternatives evaluation
- Preliminary design drawings
- Cost estimating

MEETINGS
- Project kick-off & planning
- Progress reviews
- Preliminary alternatives evaluation

DELIVERABLES
- Preliminary Engineering Report
- 30% Design drawings
- Preliminary Engineer's Opinion of Probable Cost (EOPC)
- Project Schedule

PERMITTING & REGULATORY REVIEW

ACTIVITIES
- Data collection & review
- Field reconnaissance
- Agency & Stakeholder identification & coordination
- ROW & Easement acquisition needs identification
- CT analysis

MEETINGS
- Kick-off & planning
- TCEQ Plan Review Team
- Stakeholders (as needed)

DELIVERABLES
- Permit documents as required
- CT Study
- TCEQ Plan Review

FINAL DESIGN, CONSTRUCTION DOCUMENTS & BIDDING

ACTIVITIES
- Topographic & boundary/ROW survey as required
- Design calculations
- Drafting & annotation
- Utility coordination
- Technical specifications
- Bid document development (60%, 90%, 100% submittals)
- Constructability review
- QC/QA
- Cost estimating
- ROW & Easement acquisition support as required
- Bidding support

MEETINGS
- Regular progress updates
- Plan Review workshops (60%, 90%, 100% submittals)
- Pre-bid conference

DELIVERABLES
- Bid documents (60%, 90%, 100% submittals)
- EOPC (60%, 90%, 100% submittals)
- Bid Tabulation
- Recommendation of contract award

CONSTRUCTION & PROJECT CLOSE-OUT

ACTIVITIES
- Construction contract preparation
- Submittal review
- Requests for Information (RFI's)
- Routine field orders and change orders
- Schedule review
- Pay Request review
- Construction progress reporting
- Construction observation
- Materials testing coordination
- Final close-out
- Record drawing completion
- Warranty phase coordination

MEETINGS
- Preconstruction conference
- Construction progress
- Shutdown & start-up coordination
- Final Inspection and Project Closeout

DELIVERABLES
- Meeting minutes
- Field reports with photos
- Submittals & RFI's
- Field Orders/Change Orders
- Payment recommendations
- Substantial Completion & Final Acceptance recommendations
- Record Drawings

PRELIMINARY ENGINEERING

The primary objectives of the preliminary engineering phase are to identify the principal project requirements and constraints, and advance design sufficiently to identify and address major conflicts. Our considerable experience with package treatment units and similar projects will assist and expedite the preliminary engineering phase. Some specific actions we will accomplish in this phase include:

- Collect, organize and analyze WTP #3 operating data, including raw and treated water quality and flow.
- Specifically assess components and condition of the existing WTP and RWIB.
- Develop and evaluate necessary system upgrades and innovative design concepts.
- Develop the overall project layout, including site plans for the WTP and RWIB.
- Clearly define major project design approaches and criteria for final design of the Project.
- Estimate the probable cost of the Project at a preliminary level of detail.
- Establish project quality and risk plans.
- Develop a comprehensive schedule-based procurement plan to advance the Project through final design and construction.

PERMITTING & REGULATORY REVIEW

Early identification and ongoing coordination of necessary permits and regulatory reviews ensure fulfillment of project objectives and prevent schedule delays. Our team understands that permitting and TCEQ reviews can be a lengthy process and are often on the critical path of project delivery. To reduce the risk of schedule delays, we endeavor to set the path for permitting and regulatory review efforts, as well as potential ROW and easement acquisition immediately after notice to proceed. We will provide continuous coordination with stakeholders to monitor application and review processes, addressing any questions as they arise, and providing regular status updates to the project team and City.

FINAL DESIGN, CONSTRUCTION DOCUMENTS, & BIDDING

Final Design

Our design phase project approach is based upon sound engineering management practices backed up by a proven work plan methodology. This strategy entails assigning seasoned, experienced professionals in charge of each key element so that different facets of the work can occur simultaneously. **As our Team has demonstrated during past projects, we will involve appropriate City staff at each and every critical step.** We will organize regular project coordination meetings to discuss project progress regarding the schedule, troubleshoot issues that may have arisen since previous meetings, and track the budget.

Cost Estimating

Our Team commits to delivering a final project that fits within the City's budget. In order to accomplish this goal, accurate construction cost estimating is crucial to provide true, reliable data from which you can manage budgets. Our Team employs cost estimating experts who previously worked for contractors, which allows us to prepare cost estimates at a higher level of accuracy than our competitors.



*Joerg will lead our cost estimating effort with over 40 years of bid development experience on projects up to **$2.5 BILLION.***

QC/QA

We bring tremendous design and construction experience to this project. The constructability review concept will consist of a number of engineering evaluations during the design phase, including:

- Specifications
- Electrical systems/SCADA
- Compliance with TCEQ and Chapter 290 requirements
- Conformance to design standards
- Soil conditions and geotechnical issues
- Overall project review to ensure and confirm project task coordination with all disciplines.

These elements will be thoroughly vetted. **The input from seasoned, veteran engineers on the front end of a project saves valuable time and prevents rework at the end of the final design phase.**

QC/QA METHODOLOGY & TOOLS

- Reviews of all design products and deliverables including reports, calculations, plans, and specifications
- Inter-discipline crosscheck and coordination
- Constructability reviews
- Utilization of standard checklists to facilitate efficient and consistent reviews
- Comment-resolution log documentation of staff comments and design team responses to review comments
- Routine QA/QC audits of the team including subconsultants to verify procedures are being followed
- Weekly team meetings to coordinate the work and resolve technical and management issues
- Monitoring for compliance with Lago Vista standards and guidelines

We take pride in the quality of our work!

Bidding Phase

We have vast experience to assist the City with the bidding process. We are extremely knowledgeable of the required documents and processes required in order to successfully bid a project. We have been very effective in strategically bidding projects for the financial benefit of several municipalities by being creative and innovative in seeking the lowest and best-value bid price.

We will work closely with City staff using applicable bidding platforms to provide an unmatched level of responsiveness to all bidding inquiries. Our efficient communication with City staff and potential bidders throughout the bidding process results in competitively low bids that provide great value to the City.

Finally, we are experienced in all project delivery methods. We can deliver the City a competitive value through the traditional design-bid-build method, but we also successfully use alternative deliveries, such as Competitive Sealed Proposal to combine the use of qualifications-based selection with competitive pricing to obtain a best value contractor for the City. Similarly, Construction Management at Risk and Design-Build delivery methods are at times beneficial and worthy of consideration. Walker Partners is poised to implement the **RIGHT** bidding methodology, with the **RIGHT** delivery, for the **RIGHT** value to Lago Vista.

CONSTRUCTION & PROJECT CLOSE-OUT

We will be available to address any item that might arise during construction and vow to support the City throughout the entire construction contract duration. Since our office is in Austin, we can have project engineers on the construction site within 45 minutes.

Our Team's approach to the Construction Phase of the project is simple and straightforward: issue a high-quality set of Bidding Documents and be responsive. We strive to create a team between the Owner, Contractor, and Engineer. It is acknowledged that problems can occur during construction, but we feel that the way they are handled reveals the true character of a professional. We have established working relationships with both local and regional contractors and are confident that we will know a majority of the bidders on this Project. **Our strong relationships with both local and regional contractors may well circumvent many potential conflicts during construction.**

We will provide strong leadership by facilitating all monthly progress meetings between the City, Contractor, Engineer, and any pertinent stakeholders. Our team will manage document control to streamline construction phase records and provide a central repository of project related files for the Owner, Engineer and Contractor. **We take ownership of the construction administration process not only because we designed the project, but because this is our community and we take pride in the positive impact a successful project has on all involved.**

Since the existing WTP is in operation and it is a vital component of Lago Vista's water system, maintaining continuous treatment throughout construction is important. Our team has managed construction of several water and wastewater expansion and rehabilitation projects, including the Lago Vista 2016 WWTP Improvements project. Specific construction sequencing requirements will be included in the bidding documents to prevent unnecessary shutdowns. We further recommend requiring Maintenance of Operation Plan submittals from the Contractor for complicated integration tasks to minimize related disruptions during construction.

We can also assist the City by providing in-house resident project representative services like we are doing for several nearby municipalities. Our inspectors act as an extension of our engineers and we are confident in our construction management team's ability to provide first-class quality assurance in the field, enforce the contract documents, and promote highly effective communication with all project stakeholders both in the office and on-site. Maintaining thorough and accurate construction observation is vital to the success of design projects.





"Matt Rudloff has done an excellent job of providing effective and timely RPR observation across multiple work activities and disciplines on the BCRUA Phase 1D expansion project. Everything he does is a step above what I've seen in my many years of experience with construction projects. I've witnessed his dedication many times on this project and it's obviously a great example of the Walker Partners culture of above and beyond service."

— Sam Roberts, PE, General Manager
Brushy Creek Regional Utility Authority

4 | PROJECT SCHEDULE

CITY OF LAGO VISTA

RFQ NO. 25-06

PROJECT SCHEDULE

We know maintaining and streamlining the project schedule is critical to the success of the project, and determining solutions to reduce the overall project schedule will provide unquestionable value to the City. **The schedule requirements for this Project are very similar to the Lakeway MUD WTP expansion that Walker Partners is currently completing, which has a final design phase of eight months.** To reduce the amount of time required for permitting, we propose submitting a regulatory review set to TCEQ at the 90% design milestone and initiating early permit coordination with other agencies including the LCRA, Balcones Canyonlands Preserve, and City of Lago Vista. Additionally, if desired, alternative delivery methods could be explored at the beginning of the project to further compress design duration and onboard a contractor early.

We estimate that bidding and construction durations will require approximately 3 months and 16 months, respectively. Construction duration should be thoroughly vetted during the design phase through outreach to local, qualified contractors. The ability for a contractor to meet a substantial completion date is often dictated by local factors such as contractor availability, labor force market conditions, and the supply chain. It is typical for fewer bids to be submitted on projects with unrealistic construction schedules because good contractors will not take on the risk of being assessed liquidated damages which would then have to be reported on subsequent projects and impact their ability to be selected on other projects. For those contractors that do submit a bid on a project with a tight schedule, liquidated damages are typically built into the bid price to mitigate financial risks.

PRE-PROCUREMENT

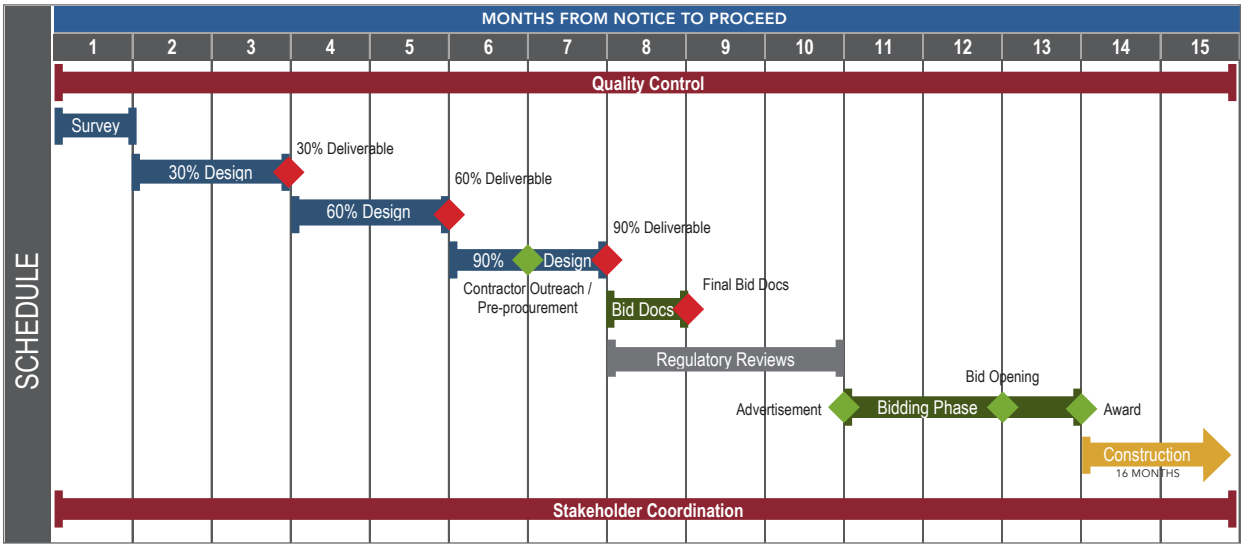
Due to variable equipment lead times and uncertain tariff impacts, our team will proactively contact key suppliers to assess the need for pre-procurement and minimize construction delays.



Alternative Delivery was used to expedite construction of the Cedar Park and Leander Drought Contingency Project 42" underwater pipeline and 30 MGD floating pump station.



Walker Partners required that a compliant recovery schedule be submitted on the BCRUA deep water intake project to get the project on track after contractor delays during shaft mining.



Below is summary of key opportunities to assist the City in reducing project schedule and mitigating potential challenges that could threaten on-time completion of the project.

ALTERNATIVE DELIVERY *Consult with the City to determine if alternative delivery methods are needed to accelerate schedule.*

COLLABORATION *Attend in-person meetings to discuss and address deliverable comments quickly.*

PRE-PROCUREMENT *Identify long-lead items and pre-procure equipment if necessary.*

TCEQ REVIEW *Submit a regulatory review set to TCEQ at 90% design to avoid delays.*

CONTRACTOR OUTREACH *Understand the current bid climate and impacts on construction schedule.*

ENGAGEMENT *Support the City in public and third party outreach to avoid surprises.*

CONTRACTOR QUALIFICATIONS *Evaluate contractors on the basis of costs and qualifications to make a best value selection.*

RECOVERY SCHEDULE *Include recovery schedule triggers to get the project back on schedule if the contractor's schedule starts slipping.*

STAFFING *Properly staff the project to turn around construction submittals within days not weeks.*

SUBSTANTIAL COMPLETION *Driving for project completion in Fall or Winter months unnecessarily shortens construction duration. Push for a late Spring completion to reduce construction costs.*



Keeping stakeholders informed (Village of Volente town hall meeting) can prevent disruptions and delays during construction.



Pump and motor lead times may require consideration of pre-procurement options.

5 | REFERENCES

CITY OF LAGO VISTA

RFQ NO. 25-06

REFERENCES

Owner: City of Cedar Park

Address: 2401 Brushy Creek Loop, Cedar Park, Texas 78613

Contact Person and Title: Kenneth Wheeler, PE, Assistant Director of Public Works-Utilities

Phone: (512) 401-5584

Email Address: kenneth.wheeler@cedarparktexas.gov

Contract Period: Multiple and ongoing

Scope of Work: Conceptual design, regulatory and stakeholder coordination, public involvement, easement acquisition, hydraulic modeling, preliminary engineering, final design, TWDB funding, WTP expansion, construction phase services, capacity re-rating, utility coordination, cost estimating, metes and bounds descriptions, topographic and boundary surveying, expert witness testimony, high services pumping improvements, floating intake design, Trident Microfloc improvements, bid phase services, environmental assessments

SUCCESSFUL OUTCOMES

During Cedar Park's rapid growth period in the 2000s, Jason and Aaron worked with the City to optimize the treatment process to produce over 26 MGD of treatment capacity on a small 2 acre site. Projects prioritized getting the most from existing systems and increasing overall system operability and reliability. The City of Cedar Park knows that they can count on Walker Partners for responsive service and innovative designs that are fiscally responsible.



Jason and Aaron have supported Cedar Park since 2007 by designing multiple expansions and improvements projects to the Cedar Park WTP.

SIMILARITIES TO WTP#3 EXPANSION

- ☑ Trident Microfloc treatment
- ☑ Treating Lake Travis water
- ☑ High service pumping
- ☑ Floating raw water intake
- ☑ Recovery water improvements
- ☑ TCEQ permitting
- ☑ Environmental services
- ☑ City and stakeholder coordination
- ☑ Bid phase support
- ☑ Construction administration
- ☑ Construction management services

CLIENT SATISFACTION

"The strength of an engineering firm rests in its people. Walker Partners has assembled a team of first-class engineers that the City of Cedar Park has trusted with many of our most important and complex projects. We always feel confident that Walker Partners will take ownership of the project and help us to navigate complex project issues with a successful outcome."

Kenneth Wheeler, Assistant Director of Utilities
City of Cedar Park

Owner: Brush Creek Regional Utility Authority

Address: 1906 Hur Industrial Blvd., Cedar Park, Texas 78613

Contact Person and Title: Sam Roberts, PE, General Manager

Phone: (512) 215-9151

Email Address: sroberts@bcrua.org

Contract Period: Multiple and ongoing

Scope of Work: Conceptual design, regulatory and stakeholder coordination, public involvement, easement acquisition, hydraulic modeling, preliminary engineering, final design, TWDB funding, WTP expansion, construction phase services, capacity re-rating, utility coordination, cost estimating, metes and bounds descriptions, topographic and boundary surveying, expert witness testimony, high services pumping improvements, floating intake design, bid phase services, environmental assessments

SUCCESSFUL OUTCOMES

Walker Partners has long served as BCRUA's trusted advisor, playing a vital role in the strategic planning and implementation of projects that expand and enhance the BCRUA regional water treatment system. With a deep understanding of local water supply and treatment challenges, Walker Partners has helped BCRUA deliver reliable, high-quality water to the growing cities of Cedar Park, Round Rock, and Leander through multiple WTP expansions and the development of a new raw water intake that reduces vulnerability to drought conditions. Our technical expertise, collaborative approach, and commitment to excellence have been instrumental in ensuring that the BCRUA system can reliably supply water demands through innovative and cost-effective designs.



BCRUA is preparing to bid a $100M WTP expansion designed by Walker Partners to increase treatment capacity to 64 MGD.

SIMILARITIES TO WTP#3 EXPANSION

- ☑ Floating raw water intake
- ☑ Treating Lake Travis water
- ☑ Building expansion
- ☑ Residuals management
- ☑ High service pumping
- ☑ TCEQ permitting
- ☑ Environmental services
- ☑ City and stakeholder coordination
- ☑ Bid phase support
- ☑ Construction administration
- ☑ Construction management services

CLIENT SATISFACTION

"People are the power behind every great engineering firm. Walker Partners' team of experienced engineers have provided responsive and dependable service on multiple pump station projects for Brushy Creek Regional Utility Authority including the $200 million Phase 2 Raw Water Delivery System. I highly recommend engaging Walker Partners to tackle complex water projects."

Karen Bondy, Former General Manager
Brushy Creek Regional Utility Authority

Owner: City of West

Address: 110 N. Reagan Street, West, Texas 76691

Contact Person and Title: Tommy Muska, Retired Mayor

Phone: (254) 709-7100

Email Address: tommy@westcommainsurance.com

Contract Period: Multiple and ongoing

Scope of Work: Conceptual design, regulatory and stakeholder coordination, public involvement, easement acquisition, hydraulic modeling, preliminary engineering, final design, TWDB funding, WTP expansion, construction phase services, capacity re-rating, utility coordination, cost estimating, ROW determination, metes and bounds descriptions, topographic and boundary surveying, expert witness testimony, TWDB funding

SUCCESSFUL OUTCOMES

DISASTER ZONE INFRASTRUCTURE IMPROVEMENTS: With Walker Partners' help, the City of West was able to reconstruct their community quickly while allowing the residents and local businesses to heal and move forward with daily life. Giving the citizens direct access to our full-time RPRs on the project allowed the City leadership to focus on other pressing tasks of rebuilding the City.



SIMILARITIES TO WTP#3 EXPANSION

- ☑ Building expansion
- ☑ Residuals management
- ☑ High service pumping
- ☑ TCEQ permitting
- ☑ Environmental services
- ☑ City and stakeholder coordination
- ☑ Bid phase support
- ☑ Construction administration
- ☑ Construction management services

CLIENT SATISFACTION

"Only after the events of April 17, 2013 did I realize just how important it is to have a relationship with a seasoned, experienced, and most importantly, caring engineering firm.

Walker Partners has been in the City of West's corner from the very beginning and the peace of mind their experience and dedication to the City makes them "top shelf" in my books. From the office staff and surveyor to the President of Walker Partners; you will never find a more humble, sincere, caring and professional group of individuals."

Tommy Muska, Retired Mayor
City of West

Owner: Schertz Seguin Local Government Corporation

Address: 108 W. Mountain Street, Seguin, TX 78155

Contact Person and Title: Andrew McBride, General Manager

Phone: (830) 386-2567

Email Address: amcbride@seguintexas.gov

Contract Period: Multiple and ongoing

Scope of Work: Conceptual design, regulatory and stakeholder coordination, easement acquisition, hydraulic modeling, preliminary engineering, final design, TWDB funding, WTP expansion, construction phase services, utility coordination, cost estimating, metes and bounds descriptions, topographic and boundary surveying, high services pumping improvements, bid phase services, environmental assessments

SUCCESSFUL OUTCOMES

For the last 10+ years, Walker Partners has supported SSLGC with the design of almost 200,000 LF of pipeline, multiple booster and high service pump stations, a 6 MGD WTP, 12 MGD WTP, and a WTP expansion. To increase capacity, Walker Partners obtained TCEQ approval for higher filter loading rates through full-scale piloting to increase capacity without adding additional treatment infrastructure.



Walker Partners designed the SSLGC Gonzales WTP as well as a subsequent expansion to 14 MGD.

SIMILARITIES TO WTP#3 EXPANSION

- ☑ Phased expansion
- ☑ Building expansion
- ☑ Residuals management
- ☑ High service pumping
- ☑ TCEQ permitting
- ☑ Environmental services
- ☑ City and stakeholder coordination
- ☑ Bid phase support
- ☑ Construction administration
- ☑ Construction management services

CLIENT SATISFACTION

Walker Partners cost estimates for the large number of SSLGC projects that have bid in the last decade have reliability been within the range of actual contractor bids, helping SSLGC to avoid surprises on bid day.

APPENDIX: RESUMES

CITY OF LAGO VISTA

RFQ NO. 25-06



JASON CHRISTENSEN, PE

PROJECT MANAGER

Jason Christensen is a seasoned civil engineering professional with over 24 years of extensive experience in water, wastewater, and reuse projects. With a strong background in planning, preliminary engineering, and permitting, he excels in process design and preparing detailed drawings and specifications. Jason successfully manages the bidding process and provides construction administration, ensuring timely and cost-effective project delivery. His ability to navigate complex design challenges and deliver innovative solutions consistently results in improved project outcomes and client satisfaction, making him a valuable resource for Lago Vista's water process initiatives.

EDUCATION

MS, Environmental Engineering, Duke University

BS, Geoscience, Hobart College

REGISTRATION

Professional Engineer, Texas No. 97527

YEARS OF EXPERIENCE

24

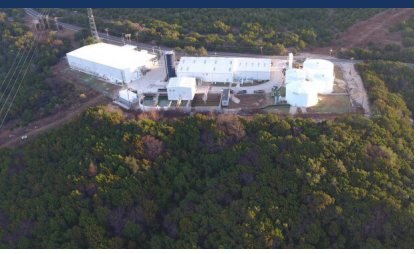


Jason successfully designed three expansions at the BCRUA WTP.



Jason is the lead design engineer for the innovative Phase 2 Raw Water Delivery System.

BENEFITS TO LAGO VISTA



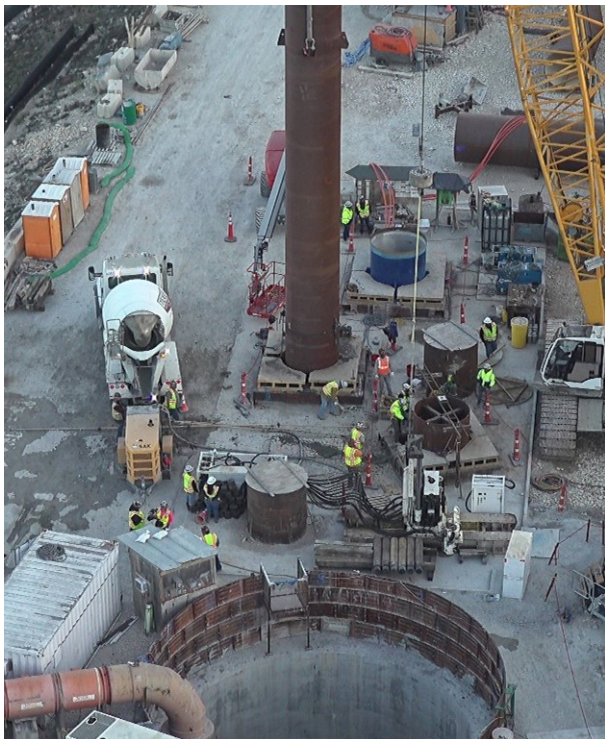
- Expert process mechanical designer with proven ability to lead large multi-discipline teams.
- Directly relevant experience with design, improvements & permitting for similar sized WTPs using package treatment units.

PROJECT EXPERIENCE

		Owner's Contact
WTP Rehabilitation & Improvement Projects City of Cedar Park, TX	Led design, bidding assistance, and CA for multiple rehabilitation and improvements projects at the existing Cedar Park WTP, which utilizes Microfloc Trident package treatment units. Projects included demolition of existing low-pressure and instrumentation air piping within one treatment building, and replacement with stainless steel piping; coatings rehabilitation and repair on seven package treatment units; replacement of clarifier media retainer screens on ten package treatment units; roof reconstruction, roof panel replacement, and insulation repair on four treatment buildings; and installation of approximately 225 LF of 24" DI pipe to connect two existing clearwells. Another project included replacement of three 16" marine raw water discharge hoses; rehabilitation and conversion of an existing clarifier for processing filter backwash waste; replacement of three vertical turbine transfer pumps; rehabilitation of sludge collectors in two backwash holding tanks; replacement of sludge pumps; and installation of a THM removal system into an existing GST.	Multiple projects, **Ongoing** **Kenneth Wheeler, PE** Assistant Director of Utilities kenneth.wheeler @cedarparktexas.gov 512.401.5350
2016 Wastewater Treatment Plant Improvements City of Lago Vista, TX	Managed construction of the project, which included installation of a new, second clarifier, additional chlorine contact basin, and new slide gates and weirs to improve flow control in the plant. The new clarifier and chlorine contact basin were designed as standalone structures, which enabled structural repairs to existing, common-wall WWTP basins. Construction was sequenced so that structural repairs of the existing aeration basin, clarifier, and aerated digester could be completed while keeping the plant in operation.	Completed **2021** **Victor Manzano** CIP Manager victor.manzano @lagovistatexas.gov 512.267.1155 x.103

JASON CHRISTENSEN, PE

PROJECT EXPERIENCE		Owner's Contact
BCRUA 1C, 1D, & 2A WTP Expansions Brushy Creek Regional Utility Authority, TX	Engineering Design Lead for multiple expansions to the BCRUA WTP to increase capacity from 22 MGD to 65 MGD. Improvements included four conventional treatment trains, a 6 MG clearwell, 2 - 1 MG raw water head tanks, belt filter press, sludge thickener, expanded raw and finished water pump stations, and a new treatment building.	**Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526
Phase 2 Regional Water System Brushy Creek Regional Utility Authority, TX	Technical Design Lead of the BCRUA Phase 2 project, which includes an ultimate 145 MGD raw water intake, 9,000 LF suction tunnel, pump station and 3,000 LF discharge tunnel. Jason's design effort focused on the raw water pump station, which will have an initial capacity of 87 MGD and will include two sets of deep well submersible pumps (high and low head) installed approximately 260 FT below grade within the same building. The five high head pumps will be installed in individual well shafts hydraulically connected to a suction chamber beneath the shafts. The four low head pumps will be suspended in a common wet well shaft located adjacent to the high lift pumps and connected to the same suction chamber.	Design Completed **2022** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526
TLAP Renewal City of Lago Vista, TX	Managed renewal of the City's TCEQ Texas Land Application Permit in 2019. Since the permit includes three operating phases, the renewal application successfully extended the authorization term from a 3-year standard to a 10-year term, which significantly reduces future renewal costs and administrative effort.	Completed **2020** **Victor Manzano** CIP Manager victor.manzano @lagovistatexas.gov 512.267.1155 x.103



Jason Christensen stands out from most engineering project managers because he remains deeply involved in the technical details of every project. Unlike others who often delegate complex engineering tasks and step back, Jason brings hands-on expertise to the table - personally tackling challenging design elements and ensuring high-quality outcomes from start to finish. His commitment to technical excellence and direct engagement sets him apart.







AARON ARCHER, PE

EDUCATION
MS, Environmental Engineering, University of North Carolina

BS, Civil Engineering, University of Texas at Austin

REGISTRATION
Professional Engineer, Texas No. 100967

YEARS OF EXPERIENCE
23

PROJECT PRINCIPAL

Aaron's direct experience designing water supply systems in Central Texas equips him to efficiently orchestrate the efforts of our team of technical experts and ensure that project resources and controls are maintained and available. Aaron's 23-year career has been successful because he anticipates and proactively responds to project issues and understands that successful project delivery entails much more than technical expertise.

Aaron's Master of Science in Environmental Engineering focused on drinking water treatment in the areas of pretreatment and disinfection. He served as the Water Quality and Technology Division Chair for the Texas Section of the American Water Works Association from 2013 to 2021.

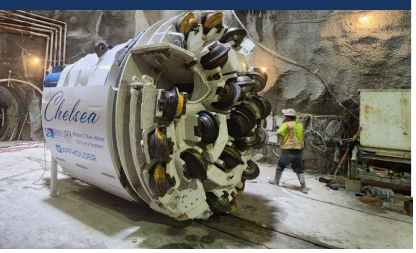


Aaron has helped BCRUA develop $500M of infrastructure over the last 20 years.



Aaron is well versed in both hard design and public involvement.

BENEFITS TO LAGO VISTA



- Experienced Project Principal with the ability to anticipate & proactively respond to resource requirements.
- Committed to providing proper staffing resources to the project.

PROJECT EXPERIENCE

		Owner's Contact
Phase 2 Raw Water Delivery System Brushy Creek Regional Utility Authority, TX	A new $250 million (TWDB SWIFT funding) raw water delivery system in Lake Travis that includes a deep lake intake; a 9,000 LF gravity intake tunnel; 300 ft deep construction access shaft; 2,600 LF transmission tunnel; and a 145 MGD pump station.	Design **2021** Construction **Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526
Belhouse Drought Preparedness Project Brazos River Authority, TX	A new 33 MGD intake and pump station on Belton Lake conveying water to an outlet in Stillhouse Hollow Lake through a 6.5 mile, 48-inch diameter raw water delivery pipeline. Additional services include land acquisition, public involvement, permitting, and risk management.	**Ongoing** **Mandy Cullar** Regional Business & Project Development Manager mandy.cullar@brazos.org 254.761.3168
BCRUA 1C, 1D, & 2A WTP Expansions Brushy Creek Regional Utility Authority, TX	Multiple expansions to the BCRUA WTP to increase capacity from 22 MGD to 65 MGD. Improvements included four conventional treatment trains, a 6 MG clearwell, 2 - 1 MG raw water head tanks, belt filter press, thickeners, expanded raw and finished water pump stations, and a new treatment building.	**Ongoing** **Sam Roberts, PE** *see above*
WTP Improvements City of Cedar Park, TX	Multiple improvements projects over almost 20 years including raw and finished water pump station upgrades, treatment improvements, chemical feed system improvements, building renovations, DBP air stripping, and surge mitigation.	Multiple projects, **Ongoing** **Kenneth Wheeler, PE** Assistant Director of Utilities kenneth.wheeler@cedarparktexas.gov 512.401.5350



ROGER NOACK, PE

EDUCATION
BS, Civil Engineering,
University of Wisconsin

REGISTRATION
Professional Engineer,
Texas No. 50376

YEARS OF EXPERIENCE
47

QA/QC

Mr. Noack has almost 50 years of experience in civil and environmental engineering in Central Texas. His experience includes the design and construction administration of water supply systems, transmission mains, treatment and distribution systems, wastewater collection and treatment facilities, and modeling of water distribution systems. Roger is especially skilled at reviewing design discipline interfaces to eliminate design gaps and overlaps that can cause change orders during construction.

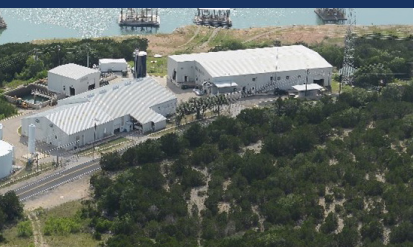


Roger designed 4 phased expansions of the Cedar Park WTP resulting in a total of 10 Trident units.



Roger has direct experience designing floating intakes, package WTPs, pump stations, and HDPE pipelines.

BENEFITS TO LAGO VISTA



- Expert Quality Control reviewer with multidiscipline experience to confirm cross discipline work is coordinated correctly.
- Construction experience that provides a practical & real world view of constructing & operating water projects.

PROJECT EXPERIENCE

		Owner's Contact
Water Treatment Plant Expansions City of Cedar Park, TX	Project manager for design and construction administration of the expansion and upgrading of the Cedar Park WTP from a capacity of 5 MGD to 26 MGD. These projects consists of a new floating raw water intake and pumping station; new parallel raw water transmission main; new treatment building, new chemical feed systems for the entire plant, laboratory and control rooms; bulk chemical storage facilities; new solids handling facilities including backwash reclaim, sludge thickening, and belt press; new above-ground clearwells; and increasing the capacity of high service pumping. The expansions were completed with extremely tight schedules to bring additional capacity online prior to summer demands.	Multiple projects, **Ongoing** **Kenneth Wheeler, PE** Assistant Director of Utilities kenneth.wheeler @cedarparktexas.gov 512.401.5350
Ground Water Treatment Plant Alliance Regional Water Authority, TX	QA/QC reviewer for the new 25 million gallon per day (MGD) Carrizo Aquifer ground water treatment plant that will treat water for ARWA and the Guadalupe-Blanco River Authority.	Completed **2024** **Jason Biemer** Operations Manager jbiemer@alliancewater.org 512.294.3214
Multiple Projects Brushy Creek Regional Utility Authority, TX	Roger has served as the QA/QC reviewer for multiple projects for the BCRUA to include: ▪ Phase 2 Raw Water Delivery System ▪ Phase 1D WTP Expansion ▪ Phase 1C WTP Expansion ▪ Underwater Pipeline Replacement	**Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526



JOSEPH JENKINS, PE

EDUCATION
MS, Agricultural Engineering, Texas A&M University

BS, Environmental Science, Texas A&M University

REGISTRATION
Professional Engineer, Texas No. 68717

YEARS OF EXPERIENCE
39

WATER TREATMENT PLANT EXPANSION

Joe Jenkins is a Vice President at Walker Partners with 39 years of experience designing very similar projects to Lago Vista's WTP #3, transmission pump stations, and pipelines. Over his career, Mr. Jenkins has developed outstanding managerial skills to organize, coordinate, and communicate with project team members. Joe has a strong technical background and in-depth knowledge on all the components of a successful project – detailed project planning, project communications, project documentation, permitting requirements, and design and construction challenges. A testament to Mr. Jenkins success has been his involvement in several Central Texas projects that have been recognized with national awards. Joe also has been involved in several alternative delivery projects including construction management-at-risk (CMAR), design-build, and progressive design-build serving in multiple capacities including design engineer, owner's agent, and engineering design manager. As a result, he has an understanding of all the various responsibilities of each party and how the project will progress.



Horizontal directional drill with 36-inch welded steel pipe under Lake Dunlap for Alliance Regional Water Authority



Schertz-Seguin Local Government Corporation Carrizo/Wilcox Groundwater Treatment Plant for Iron and Manganese Removal

BENEFITS TO LAGO VISTA



- Design experience on over 20 Central Texas Water Treatment Plants.
- 39 years of experience completing similar projects in Central Texas has allowed Joe to develop first-class negotiation & communication skills to manage the "soft" side of a design project including public engagement, permitting, funding & land acquisition which tend to drive project schedule
- Uniquely qualified to anticipate & solve key technical challenges.

PROJECT EXPERIENCE

		Owner's Contact
Wastewater Treatment Plant Improvements City of Lago Vista, TX	Assessed the City's WWTP and identified repairs in the structure, aeration system, and flow controls along with needed expansion of the secondary treatment clarification process. The initial plant layout planned the expansion of basins to attach to and use common walls. Because of the concrete failures and stresses, he planned for a separate clarifier and designed a circular clarifier with better flow characteristics and produces better clarified water than the existing clarifier resulting in improved suspended solids removal.	Completed **2021** **Victor Manzano** CIP Manager victor.manzano @lagovistatexas.gov 512.267.1155 x.103
Vista Ridge Water Supply Project San Antonio Water System (SAWS), TX	142-mile pipeline paralleling the I-35 corridor delivering water from wells in Burleson County with a capacity of 48 MGD transmitted through 54- and 60-inch diameter bar wrapped and steel pipes and 3 pump stations. Design-Build P3 approach. Served as PM and technical lead as Owner's Agent until end of 2017.	Completed **2020** **Marty Jones, PE** SAWS Construction Mgr. 210.704.7297
Ground Water Treatment Plant & Segment E Pipeline Alliance Regional Water Authority, TX	Design and construction of a 19.4 MGD ground water treatment plant, high service pump station, and 7 mile, 36-inch diameter transmission pipeline segment funded by the TWDB SWIFT program.	Completed **2024** **Jason Biemer** Operations Manager jbiemer@alliancewater.org 512.294.3214
TWDB Phase 2 Projects Schertz Seguin Local Government Corporation, Seguin, TX	TWDB SWIFT funded project increases supply and distribution of drinking water through 6 new ground water wells; a treatment plant for iron and manganese removal (6 MGD initial capacity); pre-stressed concrete clearwell and high service pump station; and 18 miles of 36-inch treated water pipeline.	Completed **2024** **Andrew McBride** General Manager amcbride@seguintexas.gov 832.386.2567



JUSTIN SCARTH, PE

EDUCATION

MS, Water Resources and Environmental Engineering, Villanova University

MS, Technology Management, Villanova University

BS, Civil Engineering,Texas A&M University

REGISTRATION

Professional Engineer, Texas No. 94772

YEARS OF EXPERIENCE

25

PUMPING DESIGN

Justin is a Senior Project Manager with over 25 years of experience. He has worked with numerous municipalities and water supply companies in central and west Texas providing sound planning and engineering services to ensure his clients are able to provide safe drinking water to their customers. His experience with potable drinking water has included the design and rehabilitation of numerous groundwater wells, ground and elevated water storage tanks, transmission lines, distribution systems, pumping stations, and all aspects of various treatment plants.



Engineer of record for Creedmoor Maha WSC designing multiple treatment, pipeline, tank, pump, and well projects to improve their system.



Expansion to the Lakeway MUD's Water Treatment Plant that will include two Trident Microfloc Treatment Units.

BENEFITS TO LAGO VISTA



- Thorough understanding of municipal water treatment and conveyance systems focusing on cost efficiency and reliability.
- Proven project designer with expertise in project development delivering projects on schedule and within the budget allotted.

PROJECT EXPERIENCE

		Owner's Contact
Water Plant Expansion Lakeway MUD, TX	Designing an estimated $11.2 million WTP expansion utilizing two Trident Micro-Floc treatment units (identical to the Lago Vista's proposed treatment expansion). The project to date has encompassed a preliminary engineering phase confirming the selection of the Trident treatment units, preparing a preliminary site layout, and preparing budgeting estimates for the client. The project also includes a cost saving strategy to convert a currently unused clarifier to settle solids from the backwash flows to improve the efficiency of the recycle stream to the head of the plant and eliminating the need to construct additional backwash holding tanks to settle the solids for removal.	Ongoing **Earl Foster, MBA** General Manager efoster@lakewaymud.org 512.261.6222 x140
Water Treatment Plant Membrane Replacement City of Pflugerville, TX	Design and construction phase services associated with a 3-year phased replacement of the City's Ultrafiltration Hollow-Fiber Membranes at the City's surface water treatment plant.	Completed **2015** **Wiley Webb** General Manager 512.614.6171
Multiple Projects Creedmor Maha WSC, TX	Provided services as the WSC's engineer of record. Designed numerous waterline projects ranging in size from 4-inch to 18-inch and various pump station and well rehabilitations.	2018 - 2024 **Matthew Pickle** General Manager mpickle@creedmoorwsc.com 512.423.2113
Multiple Projects City of Jarrell, TX	Provided engineering services as the City's Engineer of Record. Designed and managed multiple water and wastewater system improvements including planning, treatment, disinfection, storage, pumping, conveyance and well rehabilitations. Assisted in developer negotiations regarding City capacity, treatment, and methods of delivery. Assisted in the facilitation of multiple water sourcing opportunities including plan review, treatment, and delivery. Provided valuable feedback in resource stakeholder interactions.	2020 - 2024 **Grace Matlock** Former City Manager grace.matlock@inframark.com 512.864.4042



DAVID SMITH, PE, CFM

EDUCATION

MS, Environmental Engineering, Rice University

BS, Environmental Engineering,Rice University

REGISTRATION

Professional Engineer, Texas No. 56239

Certified Floodplain Manager, No. 2662-14N

YEARS OF EXPERIENCE

45

PERMITTING

David has 45 years of experience in civil engineering for multiple facets of civil engineering including street and drainage improvements, urban storm water management improvements, floodplain improvements, water and wastewater improvements, institutional projects, sports complexes and stadiums, industrial projects, and land development projects. He has obtained development approvals from cities, counties, water districts and TCEQ.

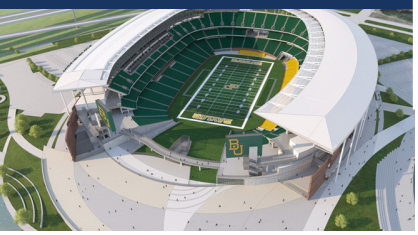


The stormwater lift station for McLane Stadium included three 40-horsepower pumps with a capacity of 5,500 gpm each.



David managed the site civil design and permitting for the BCRUA projects.

BENEFITS TO LAGO VISTA



- Thorough understanding of state and federal funding application processes.
- Extensive experience coordinating with agencies such as Travis County, TxDOT, LCRA, etc.

PROJECT EXPERIENCE

		Owner's Contact
Phase 2 Raw Water Delivery System Brushy Creek Regional Utility Authority, TX	David provided the civil engineering for the Raw Water Pump Station sitework at Lake Travis. This project obtained five environmental variances from the City of Austin for construction on steep slopes, cut and fill, and impervious cover. David also obtained a site development permit from Travis County.	Design **2021** Construction **Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526
Zipp Family Sports Park, Phase 1 City of New Braunfels, TX	David was Project Manager for the planning and development of a 150-acre sports park in New Braunfels. Phase 1 included four baseball fields, four softball fields, four soccer fields, three concession buildings, a maintenance building, and parking for over 600 vehicles. David assisted with obtaining development approvals from the City of New Braunfels, Guadalupe Blanco River Authority, and Green Valley Special Utility District.	Completed **2025** **Joshua Niles, CMIT** Capital Projects Manager jniles@newbraunfels.gov 830.221.4638
Field Operations Center City of Cedar Park, TX	David served as the project manager for the design of a two-acre expansion to the City of Cedar Park's Field Operations Storage Building project. The work included grading, drainage, paving, bulk storage building, vehicle wash area, water quality controls, and Texas Commission on Environmental Quality (TCEQ) permitting. David negotiated with TCEQ to allow the expansion to be covered by the same Water Pollution Abatement Plan that was approved for a previous project phase.	Completed **2013** **Eric Rauschuber, PE** Director of Utilities eric.rauschuber @cedarparktexas.gov 512.401.5550



JARED NIERMANN, PE

EDUCATION
BS, Civil Engineering, Texas A&M University

REGISTRATION
Professional Engineer, Texas No. 122045

YEARS OF EXPERIENCE
14

CIVIL / PERMITTING

Jared has a proven track record of implementing projects and pragmatic processes with a high level of integrity, responsiveness, and leadership. He has over 14 years of experience in the planning and design of site development projects in Central Texas. His experience also includes hydraulic and hydrologic analysis of drainageways; wastewater collection; stormwater conveyance systems; water line distribution; and roadway design. He is skilled in various software including AutoCAD Civil 3D, ArcGIS, StormCAD, HEC-HMS, and HEC-RAS.



Jared managed site civil design and permitting at the intake site for the BCRUA Phase 2 project.



Tank overflow channel designed to convey 106 MGD at the BCRUA WTP.

BENEFITS TO LAGO VISTA



- Proven civil design experience in and around the central Texas area.
- Strong background in municipal infrastructure improvement projects.
- In depth understanding of, and coordination with outside entities involved with projects.

PROJECT EXPERIENCE

		Owner's Contact
Phase 1B WTP Site Development Alliance Regional Water Authority, TX	Performed civil site design and coordinated engineering teams to successfully permit the municipal development that is currently under construction on a 40-acre portion of a 558-acre site in Caldwell County near Rosanky. Design involved review of the local codes to meet all requirements; drainage calculations; culvert and ditch/channel designs; detention pond design; site grading; design of the driveway servicing the facility, site access drives around the site, a wider County Road that services the water treatment plant site, and layout of the security fencing and gates; permitting through TxDOT for the County Road reconstruction; and permitting through Caldwell County for site development.	Completed **2024** **Jason Biemer** Operations Manager jbiemer@alliancewater.org 512.294.3214
Phase 2 Regional Water System Maintenance Building Brushy Creek Regional Utility Authority, TX	Performed civil site design and coordinated engineering teams to successfully permit the municipal development that is to be constructed on a 5.217-acre property in the Village of Volente, Texas. The municipal development involves the construction of a 3,000 SF intake maintenance facility as part of the overall BCRUA Phase 2 Raw Water Delivery System Project. Significant Village and public input resulting in the creation of an interlocal agreement with the Village. Performed drainage calculations; water quality control designs; driveway designs servicing the facility; design of a lake access maintenance drive; design and layout of the security fencing and gates; and grading of the site.	Design **2021** Construction **Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526
Phase 1D Brushy Creek Regional Utility Authority, TX	Performed emergency overflow drainage design for new raw water tanks at the BCRUA WTP site. Flow management of up to 106 MGD at full buildout by modifying existing channels and access drive culvert crossings safely directing water around structures and through the plant site to detention ponds.	Design **2023** Construction **Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526



JOERG MOSER

COST ESTIMATING

Joerg Moser has extensive experience on technical and logistically challenging projects in different environments and types of construction. His specific expertise includes contract negotiations and administration, safety, engineering management, cost controls, quality control, purchasing, scheduling, manpower and equipment management, and subcontract administration. Mr. Moser has also participated in preparing bids and managing the construction of projects ranging from $1 million to $2.5 billion and involving tunnels and shafts, concrete structures, underground utility work, earthwork, inland-marine work, and dam rehabilitation.

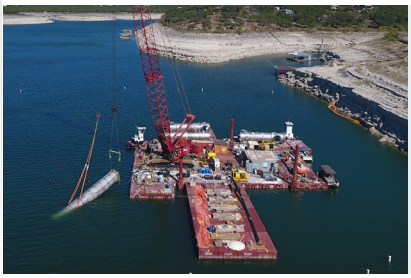
EDUCATION

BS, Civil Engineering, University of Applied Science, Constance, Germany

Construction Technician, Water Resources Authority of the State of Baden-Wuerttemberg

YEARS OF EXPERIENCE

40



Recent economic factors have increased the difficulty of cost estimating.



Joerg's experience preparing construction bids reduces the risk of overfunding or underfunding the project.

BENEFITS TO LAGO VISTA



- Unequaled experience performing cost estimating with over 30 years experience as a contractor.
- Capable of providing valuable recommendations to enhance front end documents prior to bidding.

PROJECT EXPERIENCE

		Owner's Contact
Phase 2 Raw Water Delivery System Brushy Creek Regional Utility Authority, TX	Joerg is serving as the Construction Manager for the BCRUA Phase 2 Raw Water Delivery System Project consisting of two multi-level deep intakes in Lake Travis connected to a 9,000 linear foot 96-inch finished diameter intake tunnel at depths ranging from 100 to 400 feet. The intake conveys water to a remotely located 145 MGD pump station with a 300-foot-deep wetwell. A 2,600 linear foot transmission tunnel conveys water across the lake to an existing 78" open-cut pipeline where a connection is made with a 125-foot-deep vertical shaft. Joerg is leading a large team of resident project representatives monitoring work at five different work sites 24 hours per day. The project construction cost is approximately $225 million, and the project duration is 5 years.	Construction **Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526
Lake Mead Intake No. 3 Southern Nevada Water Authority, Las Vegas, NV	Responsible for all construction related activities of this award-winning Project for the Southern Nevada Water Agency outside of Las Vegas, NV. The Project awarded as a CMAR contract with a value of over $330 million involved the construction of a 525ft deep access shaft, a 400ft long x 33ft wide x 36ft high underground cavern, 34 blind-bored well-shafts with a diameter of 8ft and a depth of 500ft, large diameter steel piping with world-wide sourced valves and appurtenances, free water surface surge tank on a discharge aqueduct; pressurized hydro pneumatic surge tank on a discharge aqueduct, a building to house electrical controls and starting equipment; electrical feed from on-site substation and the entire electrical and instrumentation installation necessary to operate the pumps. The installation of 34 of the world's largest submersible pumps with a capacity of 30 MGD each, operating at 13,000 Volt, followed by their testing, startup and commissioning brought the Project to a successful conclusion. The total installed pump capacity from a depth of 480 ft is 900 million gallons per day.	Completed **2020** **Erika Moonin, PE** Project Manager 709.769.5968



MATT RUDLOFF

RESIDENT PROJECT REPRESENTATION

Matt Rudloff is a Resident Project Representative with experience in civil and commercial construction in Central Texas. He graduated from Texas A&M University with a Bachelor of Science Degree in Construction Science.

Matt provides quality inspection and construction management services for various types of projects including water, wastewater, road construction, paving improvements, drainage improvements, and horizontal directional drilling. He is committed to each job and is very detailed and efficient in all aspects of his work to provide the highest quality construction management services for our clients.

EDUCATION
BS, Construction Science,
Texas A&M University

YEARS OF EXPERIENCE
10



Matt has served as RPR for the $18M BCRUA Phase 1D WTP Expansion.



Matt understands the contract documents to make sure Owners get what they paid for.

BENEFITS TO LAGO VISTA



- Experienced quality assurance manager that will not allow corners to be cut.
- Able to tackle many issues in the field to keep them from ending up on the Owner's desk.

PROJECT EXPERIENCE

		Owner's Contact
Phase 1D WTP Expansion Brushy Creek Regional Utility Authority, TX	Matt has been serving as the RPR for the Phase 1D expansion for the last two years. This project increases plant capacity from 32.5 MGD to 42 MGD and includes a new conventional treatment train (rapid mix, 3 stage flocculation, sedimentation, filtration), chemical feed system improvements, two new 1 MG raw water head tanks, new sludge thickener, and new belt filter press.	Construction **Ongoing** **Sam Roberts, PE** General Manager sroberts@bcrua.org 512.799.4526
Sanctuary Pump Station Salado Water Supply Corporation, TX	RPR services for a 2.5 MGD Pump Station with 300,000 Gallon GST. This project provides water for the Sanctuary Development in the Village of Salado.	Completed **2024** **Ricky Preston** General Manager swsc1@embarqmail.com 254.974.5425
Smith Street Pump Station City of Lacy Lakeview, TX	RPR services for a 1 MGD Pump Station with 300,000 Gallon GST. This project created a new pressure plane and additional capacity for the City of Lacy Lakeview.	Completed **2024** **Calvin Hodde** City Manager calvin.hodde@lacylakeview.org 254.799.2458
Schertz Connection Schertz Seguin Local Government Corporation, TX	RPR services for a 10,500 LF 18" waterline and terminus building. This project provided a metered secondary connection for the City of Schertz's new EST from SSLGC's 36" waterline.	Completed **2020** **Andrew McBride** General Manager amcbride@seguintexas.gov 832.386.2567
9th Street Pump Station Improvements City of McGregor, TX	RPR services for a 23,700 LF 16" waterline and vaults This project connected the existing Bluebonnet WSC 24" waterline to the City of McGregor's 9Th Street Pump Station. It also connected the 9th Street Pump Station to the existing City of Waco 16" waterline.	Completed **2017** **Kevin Evans** City Manager kevans@mcgregor-texas.com 254.840.2806



MARTY POLK, RPLS

SURVEYING

After graduating from Sam Houston State University in 1997, Marty moved to the Waco area where he began his surveying career. Starting on a field crew, Marty battled the harsh Texas elements, quickly advancing to survey technician, and has now been a Registered Professional Land Surveyor since 2008. He has worked diligently the last six years as a Survey Manager for Walker Partners in both their College Station and Waco offices.

Marty brings proficiency and expertise in the latest surveying techniques and equipment, including Carlson Survey software, the latest AutoCAD Civil 3D software as well as airborne and bathometric drone survey technology. At Walker Partners, he sets an example of exemplary achievement and professionalism.

Marty's dedication to his craft and his role as a mentor and technical advisor underscore his invaluable contribution to our Walker Partners' Survey Department and to the broader field of land surveying. His forward-thinking approach and technical acumen make him an ideal partner to Lago Vista, where his skills will undoubtedly drive the success of future projects.

EDUCATION
BS, Geography,
Sam Houston
State University

REGISTRATION
Registered
Professional Land Surveyor,
Texas No. 6031

YEARS OF EXPERIENCE
27



Marty's passion is performing and producing accurate, timely surveys – on every single project.



Our survey team uses the RIGHT survey equipment, software, and techniques for each specific project.

BENEFITS TO LAGO VISTA



- Extensive knowledge in topographic and boundary surveys, easements, construction layout staking, and route surveys.
- Thorough understanding of the latest surveying equipment and techniques.

PROJECT EXPERIENCE

		Owner's Contact
Downtown Fire Improvements City of Leander, TX	Marty served as Survey Manager for this Downtown Fire Improvements project in Old Downtown Leander near City Hall. This project included 3,250 LF of new 6", 8", and 12" waterline. Surveying services included establishing rights-of-way for 13 city blocks, as well as coordination with the City, subsurface utility locators, and Texas 811 to perform approximately 4600 LF of topographic/design survey. Marty also prepared four Temporary Construction Easements.	Construction **Ongoing** **Tony Bettis, PMP** CIP Program Manager tbettis@leandertx.gov 512.528.2732
Disaster Zone Infrastructure Improvements City of West, TX	Marty served as Project Surveyor for this project which includes GPS ground control for base mapping, and topographic and utility survey for disaster zone infrastructure improvements. Also included is the preparation of legal descriptions and exhibits for property and easement acquisition.	Completed **2023** **Tommy Muska** Former Mayor tommy@ westcommainsurance.com 254.709.7100
Westside Interceptor City of Bryan, TX	Marty served as Survey Project Manager and Senior CAD Technician on an 7-mile route survey for the preparation of 18 easements and the reduction of topographic survey for preliminary design and final alignment of a proposed 35,000 LF wastewater interceptor. He coordinated with two survey field crews to assure the route was correctly staked in the field and the topographic/boundary survey was completed within a timely manner.	Completed **Ongoing** **Jayson Barfknecht, PE, PhD** Public Works Director jbarfknecht@bryantx.gov 979.209.5900



BRIAN PEARCE, PE

ELECTRICAL / I&C

A licensed professional engineer in the state of Texas, Brian brings more than 20 years of expertise as an electrical and controls engineer and has worked the last decade on municipal-scale projects within the water supply, wastewater and industrial industries. His areas of expertise include Supervisory Controls and Data Acquisition (SCADA) and communications systems, design and commissioning, medium- and low-voltage power distribution, motor control/motor protection, and Arc Flash design and commissioning.

EDUCATION

BS, Electrical Engineering, University of Texas at San Antonio

AA, Audio Production, Art Institute of Seattle

REGISTRATION

Professional Engineer, Texas No. 132949

YEARS OF EXPERIENCE

20+

BENEFITS TO LAGO VISTA



- Experience in working with challenging space constraints and critical timelines.
- Demonstrated ability to minimize plant downtime while executing major improvement.

McKIM&CREED
ENGINEERS SURVEYORS PLANNERS

PROJECT EXPERIENCE

City of Cedar Park - Water System Resiliency Project

The City of Cedar Park water treatment plant is a 26 MGD plant serving over 80,000 residents. While the plant is fed from two different utility substations, the City desired to add on-site power generation to both comply with Texas Senate Bill 3 and improve the resiliency of their plant during inclement weather. Two, 2 MW generators were installed each with a 7,500 gallon fuel tank allowing the city to operate independent of the utility for 3 days without refueling. Mr. Pearce designed the automatic transfer scheme, paralleling controls, duct banks, and communications systems between generators and plant SCADA systems. One significant challenge on this project was the physical location of the generators. They had to be placed within inches of a 180' antenna tower on one side, a perimeter fence, and an overhead utility line on the other side. Working in conjunction with the structural and civil engineers a system was created to place the generators on their foundation using a remote controlled skate system instead of a traditional crane lift.

Brushy Creek Regional Utility Authority – Raw Water Pump Optimization and Cable Testing

Like many cities and water authorities who use Lake Travis as their water source Brushy Creek Regional Utility Authority (BCRUA) operates two floating intake barges. In total there are seven, 700 HP pumps between the two barges. A shoreside electrical building houses the switchgear, soft starters, and variable frequency drives which are connected to the pumps via underwater cables. Mr. Pearce led a team of maintenance and testing personnel through a multi-day preventative maintenance, testing, and optimization process. All submersible cables were tested using non-destructive techniques to develop a baseline value for insulation health. All switchgear, soft starters, and VFDs were cleaned and serviced per manufacturer and NETA procedures. Mr. Pearce optimized the starting and stopping profiles of all the soft starters to reduce mechanical stress on the raw water pipeline during pump start and stop. Additionally, he conducted a comprehensive review of motor protection settings, making several updates to enhance motor protection and reduce the possibility of nuisance tripping.

City of Concord - US Highway 29 Water Pump Station

Senior Electrical Engineer. McKim & Creed provided engineering services for the design of a new in-line water booster pump station near the intersection of US Highway 29 and George Lyles Parkway SW in Concord, NC. The pump station was designed for 5 MGD initial capacity and is expandable to 7 MGD, and provided for future water system demands for multiple pressure zones by feeding the City's newly Highway 29 EST (elevated storage tank). The pump station included a 3000 square foot pump station building, three 100 HP pumps with room for a fourth pump in the future, VFD operation, standby generator, flow and pressure metering, access from a NCDOT roadway, and associated piping and valving. The project is at 90% design completion, with bidding scheduled for September 2022.

Sabine River Authority - Earl Williams Pump Station, Orange, TX

Sabine River Authority's new raw water pump station is a 180 MGD station, expandable to 400 MGD. Mr. Pearce designed the electrical infrastructure to support the first three of eight pump bays. He designed raceway, access, and instrumentation for the future five pumps as well as a SCADA and communication system to connect the pump station with the check and discharge structure and the Gulf Coast main office. Finally, he designed a 1.25 MW backup diesel power generation system with auxiliary fuel tank capable of operating the pump station for 7 days at full capacity.



RACHEL MALDOMADO, PE

EDUCATION
BS, Architectural Engineering, University of Texas at Austin

REGISTRATION
Professional Engineer, Texas No. 117500

YEARS OF EXPERIENCE
18

STRUCTURAL

Rachel Maldomado, a Senior Associate and Structural and Project Engineer at Encotech, brings a wealth of over 17 years of experience to the firm. Her journey began at the University of Texas at Austin, where she earned a B.S. in Architectural Engineering. Since then, she has been a key contributor at Encotech, with her early work including serving as the Engineer-in-Training for the award-winning Waller Creek Tunnel renovation project, which featured the Boathouse, Outlet Structure, and Pedestrian Bridge.

Ms. Maldomado's career is a testament to her versatility and adaptability. She has honed her skills in steel and wood-framed one-story construction, civil-related concrete, load bearing CMU, and concrete tilt-wall construction. Her diverse portfolio, which spans public and private sectors, includes government buildings, educational institutions, healthcare facilities, and commercial properties. Her ability to collaborate effectively with architects, contractors, and manufacturers has established her as a proficient leader, consistently delivering projects on time, within budget, and to the highest structural standards.

Known for her service-oriented leadership, Ms. Maldomado excels at finding structurally sound and cost-effective solutions. Her dedication to quality and proactive approach to problem-solving have solidified her reputation as a dependable engineer committed to delivering successful outcomes for all stakeholders.

BENEFITS TO LAGO VISTA

» Worked with Walker Partners on two recent WTP and pump station projects.

» Extensive structural experience on pump station design throughout Central Texas.

ENCOTECH
We shape the world you live in.

PROJECT EXPERIENCE

- Austin Energy Regulatory Consulting Services — Austin, Texas
- City of Austin

Stormwater Improvements
AISD Mains to Capitol Complex
Austin Energy East Avenue Duct Bank
Austin Energy Regulatory Consulting Services
Davis Water Treatment Plant Facility Assessment
Davis Water Treatment Plant Sludge Processing Improvements
Davis WTP Sludge Processing Improvements
DCP-1 Cooling Tower Additions
Downtown Tunnel, Access Shafts
Downtown Wastewater Tunnel Project
Downtown Wastewater Tunnel Seaholm Addition
Govalle Wastewater Service Improvements
Holly Power Plant Decommissioning
Little Walnut Creek Flood Hazard Reduction, Metric to Rutland
Longhorn Dam Improvements
Lookout Pump Station
Mains to Capital Complex
Martin Hill Reservoir Mixing Improvements
Montopolis Water Reclamation Initiative Storage Reservoir and Pump Station
Montopolis Water Resource Initiative (WRI) Tank
Onion Creek Tunnel: Slaughter & WTP Shafts
Onion Creek Wastewater Interceptor: I-35 to Rinard
Onion Creek Wastewater Interceptor: Rinard to Slaughter
Parmer Lane Interceptor Sewer Tunnel Access Shafts
Pilot Knob Pump Station Buildings
Pilot Knob Pump Station Detention Pond
Plaza Saltillo Phase II Water Line Replacement



JAIME PALOMO, AIA

ARCHITECTURAL

Jaime has built a valued reputation among clients and consultants for his ability to create design solutions that fall consistently within the client's budget. He has led the architectural vision for the expansion and renovation of multiple wastewater treatment projects. Jaime is also well regarded for his understanding of how to work efficiently and effectively with the consulting disciplines. His projects have received multiple design awards and recognitions by local and state-wide organizations.

EDUCATION

MS, Architecture, University of Texas at Austin

BA, Louisiana State University Baton Rouge

REGISTRATION

Registered Architect, Texas No. 15565

YEARS OF EXPERIENCE

35

PROJECT EXPERIENCE

CITY OF SAN MARCOS, TX
Public Works Office *RENOVATION*

GATESVILLE WASTEWATER TREATMENT FACILITY UPGRADE & EXPANSION, TX
Stillhouse Wastewater Treatment Plant *EXPANSION AND RENOVATION*

TRAVIS COUNTY, TX
Uplands Water Treatment Expansion *EXPANSION*
Pedernales Fire Station Expansion *NEW & RENOVATION*

LAKE GEORGETOWN WATER TREATMENT PLANT, TX
Chemical Feed System Building *NEW*

BRAZOS RIVER AUTHORITY, WILLIAMSON CO., TX
Copper Ion Generator Building *NEW*

MONTOPOLIS WATER RECLAMATION INITIATIVE, TX
Pump Station and Storage Reservoir *NEW*

DAVIS WATER TREATMENT PLANT, TX
Medium Service Pump Station Building *NEW*

WALNUT CREEK WASTEWATER TREATMENT PLANT, TX
Facility Assessment and Expansion *MULTIPLE BUILDINGS*

ULLRICH WATER TREATMENT PLANT, TX
Conversion to On-Site Sodium Hypochlorite Generation
160 MGD Expansion *MULTIPLE NEW BUILDINGS*

BENEFITS TO LAGO VISTA

- Experience assessing water treatment plants and providing necessary upgrades.
- Experience identifying risks early on and implementing proactive strategies to manage schedules and budgets.
- Understanding of local codes, regulations and permitting required for water and WWTPs.

fgma



TRAVIS BRYANT, PE

EDUCATION
BS, Civil Engineering,
University of Texas at Austin

REGISTRATION
Professional Engineer,
Texas No. 115527

YEARS OF EXPERIENCE
16

BENEFITS TO LAGO VISTA



- Family owned and operated, serving the Central Texas area since 1978.
- Holt owns and operates two, CME-55 drill rig with licensed drillers capable of providing drilling, coring, soil and rock sampling, packing testing, and monitoring well installation.
- Certified lab and technicians capable of providing most testing needs.

GEOTECHNICAL

Travis H. Bryant is the President and Principal Engineer with Holt Engineering, Inc. Mr. Bryant has been with Holt Engineering, Inc. full time since 2009. As President and Principal Engineer, he is responsible for contract negotiations, project management, construction supervision, and project coordination with clients, architects, government agencies, contractors, and engineers of other professions for all types of buildings, roads, bridges, retaining structures, water quality ponds, dams, concrete structures, and pre-engineered metal buildings. He also directs and maintains the company's QA/QC Program and AASHTO accreditation, supervises lab technicians responsible for sampling and testing construction materials, field inspections with written reports, review of lab specifications, and evaluation of materials for construction projects.

As Principal Engineer, Mr. Bryant is responsible for overseeing and directing Geotechnical Investigations that include drilling, logging, and sampling bore holes, field testing, developing a laboratory testing program specific to the project and providing written engineering reports with specific recommendations. Depending on the project, recommendations may include shallow or deep seated foundation recommendations, pavement evaluation and rehabilitation options for HMAC or concrete, cement or lime stabilized subgrade, backfill, bedding material and compaction recommendations for utility construction, recommended OSHA soil classifications, lateral and end bearing values, slope analyses, construction considerations and recommendations for construction materials testing and inspection quality assurance plans. He is also a licensed monitoring well and pump installer.

PROJECT EXPERIENCE

City of Lago Vista - Elevated Storage Tank, Ming Trail

Proposed elevated water storage tank with a 150,000-gallon capacity. The elevated tank will be a composite structure (concrete pedestal with steel tank) with a pedestal diameter of 22.5 feet and a tank diameter of 35 feet.

Services Provided: Drilling, logging, and sampling 2 borings at 15 feet to 40 feet. Lab testing and geotechnical report with foundation recommendations including bearing capacity, lateral bearing capacity, and settlement calculations, and seismic design criteria.

Williamson County - North Fork Wastewater Treatment Plant, Ronald Raegan Blvd.

Multiple structures were constructed on the site. The structures consist of an MBR (membrane bioreactor) plant, primary and secondary headworks facility, effluent lift station with piping pad, centrifuge building, chemical storage building, pump blower building, lab/office building, effluent lift station, and on-site lift station.

Services Provided: Drilling, logging and sampling 9 borings to depths of 15 feet to 30 feet. Lab Testing and geotechnical report with foundations recommendations including bearing capacities, lateral pressures, benching and sloping recommendations, pavement thickness design recommendations, and seismic design criteria.

Travis County WCID No. 17 - Mansfield WTP Expansion

Holt's services provided include moisture density relationship testing, nuclear density field testing, asphalt concrete sampling and testing, reinforced concrete testing, proofrolling, visual inspection, and observation of subgrade cuts and excavations, reinforced steel observations and inspection, and shotcrete sampling and testing.

HOLT ENGINEERING, INC.
Geotechnical Engineering & Materials Testing

AGENDA ITEM NO. 8a

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Mayor Sullivan, City Council

SUBJECT: Discussion regarding possible recommended changes to the City of Lago Vista City Charter as suggested by the Charter Review Committee.

BACKGROUND: The Charter Review Committee has been meeting for several months.

FINANCIAL IMPACT: N/A

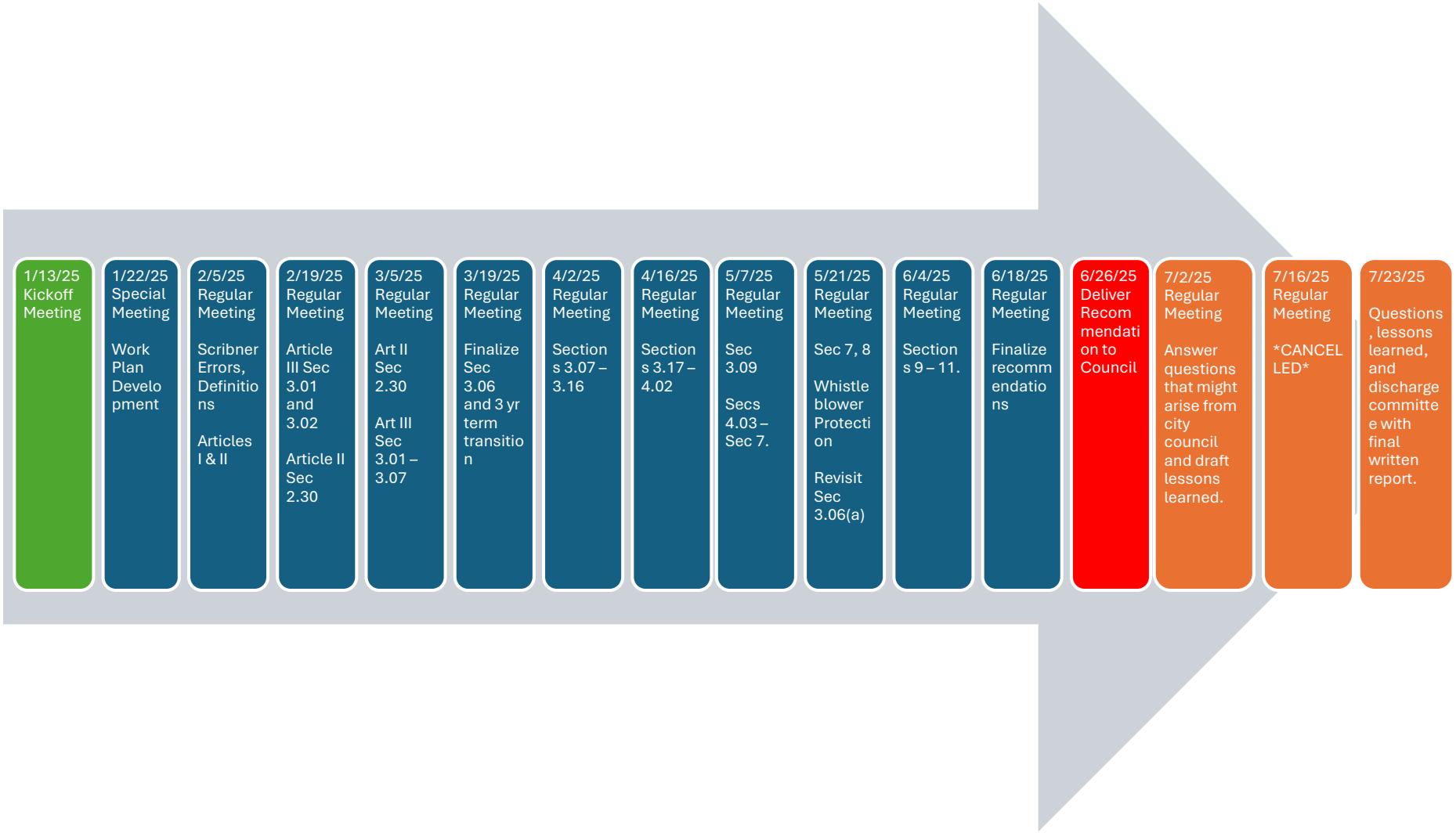
ATTACHMENTS:
2025 Charter Review.pdf

2025 Charter Review

7/7/2025

CITY OF
LAGO VISTA
TEXAS

Timeline of Activities



Recommendations

#	Section	Date	Recommendation Description	Detail Slide
1	1.04(b)	2/5/2025	Reviewed dis-annexation feedback and criteria and recommend no changes.	
2	2.03	3/5/2025	Considered restricting city Eminent Domain powers and ultimately concluded contemplated property rights are already provided per the Texas Constitution.	
3	3.01/6.11	3/5/2025	Recommend Revising Section 3.01 to extend Mayor and council terms to 3 years and requiring a majority vote to win elections. This would also require updating Section 6.11 to reference 3 year terms.	Slide 7-9
4	3.01	3/19/2025	Recommend in conjunction with 3 years terms, transition plan to have council places staggered 2 per election over 3 election cycles by adding Exhibit 2025-01	Slide 7-9
5	3.06	3/19/2025	Recommend retitling and replacing Sec 3.06 entirely to clarify Mayor and council member roles.	Slide 10
6	3.01	3/19/2025	Considered recommendation for term limits and committee recommends rejecting as it could be awkward to have term extension and term limits on the same ballot; Council should consider term limits for a future ballot if term extension is approved.	
7	3.06	4/2/2025	The committee recommends not amending the Charter include a “duty to report” Charter or Ethics Policy violations in Section 3.06.	
8	3.08	4/2/2025	Incorporate Ms. Pitts’ non substantive edits revisions, to require a vote of five (5) Council Members to remove to remove a Council Member, and to add the following lessor penalties by editing the sentence: *The decision of the Council shall be final and binding. If the Council determines that a violation has occurred, but removal from office is not warranted, with a majority vote of four (4) members, the Council may, in the discretion of the Council, include a lesser penalty of censure, suspension of up to thirty (30) days, and/or loss of voting rights at city council meetings for up to ninety (90) days.* Further, the committe recomends adding "to present evidence" to this sentence: *The Council Member complained against shall have the right to representation at the hearing, to present evidence, and to question and cross-examine all witnesses but may not vote on the question of removal.*	Slide 11

Recommendations pg. 2

#	Section	Date	Recommendation Description	Detail Slide
9	3.09	5/7/2025	The committee recommends complete revising section 3.09 to allow voters to choose replacement council members when there are vacancies in certain circumstances.	Slide 12
10	3.11	4/2/2025	The committee recommends revising of Section 3.11 by deleting the sentence, "Special Called Meetings shall be held as determined by the Council or called by the Mayor." as duplicitous with the recommended revisions to Section 3.06 regarding Special Called Meetings.	
11	3.12	4/2/2025	The committee recommends revising of Section 3.12 by accepting the non substantive edits, by deleting the phrase "provided that less than a quorum may adjourn any meeting or canvass an election," and moving a new sentence, "Notwithstanding the foregoing, less than a quorum may adjourn any meeting or Canvass an Election." to the end of the paragraph improve clarity of the section.	
12	3.16 & 3.06	4/2/2025	The committee recommends revising of Section 3.16 by deleting the phrase "or, in the absence of the Mayor", by adding a comma prior to "and the City Secretary," and by further revising the prior recommended 3.06 (j) edits to include "Mayor or Mayor Pro-Tem will sign…."	
13	3.17	4/16/2025	The committee does not recommend any revisions to Section 3.17 other than noted Scrivner's corrections, however, the committee does recommend to add the term "Official Notice" to the proposed definitions list in recommended to be added to Section A.	
14	4.01	4/16/2025	The committee recommends deleting sentences from the 4th paragraph of Section 4.01, starting with "Except" on line 641 of the packet draft through line 645, ending with "Charter," as duplicitive with the directive in Section 3.23 and recommended revisions to 3.06.	Slide 13
15	5.04	5/7/2025	The committee recommends changing to require officeholders receive a majority vote rather than simply a plurality, and implement runoffs if required.	Slide 14
16	6.01	5/7/2025	The committee does not recommend lowering the petition threshold from 10% to 5%.	
17	6.02	5/7/2025	The committee does not recommend lowering the petition threshold from 15% to 5%; however, the committee does recommend lowering the threshold from 15% to 10%.	Slide 15
18	6.08	5/7/2025	The committee, recommends reducing the petition threshold for forcing a recall process from 10% to 5% particularly considering the recommendation for three-year terms.	Slide 16

Recommendations pg. 3

#	Section	Date	Recommendation Description	Detail Slide
19	3.06 (a)	5/21/2025	The committee recommends further amending recommendation #5 to provide unrestricted access to city employees by city council members.	Slide 17
20	Add 7.05	5/21/2025	The committee recommends adding Section 7.05 to Charter as follows: Section 7.05 Building and Standards Commission. A Building and Standards Commission is established to perform such duties and functions as required or authorized by State law, this Charter, and the enabling Ordinance.	Slide 18
21	Add 11.09	5/21/2025	Add Whistleblower Protections for city employees in addition to protections in Tx Government Code Sec 554.	Slide 19
22	8.02	5/21/2025	Add language to Sec 8.02 to clarify City Council's Role in Budget Preparation	Slide 20
23	11.03	6/4/2025	The committee recommends striking the phrase "by microfilm or other photographic process" from the last sentence in Section 11.03, if the revision can be considered in the list of "non substantive" edits. Note, the CRC subsquently learned the city attorney would consider this a substantive change so this recommendation may be disregarded.	
24	11.15	6/4/2025	The committee recommends adding the following as a second paragraph in Section 11.15 to provide guidance in interpreting conflicts within the Charter: *"In the event of a conflict or ambiguity between provisions of this Charter, such provisions shall be construed in a manner that most effectively upholds the principles of transparency, accountability, and the individual rights of Council members as set forth in this Charter."*	
25	11.06	6/18/2025	The committee recommends updating the charter to allow for gifts permissible by state law and the city's Ethics Policy. Currently the Charter prohibits gifts but the Ethics Policy allows them limited to $50.	Slide 21

Recommendations pg. 4

#	Section	Date	Recommendation Description	Detail Slide
26	11.17	6/18/2025	The committee viewed 11.17 as redundant and confusing as it could be read as asserting city authority over other governmental units, however voted to accept the City Attorney's recommendation to not substantively revise.	
27		6/18/2025	The committee recommends adding definitions to section A and other non-substantive edits throughout the entire document for consistency in use of terms, capitization of terms, and standarization of terms.	Separate Handout
28		6/18/2025	If term extensions are approved by the voters in 2025, the committee formally recommends the 2027 City Council consider placing a charter amendment for term limits on the 2027 ballot.	
29		6/18/2025	The committee recommends, upon completion of final charter edits and pagination after the 2025 election, a table of contents already approved by the voters in 2018 be added to the charter.	Slide 22

Recommendation #3&4: Extend council terms to 3 years, staggered 2-2-2
Article III / Section 3.01

The committee recommends revising the Charter to extend terms of elected officers to 3 years, which by law will require revising the charter to provide for election by majority rather than plurality. This:

Provides a “learning curve” for new council members to develop expertise,

Enhances continuity in policy, and

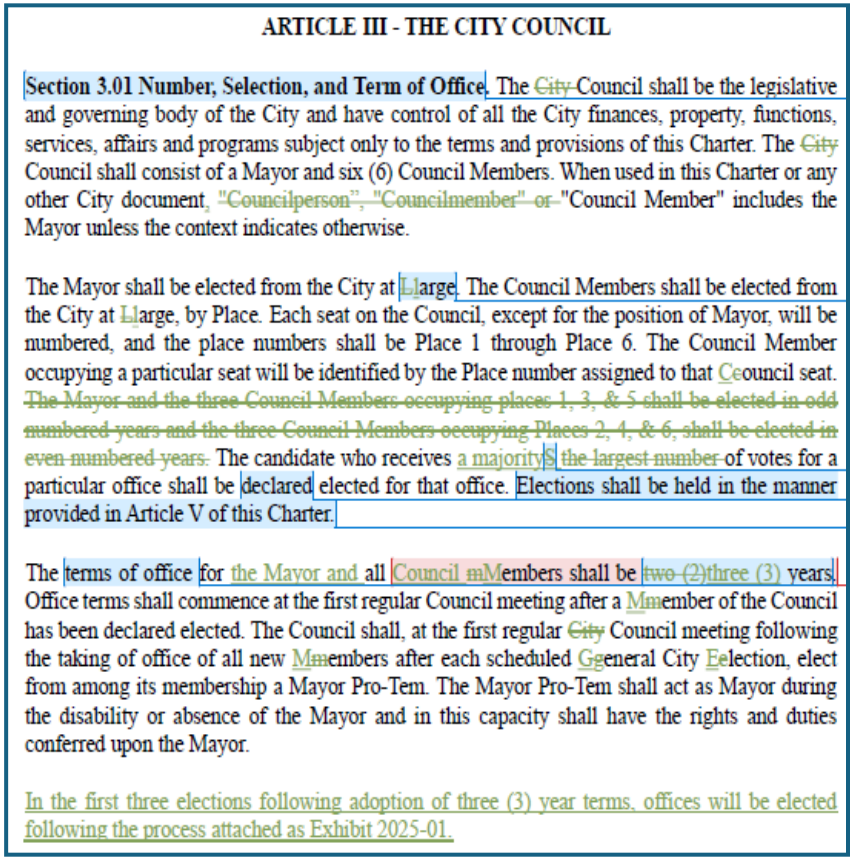
Allows council members to have two years focused service without re-election consideration every other year.

In addition, the committee voted to adopt a transition process that spreads the six council places across the three year expanded terms such 2 places are staggered each year with a 2-2-2 cadence rather than the 3-3-0 cadence produced by simply expanding terms. This,

Maintains and smooths the staggered terms to a consistent, overlapping cadence.

Reduces elections from 3 places to 2, minimizing the likelihood of uncontested races.

Section 3.01 will be deleted and replaced with new section 3.01, and Exhibit 2025-01 added to the charter.



ARTICLE III - THE CITY COUNCIL

Section 3.01 Number, Selection, and Term of Office. The ~~City~~ Council shall be the legislative and governing body of the City and have control of all the City finances, property, functions, services, affairs and programs subject only to the terms and provisions of this Charter. The ~~City~~ Council shall consist of a Mayor and six (6) Council Members. When used in this Charter or any other City document, ~~"Councilperson", "Councilmember" or~~ "Council Member" includes the Mayor unless the context indicates otherwise.

The Mayor shall be elected from the City at Llarge. The Council Members shall be elected from the City at Llarge, by Place. Each seat on the Council, except for the position of Mayor, will be numbered, and the place numbers shall be Place 1 through Place 6. The Council Member occupying a particular seat will be identified by the Place number assigned to that Ccouncil seat. ~~The Mayor and the three Council Members occupying places 1, 3, & 5 shall be elected in odd numbered years and the three Council Members occupying Places 2, 4, & 6, shall be elected in even numbered years.~~ The candidate who receives a majority~~S~~ ~~the largest number~~ of votes for a particular office shall be declared elected for that office. Elections shall be held in the manner provided in Article V of this Charter.

The terms of office for the Mayor and all Council ~~m~~Members shall be ~~two (2)~~three (3) years. Office terms shall commence at the first regular Council meeting after a Mmember of the Council has been declared elected. The Council shall, at the first regular ~~City~~ Council meeting following the taking of office of all new Mmembers after each scheduled Ggeneral City Eelection, elect from among its membership a Mayor Pro-Tem. The Mayor Pro-Tem shall act as Mayor during the disability or absence of the Mayor and in this capacity shall have the rights and duties conferred upon the Mayor.

In the first three elections following adoption of three (3) year terms, offices will be elected following the process attached as Exhibit 2025-01.

Recommendation #3 & 4: Extend council terms to 3 years, staggered 2-2-2
Article III / Section 3.01 Exhibit 2025-01
Page 2

Exhibit 2025 – 01

Transition Process for staggering three (3) year terms adopted in 2025 applicable to 2026, 2027, and 2028 elections.

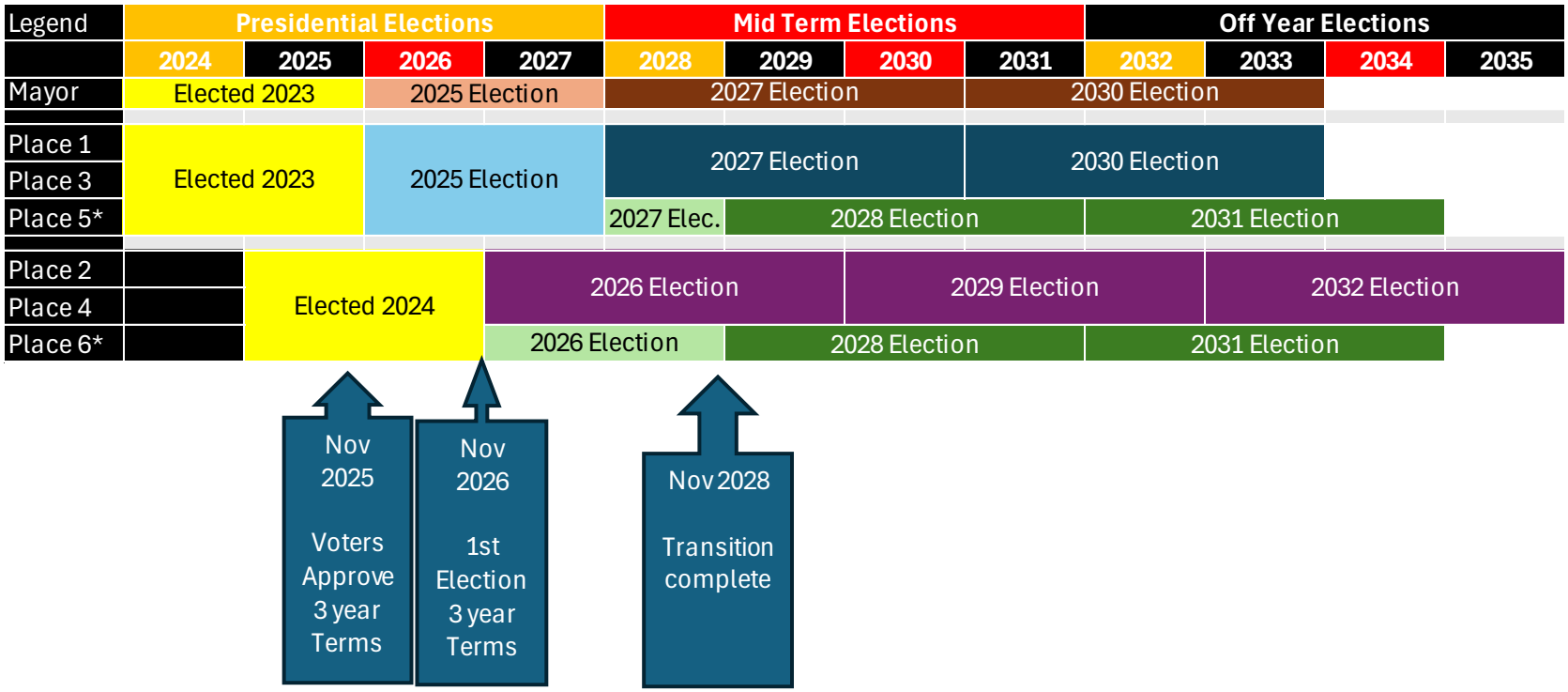
In the first three elections following adoption of three (3) year terms, offices will be elected following the process as follows:

- In the first Election [2026] after adopting three (3) year terms, Places 2, 4 and 6 will be up for election. Two (2) Places will be elected to serve three (3) years, and one (1) Place ("Short Term") will serve a one-time two (2) year term to set up a staggered cycle.
- In the second Election [2027] after adopting three (3) year terms, the Mayor and Places 1, 3 and 5 will be up for election. The Mayor and two (2) Places will be elected to serve three (3) years, and one (1) Place ("Short Term") will serve a one-time one (1) year term to set up a staggered cycle.
- In the third Election [2028] after adopting three (3) year terms, the two (2) "short terms" from the prior two (2) elections will be elected to serve three (3) years, completing the transition to staggered three (3) year terms.
- All subsequent elections will be for three (3) year terms for the Mayor and Council Members, with two (2) places elected each year, and the Mayor elected every third election.

The transitional "short terms" will be determined as follows:

- If there is a single uncontested race, the uncontested race is the "short term".
- If there are no uncontested races, or multiple uncontested races in 2026 and 2027, the winning candidate with the lowest vote total receives the short term.

Illustrated Transition to Three Year Terms 2-2-2



*Note: Places 5 and 6 are shown as short transition terms for illustration only. The actual short term places could be decided several ways:

The transition "short terms" will be determined individually, or in combination by:

- If there is a single uncontested race, the uncontested race is the short term.
- If there are no uncontested races, or multiple uncontested races in 2026 and 2027, the winning candidate with the lowest vote total receives the short term.

Other possible options council may consider:

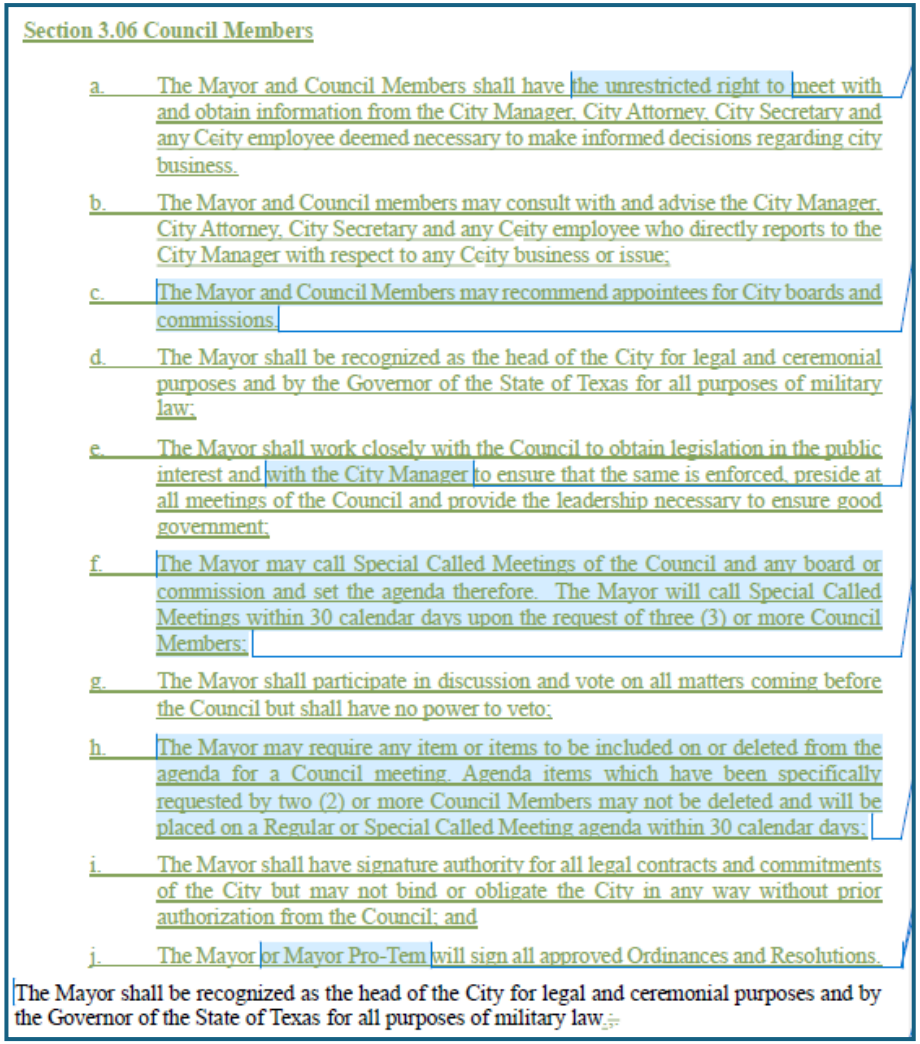
- Defining Specific Places to be short terms and allow candidates to self-select running for a short term.
- Winning candidates in 2026 and 2027 draw straws or coin toss for the short term.

Recommendation #5: Revise Section 3.06 to clarify Mayor and Council Member Rules
Article III / Section 3.06

The committee recommends revising Section 3.06 of the Charter to clarify rules for the Major and Council Members. Currently 3.06 pertains to the Mayor, and there is no corresponding section for Council Members. The Mayor is a co-equal member of the city council, with a few specific and ceremonial duties.

"Section 3.06 Mayor" will be deleted and replaced with new "Section 3.06 Council Members" and Sections 3.23 and 4.01 will be amended to align with the new Section 3.06.

See also Recommendation 19, further amending Section 3.06 (a).



Section 3.06 Council Members

a. The Mayor and Council Members shall have the unrestricted right to meet with and obtain information from the City Manager, City Attorney, City Secretary and any Ceity employee deemed necessary to make informed decisions regarding city business.

b. The Mayor and Council members may consult with and advise the City Manager, City Attorney, City Secretary and any Ceity employee who directly reports to the City Manager with respect to any Ccity business or issue;

c. The Mayor and Council Members may recommend appointees for City boards and commissions.

d. The Mayor shall be recognized as the head of the City for legal and ceremonial purposes and by the Governor of the State of Texas for all purposes of military law;

e. The Mayor shall work closely with the Council to obtain legislation in the public interest and with the City Manager to ensure that the same is enforced, preside at all meetings of the Council and provide the leadership necessary to ensure good government;

f. The Mayor may call Special Called Meetings of the Council and any board or commission and set the agenda therefore. The Mayor will call Special Called Meetings within 30 calendar days upon the request of three (3) or more Council Members;

g. The Mayor shall participate in discussion and vote on all matters coming before the Council but shall have no power to veto;

h. The Mayor may require any item or items to be included on or deleted from the agenda for a Council meeting. Agenda items which have been specifically requested by two (2) or more Council Members may not be deleted and will be placed on a Regular or Special Called Meeting agenda within 30 calendar days;

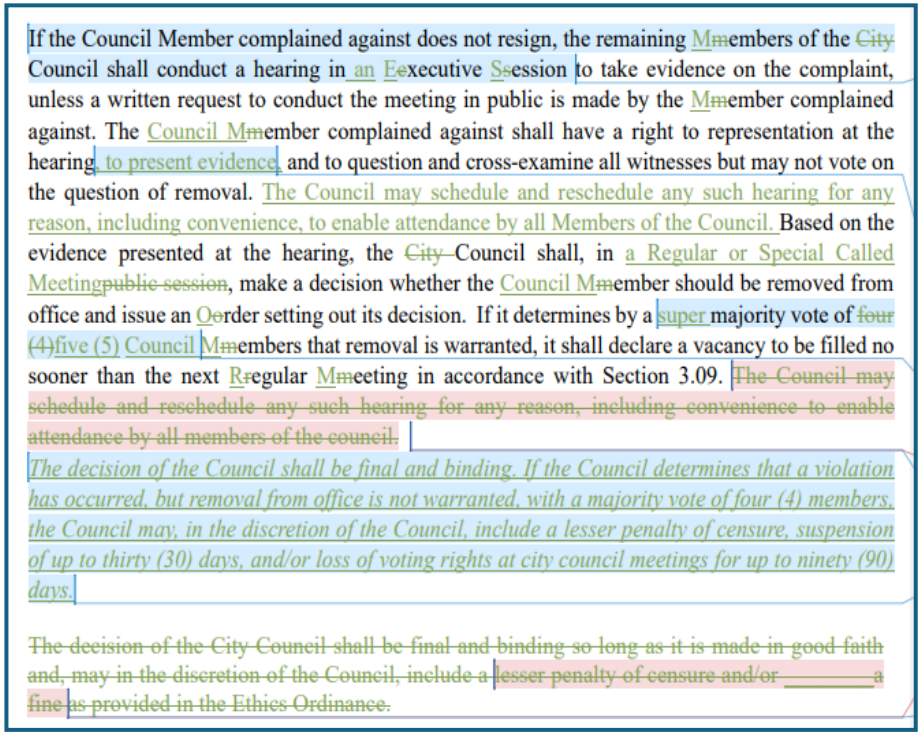
i. The Mayor shall have signature authority for all legal contracts and commitments of the City but may not bind or obligate the City in any way without prior authorization from the Council; and

j. The Mayor or Mayor Pro-Tem will sign all approved Ordinances and Resolutions.

The Mayor shall be recognized as the head of the City for legal and ceremonial purposes and by the Governor of the State of Texas for all purposes of military law;

Recommendation #8: Revise Section 3.08 regarding removal from office
Article III / Section 3.08

The committee recommends revising Section 3.08 of the Charter to adopt non substantive edits, require super majority vote of 5 council members to remove from office, and add lessor penalties upon vote of 4 council members. Further the committee recommends 3.08 be revised to include "to present evidence" as a right of the accused at hearings.



If the Council Member complained against does not resign, the remaining Mmembers of the ~~City~~ Council shall conduct a hearing in an Eexecutive Ssession to take evidence on the complaint, unless a written request to conduct the meeting in public is made by the Mmember complained against. The Council Mmember complained against shall have a right to representation at the hearing, to present evidence, and to question and cross-examine all witnesses but may not vote on the question of removal. The Council may schedule and reschedule any such hearing for any reason, including convenience, to enable attendance by all Members of the Council. Based on the evidence presented at the hearing, the ~~City~~ Council shall, in a Regular or Special Called Meeting~~public session~~, make a decision whether the Council Mmember should be removed from office and issue an Oorder setting out its decision. If it determines by a super majority vote of ~~four (4)~~five (5) Council Mmembers that removal is warranted, it shall declare a vacancy to be filled no sooner than the next Rregular Mmeeting in accordance with Section 3.09. ~~The Council may schedule and reschedule any such hearing for any reason, including convenience to enable attendance by all members of the council.~~

The decision of the Council shall be final and binding. If the Council determines that a violation has occurred, but removal from office is not warranted, with a majority vote of four (4) members, the Council may, in the discretion of the Council, include a lesser penalty of censure, suspension of up to thirty (30) days, and/or loss of voting rights at city council meetings for up to ninety (90) days.

~~The decision of the City Council shall be final and binding so long as it is made in good faith and, may in the discretion of the Council, include a lesser penalty of censure and/or _____ a fine as provided in the Ethics Ordinance.~~

Recommendation 9: Revise Section 3.09 to allow voters to choose fill council vacancies

The committee recommends that council vacancies be permanently filled by election by the voters rather than by appointment, particularly with the recommendation to extend terms to three years, by replacing section 3.09 with this revision:

Section 3.09 Filling Vacancies.

Within thirty (30) days of declaring a Council vacancy, or vacancies, the remaining Members of Council shall make appointment by majority vote to fill such vacancy. An appointment to fill a vacancy will be valid until the next general election or an earlier uniform election date. If the next scheduled election is more than 180 days in the future, a Special Election will be called within thirty (30) days of the vacancy to fill said vacancy.

If no qualified candidate(s) files an application for any Special or General Election to fill the vacancy, the Council shall appoint a qualified person(s) to fill the vacancy until the next General Election.

If at any time there are no Members of the Council able to serve, or if a quorum of the Council is not able to serve, the remaining Council Members will appoint the Chairpersons of the Planning and Zoning Commission and the Board of Adjustment, as temporary Council Members to conduct city business that is deemed urgent and unable to postpone until a Special Election can be called. If necessary, the above individuals will appoint any standing City Committee, Commission, or Board Chairpersons, as temporary Council Members until a temporary Council of five (5) members is formed. The temporary Council will immediately call a Special Election to fill the Council vacancies filed by appointees

Recommendation #14: Revise Section 4.01 to align with recommendations for 3.06 and redundancy with 3.23.
Article IV / Section 4.01

The committee voted to recommend deleting sentences from the 4th paragraph of Section 4.01, starting with "Except" on line 641 of the packet draft through line 645, ending with "Charter," as duplicative with the directive in Section 3.23 and recommended revisions to 3.06.

The Council, except as provided for in Section 3.06 of this Charter, shall direct and supervise the City Manager only by majority vote. ~~*Except for the purposes of inquiries and investigations under this Charter, the Council or its Members shall deal with employees who are subject to the supervision of the City Manager solely through the City Manager. Neither the Council nor its Members shall give orders to or in any way exercise the influence of their office on such Officer or employee, either publicly or privately, except as otherwise provided in this Charter.*~~

Recommendation #15: Revise Section 5.04 to require election by majority vote.
Article V / Section 5.04

The committee previously recommended extending terms to three years, which if approved, would, by state law, require elections by majority and Section 5.04 was revised in tandem with extending terms to three years.

Going further, should the term extension recommendation fail to have council or voter support, the committee's unanimous sentiment is Section 5.04 should be revised as a standalone recommendation to provide that office holders must receive a majority vote to be seated and provide for run off elections if required. This ensures that ultimately officeholders have a majority support of the voters, which may not be the case with a plurality.

Section 5.04 Election. Candidates for the Council shall file for a specific office, designated by Place number or Mayor, and the Mayor and the Council Member for each Place shall be elected by ~~plurality~~ majority vote. In the event no candidate for an office receives a ~~plurality~~majority of the votes cast for that office in the Ggeneral or Sspecial Eelection, the Council shall, upon completion of the official Ceanvass, order a Rrun-Ooff Eelection among the two (2) candidates who received ~~tied for~~ the highest number of votes. The Rrun-Ooff Eelection shall be held on the third Saturday following the Ceanvass of the vote in the Ggeneral or Sspecial Eelection.

Recommendation #17: Lowering the petition threshold in 6.02 from 15% to 10%.
Article VI / Section 6.02

The committee does not recommend lowering the petition threshold in Sec 6.01 or 6.02 to 5% but does recommend lowering from 15% to 10% in Sec 6.02 to be consistent with voter initiative thresholds in other Charter sections.

Section 6.02 Power of Referendum. The ~~people~~Residents reserve the power to approve or reject at the polls any legislation enacted by the Council which is a proper subject for the initiative process under this Charter, except for the limitations specified in this Article and in Section 8.10. An Emergency O~~o~~rdinance enacted for the immediate preservation of the public peace, health or safety is not subject to R~~r~~eferendum if it contains a statement declaring a specific emergency and the requirement for immediate and urgent action. Referendum P~~p~~etitions shall be signed by ~~qualified~~ registered voters of the City equal in number to at least ~~ten~~fifteen (1~~0~~5) percent of the number of registered voters who resided in the City on the date of the last G~~g~~eneral ~~City~~ E~~e~~lection. When such a P~~p~~etition has been certified as sufficient by the City Secretary, the Council shall proceed in accordance with the requirements of this A~~a~~rticle.

Recommendation #18: Lowering the petition threshold in 6.08 from 10% to 5%.
Article VI / Section 6.08

The committee, recognizing the importance of the voice of the voter in holding officeholders accountable, recommends reducing the petition threshold for forcing a recall process from 10% to 5% particularly considering the recommendation for three-year terms.

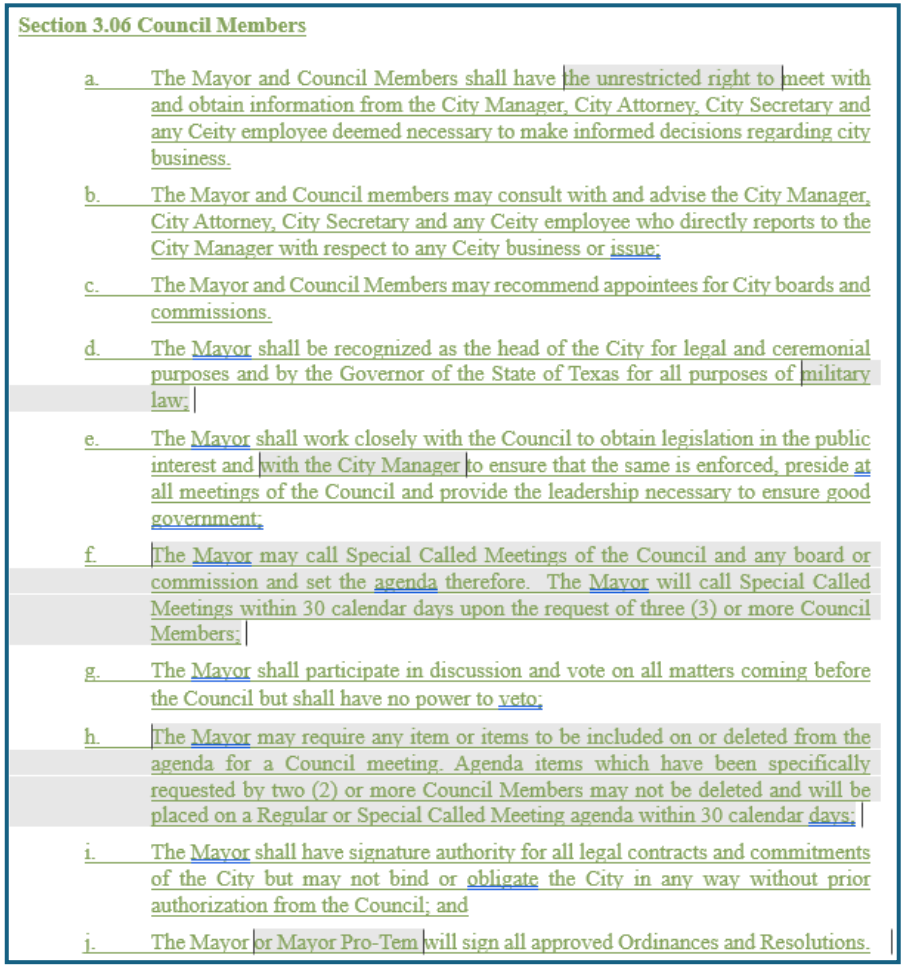
Section 6.08 Power of Recall. The ~~people~~Residents of the City reserve the power to recall the Mayor or any other M~~m~~ember of the Council and may exercise such power by filing with the City Secretary a valid Recall P~~p~~etition demanding the removal of the Mayor or a Council Member(s). Such P~~p~~etition shall be signed by ~~qualified~~ registered voters of the City equal in number to at least five ~~ten~~ (~~10~~5) percent of the number of registered voters who resided in the City at the time of the last G~~g~~eneral ~~City~~ E~~e~~lection. The P~~p~~etition shall be signed and verified as required by Section 6.12 and shall contain a specific statement of the grounds for which the removal is sought. One of the signers of each P~~p~~etition shall make an affidavit that the statements therein made are true. A separate P~~p~~etition is required for each elected official to be R~~r~~ecalled. The R~~r~~ecall P~~p~~etition process shall begin with the filing of a written notice of intent with the City Secretary. This notice shall be signed by five (5) ~~qualified~~ registered voters of the City and shall state the name of the elected official to be R~~r~~ecalled. The filing date of this notice shall be the formal beginning of the R~~r~~ecall process. All P~~p~~etition signatures shall be collected and the P~~p~~etition filed with the City Secretary in accordance with the requirements specified in Section 6.12.
(Rev. November 2, 2021)

Recommendation #19: Further revise Section 3.06 to provide unrestricted access to city employees by council members
Article III / Section 3.06 (a)

The CRC reconsidered recommendation #5 amending Section 3.06 (a), regarding city council members' and city staff's interactions and discussed further loosening of restrictions on city council members to directly engage city staff to obtain information to inform decisions on city operations.

Interim City Secretary Quinn spoke during citizen comments on behalf of herself and other city employees advocating that city council members should not have unrestricted access to every city employee but should work through the City Manager or department heads.

The CRC voted to recommend further amending Section 3.06 (a) to allow council members unrestricted access to city employees.



Section 3.06 Council Members

a. The Mayor and Council Members shall have the unrestricted right to meet with and obtain information from the City Manager, City Attorney, City Secretary and any Ceity employee deemed necessary to make informed decisions regarding city business.

b. The Mayor and Council members may consult with and advise the City Manager, City Attorney, City Secretary and any Ceity employee who directly reports to the City Manager with respect to any Ceity business or issue;

c. The Mayor and Council Members may recommend appointees for City boards and commissions.

d. The Mayor shall be recognized as the head of the City for legal and ceremonial purposes and by the Governor of the State of Texas for all purposes of military law;

e. The Mayor shall work closely with the Council to obtain legislation in the public interest and with the City Manager to ensure that the same is enforced, preside at all meetings of the Council and provide the leadership necessary to ensure good government;

f. The Mayor may call Special Called Meetings of the Council and any board or commission and set the agenda therefore. The Mayor will call Special Called Meetings within 30 calendar days upon the request of three (3) or more Council Members;

g. The Mayor shall participate in discussion and vote on all matters coming before the Council but shall have no power to veto;

h. The Mayor may require any item or items to be included on or deleted from the agenda for a Council meeting. Agenda items which have been specifically requested by two (2) or more Council Members may not be deleted and will be placed on a Regular or Special Called Meeting agenda within 30 calendar days;

i. The Mayor shall have signature authority for all legal contracts and commitments of the City but may not bind or obligate the City in any way without prior authorization from the Council; and

j. The Mayor or Mayor Pro-Tem will sign all approved Ordinances and Resolutions.

Recommendation #20: Clarifying the status of BSC Article VII / Section 7.05

The committee discussed the BSC is not specifically cited as a quasi-judicial body in Section 7 of the charter as are P&Z and BOA. The committee questioned whether BSC should be considered advisory only. The city attorney advised BSC has quasi-judicial authority derived from Sec.54.036 of the Local Government Code. However, attorneys noted that the Lago Vista ordinances are unusual in that a decision by BSC is appealable to the City Council, which may conflict with state law. In addition, the CA cited 6 duties of Lago Vista's BSC that go beyond traditional duties and stated "Ultimately, the charter probably needs to be amended to clarify this. But one could argue that these are board of adjustment-like functions given to the BSC so it does not violate the charter."

Given the ambiguity and the CRC's lack of clarity of what, if anything needs to be addressed, the CRC felt this should be called out in a recommendation by adding a Section 7.05 and allow council to work with the city attorney on a final recommendation if a ballot measure is warranted.

Section 7.05 Building and Standards Commission. *A Building and Standards Commission is established to perform such duties and functions as required or authorized by State law, this Charter, and the enabling Ordinance.*

Recommendation #21: Adding Whistleblower Protections for city employees
Article XI / Section 11.19

The CRC recognizes that while State law provides Whistleblower protection and prevents retaliation for city employees that report, in good faith, violations of law (Sec 554.002 Texas Government Code Title 5, Chapter 554), the CRC recommends extending this protection to reporting of ethical and/or operational concerns by adding a Section 11.19 to the charter.

Section 11.19 – Whistleblower Protection *– In addition to protections in Chapter 554 of the Texas Government Code, City employees shall have the right to communicate with any elected official without fear of reprisal. This includes raising concerns regarding policy, operations, or employment matters. Any retaliation against employees for exercising this right is prohibited.*

Recommendation #22: Clarifying City Council's Role in Budget Preparation
Article VIII / Section 8.02

The CRC discussed feedback that the role of city council in the budget process is not well defined and reviewed language regarding budget oversight in the National Civic League's Model City Charter (MCC). The relevant section of the MCC reads:

> ***Section 5.08. Administration and Fiduciary Oversight of the Budget.***
>
> *The city council shall provide by ordinance the procedures for administration and fiduciary oversight of the budget.*

The CRC felt requiring the city council to, by ordinance, establish budget procedures, timelines, targets, and deliverables and clearly delineating that fiduciary oversight of the budget lies with the city council would clarify the council's role in budget preparation and recommends amending section 8.02 by adding the MCC language to Sec. 8.02.

Section 8.02 Submission of Budget. *The city council shall provide by ordinance the procedures for administration and fiduciary oversight of the budget. The City Manager, prior to August first of each year, shall submit to the Council a proposed budget for the ensuing fiscal year and an accompanying budget message.*

Recommendation #25: Revise Charter to Allow for Small Gifts Article XI / Section 11.06

Current Charter Language prohibits gifts other than marketing swag:

Section 11.06 Acceptance of Gifts. No officer or employee of the City shall accept directly or indirectly, any gift, favor, or privilege, or employment from any utility, corporation, person or entity having a franchise or contract with, or doing business with, or seeking to do business with the City. This section shall not be interpreted to include any pen, pencil, calendar, cap or similarly valued item distributed by any such company for advertising purposes.

However, Section 1.1803 of the Ethics Policy (and State Law Penal Code Title 8, Section 36.10) allows small, noncash gifts of less than $50 value.

- *The following factors are considered in evaluating whether a gift is prohibited: (A) The value of the gift, or gifts, does not exceed $50.00, or $200.00 during any twelve (12) consecutive calendar months;*

The CRC recommends the charter be amended to align the charter with the Ethics policy and actual practice.

Proposed Revision:

Section 11.06 Acceptance of Gifts. ~~No o~~Officers or employees of the City ~~shall~~may accept directly or indirectly, any non cash gift, favor, or privilege, or employment from any utility, corporation, person or entity having a franchise or contract with, or doing business with, or seeking to do business with the City only in accordance with the City's Ethics Policy. This section shall not be interpreted to include any pen, pencil, calendar, cap or similarly valued item distributed by any such company for advertising purposes. Officers and employees shall not accept cash or cash equivalents under State Law.

Recommendation #29: Add a Table of Contents to the Charter

The committee observed that the addition of a table of contents to the charter was approved by the voters in 2018, Proposition G:

> *2018 PROPOSITION G: Shall the Charter be amended to correct non-substantive grammatical and typographical errors and to allow for the addition of a table of contents?*

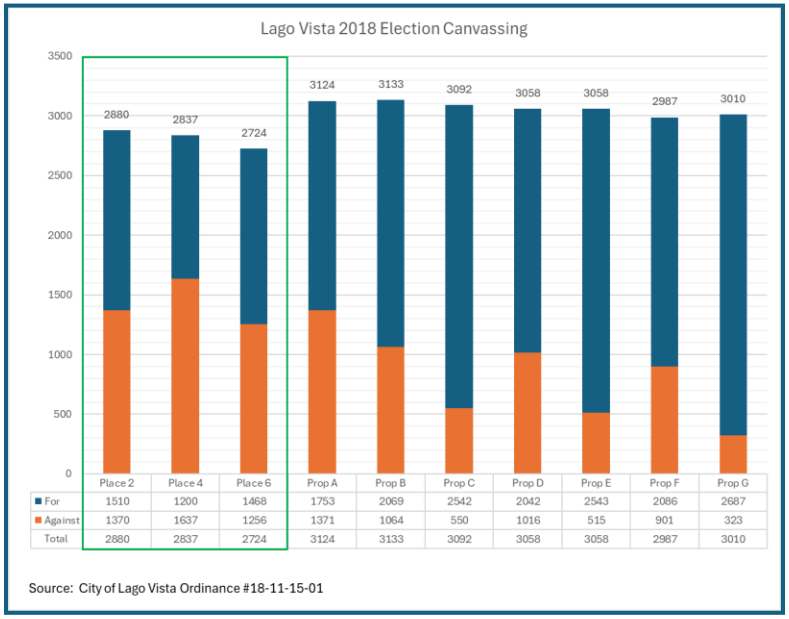
2018 Proposition G was passed 2687 to 353 per canvassing ordinance 18-11-15-01 (page 5) but is currently missing from the charter.

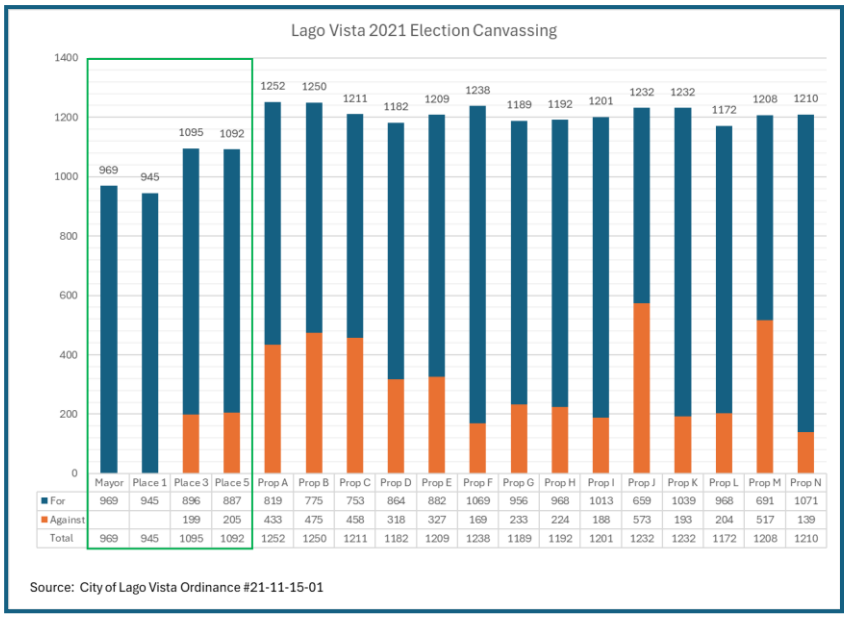
The committee finds no subsequent action to remove the table of contents and so recommends, upon completion of final charter edits and pagination after the 2025 election, a table of contents already approved by the voters be added to the charter.

City Council Q&A

What is the appropriate number of ballot initiatives?

Over 95% of Lago Vista voters were highly engaged through 7 propositions in 2018 and 14 propositions in 2021





Observations

- The vote drop off from Prop A to lowest prop vote count was 137 votes, or 4.4% in 2018 and 80 or 6.4% in 2021.
- The drop off from Prop A to last prop was 114 votes, or 3.6% in 2018 and 42 or 3.4% in 2021.
- Voter engagement **increased** from 2018 Prop F to Prop G and 2021 Prop L to M&N, suggesting even up to 14 propositions is tolerable.
- One documented indication of voter fatigue is "Status Quo Bias" where voters simply start voting against change.
  - Both elections, "Against" votes **decreased** down ballot on average, indicating voters were still engaged.
- The for/against votes vary widely down ballot further proving voters were engaged and evaluating each measure on its merits through all propositions.
- Voter engagement on every Charter proposition was higher than voter engagement for any of the candidate races.

Conclusion

The 2021 data suggests that fourteen propositions is easily tolerable by voters with over 95% of the voters continuing to be highly engaged. Although there is some indication some voter fatigue may have occurred after six propositions simply based on raw vote totals, the "Status Quo Bias" had not yet been reached. It should be noted that last props were related to correcting non substantive grammatical and typographical errors, so the low "against" votes would make sense.

The prior two charter amendment elections suggest that perhaps as many as 15-18 propositions are tolerable to the voters.

Mayor's request for background regarding on CRC Recommendation #5 from the 6/26/25 council meeting and later posted on the council discussion board:

I was the one that requested that item 5 be reviewed for some explanation as to why the CRC was recommending as I reviewed 6 different charters and could not find a one that followed the CRC recommendation found in item 5. I know my request to review section 5 did NOT include a request to review item 19 as well. I would also comment that not only did the other 6 charters not have a section giving individual council members the right to talk to any city employee, they tended to restrict council access to employees and discourage such interaction. Especially attempts to direct employees.

The committee considered and discussed the Mayor's request noting a few subtopics included in Recommendation #5.

i) Access to city employees - By Council rejecting Recommendation 19, which amended Recommendation 5 for 3.06(a), the CRC's prior Recommendation #5 of language for 3.06(a) stands and reads as follows:

> *a. The Mayor and Council Members may meet with and obtain information from the City Manager, City Attorney, City Secretary and any city employee who directly reports to the City Manager;*

The CRC's recommendation is based on the consensus that elected officials, in the performance of their duties, must have wider access to unfiltered information beyond just the City Manager for setting policy and uncovering potential investigatory matters for the council as body to pursue. In addition, such access extends to all elected officials, not just the Mayor. Finally, as addressed in other Charter sections, this access is to gather facts only and elected officials may not independently give direction to city staff.

ii) The Role of the Mayor - The committee, in recommending a complete rewrite and retitling of 3.06, is recommending stronger codification that the Mayor is a co-equal member of the Council and shares the responsibilities and authorities of policy setting with all council members. This seems to be the intention of the voters when the city moved from an executive Mayor to the current Charter. As a first among equals, the Mayor does have some administrative, ceremonial, and emergency duties, but those duties do not extend into policy setting. Since there is no Charter Section detailing the authorities of council members, rather than adding a "Council Members" Section, the CRC recommends that 3.06 be re-written to clearly state which authorities are shared, and which are mayoral only.

iii) Other – While the CRC did not discuss on 7/2/25, it is noteworthy that Recommendation # 5 included other significant topics regarding the calling of Special Called Meetings and signature endorsement of Ordinances and Resolutions that were discussed at length in prior meetings. The final draft of the Charter submitted to the council included revision to align with the now rejected Recommendation #19. A draft of Section 3.06 as drafted per Recommendation #5 is attached.

iv) The CRC is unpersuaded by the observation other city charters differ from the CRC recommendations. Perhaps they should for the reasons stated above.

Councilor Benefield's Discussion Board Request:

I'd like to respectfully request that the Charter Review Committee consider a revision to limit the Mayor's voting rights to tie-breaking situations only. This model is common and helps reinforce the Mayor's role as a neutral presiding officer.

The committee considered and discussed Councilor Benefield's request as an additional subject under Sec. 3.06 that the Mayor requested more background on. The request was posted on the morning of the scheduled CRC meeting, so committee members did not have much opportunity to research and form thoughtful opinions. The committee discussion included:

i) Preliminary research found that in Texas, Mayors in General Law city charters do not vote except in case of a tie-breaker. Mayoral voting in Home Rule City Charters is split.

ii) The committee, in reworking 3.06 completely, was trying to codify that the Mayor is an equal member of the council body with no additional authority beyond a few administrative, ceremonial, and emergency duties. In other words, a first among equals. While limiting the Mayor's voting to tie-breaking would reinforce the "neutral presiding officer" role, such action would undermine the overall larger principle that the Mayor is an equal member of council afforded no significant additional authority.

iii) Most importantly, limiting the Mayor's voting authority would shield the mayor from taking public positions via voting. When a sitting Mayor runs for reelection, the voters would not really know the Mayor's true position on items of importance. Mayoral reelections could devolve into popularity contests and hypothetical talk as a campaign rather than a discussion of factual voting records.

As this topic is on the CRC agenda as a "Discussion" item, the CRC is unable to take action in the form of a formal recommendation and hopes the discussion recap is helpful to council.

Mayor's request to review Section 3.21 Investigations and 3.23 from June 26th

The committee considered and discussed the Mayor's request to review Section 3.21 and 3.23. The discussion yielded consensus that Section 3.21 is very clear that investigations are only conducted by the Council as a body and it would require a very contorted interpretation to suggest individual council members may conduct investigations. This is reinforced by 3.23 and discussion yielded no conflict between these Sections. Further, the proposed revision to 3.06(a) would establish individual council member's authority to gather information to establish facts. Such factual information may serve as the basis for the council as a body to launch an investigation, but no council member may individually do so.

In addition, Recommendation #14 recommends revising Section 4.01 by striking the last sentence "Except for the purposes of inquiries and investigations under this charter, the City Council or its members shall deal with employees who are subject to the supervision of the City Manager solely through the City Manager. Neither the Council nor its members shall give orders to or in any way exercise the influence of their office on such officer or employee, either publicly or privately, except as otherwise provided in this Charter."

The consensus of the committee is that 3.21, 3.23, revised 3.06 and revised 4.01 are aligned, and clarifies that Investigations are conducted by the council as a whole, but factfinding by individual council members is permissible.

Paraphrasing Councilor Robert's question from the June 26th City Council Meeting:

Councilor Roberts asked us to look at the disciplinary process of department heads, specifically the firing of department heads. The Charter requires CC to hire and terminate department heads. Is that timely and practical given open meeting posting requirements and the council calendar if an urgent issue necessitating removal should arise with a department head? Should CM be allowed to terminate a department head without CC action?

The committee considered and discussed Councilor Robert's question, invited input from the City Manager, and reviewed Section 4.01 (b) of the charter, which reads as follows:

Appoint, supervise and/or give direction to all departments, offices, and agencies of the City and hire, suspend or remove any employee of the City except for department heads which require Council approval for employment or removal;

The committee felt this sentence is poorly worded and could be read in three ways depending upon the meaning of "department heads" and grammar:

i) The CM cannot take any action on the "department heads" which require City Council approval per the Charter. Those positions are further defined in Section 4 as the City Secretary, Municipal Judge(s), the City Attorney, and Police Chief. Human Resources, as a department, is established by the Charter but Section 4.06 does not specifically state the HR Director is approved by City Council. Other positions such as department directors established by ordinance rather than the Charter are completely subject to the discretion of the CM alone.

ii) The CM cannot take any action on the "department heads" as defined by city practice and conventional use of the term by council, city attorney, and city staff. This would include department directors and potentially all CM direct reports.

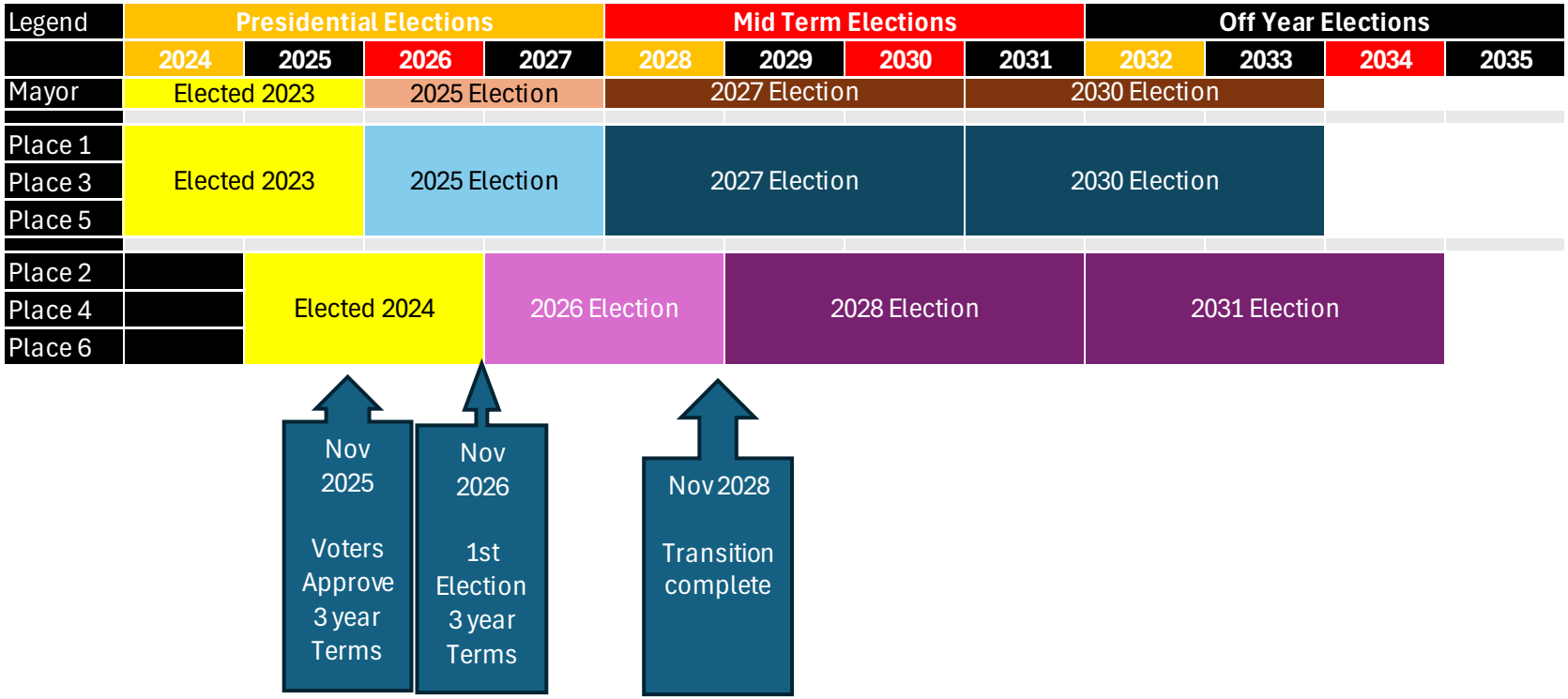
iii) The CM may suspend "department heads" however defined in i) or ii) but may not employ or remove them.

Given this ambiguity, the discussion produced consensus that Council should consider revising Section 4.01(b) to clearly express the "intent" of Council on this policy matter. There was no consensus on how restrictive the policy should be, with some members feeling the CM's hands should not be tied at all on personnel matters and others expressing key positions should absolutely require council approval to hire or terminate. Regarding the timeliness concern in the original question, council may want to clearly articulate and preserve the "suspension pending investigation" option should council want to withhold making the final termination decision on "department heads" beyond the 4 positions established by Charter.

As this topic is on the CRC agenda as a "Discussion" item, the CRC is unable to take action in the form of a formal recommendation and hopes the discussion recap is helpful to council.

Appendix

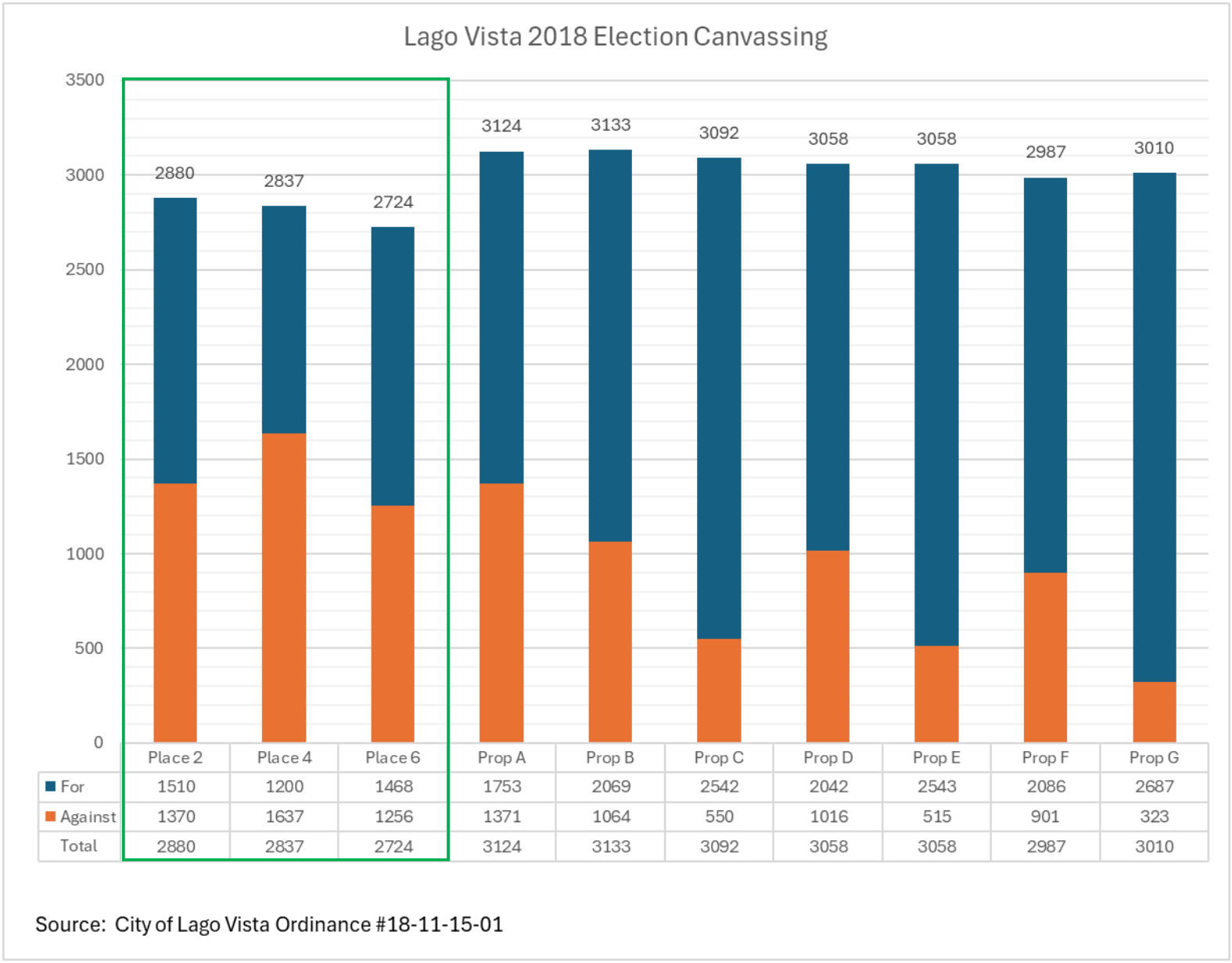
Alternative Transition to Three Year Terms 3-3-0 Cadence (Considered but not recommended by committee)



If adopted by voters in 2025 and how the draft language currently reads, the first election to be affected would be 2026:

In the first Election after adopting three (3) year terms, the Mayor and Council Members elected to Places 1, 3, and 5 would be elected to three (3) year terms, [2027 election], while the Council Members elected to Places 2, 4 and 6 would serve a one-time two (2) year term [2026 election] to set up a staggered cycle. After said two (2) year terms expire, Places 2, 4, and 6 would switch to three (3) year terms going forward, ensuring that half of the Council is up for election every three (3) years. [election years added for clarity]

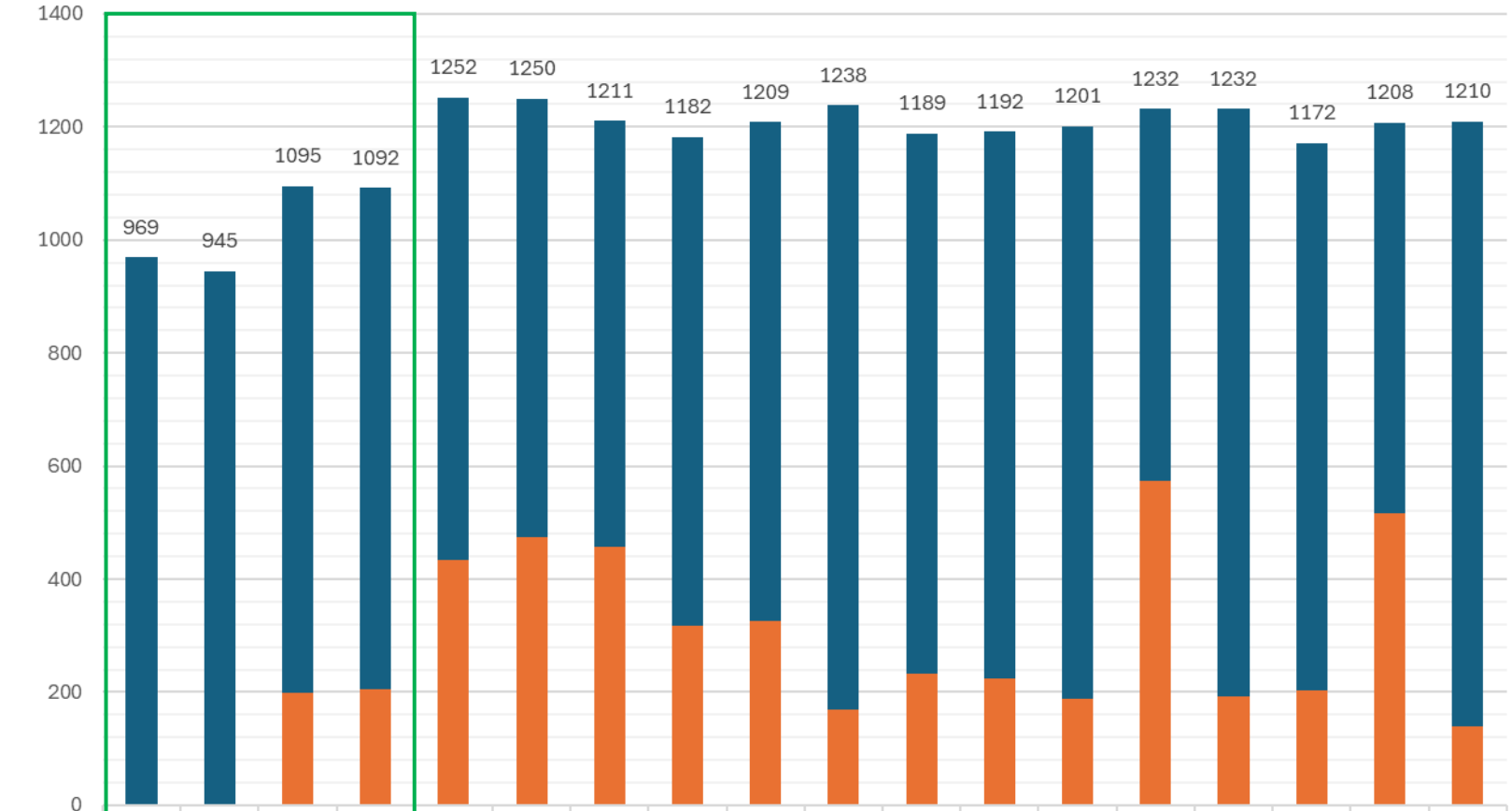
This produces a 3-3-0, cadence, where there are no races in 2029, 2032, and so on every three years.



	Place 2	Place 4	Place 6	Prop A	Prop B	Prop C	Prop D	Prop E	Prop F	Prop G
For	1510	1200	1468	1753	2069	2542	2042	2543	2086	2687
Against	1370	1637	1256	1371	1064	550	1016	515	901	323
Total	2880	2837	2724	3124	3133	3092	3058	3058	2987	3010

Source: City of Lago Vista Ordinance #18-11-15-01

Lago Vista 2021 Election Canvassing



	Mayor	Place 1	Place 3	Place 5	Prop A	Prop B	Prop C	Prop D	Prop E	Prop F	Prop G	Prop H	Prop I	Prop J	Prop K	Prop L	Prop M	Prop N
For	969	945	896	887	819	775	753	864	882	1069	956	968	1013	659	1039	968	691	1071
Against			199	205	433	475	458	318	327	169	233	224	188	573	193	204	517	139
Total	969	945	1095	1092	1252	1250	1211	1182	1209	1238	1189	1192	1201	1232	1232	1172	1208	1210

Source: City of Lago Vista Ordinance #21-11-15-01

AGENDA ITEM NO. 8b

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Councilor Roberts, City Council
SUBJECT:	Discussion, consideration, and possible action on concerns regarding water and wastewater master plan.
FINANCIAL IMPACT:	To be determined

AGENDA ITEM NO. 8c

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Charles West, City Manager

SUBJECT: Discussion and possible action regarding recent flood events, concerning establishing any needed assistant centers, actions taken by the city and future needs.

BACKGROUND: After the recent storm events it was discussed having an item that discussed what worked and did not work. Following recent announcements from TDEM and FEMA, the city needs to discuss the possible needs of establishing an assistance center for victims to report damage and file for assistance and or report damage due to the recent events.

FINANCIAL IMPACT: Minimum

AGENDA ITEM NO. 8d

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Councilor Saum, City Council

SUBJECT: Discussion regarding adoption of New Section 10.606 – Public Parkland Disclosure and Communication Requirements.

BACKGROUND:

Residents and prospective homebuyers in recent subdivisions —including areas within Public Improvement Districts (PIDs) and Municipal Utility Districts (MUDs)—have expressed concern about the ownership, maintenance, and public accessibility of neighborhood parkland, particularly in developments where public and private amenities are closely intertwined. This ordinance creates a clear, enforceable framework for disclosing parkland status in marketing, on the City's website, and directly within the development.

FINDINGS:

Section 10.606 establishes minimum transparency requirements for developers of residential or mixed-use subdivisions involving public parkland. Key provisions include:

- Requiring developers to submit all marketing materials related to public parks or amenities for City review prior to public distribution.
- Ensuring the City website displays accurate, developer-coordinated summaries of parkland ownership, maintenance responsibilities, and access rights.
- Mandating a plain-language public disclosure sheet and physical signage onsite indicating whether amenities are public or private.
- Allowing residents or HOAs to submit complaints about misleading marketing materials, which may trigger City staff review and enforcement action.
- Establishing that failure to comply may result in withholding of permits or posting of public notices of noncompliance.

FINANCIAL IMPACT: Not Applicable

ATTACHMENTS:
Lago_Vista_Ordinance_10_606_Parkland_Disclosure - suggested language

ARTICLE 10.600 – PARK LAND DEDICATION REQUIREMENTS

Section 10.606 – Public Parkland Disclosure and Communication Requirements

Sec. 10.606.001 Purpose
The City finds that accurate public communication regarding the ownership, maintenance, and accessibility of public parkland is vital to promoting transparency, preventing confusion among residents, and preserving public trust. This section establishes minimum disclosure and communication requirements for developers whose projects include or are adjacent to parkland dedicated to or owned by the City.

Sec. 10.606.002 Applicability
This section shall apply to all residential or mixed-use developments within the City limits or extraterritorial jurisdiction (ETJ) that are subject to parkland dedication requirements or involve Public Improvement Districts (PIDs) or Municipal Utility Districts (MUDs) with parkland represented as a public amenity.

Sec. 10.606.003 Marketing Material Disclosure
(a) Prior to public distribution, developers shall submit to the City any marketing materials—digital or printed—that include references to parkland, trails, open space, or recreational amenities represented as public or City-owned. These materials shall be reviewed for accuracy, particularly regarding:
(1) Ownership and dedication status of the parkland;
(2) Maintenance responsibilities;
(3) Public access and use rights.
(b) The City may require corrections or clarifications prior to issuance of marketing permits or plat approvals.
(c) This requirement shall not be construed as limiting protected speech, but as a condition of compliance with parkland dedication regulations.

Sec. 10.606.004 City Website Coordination
Developers shall coordinate with City staff to ensure the City's website includes accurate, concise, and accessible information about parkland within or adjacent to the development. This shall include:
(1) A summary of ownership and maintenance;
(2) Any restrictions on public access or use;
(3) Status of dedication and related PID/MUD disclosures.
The City may post a disclaimer noting the source of information when provided by a third party.

Sec. 10.606.005 Developer-Provided Public Disclosures

Developers shall provide a one-page, plain-language fact sheet for each applicable parkland area suitable for public posting. The document shall be approved by the City prior to posting and must:

(1) Clearly identify ownership, access rights, and maintenance entities;

(2) Be updated as development phases or governing entities change;

(3) Be made available to associated HOAs, PIDs, MUDs, and sales representatives.

City staff may post these documents to the City's transparency portal and maintain them as part of the subdivision file.

(4) Developer shall install durable, on-site signage identifying whether each recreational amenity is publicly owned or maintained, or if it is private and for limited use.

Sec. 10.606.006 Enforcement

(a) Failure to comply with this section may result in delay or withholding of final plat, construction permit, or marketing permit approvals.

(b) The City may also provide public notice of non-compliance on its website or notify any associated PID or MUD.

(c) Nothing in this section shall prevent the City from pursuing other remedies under this Code or development agreements.

(d) City staff may review credible reports from residents, HOAs, or PID boards regarding inaccurate marketing of public parkland features. If verified, the City may notify the developer and request clarification, correction, or removal of misleading materials.

Sec. 10.606.007 Severability

If any provision of this section is found to be invalid, the remaining provisions shall remain in full force and effect.

AGENDA ITEM NO. 9a

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Charles West, Development Services

SUBJECT: **Project # 23-2734-R-REZ** Conduct a public hearing for consideration of a request to rezone a parcel of land from C-1A "Professional Office, Neighborhood Retail" District to C-2 "General Commercial / Retail" District on approximately 1.8681 acres of land addressed as 8039 Bronco Ln, TX 78748 and being Lot 5, Blk A of Lago Vista Retail Subd Addition, Lago Vista, Travis County, Texas. Said property generally described as approximately 685' ESE of the intersection of Bronco Lane and Bar K Ranch Rd. and 242' NW of the Post Office Site.

BACKGROUND: See attached Materials

FINDINGS: See attached materials

FINANCIAL IMPACT: See attached materials

RECOMMENDATION: Conduct a public hearing and consider

ATTACHMENTS:
23-2734-zoning application (pdf)-2.pdf
23-2734-R-REZ-concept.pdf
23-2734-20-002 bronco retail letter size prt.pdf
23-2734-R-REZ-2734-caruso.pdf

CITY OF LAGO VISTA · DEVELOPMENT SERVICES
5803 THUNDERBIRD STREET • P.O. BOX 4727 • LAGO VISTA, TX 78645
Tel. (512) 267-5259 *Fax (512) 267-5265*

NOTE: Applicants should seek legal advice concerning the applicability of any existing private covenants or deed restrictions and their ability to be enforced or waived by other specific property owners.

APPLICATION FOR ZONING DISTRICT CHANGE

Contact Person: Zvi Goldshtein **Fee:** See Ordinance Appendix A (non-refundable)

Contact Phone: 512-986-2592 **Contact Email:** zvikon25@gmail.com

Property Owner(s):* ZYG Capital LLC

Owner's mailing address: 11303 Clearview Dr, Jonestown TX 78645

COMPLETE LEGAL DESCRIPTION OF SUBJECT PROPERTY

Subdivision, Section and Lot Number(s) if platted. Attach metes & bounds or equal description otherwise*

LOT 5 BLK A LAGO VISTA RETAIL SUBD

Municipal Address(es)* if applicable:

NATURE OF REQUEST

Current Zoning District(s): C-1C **Requested District:** C-2

Purpose or Basis of Request* (if PDD, include whether concept and/or detail plan approval is sought):

Change the current zoning from C-1C to C-2.

Additional individual(s) authorized to act on behalf of the property owner(s)* regarding this application:

Name of Agent: Kameron Schram **Email:** contact@cleobuilders.com

Mailing Address: PO Box 5563, Lago Vista TX 78645 **Phone:** 512-969-7578

NOTE: **Applications must be complete including all applicable portions of this form, payment of fees and all required drawings or documentation. All applications are accepted provisionally pending a completion review. PLEASE TAKE SPECIFIC NOTICE AND INCORPORATE OR ADDRESS ALL LOCAL ORDINANCE REQUIREMENTS IN YOUR APPLICATION.**



10/08/2024

Property Owner's signature(s)* **Date**

***Attach additional sheets as required**



1 OVERALL SITE PLAN
1" = 20'-0"

589

ICHOR GROUP
COMMERCIAL GENERAL CONTRACTOR

These plans are the property of the Owner/Tenant and Architect. Any reprinting, copying, and or construction from these plans without prior written consent of the Owner and the Architect is prohibited. All legal remedies available to Owner/Tenant and Architect will be brought upon parties involved in unauthorized use of these plans.

the brown group
Architectural/Real Estate Development Services
259 BONHAM LOOP
GEORGETOWN, TX 78633
Office: (512) 426-9986

NOT FOR CONSTRUCTION
REVIEW ONLY

10/20/2022

No.	Description	Date

DESIGN DEVELOPMENT

LAGO VISA TEXAS

AREA PLAN

A101.0

Scale 1" = 20'-0"

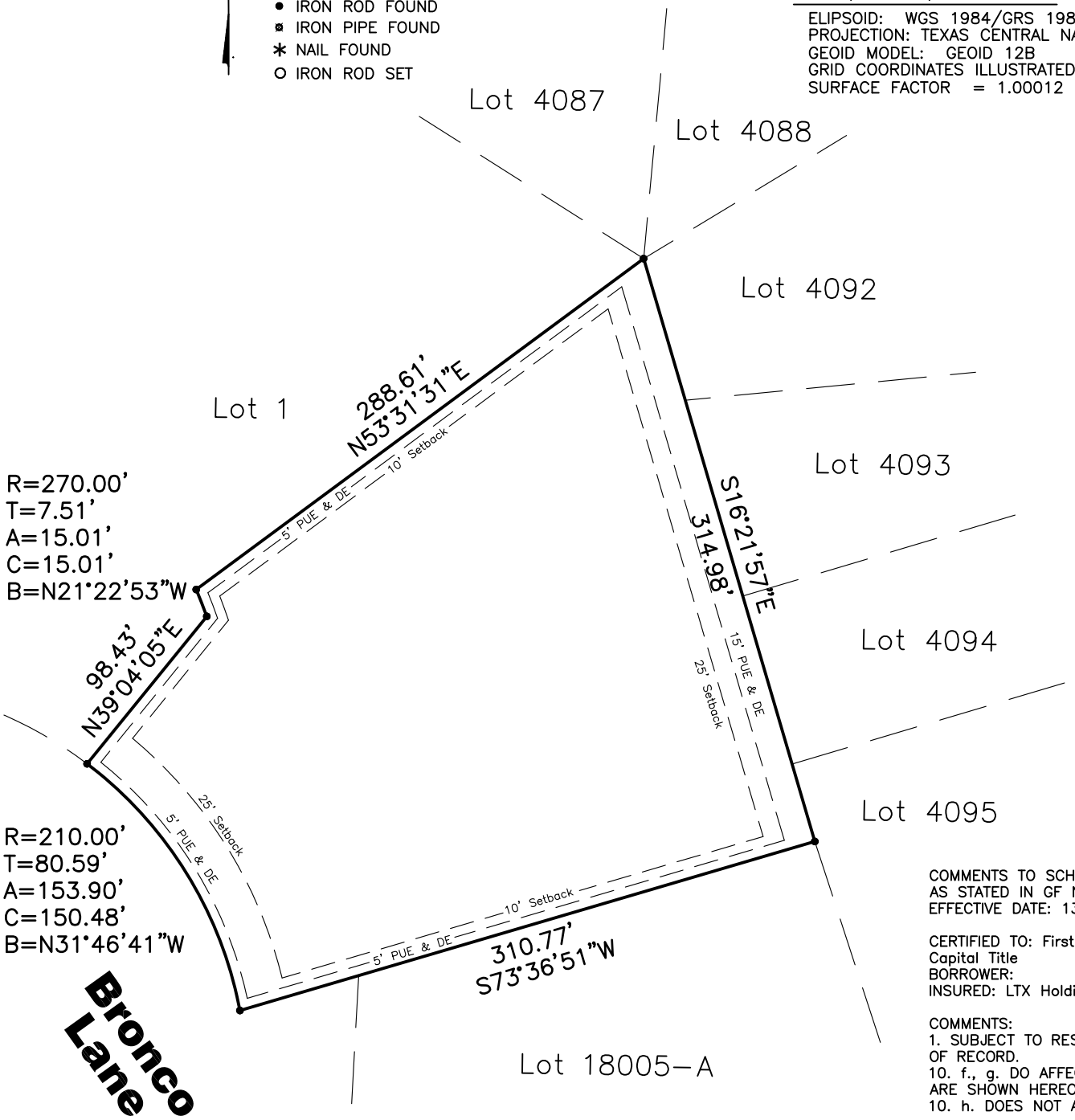
SURVEY SKETCH

LOT 5, BLOCK A, LAGO VISTA RETAIL SUBDIVISION, A SUBDIVISION IN TRAVIS COUNTY, TEXAS, ACCORDING TO PLAT AS RECORDED IN DOCUMENT NO. 200600028 IN THE OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS.

0 15 30
APPROXIMATE SCALE IN FEET

LEGEND
- IRON ROD FOUND
- IRON PIPE FOUND
- NAIL FOUND
- IRON ROD SET

TOPO/BEARING/COORDINATE BASIS
ELIPSOID: WGS 1984/GRS 1980
PROJECTION: TEXAS CENTRAL NAD83 NAVD88
GEOID MODEL: GEOID 12B
GRID COORDINATES ILLUSTRATED
SURFACE FACTOR = 1.00012



COMMENTS TO SCHEDULE B
AS STATED IN GF NO. 22-666559-DT,
EFFECTIVE DATE: 13 March 2022

CERTIFIED TO: First National Title and Capital Title
BORROWER:
INSURED: LTX Holdings

COMMENTS:
1. SUBJECT TO RESTRICTIVE COVENANTS OF RECORD.
10. f., g. DO AFFECT THIS TRACT AND ARE SHOWN HEREON.
10. h. DOES NOT AFFECT THIS TRACT.

THIS SURVEY SUBSTANTIALLY COMPLIES WITH THE CURRENT TEXAS SOCIETY OF PROFESSIONAL SURVEYORS ASSOCIATION STANDARDS AND SPECIFICATIONS FOR A CATEGORY 1A, CONDITION II, LAND TITLE SURVEY AS DESCRIBED IN THE MANUAL OF PRACTICE FOR LAND SURVEYING IN THE STATE OF TEXAS.

01 April 2022

Steven Warner Womack, RPLS, PLS, NCEES Date
National Council of Examiners for Engineering and Surveying #1928
Texas Registered Professional Land Surveyor #5025
North Carolina Professional Land Surveyor #L-5043
E-Mail: SWRPLS@Gmail.com Phone/Text: (512) 638-0220

STATE OF TEXAS REGISTERED STEVEN W. WOMACK 5025 PROFESSIONAL LAND SURVEYOR

Texas Society of Professional Surveyors MEMBER

DATE: 01-04-2022
DRAWN BY: Staff
FILE NAME: 20-002.dwg

PROJECT NO. : 20-002

590

Notice of Public Hearing

June 9, 2025

CITY OF LAGO VISTA TEXAS

Project #: **23-2734-R-REZ**

Hearing Date and Time: City Council, Thursday, July 17, 2025, at 6:30 PM in the Council Chambers at City Hall, 5803 Thunderbird Street, Lago Vista, Texas

CARUSO NATHAN A (1922619)
13805 FIELD SPAR DR
MANOR TX 78653-3881

Notification Mailing ID # 7

Project Property Location:
Property ID 728611 Travis Central Appraisal District. Addressed as 8039 Bronco Ln, being approximately 1.8681 acres of land and being Lot 5, Blk A of Lago Vista Retail Subd Addition. Said property generally described as approximately 685' ESE of the intersection of Bronco Lane and Bar K Ranch Rd. and 242' NW of the Post Office site.

Project #23-2734-R-REZ This notice is to inform you that the City of Lago Vista has received a request to consider a rezoning request from C-1A "Professional Office, Neighborhood Retail" District to C-2 "General Commercial / Retail" District on the project identified above.

E-mail:	development@lagovistatexas.gov
Phone Number:	512-267-5259
In Person:	Development Services, Lago Vista City Hall 5803 Thunderbird St.
Postal Address:	City of Lago Vista, Development Services P.O. Box 4727, Lago Vista, TX, (U.S.A.) 78645

You are hereby provided this opportunity to comment on the proposal or you may attend the meeting indicated above. Please return your comments as soon as possible. Individuals who do not own property within the notification boundary or those unable to deliver written comments must attend the public hearing to provide input. **Please note that unexplained support or opposition is less useful to the voting members than comments with context and a specific basis.** **Some items may require multiple meetings for a final action listed may be postponed to later meetings meeting times**

☑ In Favor ☐ Opposed

Comments:

Signed: _____

Please type or write legibly above. you may use the back side if needed

This **whole page** may be returned

AGENDA ITEM NO. 9b

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Charles West, City Manager

SUBJECT: **Project # 23-2816** Consideration of a Concept Plan for approximately 32.42 acres of land out of the H & O. B. Railroad Survey, Abstract # 2152, Lago Vista, Travis County Texas. Said Concept Plan being for a proposed future 15-lot single family subdivision. Said property currently zoned R1S and being more generally described as being on the south side of Highland Lake Drive approximately 100 feet +/- west of Santa Monica Ave.

BACKGROUND: This project has been in the works for several months and the applicant has shown patience in the amount of time it has taken to get this project to this point. The Planning & Zoning Commission heard this item at the June 30, 2025, meeting and tabled the item until its regular meeting held on July 10, 2025. The concept plan meets all requirements established within our subdivision ordinance under section 2.15 Concept Plan.

FINDINGS: Application meets all requirements for a concept plan and approval is recommended.

RECOMMENDATION: Conduct a Public Hearing and consider approval.

ATTACHMENTS:
23-2816-signed subdivision-application-form-050725.pdf
23-2816-Santa Vista Way - Concept Plan _1.pdf
23-2816-deed.pdf
23-2816-tax certificate.pdf

CITY OF LAGO VISTA
5803 THUNDERBIRD SUITE I03
PO BOX 4727
LAGO VISTA, TX. 78645

DEVELOPMENT SERVICES
512-267-5259
development@lagovistatexas.gov

SUBDIVISION APPLICATION

Request is for:

☐ **Amended Plat** ☐ **Preliminary Plat** ☐ **Final Plat** ☐ **Minor Plat** ☒ **Other (describe)** Concept Plan

(Please Print)

Property owner's name: Edify Asset Management

Mailing address: 3307 Northland Drive Suite 100 (Number & Street) Austin (City) TX (State) 78731 (Zip code)

Phone: (512) 964-9960 (Day time) ( ) (Cell) ( ) (Fax)

Surveyor/Engineer: Rao's Consulting Engineers (Name of Company) Rao Vasamsetti (Contact person)

Phone: (210) 549 7557 (Office) ( ) (Fax)

Name of Proposed Project/Subdivision: Santa Vista Way

Complete Legal Description of the Proposed Property

Tax Parcel ID #: 158142 **Subdivision:**

Lot Number(s): 1-16 **Section:** 1 **Block:** 1

Number and Street Address: 21201 Santa Vista Way

Deed is recorded in Volume: _____ **Page:** _____ **of Travis County Records.**

I authorize the following person/company to act in my behalf as my designated agent:

Name of agent/company: Rao's Consulting Engineers (Name of Company) Rao Vasamsetti (Name of Contact)

Phone Numbers: 210 549 7557 (Day time) 832 620 0719 (Cell) (Fax)

Signature of Applicant: _____ **Date:** 6-30-24

LOTS: 15
ACREAGE: 32.659
L.F. OF NEW STREETS: 1693 LF [PRIVATE]

OWNER:
EDIFY ASSET MANAGEMENT
3307 NORTHLAND #100
AUSTIN, TEXAS 78731

SURVEYOR:
STEVE WOMACK
10703 SIERRA OAKS AUSTIN,
TEXAS 78759
PHONE: (512) 638-0220

ENGINEER:
RAO VASAMSETTI, P.E.
PH: 210-549-7557
MOB: 832-620-0719
EMAIL: RAO@RAOSENGINEERING.COM
WWW.RAOSENGINEERING.COM

LAND USE SUMMARY

USE	LOTS/UNITS	ACREAGE	DENSITY	LUE'S REQUIRED	TRIPS GENERATED
SINGLE FAMILY	15	29.784 ACRES	0.5UNIT/ACRE	15	150
RIGHT OF WAY	1	2.636 ACRES			
	TOTAL	32.42 ACRES		15	150

FLOODPLAIN NOTE: ENTIRE PROPERTY LIES WITHIN THE LIMITS OF A FLOOD HAZARD AREA OR WITHIN THE LIMITS OF THE 100 YEAR FLOOD AS IDENTIFIED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FEDERAL INSURANCE ADMINISTRATION, AS SHOWN ON FEMA FLOOD PANEL NO. 48453C0195J, EFFECTIVE DATE 1/22/20 FOR TRAVIS COUNTY, TEXAS.

Santa Rosa Ave
Highland Lake Dr
Cardinal Ave
Santa Monica Ave.
Santa Ana Cv.

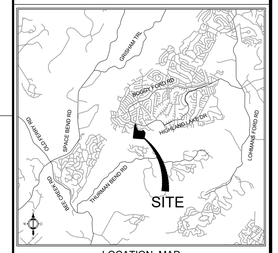
LOT 1 3.00 ACRES
LOT 2 2.72 ACRES
LOT 3 2.41 ACRES
LOT 4 2.08 ACRES
LOT 5 1.84 ACRES
LOT 6 1.79 ACRES
LOT 7 1.79 ACRES
LOT 8 1.79 ACRES
LOT 9 1.77 ACRES
LOT 10 1.75 ACRES
LOT 11 1.73 ACRES
LOT 12 1.89 ACRES
LOT 13 1.82 ACRES
LOT 14 1.81 ACRES
LOT 15 1.89 ACRES

S.No	Owner Name & Mailing Address	Situs Address	Legal Description
1	JACKSON ROBERT M & JULIE K (150849) 1919 PLANTATION DR ROUND ROCK TX 78681-2166	21315 CARDINAL AVE, TX 78645	LOT 8 BLK C EMERALD BEND SEC 1 & ABS 2091 SUR 38 BALDWIN J K ACR 1.1200
2	CIULLA PHILLIP & JENNIFER CIULLA (1974959) 21313 CARDINAL AVE LAGO VISTA TX 78645	21313 CARDINAL AVE, TX 78645	LOT 7 BLK C EMERALD BEND SEC 1 & ABS 2152 SUR 35 H & O B R R CO ACR 0.53 (TOTAL 1.7511 A) (TRT (1.1)
3	CHAU MYTHANH V (1344117) 4307 ACROPOLIS CT APT C AUSTIN TX 78759-3411	21311 CARDINAL AVE, TX 78645	LOT 6 BLK C EMERALD BEND SEC 1
4	WINDON RONALD JOSEPH JR & (2026936) 21309 CARDINAL AVE LAGO VISTA TX 78645	21309 CARDINAL AVE, TX 78645	LOT 5 BLK C EMERALD BEND SEC 1
5	CARLISLE KATELYN MARY (1851648) 1688 34TH AVE KENOSHA WI 53144-3314	21307 CARDINAL AVE, TX 78645	LOT 4 BLK C EMERALD BEND SEC 1
6	KAMMOUNA ELLA & TARA & ZAINA (1767045) 11716 SWEARINGEN DOR AUSTIN TX 78758	21305 CARDINAL AVE, TX 78704	LOT 3 BLK C BELOW 715' EMERALD BEND SEC 1
7	MONTEMAYOR YVONNE MICHEL (150855) 12305 W COW PATH AUSTIN TX 78727-5758	21303 CARDINAL AVE, TX 78645	LOT 2 BLK C EMERALD BEND SEC 1
8	EWA GOSEK LIVING TRUST UTD (1938162) 21301 CARDINAL AVE LAGO VISTA TX 78645	21301 CARDINAL AVE, TX 78645	LOT 1 BLK C *BELOW 715' EMERALD BEND SEC 1
9	NAGAI MARYAM K & MITRA Y KAZEMI (1260613) 11 SEATON CT	21300 BLUEJAY BLVD, TX 78645	LOT 10 BLK A EMERALD BEND SEC 1
10	HAMLEY FAMILY TRUST (1995450) 3020 CAJUILES DR PFLUGERVILLE TX 78660-5094	21403 HIGHLAND LAKE DR, TX 78645	LOT 26254 HIGHLAND LAKE ESTATES SEC 26 AMENDED
11	WORD OF GRACE BROADCAST INC (2000253) 3455 PINTO PONY LN SAN ANTONIO TX 78247-4487	21401 HIGHLAND LAKE DR, TX 78645	LOT 26255 HIGHLAND LAKE ESTATES SEC 26 AMENDED
12	GRAJALES OSCAR (150782) 9823 MANDEVILLE CIR AUSTIN TX 78750-2854	21307 HIGHLAND LAKE DR, TX 78645	LOT 26256 HIGHLAND LAKE ESTATES SEC 26 AMENDED
13	EDIFY ASSET MANAGEMENT LLC (2002285) 3307 NORTHLAND DR STE 100 AUSTIN TX 78731-4941	21303 HIGHLAND LAKE DR, TX 78645	LOT 26257 *BELOW 715' CONTOUR HIGHLAND LAKE ESTATES SEC 26 AMENDED
14	TORRES STEVEN & NELIA (150792) LOT 1 13032 MACDONA LACOSTE RD ATASCOSA TX 78002-3616	21301 HIGHLAND LAKE DR, TX 78645	LOT 26258 *BELOW 715' CONTOUR HIGHLAND LAKE ESTATES SEC 26 AMENDED
15	VUONG THANH (252278) PO BOX 7253 ROUND ROCK TX 78683-7253	21211 SANTA MONICA AVE, TX 78645	LOT 30015A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
16	LANTOGA PROPERTIES LLC (1679029) 2719 SAM BASS RD ROUND ROCK TX 78681-1761	21209 SANTA MONICA AVE, TX 78645	LOT 30014A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
17	GUILLEN ANTHONY RAUL (1857692) 911 W ELLIO AVE SAN ANTONIO TX 78212-5134	21205 SANTA MONICA AVE, TX 78645	LOT 30013A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
18	WELCH RYAN (1689318) 2409 REPUBLIC TRAIL BLVD LEANDER TX 78641-2726	21201 SANTA MONICA AVE, TX 78645	LOT 30012A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
19	LAVERNE MONICA L P (1926174) 1025 TULAROSA PASS AUSTIN TX 78726	21107 SANTA MONICA AVE, 78645	LAVERNE RESUBD OF LT 30011A RESUB OF PT HIGHLAND LAKE ESTATES SEC 30 LOT 30011AA
20	LAMB DAVID A & ASHLEY A (1900782) 4801 ARROWHEAD DR LAGO VISTA TX 78645-6003	21105 SANTA MONICA AVE, TX 78645	LOT 30010-A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
21	LAMB DAVID A & ASHLEY A (1900782) 4801 ARROWHEAD DR LAGO VISTA TX 78645-6003	21105 SANTA MONICA AVE, TX 78645	LOT 30010-A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
22	LANTOGA PROPERTIES LLC (1679029) 2719 SAM BASS RD ROUND ROCK TX 78681-1761	21103 SANTA MONICA AVE, TX 78645	LOT 30009-A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
23	ARADI CORPORATION (1891848) 510 OAK FOREST DR BUDA TX 78610-3111	21101 SANTA MONICA AVE, TX 78645	LOT 30008-A RESUB OF LOTS 30001-30072 HIGHLAND LAKE ESTATES SEC 30
24	SPLASH INVESTMENTS LTD (1314141) 20506 HOUSTON CV LAGO VISTA TX 78645-7005	20990 WATERSIDE DR, TX 78645	BOAT HOUSE DOCKOMINIUMS AMENDED (COMMON AREA)
25	WATERSIDE OAKS CONDOMINIUM (522626) 20900 WATERSIDE DR AUSTIN TX 78734	AMERICAN DR, TX 78645	WATERSIDE OAKS CONDOMINIUM AMENDED (COMMON AREA)
26	CITY OF LAGO VISTA (153109) PO BOX 4727 LAGO VISTA TX 78645-0008	MOCKINGBIRD ST, TX 78645	ABS 2152 SUR 35 H & O B R R CO & ABS 2091 SUR 38 BALDWIN J K ACR 63.303 (TRT (1.1)

DATE OF PREPARATION: 05/06/2025

REV. NO.	DESCRIPTION	DATE

Notes:



LOCATION MAP
N.T.S.

LEGEND

N
W E
S

100' 50' 0' 100' 200'
SCALE 1"= 100'

SIGNATURE/SEAL

03/15/2025
STATE OF TEXAS
RAO S. VASAMSETTI
104346
LICENSED
PROFESSIONAL ENGINEER

RCE RAO'S CONSULTING ENGINEERS
TBPE F#8697700
P.O. BOX: 682391 SAN ANTONIO TX 78258
PHONE: 210.549.7557. FAX:512.856.4595
ww.raosengineering.com

PROJECT DESCRIPTION:
SANTA VISTA WAY SUBDIVISION

TITLE:
CONCEPT PLAN

DATE : 05/06/25	JOB NO. 2024-2502
DESIGNED BY : RV	DRG NO
DRAWN BY : PK	C1.00
CHECKED BY : RV	

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS
Dyana Limon-Mercado, County Clerk
Travis County, Texas
Jun 03, 2024 04:57 PM Fee: $45.00
2024060950
Electronically Recorded

UNOFFICIAL DOCUMENT

Notice of confidentiality rights: If you are a natural person, you may remove or strike any or all of the following information from any instrument that transfers an interest in real property before it is filed for record in the public records: your Social Security number or your driver's license number.

General Warranty Deed with Vendor's Lien

Date: **31st day of May, 2024**

Grantor: **Casey Simmons and Megan Herrera aka Megan Simmons, husband and wife**

Grantor's Mailing Address: 4309 Olive Grove Cove, Leander, TX 78641

Grantee: **Edify Asset Management, LLC, a Texas limited liability company**

Grantee's Mailing Address: 21201 Santa Vista Way, Lago Vista, TX 78645

Consideration: Cash and a note of even date executed by Grantee and payable to the order of **Keystone Bank** in the principal amount of **$2,400,000.00**. The note is secured by a first and superior vendor's lien and superior title retained in this deed in favor of **Keystone Bank**, and by a first-lien deed of trust of even date from Grantee to **Rex G. Baker, III**, Trustee. **Keystone Bank**, at Grantee's request, has paid in cash to Grantor that portion of the purchase price of the Property that is evidenced by the note. The first and superior vendor's lien against and superior title to the Property are retained for the benefit of **Keystone Bank** and are transferred to **Keystone Bank** without recourse against Grantor.

Property (including any improvements):
32.410 ACRES (CALLED 32.42 ACRES) OF LAND, MORE OR LESS, OUT OF THE H & O. B. RAILROAD SURVEY NO. 35, SITUATED IN TRAVIS COUNTY, TEXAS AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS IN DEED RECORDED IN VOLUME 12790, PAGE 2082, REAL PROPERTY RECORDS, TRAVIS COUNTY, TEXAS and BEING THE FOLLOWING 6 TRACTS OF LAND:

Tract I:
5.30 ACRES OF LAND, BEING A PORTION OF A 32.410 ACRES (CALLED 32.42 ACRES) TRACT OF LAND SITUATED IN THE H & O. B. RAILROAD SURVEY NO. 35, TRAVIS COUNTY, TEXAS AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS IN DEED RECORDED IN DOCUMENT NO. 2021053827, REAL PROPERTY RECORDS, TRAVIS COUNTY, TEXAS, AS SHOWN ON THE ATTACTED SKETCH AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

UNOFFICIAL DOCUMENT

Beginning at an iron rod found at the easterly intersecting right-of-ways of Vista Way and Canary Way at the northeast corner of Lot 1-C, Emerald Bend, Section One, for the Point of Beginning and northwest corner of the herein described tract;

Thence S 69 deg 36 min 34 sec E 50.13 feet an iron rod found at northwest corner of Lot 30015A, Resubdivision of a portion of Highland Lake Estates, Section Thirty, for the northmost northeast corner of the herein described tract;

Thence with the southerly line of the said Resubdivision the following courses and distances: S 11 deg 48 min 16 sec W 212.94 feet to an iron rod found;

S 24 deg 55 min 37 sec E 678.32 feet to an iron rod found, for the eastmost corner of the herein described tract;

Thence S 51 deg 56 min 49 sec W passing an iron rod set at 320.36 feet and continuing for a total distance of 578.12 feet to a calculated point submerged under the waters of Lake Travis, being also on the east line of a 65.94 acre tract conveyed to the City of Lago Vista by instrument of record in Document No. 2009055227, for the southeast corner of the herein described tract;

Thence N 06 deg 22 min 42 sec E 391.25 feet to an iron pipe found at the southeast corner of Lot 6-C of the said Emerald Bend subdivision;

Thence N 06 deg 24 min 12 sec E 483.92 feet an iron rod found at the northeast corner of Lot 3-C of said subdivision;

Thence N 11 deg 48 min 46 sec E 334.73 feet to the Point of Beginning, containing 5.30 acres of land, more or less.

Tract II:
5.30 ACRES OF LAND, BEING A PORTION OF A 32.410 ACRES (CALLED 32.42 ACRES) TRACT OF LAND SITUATED IN THE H. & O. B. RAILROAD SURVEY NO. 35, TRAVIS COUNTY, TEXAS AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS IN DEED RECORDED IN DOCUMENT NO. 2021053827, REAL PROPERTY RECORDS, TRAVIS COUNTY, TEXAS, AS SHOWN ON THE ATTACTED SKETCH AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Beginning at an iron rod set on the south line of Lot 30011A, Resubdivision of a portion of Highland Lake Estates, Section Thirty, for the Point of Beginning and northeast corner of the herein described tract;

Thence S 32 deg 44 min 36 sec W passing an iron rod set at 439.79 feet and continuing for a total distance of 1059.76 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southeast corner of the

herein described tract;

Thence N 86 deg 27 min 25 sec W 91.34 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, being the southeast corner of a 65.94 acre tract conveyed to the City of Lago Vista by instrument of record in Document No. 2009055227, for the southwest corner of the herein described tract;

Thence N 06 deg 22 min 42 sec E 557.36 feet to a calculated point submerged under the waters of Lake Travis for the westmost northwest corner of the herein described tract;

Thence N 51 deg 56 min 49 sec E passing an iron rod set at 257.76 feet and continuing for a total distance of 578.12 feet to an iron rod found at the southmost southwest corner of said Lot 30011A, for the northwest corner of the herein described tract;

Thence S 80 deg 19 min 59 sec E 149.25 feet to the Point of Beginning, containing 5.30 acres of land, more or less.

Tract III:
5.30 ACRES OF LAND, BEING A PORTION OF A 32.410 ACRES (CALLED 32.42 ACRES) TRACT OF LAND SITUATED IN THE H & O. B. RAILROAD SURVEY NO. 35, TRAVIS COUNTY, TEXAS AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS IN DEED RECORDED IN DOCUMENT NO. 2021053827, REAL PROPERTY RECORDS, TRAVIS COUNTY, TEXAS, AS SHOWN ON THE ATTACTED SKETCH AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Beginning at an iron rod set on the south line of Lot 30010A, Resubdivision of a portion of Highland Lake Estates, Section Thirty, for the Point of Beginning and northeast corner of the herein described tract;

Thence S 22 deg 50 min 32 sec W passing an iron rod set at 389.81 feet and continuing for a total distance of 965.43 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southeast corner of the herein described tract;

Thence N 86 deg 27 min 25 sec W 346.35 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southwest corner of the herein described tract;

Thence N 32 deg 44 min 36 sec E passing an iron rod set at 619.97 feet and continuing for a total distance of 1059.76 feet to an iron rod set on the south line of Lot 30011A, for the northwest corner of the herein described tract;

Thence S 80 deg 19 min 59 sec E 149.25 feet to the Point of Beginning, containing 5.30 acres of land, more or less.

UNOFFICIAL DOCUMENT

Tract IV:
5.30 ACRES OF LAND, BEING A PORTION OF A 32.410 ACRES (CALLED 32.42 ACRES) TRACT OF LAND SITUATED IN THE H & O. B. RAILROAD SURVEY NO. 35, TRAVIS COUNTY, TEXAS AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS IN DEED RECORDED IN DOCUMENT NO. 2021053827, REAL PROPERTY RECORDS, TRAVIS COUNTY, TEXAS, AS SHOWN ON THE ATTACTED SKETCH AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Beginning at an iron rod set on the southerly line of Lot 300096A, Resubdivision of a portion of Highland Lake Estates, Section Thirty, for the Point of Beginning and northeast corner of the herein described tract;

Thence S 10 deg 31 min 00 sec W passing an iron rod set at 306.04 feet and continuing for a total distance of 904.01 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southeast corner of the herein described tract;

Thence N 86 deg 27 min 25 sec W 357.84 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southwest corner of the herein described tract;

Thence N 22 deg 50 min 32 sec E passing an iron rod set at 575.62 feet and continuing for a total distance of 965.43 feet to an iron rod set on the south line of Lot 30010A, for the northwest corner of the herein described tract;

Thence S 80 deg 19 min 59 sec E 149.37 feet to the Point of Beginning, containing 5.30 acres of land, more or less.

Tract V:
5.30 ACRES OF LAND, BEING A PORTION OF A 32.410 ACRES (CALLED 32.42 ACRES) TRACT OF LAND SITUATED IN THE H & O. B. RAILROAD SURVEY NO. 35, TRAVIS COUNTY, TEXAS AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS IN DEED RECORDED IN DOCUMENT NO. 2021053827, REAL PROPERTY RECORDS, TRAVIS COUNTY, TEXAS, AS SHOWN ON THE ATTACTED SKETCH AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Beginning at an iron rod found at the easterly southwest corner of Lot 30008A, Resubdivision of a portion of Highland Lake Estates, Section Thirty, for the Point of Beginning and northeast corner of the herein described tract;

Thence S 03 deg 40 min 00 sec E passing an iron rod set at 371.09 feet and continuing for a total distance of 890.58 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southeast corner of the

Unofficial Document

herein described tract;

Thence N 86 deg 27 min 25 sec W 370.06 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southwest corner of the herein described tract;

Thence N 10 deg 31 min 00 sec E passing an iron rod set at 597.97 feet and continuing for a total distance of 904.01 feet to an iron rod set on the south line of Lot 30009A of said subdivision, for the northwest corner of the herein described tract;

Thence S 80 deg 19 min 59 sec E 149.37 feet to the Point of Beginning, containing 5.30 acres of land, more or less.

Tract VI:
5.91 ACRES OF LAND, BEING A PORTION OF A 32.410 ACRES (CALLED 32.42 ACRES) TRACT OF LAND SITUATED IN THE H & O. B. RAILROAD SURVEY NO. 35, TRAVIS COUNTY, TEXAS AND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS IN DEED RECORDED IN DOCUMENT NO. 2021053827, REAL PROPERTY RECORDS, TRAVIS COUNTY, TEXAS, AS SHOWN ON THE ATTACTED SKETCH AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Beginning at an iron rod found at the southeast corner of Lot 30008A, Resubdivision of a portion of Highland Lake Estates, Section Thirty, being also on the westerly line of Boat House Dockominums, for the Point of Beginning and northmost corner of the herein described tract;

Thence S 34 deg 42 min 14 sec E 356.86 feet to an iron rod found and S 11 deg 35 min 32 sec W 740.24 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southeast corner of the herein described tract;

Thence N 86 deg 27 min 25 sec W 165.77 feet to a calculated point submerged under the waters of Lake Travis on the original north margin of the Colorado River, for the southwest corner of the herein described tract;

Thence N 03 deg 40 min 00 sec W 890.58 feet to an iron rod found at a southwesterly corner of said Lot 30008A, for the northwest corner of the herein described tract;

Thence N 54 deg 46 min 47 sec E 205.55 feet to the Point of Beginning, containing 5.91 acres of land, more or less.

Reservations from Conveyance: None.

Exceptions to Conveyance and Warranty:

This conveyance is made and accepted subject to all restrictions, covenants, conditions, rights-of-way, assessments, outstanding royalty and mineral reservations and easements, if any, affecting the above described property that are valid, existing and properly of record as of the date hereof and subject, further, to taxes for the year **2024** and subsequent years.

Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, grants, sells, and conveys to Grantee the Property, together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty.

The vendor's lien against and superior title to the Property are retained until each note described is fully paid according to its terms, at which time this deed will become absolute.

When the context requires, singular nouns and pronouns include the plural.

Casey Simmons

Megan Herrera aka Megan Simmons

Megan Herrera aka Megan Simmons

STATE OF ~~TEXAS~~ FLORIDA
COUNTY OF ~~TRAVIS~~ ORANGE

APPEARED BY MEANS OF:
☒ PHYSICAL PRESENCE

Before me, JAMILA S. GRANT, on this day personally appeared Casey Simmons and Megan Herrera aka Megan Simmons, known to me or proved to me on the oath of _____ or through TX DRIVER'S LICENSE to be the persons whose names are subscribed to the foregoing instrument and acknowledged to me that they executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 31st day of May, 2024.

Notary Public Signature

Notary Public State of Florida
Jamila S. Grant
My Commission HH 097252
Expires 02/24/2025

After recording, please return to:
Edify Asset Management, LLC
21201 Santa Vista Way
Lago Vista, TX 78645

1845-24-1979

UNOFFICIAL DOCUMENT

Celia Israel
Travis County Tax Assessor-Collector
P.O. BOX 149328
Austin, TX 78714-9328
(512) 854-9473 SE HABLA ESPAÑOL

Travis County Tax Office
2433 Ridgepoint Drive
Austin, TX 78754-5231
Pay online at www.traviscountytax.org

Failure to receive the tax bill does not affect the validity of the taxes, the penalty, the interest, the due date, or the existence of a tax lien. Sec. 31.01(g) of Texas Property Code.

Payments by mail are credited according to U.S. Postmark (not meters). Taxes not paid in full by January 31 are charged penalty and interest by state law and may be subject to legal fees. Penalty and interest is added on the 1st day of each month as follows with an additional 12% interest charged per year thereafter.

February	7%	May	13%	August	19%	November	22%
March	9%	June	15%	September	20%	December	23%
April	11%	July	18%	October	21%	January	24%

1 TAX YEAR	2 BASE TAX	3 PENALTY AND INTEREST DUE	4 ATTORNEY FEES DUE	5 TOTAL DUE

TOTAL BASE TAXES, PENALTY, INTEREST & ATTORNEY FEES DUE:	6	0.00
TOTAL OTHER FEES DUE:	7	0.00
TOTAL AMOUNT DUE FOR ALL YEARS:	8	0.00

EDIFY ASSET MANAGEMENT LLC

21201 SANTA VISTA WAY

LAGO VISTA,TX 78645

9 PROPERTY LOCATION ADDRESS		
21201 SANTA VISTA WAY		
10 LEGAL DESCRIPTION		
ABS 2152 SUR 35 H & O B R R CO ACR 32.420		
11 BILLING NO.	12 PROPERTY TYPE	
	REAL	PERSONAL
47040	X	
13 PARCEL NUMBER		
01599604020000		

ELECTRONIC PAYMENT OPTIONS

- Payment made via credit card or electronic check are subject to an additional fee
- Visit www.traviscountytax.org for details
- Pay taxes and print bills or receipts at www.traviscountytax.org
- Pay by phone at: 1-888-286-9242

05/07/2025 10:14:01

AGENDA ITEM NO. 9c

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Charles West, Development Services

SUBJECT: **Project # 23-2777-R-REZ** Conduct a public hearing for consideration of a request to rezone a parcel of land from "TR-1" Temporary Restricted to "C-2" General Commercial Retail. Said rezoning is proposed for an approximately 4.035-acre tract of land identified as Property ID No. 984238 by the Travis Central Appraisal District and situated in the Mary Campbell Survey, Abstract No. 129, in the City of Lago Vista, Travis County, Texas. Said tract was conveyed to Leonard Strickler and is more generally described as being along the west side of Lohman Ford Road, approximately 380 feet south of the intersection of Lohman Ford Road and Travis Drive.

BACKGROUND: See Attachments Below

FINDINGS: See Attachments Below

FINANCIAL IMPACT: See Attachments Below

RECOMMENDATION: See Attachments Below

ATTACHMENTS:
Staff Packet (03-27-2025) P&Z (Final).docx

AGENDA TYPE: Public Hearing	Finance Review	☐ Yes	☒ N/A
	Legal Review	☐ Yes	☒ N/A
Meeting Date: March 27, 2025	BUDGET IMPACT: None anticipated		
Staff Contact: Ed McRoy			
Department: Development Services			

ACTION REQUESTED

Conduct a Public Hearing & Consider a recommendation to the City Council to rezone a property from TR-1 to C-2

AGENDA CAPTION

Project # 23-2777-R-REZ CONDUCT A PUBLIC HEARING FOR CONSIDERATION OF A REQUEST TO REZONE A PARCEL OF LAND FROM "TR-1" TEMPORARY RESTRICTED TO C-2 "GENERAL COMMERCIAL RETAIL" SAID REZONING PROPOSED FOR AN APPROXIMATE 4.035 ACRE TRACT OF LAND IDENTIFIED AS PROPERTY ID NO. 984238 BY THE TRAVIS CENTRAL APPRAISAL DISTRICT AND SITUATED IN THE MARY CAMPBELL SURVEY ABSTRACT NO. 129 IN THE CITY OF LAGO VISTA , TRAVIS COUNTY TEXAS. SAID TRACT HAVING BEEN CONVEYED TO LEONARD STRICKLER AND MORE GENERALLY DESCRIBED AS BEING ALONG THE WEST SIDE OF LOHMAN FORD ROAD APPROXIMATELY 380 FEET SOUTH OF THE INTERSECTION OF LOMAN FORD RD. AND TRAVIS DR.

BACKGROUND/SUMMARY/ANALISYS

Property Status

Current Zoning:	TR-1	Comp Plan:	Commercial
Current Use:	Vacant	Proposed:	Unspecified
Nearby Zoning			
North	R-2 & C1-C	East	R-1
South	C-2	West	N/A (ETJ)

This site was a part of an original approximate 10-acre parcel recently annexed into the city. Approximately 3 acres in the center of the original tract was rezoned to C-2 for retail use and sold. This 4-acre northern portion, and an approximate 3-acre southern remainder portion were not included in the rezoning action for the middle section. The proposed action is to establish zoning consistent what that of the adjacent southern C-2 property.

The proposed zoning has been determined to be consistent with the Comprehensive Plan designation. The proposed commercial zoning is located along a significant major roadway. (Lohman Ford Rd). Property to the west is owned by the Lago Vista ISD. A utility analysis, tree survey, engineering analysis, drainage plan will be required with any future site development. A design plan review and TIA may also be deferred to that time. The proposed zoning appears compatible with directly adjacent properties. Compatibility with nearby non-adjacent properties is determined herein based on conformance with the Comprehensive Plan.

PROCESS DESCRIPTION

This agenda item is to 1) receive citizen comments, questions and suggestions for a proposed zoning change as indicated in the agenda caption and to 2) consider a possible recommendation to the City Council.

Typical process (simplified): A. Chair introduces the item
B. Staff Briefing/Comments/Technical Questions/Discussion
C. Applicant Presentation
D. Public Hearing Open - Conduct – Close
E. Discussion/Motions/Vote

Briefing /Comments

Public Hearing Protocols

1) The intent of a public hearing is simply to take public input as maybe applicable to the item in question.
2) Members of the public should address all comments, questions, or submissions to the Council, Commission, Board, or Committee and not to City staff, or other members of the audience.
3) Side conversations, repetitive statements, and non-germane matters are to be avoided.
4) All participants should maintain proper decorum and avoid the use of profane, vulgar, or defamatory statements.

OPTIONS AND RECOMMENDATIONS

Option 1 Recommend the City Council **Approve** the request **as presented**.

Option 2 Recommend the City Council **Deny** the request Option 3

Postpone consideration to a specific day/time.

Staff Recommendation: – Approve

Attachments

1. **Location Map**
2. **Application Materials**
3. **Current Zoning Map**
4. **Comprehensive Plan Map**

Attachment 2
Location Map



Date

03/12/2025

N

NTS

Request Type	Zoning Change	Projects
Change Requested	TR-1 - C2	23-2777-R-REZ & 23-2778-R-REZ
Map Purpose	Location	

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

CITY OF LAGO VISTA TEXAS

Attachment 2
Application Materials

LAGO VISTA
TEXAS

CITY OF LAGO VISTA · DEVELOPMENT SERVICES
5803 THUNDERBIRD STREET · P.O. BOX 4727 · LAGO VISTA, TX 78645
Tel. (512) 267-5259 *Fax (512) 267-5265*

NOTE: Applicants should seek legal advice concerning the applicability of any existing private covenants or deed restrictions and their ability to be enforced or waived by other specific property owners.

APPLICATION FOR ZONING DISTRICT CHANGE

Contact Person: Leonard Strickler **Fee:** See Ordinance Appendix A (non-refundable)

Contact Phone: 512 748.8032 **Contact Email:** leonardstrickler@yahoo.com

Property Owner(s):* Leonard Strickler

Owner's mailing address: 2701 Cavileer Ave, Austin Tx 78757

COMPLETE LEGAL DESCRIPTION OF SUBJECT PROPERTY

Subdivision, Section and Lot Number(s) if platted. Attach metes & bounds or equal description otherwise*

Tax ID # 984238

Municipal Address(es)* if applicable: 5700 Lohmans Ford Road

NATURE OF REQUEST

Current Zoning District(s): Recently Annexed **Requested District:** C-2

Purpose or Basis of Request* (if PDD, include whether concept and/or detail plan approval is sought):

Recently Annexed

Additional individual(s) authorized to act on behalf of the property owner(s)* regarding this application:

Name of Agent: _____ **Email:** _____

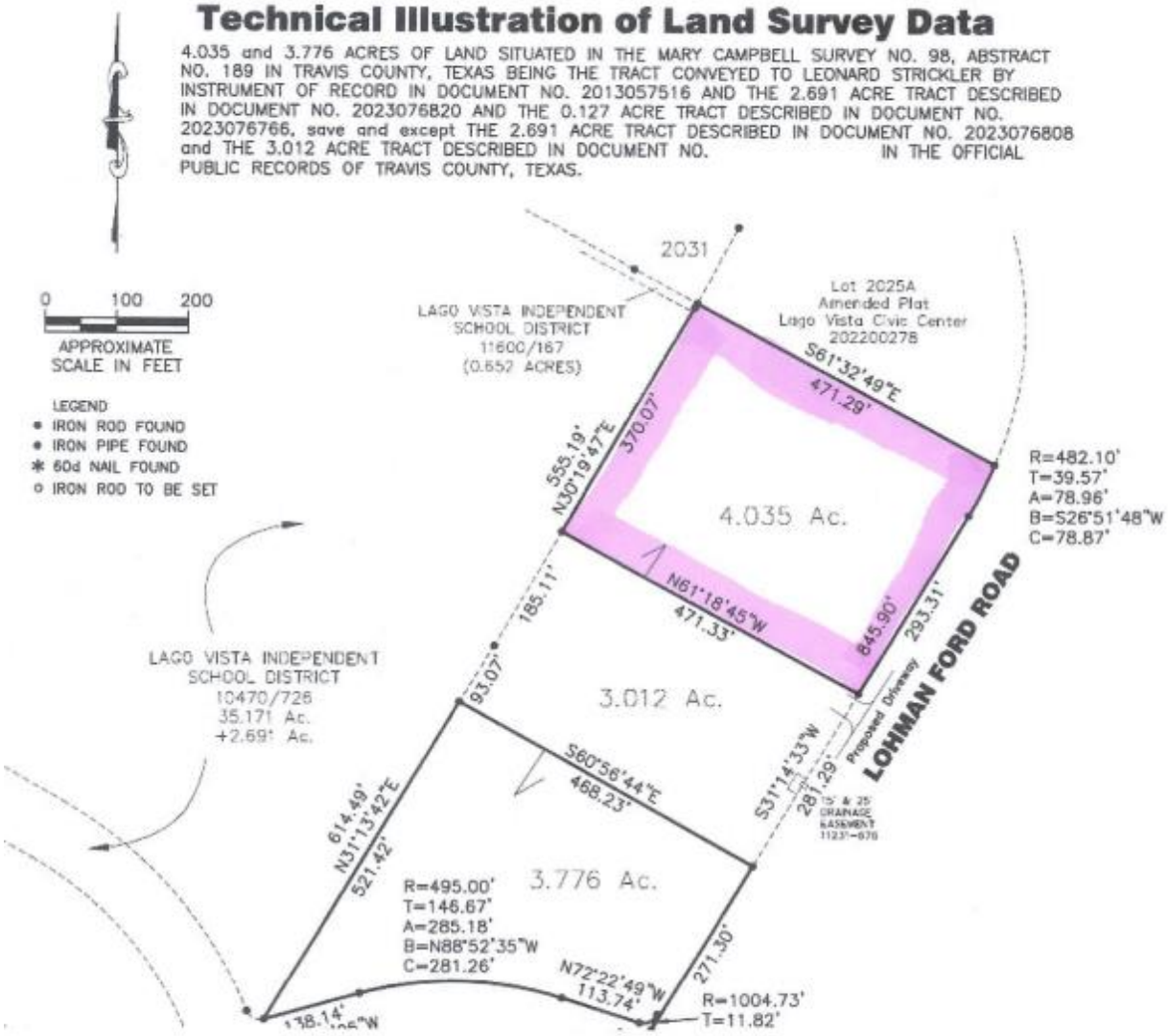
Mailing Address: _____ **Phone:** _____

NOTE: **Applications must be complete including all applicable portions of this form, payment of fees and all required drawings or documentation. All applications are accepted provisionally pending a completion review.** PLEASE TAKE SPECIFIC NOTICE AND INCORPORATE OR ADDRESS ALL LOCAL ORDINANCE REQUIREMENTS IN YOUR APPLICATION.

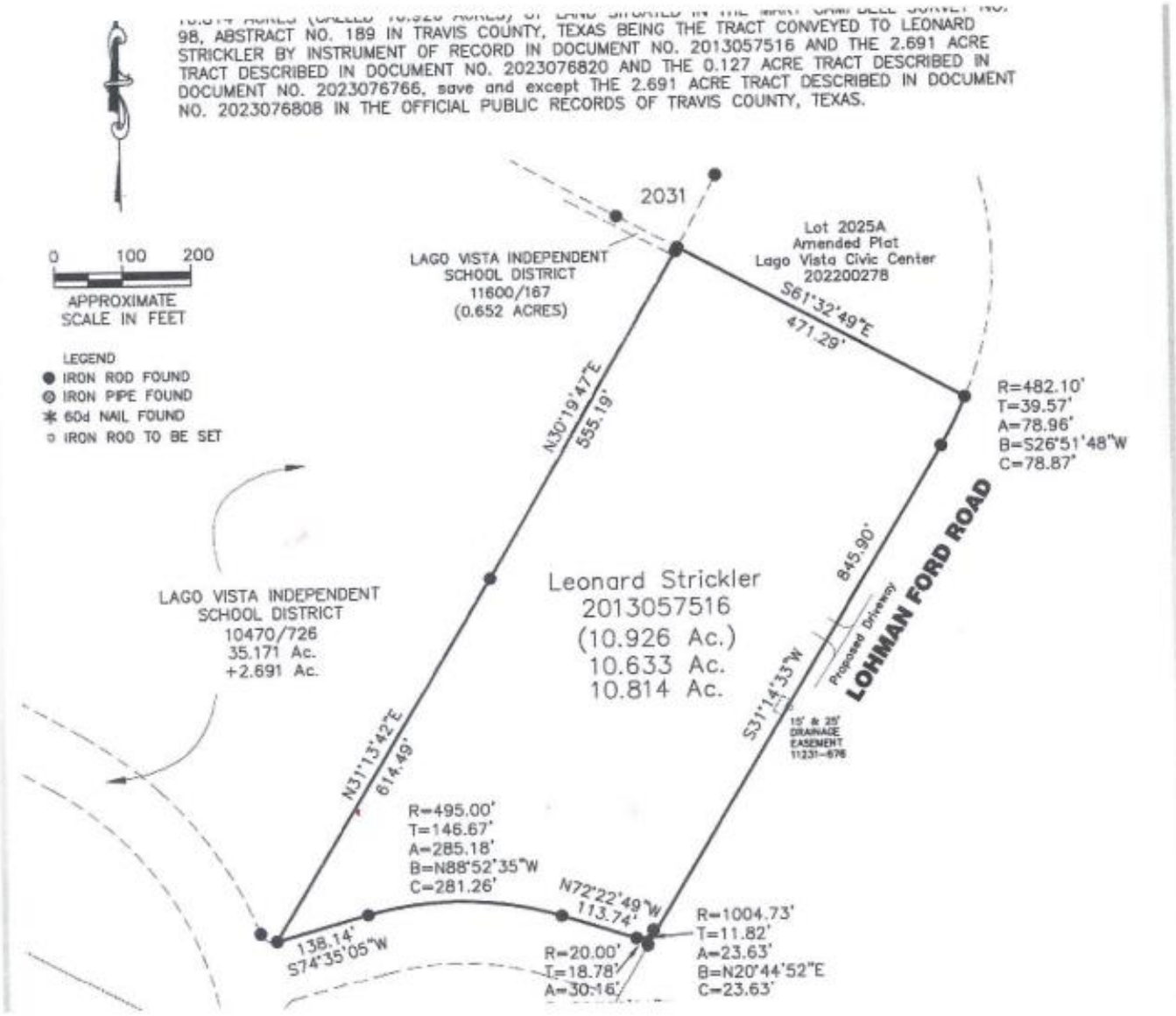
Property Owner's signature(s)* 3/9/25 **Date**

***Attach additional sheets as required**

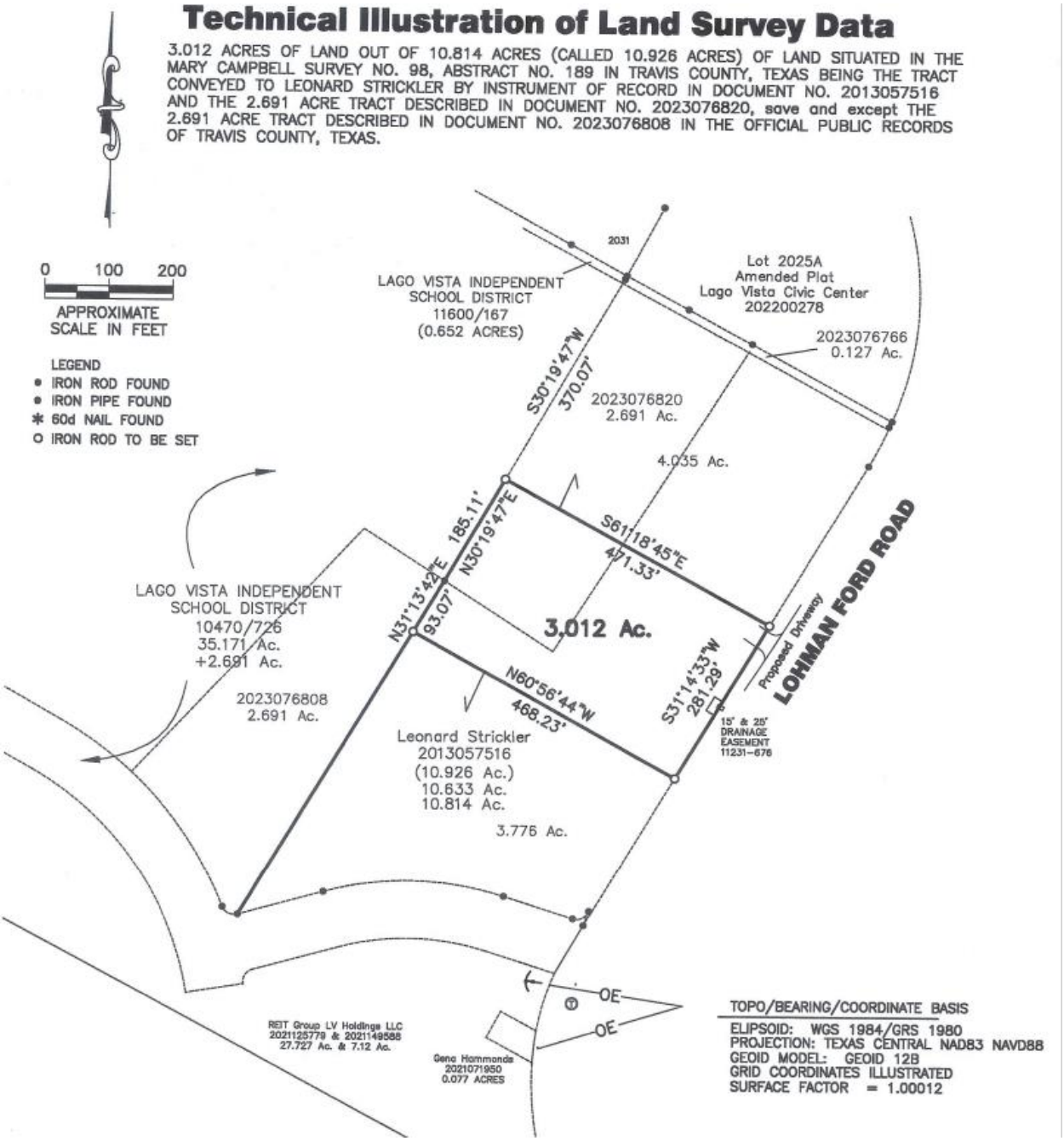
Attachment 2
Application Materials
Current Request – Survey



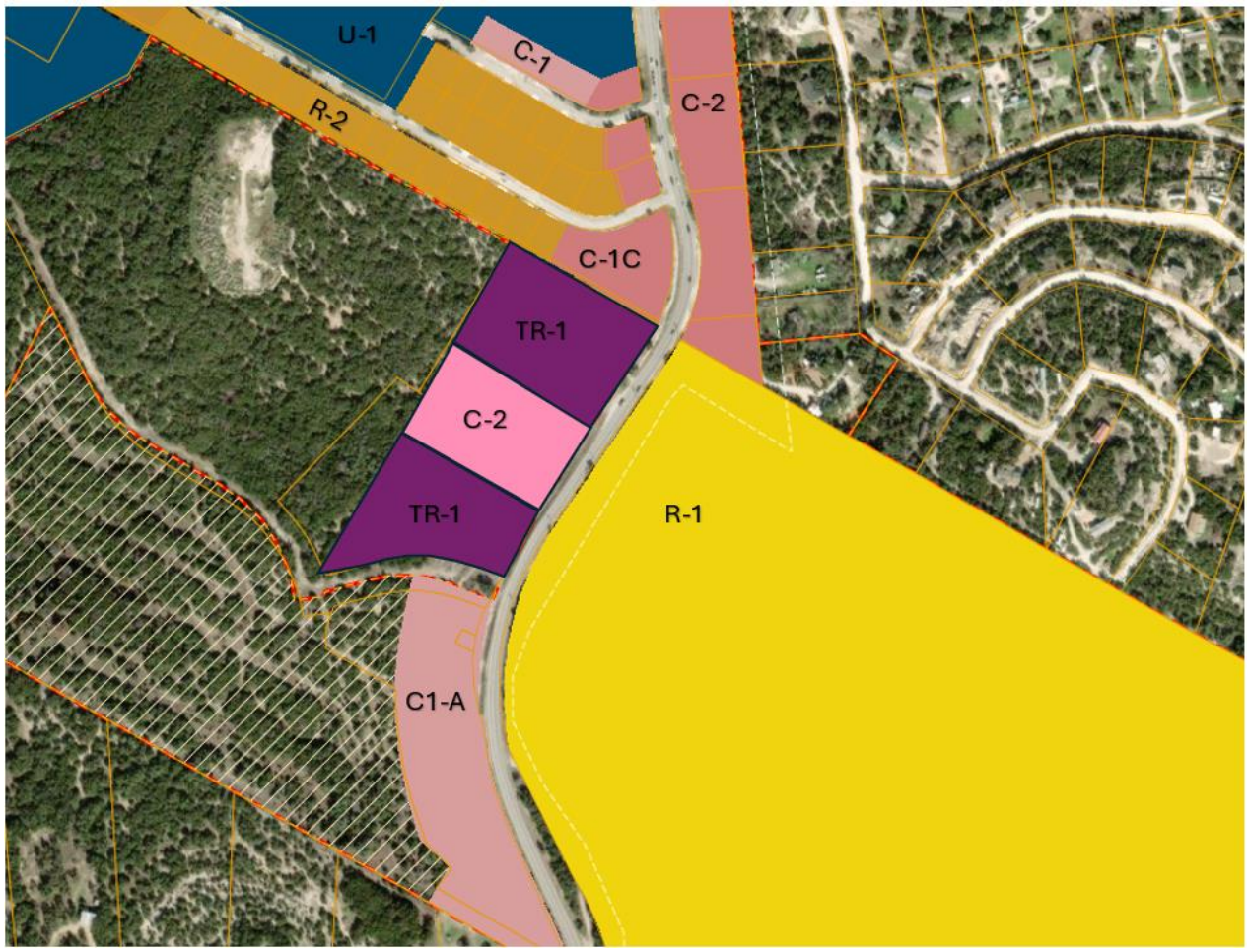
Attachment 2
Application Materials
Original Tract 10 acre Tract



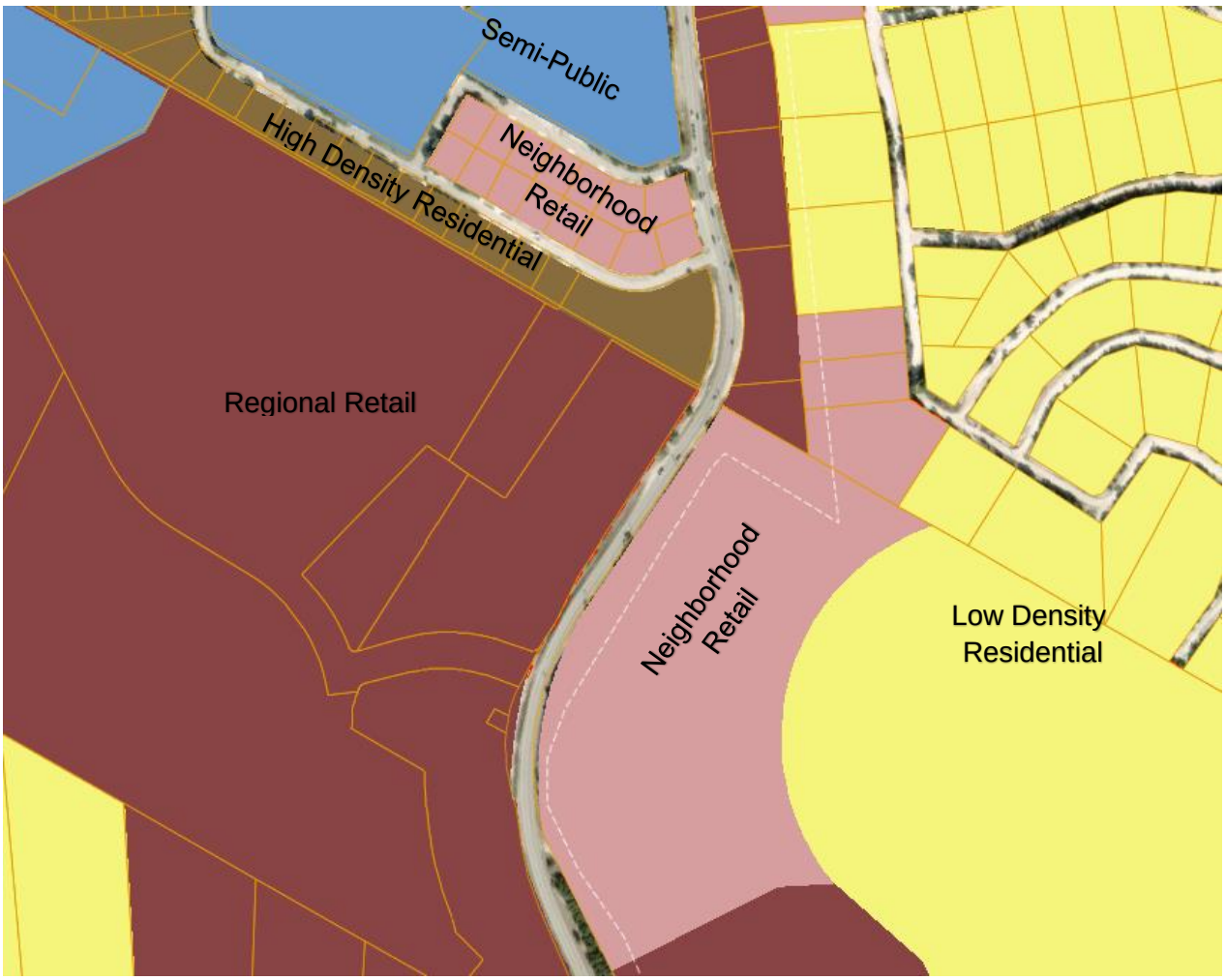
Attachment 2
Application Materials
Current Conditions



Attachment 3
Current Zoning



Attachment 3
Comprehensive Plan



AGENDA ITEM NO. 9d

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Charles West, City Manager

SUBJECT: **Project # 23-2778-R-REZ** Conduct a public hearing for consideration of a request to rezone a parcel of land from “TR-1” Temporary Restricted to C-2 “General Commercial Retail”. Said rezoning Proposed for an approximate 3.776-acre tract of land identified as Property ID NO. 999032 by the Travis Central Appraisal District and situated in the Mary Campbell Survey Abstract NO. 129 in the City of Lago Vista, Travis County Texas. Said Tract Having Been conveyed to Leonard Strickler and more generally described as being along the west side of Lohman Ford Road Approximately 954 Feet South of the intersection of Lohman Ford RD. and Travis Dr.

BACKGROUND: See Materials Below

FINDINGS: See Materials Below

RECOMMENDATION: Conduct a Public Hearing, Discuss and Consider.

ATTACHMENTS:
Staff_Packet__03-27-2025___Final_.docx

AGENDA TYPE: Public Hearing	Finance Review	☐ Yes	☒ N/A
	Legal Review	☐ Yes	☒ N/A
Meeting Date: March 27, 2025 **Staff Contact:** Ed McRoy **Department:** Development Services	BUDGET IMPACT: None anticipated		

ACTION REQUESTED

Conduct a Public Hearing & Consider a recommendation to the City Council to rezone a property from TR-1 to C-2

AGENDA CAPTION

Project # 23-2778-R-REZ CONDUCT A PUBLIC HEARING FOR CONSIDERATION OF A REQUEST TO REZONE A PARCEL OF LAND FROM "TR-1" TEMPORARY RESTRICTED TO C-2 "GENERAL COMMERCIAL RETAIL" SAID REZONING PROPOSED FOR AN APPROXIMATE 3.776 ACRE TRACT OF LAND IDENTIFIED AS PROPERTY ID NO. 999032 BY THE TRAVIS CENTRAL APPRAISAL DISTRICT AND SITUATED IN THE MARY CAMPBELL SURVEY ABSTRACT NO. 129 IN THE CITY OF LAGO VISTA , TRAVIS COUNTY TEXAS. SAID TRACT HAVING BEEN CONVEYED TO LEONARD STRICKLER AND MORE GENERALLY DESCRIBED AS BEING ALONG THE WEST SIDE OF LOHMAN FORD ROAD APPROXIMATELY 954 FEET SOUTH OF THE INTERSECTION OF LOMAN FORD RD. AND TRAVIS DR.

BACKGROUND/SUMMARY/ANALISYS

Property Status

Current Zoning:	TR-1	Comp Plan:	Commercial
Current Use:	Vacant	Proposed:	Unspecified

Nearby Zoning

North	C-2 & N/A	East	R-1
South	C-1A	West	N/A (ETJ)

This site was a part of an original approximate 10-acre parcel recently annexed into the city. Approximately 3 acres in the center of the original tract was rezoned to C-2 for a retail use and sold. This 4-acre northern portion, and an approximate 3-acre southern remainder portion were not included in the rezoning action for the middle section. The proposed action is to establish zoning consistent what that of the adjacent southern C-2 property.

The proposed zoning has been determined to be consistent with the Comprehensive Plan designation. The proposed commercial zoning is located along a significant major roadway. (Lohman Ford Rd). Property to the west is owned by the Lago Vista ISD. A utility analysis, tree survey, engineering analysis, drainage plan will be required with any future site development. A TIA may also be required at that time. The proposed zoning appears compatible with directly adjacent properties. Compatibility with nearby non-adjacent properties is determined herein based on conformance with the Comprehensive Plan.

PROCESS DESCRIPTION

This agenda item is to 1) receive citizen comments, questions and suggestions for a proposed zoning change as indicated in the agenda caption and to 2) consider a possible recommendation to the City Council.

Typical process (simplified):

A. Chair introduces the item
B. Staff Briefing/Comments/Technical Questions/Discussion
C. Applicant Presentation
D. Public Hearing Open - Conduct – Close
E. Discussion/Motions/Vote

Briefing /Comments

Public Hearing Protocols

1) The intent of a public hearing is simply to take public input as maybe applicable to the item in question.
2) Members of the public should address all comments, questions, or submissions to the Council, Commission, Board, or Committee and not to City staff, or other members of the audience.
3) Side conversations, repetitive statements, and non-germane matters are to be avoided.
4) All participants should maintain proper decorum and avoid the use of profane, vulgar, or defamatory statements.

OPTIONS AND RECOMMENDATIONS

Option 1 Recommendation the City Council **Approve** the request **as presented**.

Option 2 Recommend the City Council **Deny** the request

Option 3 **Postpone** consideration to a specific day/time.

Staff Recommendation: – Approve

Attachments

1. **Location Map**
2. **Application Materials**
3. **Current Zoning Map**
4. **Comprehensive Plan Map**

Attachment 2
Location Map



Date

03/12/2025

N

NTS

Request Type	Zoning Change	Projects
Change Requested	TR-1 - C2	23-2777-R-REZ & 23-2778-R-REZ
Map Purpose	Location	

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

CITY OF LAGO VISTA TEXAS

Attachment 2
Application Materials

LAGO VISTA
TEXAS

CITY OF LAGO VISTA · DEVELOPMENT SERVICES
5803 THUNDERBIRD STREET · P.O. BOX 4727 · LAGO VISTA, TX 78645
Tel. (512) 267-5259
Fax (512) 267-5265

NOTE: Applicants should seek legal advice concerning the applicability of any existing private covenants or deed restrictions and their ability to be enforced or waived by other specific property owners.

APPLICATION FOR ZONING DISTRICT CHANGE

Contact Person: Leonard Strickler **Fee:** See Ordinance Appendix A (non-refundable)

Contact Phone: 512 748-8032 **Contact Email:** leonardstrickler@yahoo.com

Property Owner(s):* Leonard Strickler

Owner's mailing address: 2701 Cavalier Ave Austin Tx 78757

COMPLETE LEGAL DESCRIPTION OF SUBJECT PROPERTY

Subdivision, Section and Lot Number(s) if platted. Attach metes & bounds or equal description otherwise*

Tax ID # 999032

Municipal Address(es)* if applicable: 5700 Lohmans Ford Road

NATURE OF REQUEST

Current Zoning District(s): Recently Annexed **Requested District:** C-2

Purpose or Basis of Request* (if PDD, include whether concept and/or detail plan approval is sought):

Recently Annexed

Additional individual(s) authorized to act on behalf of the property owner(s)* regarding this application:

Name of Agent: _____ **Email:** _____

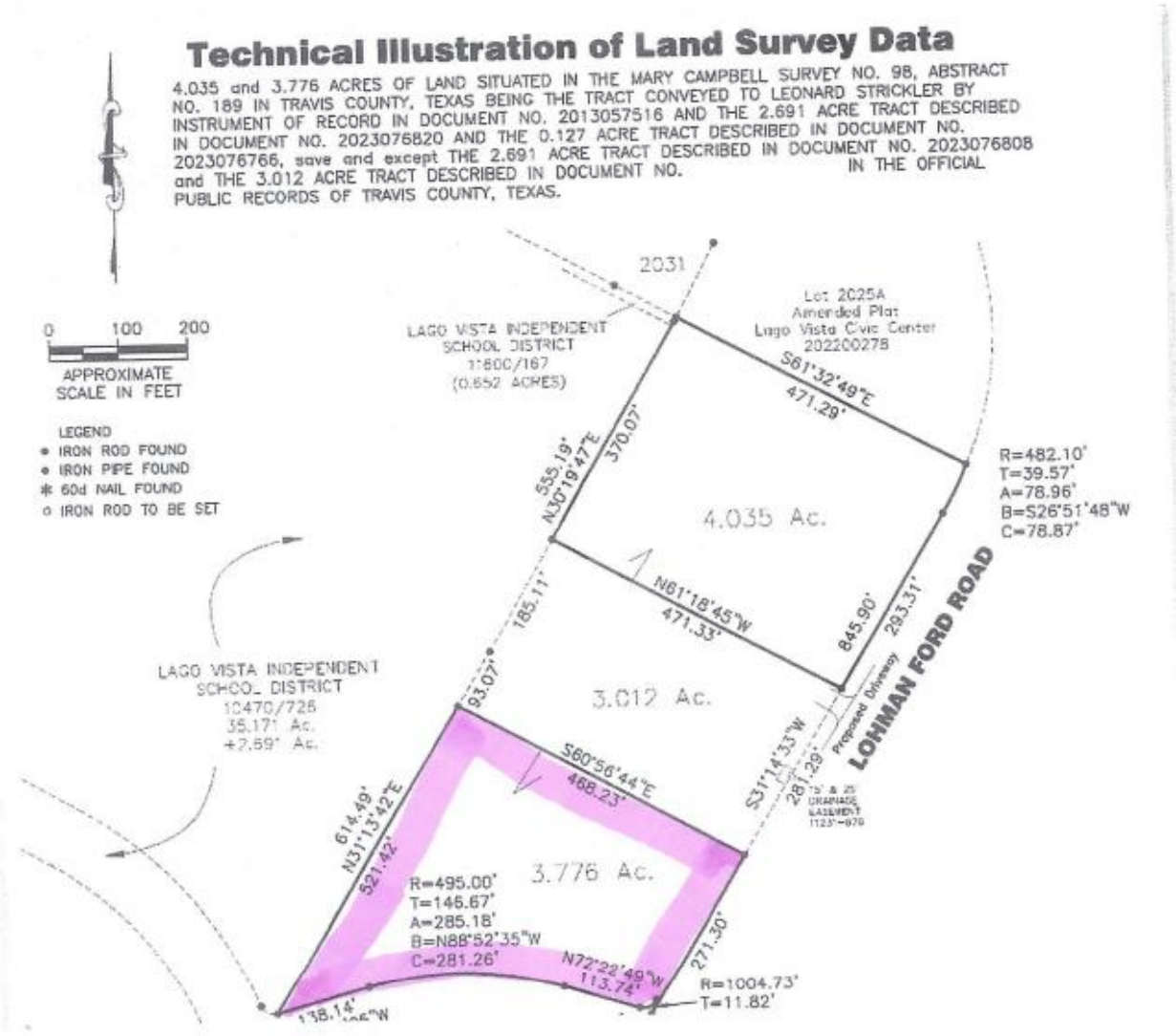
Mailing Address: _____ **Phone:** _____

NOTE: **Applications must be complete including all applicable portions of this form, payment of fees and all required drawings or documentation. All applications are accepted provisionally pending a completion review.** PLEASE TAKE SPECIFIC NOTICE AND INCORPORATE OR ADDRESS ALL LOCAL ORDINANCE REQUIREMENTS IN YOUR APPLICATION.

Property Owner's signature(s)* **Date** 3/9/25

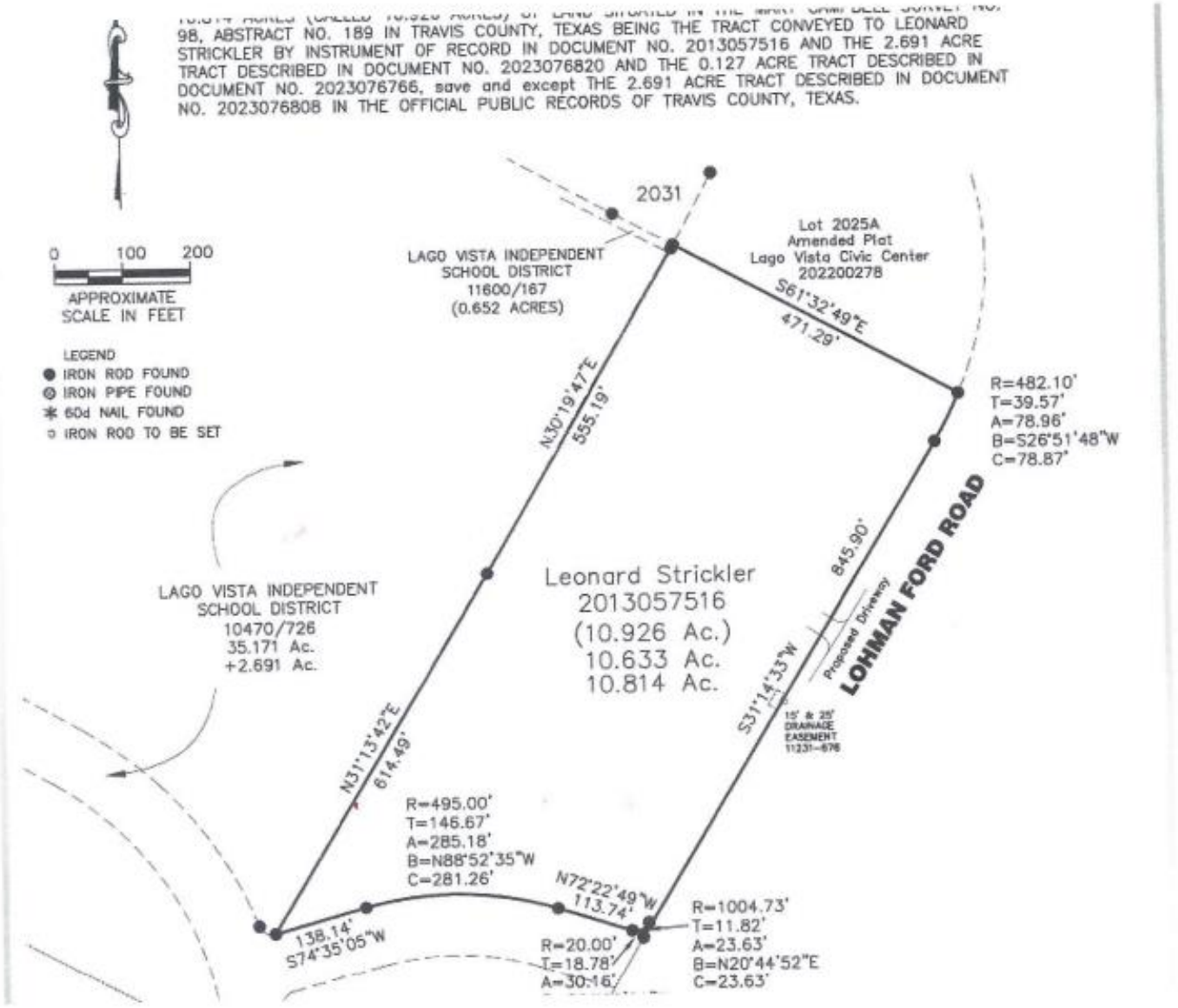
***Attach additional sheets as required**

Attachment 2
Application Materials
Current Request – Survey

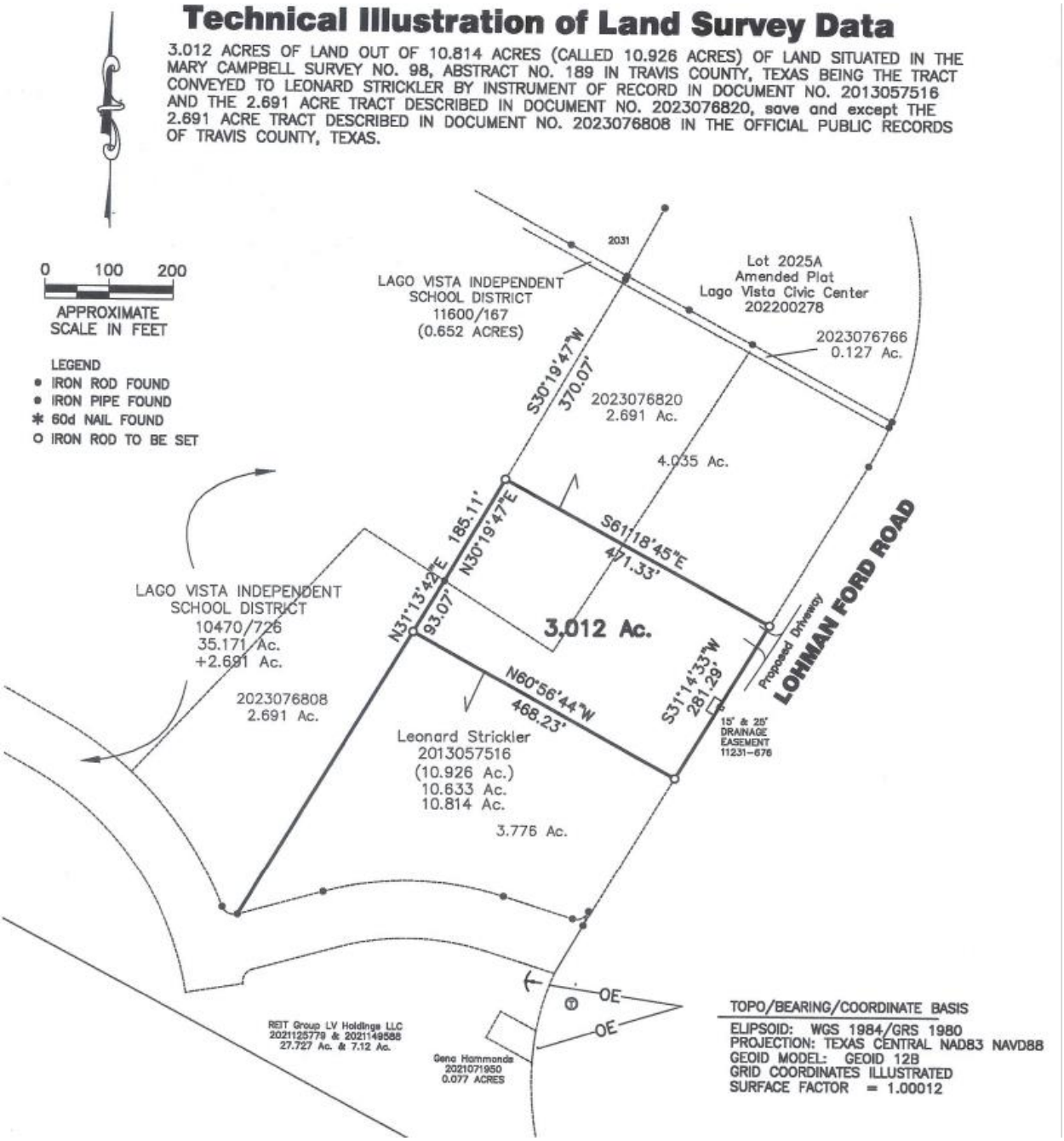


Attachment 2
Application Materials
Original Tract 10 acre Tract

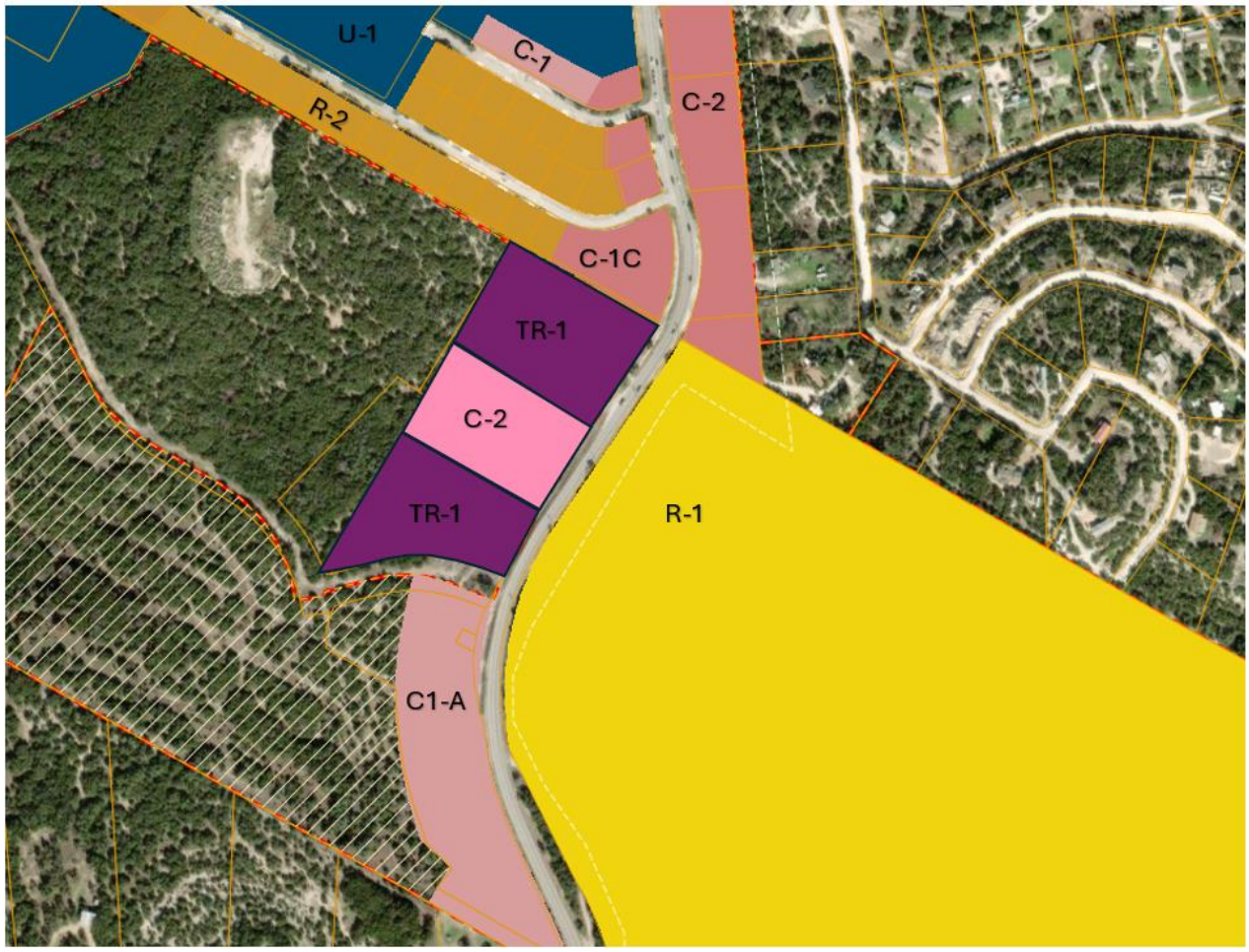
98, ABSTRACT NO. 189 IN TRAVIS COUNTY, TEXAS BEING THE TRACT CONVEYED TO LEONARD STRICKLER BY INSTRUMENT OF RECORD IN DOCUMENT NO. 2013057516 AND THE 2.691 ACRE TRACT DESCRIBED IN DOCUMENT NO. 2023076820 AND THE 0.127 ACRE TRACT DESCRIBED IN DOCUMENT NO. 2023076766, save and except THE 2.691 ACRE TRACT DESCRIBED IN DOCUMENT NO. 2023076808 IN THE OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS.



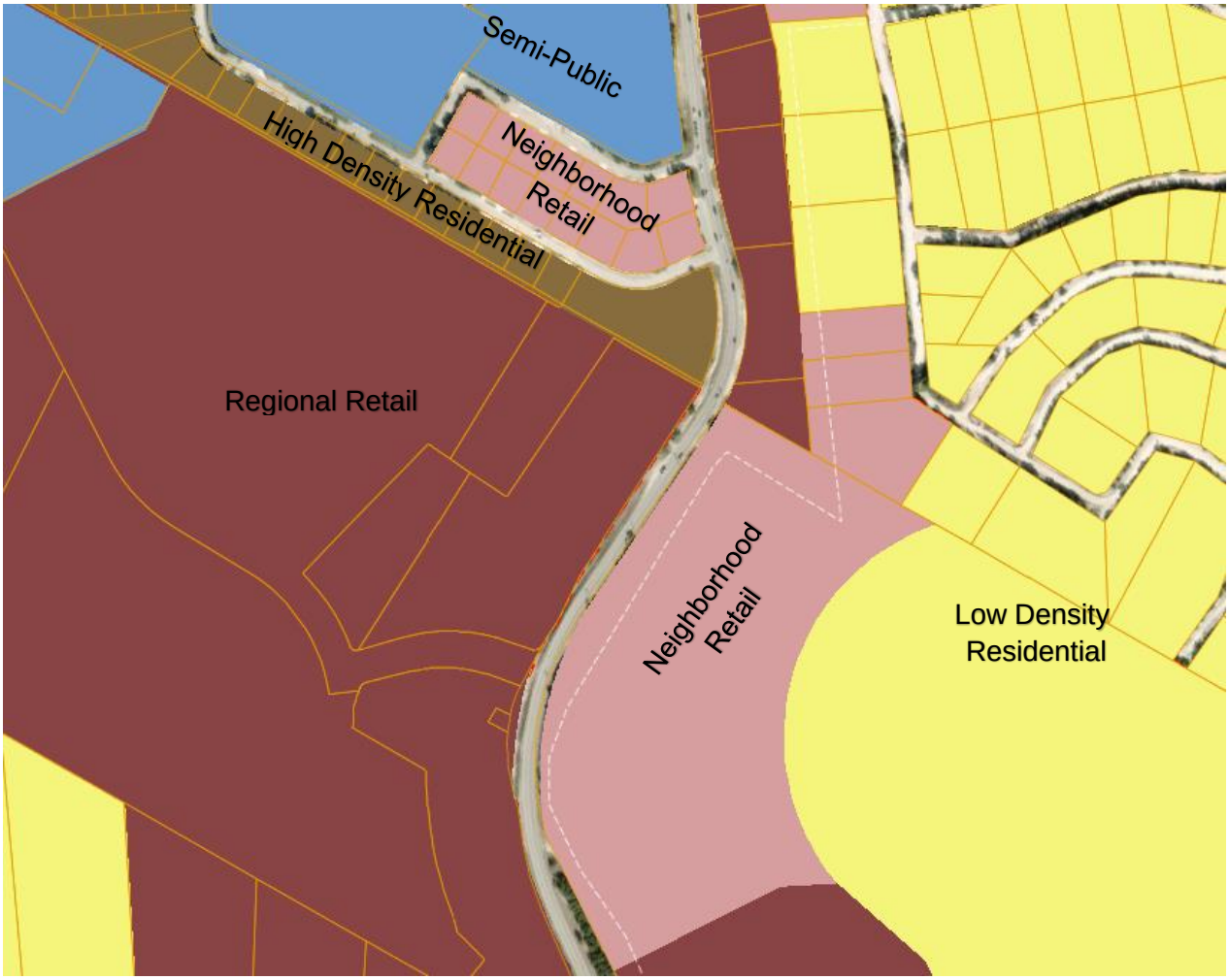
Attachment 2
Application Materials
Current Conditions



Attachment 3
Current Zoning



Attachment 3
Comprehensive Plan



AGENDA ITEM NO. 10a

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Mayor Sullivan, City Council

SUBJECT: Consideration and possible action on adopting **Resolution No. 25-2141** committing to zero roadway fatalities and serious injuries and adopting the Safe Streets and Roads for All (SS4A) Travis County Safety Action Plan.

BACKGROUND: The U.S. Department of Transportation has launched the Safe Streets and Roads for All (SS4A) program to support local efforts to reduce and ultimately eliminate roadway fatalities and serious injuries. Recognizing that every traffic-related death or severe injury is preventable, Travis County staff, in coordination with regional partners, have developed the Travis County Safety Action Plan. This plan uses a data-driven Safe System Approach to identify high-risk areas, analyze crash patterns, engage community stakeholders, and outline actionable safety strategies.

The Commissioner's Court has previously expressed commitment to transportation safety, and this resolution formalizes that commitment with clear, measurable goals and alignment with federal and state initiatives, including the Texas Road to Zero.

FINDINGS: Traffic fatalities and serious injuries are a critical public safety concern across Travis County. Participation in the SS4A program enables access to federal resources and technical assistance to improve roadway safety. The Travis County Safety Action Plan reflects a collaborative effort to establish a long-term vision for safer streets through engineering, enforcement, education, and policy changes. Setting quantifiable goals for fatality and injury reduction reinforces accountability and progress tracking.

FINANCIAL IMPACT: No immediate financial commitment is required to adopt the resolution or the Safety Action Plan.

RECOMMENDATION: Approve the Resolution committing to a Vision Zero goal of eliminating roadway fatalities and serious injuries in Travis

County. Specifically, this includes:

- Adopting the Travis County Safety Action Plan;
- Committing to reduce fatalities and serious injuries by 50% by 2035 and 100% by 2050;
- Agreeing to monitor and report progress toward these goals;
- Authorizing implementation of projects, policies, and strategies outlined in the Plan.

ATTACHMENTS:

Resolution_No._25-2141_Committing to Zero Roadway Fatalities & Serious Injuries SS4A.pdf
Travis County SS4A Safety Action Plan-Single Pages.pdf

RESOLUTION NO. 25-2141

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS, COMMITTING TO ZERO ROADWAY FATALATIES AND SERIOUS INJURIES AND ADOPTING THE SAFE STREETS AND ROADS FOR ALL (SS4A) TRAVIS COUNTY ACTION PLAN

WHEREAS, the City of Lago Vista recognizes that traffic fatalities and serious injuries are preventable and that no loss of life on our roadways is acceptable; and

WHEREAS, the U.S. Department of Transportation's Safe Streets and Roads for All (SS4A) program supports local initiatives aimed at eliminating roadway fatalities and serious injuries through a Safe System Approach; and

WHEREAS, Travis County staff and regional partners participated in development of the Travis County Safety Action Plan that identified high-risk areas, analyzed crash data, engaged stakeholders, and outlined strategies to enhance transportation safety; and

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS: Commits to reducing fatalities and serious injury crashes by 50% by 2035 and by 100% by 2050, aligning with the objectives of the SS4A program and Texas Road to Zero; and

BE IT FURTHER RESOLVED Adopts the Travis County Safety Action Plan and intends to implement projects, strategies, and policies from the plan**.**

Effective Date: This resolution shall take effect immediately upon adoption.

PASSED AND APPROVED this **17th** day of **July 2025** by the City Council of the City of Lago Vista, Texas.

CITY OF LAGO VISTA, TEXAS

_____
Kevin Sullivan, Mayor

ATTEST:

_____
Susie Quinn, Interim City Secretary

On a motion by Councilor _____, seconded by Councilor _____ the above and foregoing instrument was passed and approved.



TRAVIS COUNTY SAFETY ACTION PLAN

SAFE STREETS AND ROADS FOR ALL (SS4A)

JUNE 2025

Transportation and Natural Resources Department

Our Commitment:

TRAVIS COUNTY COMMITS TO REDUCING ROADWAY FATALITIES AND SERIOUS INJURIES BY 50% BY 2035 AND BY 100% BY 2050.

ZERO *BY 50*



Rollingwood, TX

COMMISSIONERS COURT MEMBERS

COUNTY JUGDE - ANDY BROWN

PRECINCT ONE - JEFF TRAVILLION

PRECINCT TWO - BRIGID SHEA

PRECINCT THREE - ANN HOWARD

PRECINCT FOUR - MARGARET GÓMEZ

PARTNER JURISDICTIONS

JONESTOWN

LAGO VISTA

LAKEWAY

MANOR

PFLUGERVILLE

ROLLINGWOOD

SAN LEANNA

VOLENTE

WEST LAKE HILLS

DEL VALLE INDEPENDENT SCHOOL DISTRICT

UNINCORPORATED TRAVIS COUNTY

PARTICIPATING AGENCIES

CITY OF AUSTIN

CAMPO

TxDOT

CapMetro

CARTS

CTRMA

Travis Co. Sherrif's Office

Office of Emergency Management

TNR Public Works

**To be updated after adoption*

A Resolution Committing to Zero Roadway Fatalities and Serious Injuries and Adopting the Safe Streets and Roads for All (SS4A) Travis County Safety Action Plan

WHEREAS, the Commissioners Court of Travis County recognizes that traffic fatalities and serious injuries are preventable and that no loss of life on our roadways is acceptable; and

WHEREAS, the U.S. Department of Transportation's Safe Streets and Roads for All (SS4A) program supports local initiatives aimed at eliminating roadway fatalities and serious injuries through a Safe System Approach; and

WHEREAS, Travis County staff and regional partners participated in development of the Travis County Safety Action Plan that identified high-risk areas, analyzed crash data, engaged stakeholders, and outlined strategies to enhance transportation safety; and

THEREFORE, BE IT RESOLVED, that the Commissioners Court commits to reducing fatalities and serious injury crashes by 50% by 2035 and by 100% by 2050, aligning with the objectives of the SS4A program and Texas Road to Zero; and

BE IT FURTHER RESOLVED, that the Commissioners Court will monitor and periodically report on progress toward the road to zero goal; and

BE IT FURTHER RESOLVED, that the Commissioners Court adopts the Travis County Safety Action Plan and intends to implement projects, strategies, and policies from the plan.

Resolution adopted on this 10th day of June 2025.

Judge Andy Brown
Travis County

Commissioner Jeffrey W. Travillion
Precinct One

Commissioner Brigid Shea
Precinct Two

Commissioner Ann Howard
Precinct Three

Commissioner Margaret J. Gomez
Precinct Four

ON JUNE 10TH, 2025 [PENDING] THE TRAVIS COUNTY COMMISSIONERS COURT PASSED A RESOLUTION COMMITTING TO ZERO ROADWAY FATALITIES AND SERIOUS INJURIES AND ADOPTING THE SAFE STREETS AND ROADS FOR ALL (SS4A) TRAVIS COUNTY SAFETY ACTION PLAN.

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Please Note: The Travis County SS4A Safety Action Plan Appendices are a separate PDF document

DISCLAIMER | 23 United States Code Section 407

Discovery and admission as evidence of certain reports and surveys

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.


Rollingwood, TX

LIST OF ABBREVIATIONS

COA	City of Austin
CRIS	Crash Records Information System
FHWA	Federal Highway Administration
HIN	High Injury Network
ISD	Independent School District
KABCO*	Injury Severity Scale
	K – Fatal Injury
	A – Suspected Serious Injury
	B – Suspected Minor Injury
	C – Possible Injury
	O/N – No Apparent Injury
NHTSA	National Highway Traffic Safety Administration
PHB	Pedestrian Hybrid Beacon
RRFB	Rectangular Rapid Flashing Beacon
RSA	Road Safety Audit
SHSP	Strategic Highway Safety Plan
SS4A	Safe Streets and Roads for All
TWLT	Two Way Left Turn
USDOT	US Department of Transportation
VMT	Vehicle Miles Traveled
VSL	Variable Speed Limit

**Note: Some crash recording systems, including CRIS, use the N notation for No Apparent Injury crashes..*

TxDOT - The Texas Department of Transportation is responsible for the planning, construction, and maintenance of state roads.

CAMPO - The Capital Area Metropolitan Planning Organization is responsible for coordinating regional transportation and funding.

CapMetro - The Capital Metropolitan Transportation Authority is the public transit agency serving Austin and Central Texas.

CTRMA - The Central Texas Regional Mobility Authority is an independent government agency responsible for planning, financing, constructing, and operating toll roads in Travis and Williamson County.

CARTS - The Capital Area Rural Transportation System is the regional public transit agency providing services to rural areas across Central Texas.

INTRODUCTION

In early 2025, Travis County Commissioners Court formally committed to significantly reducing the number of deaths and serious injuries on roadways throughout Travis County, with the goal of eliminating them entirely by 2050. The Travis County Safety Action Plan identifies and evaluates road safety problem areas and proposes proven safety solutions that the County and its partners can implement.

The United States Department of Transportation (USDOT) Safe Streets and Roads for All Grant Program (SS4A) discretionary program provided a grant that helped fund the creation and development of this plan. The Bipartisan Infrastructure Law established the SS4A discretionary grant program in 2022. The program provides $1 billion annually in grants to support regional, local, and tribal initiatives to eliminate roadway fatalities and serious injuries.

Roadway safety planning through the SS4A program prioritizes safety for all users of the transportation network. In 2024, the program also emphasizes the prioritization of roadway safety needs and projects for underserved communities whose transportation needs have historically been overlooked.

The Travis County Safety Action Plan is consistent with the 2024 SS4A Safety Action Plan required components listed below.

- LEADERSHIP COMMITMENT AND GOAL SETTING
- PLANNING STRUCTURE
- SAFETY ANALYSIS
- ENGAGEMENT AND COLLABORATION
- EQUITY
- POLICY AND PROCESS CHANGES
- STRATEGY AND PROJECT SELECTIONS
- PROGRESS AND TRANSPARENCY



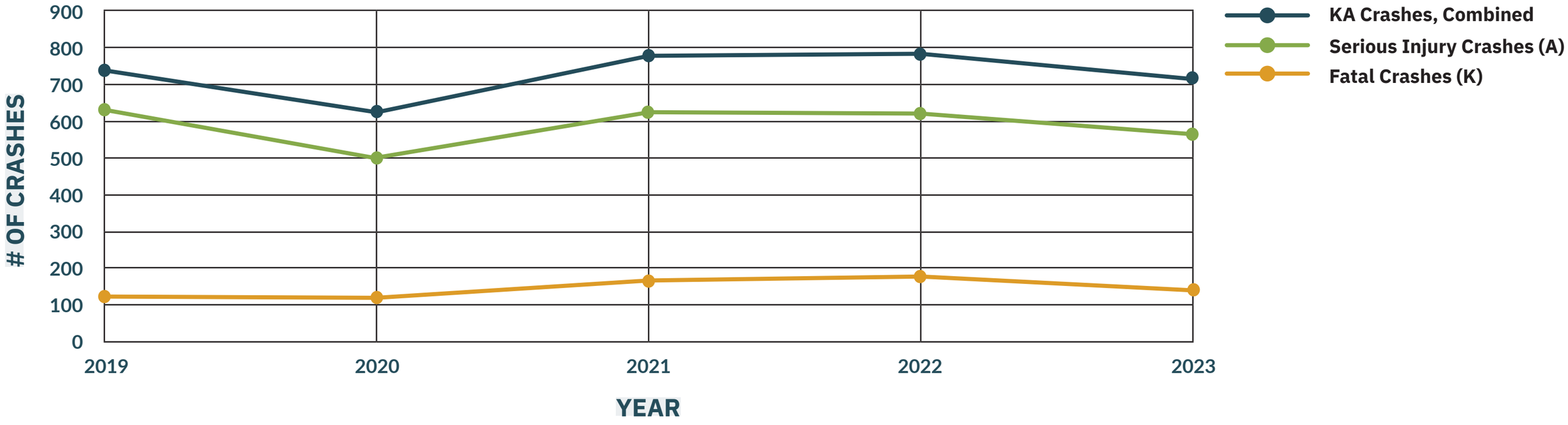
ROADWAY SAFETY IN TRAVIS COUNTY

About 1.34 million people live in Travis County, with many thousands more traveling through the County each day. The Travis County Safety Action Plan focuses on roadways in all parts of Travis County that are not within the City of Austin limits. The City of Austin has a city-wide Vision Zero road safety action plan and implementation program that is incorporated into the Travis County Safety Action Plan by reference. For more information visit the City of Austin Vision Zero webpage here. It is important to note that crash accounting methodology may vary from City of Austin methodology resulting in slight differences in crash counts shown.

From 2019 through 2023, 701 fatal crashes occurred in Travis County. In addition to those fatal crashes, another 2,974 crashes resulted in one or more serious injuries. Of these 3,675 fatal and serious injury crashes, about 69 percent of them occurred within the City of Austin. The remaining 31 percent occurred on roadways in unincorporated portions of Travis County or in one of its other municipal jurisdictions.

Area	Year	Total Number of No Injury Crashes (N/O)	Total Number of Non-Serious Injury Crashes (B, C)	Total Number of Serious Injury Crashes (A)	Total Number of Fatal Crashes (K)	Total Number of Crashes, Combined
Travis County Excluding City of Austin	2019	3,407	1,466	160	31	5,064
	2020	2,855	1,257	147	43	4,302
	2021	3,049	1,379	191	45	4,664
	2022	3,452	1,558	182	53	5,245
	2023	3,604	1,735	170	65	5,574
	Total	**16,367**	**7,395**	**850**	**237**	**24,849**
City of Austin	2019	7,694	6,526	466	87	14,773
	2020	5,596	4,733	350	84	10,763
	2021	5,608	5,228	429	100	11,365
	2022	5,792	5,369	440	109	11,710
	2023	5,583	5,041	389	84	11,097
	Total	**30,273**	**26,897**	**2,074**	**464**	**59,708**

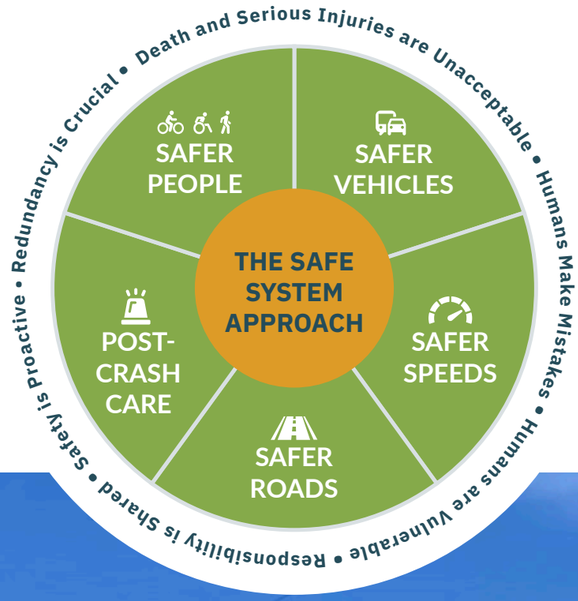
TRAVIS COUNTY KA CRASH TOTALS BY YEAR



PLAN DEVELOPMENT APPROACH

The Travis County Safety Action Plan was developed with the Safe System Approach in mind. As part of its National Roadway Safety Strategy released in January 2022, USDOT adopted the Safe System Approach as its guiding paradigm to address roadway safety challenges nationwide. This approach acknowledges both human mistakes and human vulnerability and is designed to protect all roadway users.

The Safe System Approach is built around six guiding principles that summarize the mentality that the Travis County Roadway Safety Action Plan has adopted. The Safe System Approach also has five core objectives that correspond to each element of the roadway system, and this plan's recommendations are directed toward one or more of these objectives.



Guiding Principles

DEATH AND SERIOUS INJURIES ARE UNACCEPTABLE.

The Safe System Approach prioritizes the elimination of crashes that result in death and serious injuries on roadways.

HUMANS MAKE MISTAKES.

People will inevitably make mistakes and decisions that can lead or contribute to crashes, but the transportation system can be designed and operated to accommodate certain types and levels of human mistakes, and avoid death and serious injuries when a crash occurs.

HUMANS ARE VULNERABLE.

People have physical limits for tolerating crash forces before death or serious injury occurs; therefore, it is critical to design and operate a transportation system that is human-centric and accommodates physical human vulnerabilities.

RESPONSIBILITY IS SHARED.

All stakeholders – including government at all levels, industry, nonprofit/advocacy, researchers, and the public – share responsibility in preventing fatalities and serious injuries on our roadways.

SAFETY IS PROACTIVE.

Proactive tools should be used to identify and address safety issues in the transportation system, rather than waiting for crashes to occur and reacting afterwards.

REDUNDANCY IS CRUCIAL.

Reducing risks requires that all parts of the transportation system be strengthened, so that if one part fails, the other parts still protect people.

The Plan includes an analysis of all Travis County crash data, excluding City of Austin, from 2019 through 2023. This data is used to establish both county-wide and municipality-level High Injury Networks (HINs) that identifies roadway locations with the greatest density of fatal and serious injury crashes. The analysis also establishes systemic focus areas based upon specific crash types and their occurrence throughout the County. In addition to the crash data analysis, the Plan includes a data-driven equity analysis that highlights the locations of underserved populations and the trips they take on roadways across Travis County.

Extensive public and partner agency engagement informed the development of the Travis County Safety Action Plan and its priorities. The Travis County Safety Task Force, comprised of more than 40 stakeholders, guided the Plan's development. The Project Team met with partner agency representatives in individual meetings and safety field reviews to identify needs and develop recommendations. Staff also gathered input from the public through both in-person events and an interactive project website where visitors contributed more than 2,000 survey responses and map-based comments.

The Travis County Safety Action Plan synthesizes this data analysis and engagement input into needs and opportunities for transportation safety improvements across the County. The Plan identifies potential implementation projects as well as potential policy changes both county-wide and for participating jurisdictions.

Objectives

SAFER PEOPLE.

Encourage safe, responsible behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed.

SAFER ROADS.

Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.

SAFER VEHICLES.

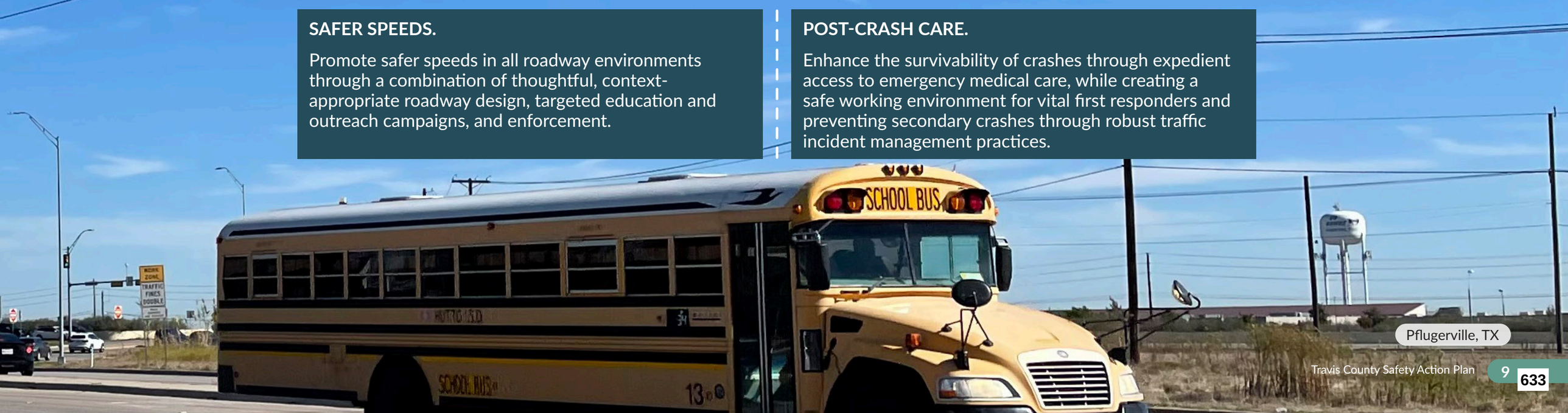
Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.

SAFER SPEEDS.

Promote safer speeds in all roadway environments through a combination of thoughtful, context-appropriate roadway design, targeted education and outreach campaigns, and enforcement.

POST-CRASH CARE.

Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.



Pflugerville, TX



Travis County commits to Reducing Roadway Fatalities and Serious Injuries by 50% by 2035 and by 100% by 2050.

Austin, TX

LEADERSHIP COMMITMENT AND GOAL SETTING

The Travis County Safety Action Plan outlines strategies to achieve an ambitious roadway safety commitment. On March 11, 2025, the Travis County Commissioners Court adopted a commitment to reduce and eventually eliminate roadway fatalities and serious injuries in Travis County.

This commitment is consistent with the Texas Department of Transportation (TxDOT) Road to Zero policy commitment for the State of Texas. The Travis County Safety Action Plan establishes an approach to achieving this safety commitment, guided by a roadway safety vision and six roadway safety goals that describe what Travis County and other partner jurisdictions and participating agencies intend to accomplish through implementing this Plan.



TRAVIS COUNTY'S ROADWAY SAFETY VISION

We commit to eliminating deaths and serious injuries on our roadways through a data driven, equitable, multi-modal, and community-based approach to safety.

Travis County Roadway Safety Goals

1

ENHANCE SAFETY FOR ALL ROAD USERS

Ensure the safety of drivers, passengers, and vulnerable users such as pedestrians, cyclists, disabled populations, transit riders, and students by accounting for systemic risk factors and applying effective countermeasures.

2

IMPLEMENT A DATA-DRIVEN APPROACH

Utilize quantitative and qualitative data to prioritize projects that will have the greatest impact on reducing fatal and serious injury crashes.

3

PROMOTE EQUITY IN SAFETY

Ensure that all safety projects consider equity, focusing on the needs of historically underserved users and providing comprehensive and multilingual outreach to engage all community members.

4

ENSURE THE PROTECTION OF TRAFFIC INCIDENT AND ROADWAY WORKERS

Ensure the safety of emergency services, law enforcement, and roadway workers by promoting public awareness and utilizing robust safety protocols.

5

PROVIDE TIMELY AND EFFICIENT IMPROVEMENTS

Implement quick and low-cost improvements such as demonstration projects to ensure prompt and cost-effective implementation, as well as larger improvements that allow for sustained and significant safety benefits.

6

IMPROVE QUALITY OF LIFE

Enhance the quality of life for all residents by improving health outcomes, ensuring peace of mind for road users, and creating a safer, more connected community through implementation of thoughtful and inclusive transportation safety plans.

SAFETY PLANNING STRUCTURE

The study area for this plan includes all of Travis County, focusing on the unincorporated areas of Travis County as well as nine partner jurisdictions within the County: Pflugerville, Jonestown, Rollingwood, San Leanna, Volente, Lago Vista, Lakeway, West Lake Hills, and Manor. The City of Austin's Vision Zero safety plan and ongoing safety planning efforts are included in the Travis County Safety Action Plan by reference. Once complete, the Travis County Safety Action Plan will be incorporated into the Capital Area Metropolitan Planning Organization's (CAMPO's) Regional Safety Action Plan, which has the similar goal of eliminating roadway fatalities and serious injuries across the CAMPO planning area. More information on the City of Austin Vision Zero program can be found here, while more information on CAMPO's Regional Safety Action Plan can be found here.

TRAVIS COUNTY SAFETY TASK FORCE

The planning structure for the development of the Travis County Safety Action Plan is the Travis County Safety Task Force. The Task Force includes representatives from the County and its member cities and villages, as well as key transportation partners such as TxDOT, CAMPO, the Central Texas Regional Mobility Authority (CTRMA), CapMetro, and Capital Area Rural Transportation System (CARTS). The table on the right includes the members of the Travis County Safety Task Force.

TRAVIS COUNTY SAFETY TASK FORCE

Name	Agency	Role
Charlie Watts	Travis County Transportation & Natural Resources	Planning Project Manager
Cathy Stephens	Travis County Transportation & Natural Resources	Senior Planner
Scheleen Walker	Travis County Transportation & Natural Resources	Long Range Planning Manager
Brian Burk	Travis County Public Works	Senior Engineer
David Greear	Travis County Public Works	Public Works Director
Eric Carter	Travis County Office of Emergency Management	Chief Emergency Management Coordinator
Blake Clampffer	Travis County Office of Emergency Management	Chief Deputy Emergency Management Coordinator
Thomas Szimanski	Travis County Sheriff's Office	West Command Captain
David Milewski	Travis County Sheriff's Office	West Special Operations Lieutenant
Donnie Norman	Travis County ESD 1 Fire Department	Fire Chief
Steven Alves	Del Valle ISD	Assistant Superintendent for Operations
Robert Vela	Del Valle ISD	Police Department Chief
Veronica Anguiano	Del Valle ISD	Administrative Assistant of Maintenance
Margaret Bohannon	Del Valle ISD	Executive Assistant of Construction & Planning, Maintenance, Transportation, Facilities
Tracie Hlavinka	City of Jonestown	City Administrator
Paul Taylor	City of Jonestown	Police Chief
Charlie Sullivan	City of Lakeway	Senior Planner
Andrew Wanees	City of Lago Vista	City Engineer
Kevin Sullivan	City of Lago Vista	Mayor
Taylor Whichard	City of Lago Vista	Public Works Director/Interim City Manager
Gary Boshears	City of Lago Vista	Police Chief
Lance Zeplin	City of Manor	Parks and Streets Superintendent
Scott Dunlop	City of Manor	Manor Development Services Assistant Director
Michael Patroski	City of Pflugerville	Senior Planner
Kristol Munoz	City of Rollingwood	Police Chief
Rebecca Howe	Village of San Leanna	Village Administrator
Molly Quirk	Village of San Leanna	Mayor
Danny Villereal	Village of San Leanna	Road Commissioner
Lacie Hale	Village of Volente	City Administrator
Trey Fletcher	City of West Lake Hills	City Administrator
Scott Gerdes	City of West Lake Hills	Police Chief
Jennifer Bills	City of West Lake Hills	Building and Development Service Director

> *...the planning structure guiding the Plan's development is the Travis County Safety Task Force.*

TRAVIS COUNTY SAFETY TASK FORCE (CONTINUED)

Name	Agency	Role
Joel Meyer	City of Austin	Austin Transportation Safety Officer
Mary Vo	City of Austin	Vision Zero Program Manager
William Lisska	CAMPO	Regional Planning Manager
Nicholas Samuel	CAMPO	Senior Regional Planner
Josh Peterman	CAMPO	Consultant Liaison
Christopher Metzbower	CapMetro	Field Safety Officer
Ed Collins	CARTS	Special projects Manager
Tina Schneider	CARTS	Assistant General Manager of Safety and Training
Michael Sexton	CTRMA	Director of Engineering
Brenda Guerra	TxDOT	Austin District Director of Transportation Operations
Amanda Martinez	TxDOT	Austin District Transportation Specialist
Cory Jucius	TxDOT	Austin District Transportation Engineer
Raju Thapa	TxDOT	Austin District Transportation Engineer
Daniel Fleishman	TxDOT	Travis North Area Office Engineer
Matthew Kelly	TxDOT	Travis North Area Office Transportation Engineer
William Semora	TxDOT	Travis South Area Office Engineer
Adam Ramirez	TxDOT	Travis South Area Office Transportation Engineer
Tanli Sun	TxDOT	Travis South Area Office Transportation Engineer
Kyle Russell	TxDOT	Georgetown Area Office Engineer
Masoud Moradian	TxDOT	Georgetown Area Transportation Engineer

CONNECTIONS TO OTHER SAFETY PLANNING EFFORTS

The Travis County Safety Action Plan includes recommendations and guidance from several other concurrent safety planning efforts from the City of Austin, CAMPO, and the TxDOT Austin District.

CITY OF AUSTIN VISION ZERO: Vision Zero is Austin's goal to reduce people hurt or killed by crashes to zero with street improvements, policy changes, enforcement and education. Austin's City Council adopted Vision Zero as a part of the Imagine Austin Comprehensive Plan in October 2015. Austin's Vision Zero program is a member of the Vision Zero Network, which is a growing coalition of cities across the United States committed to eliminating all traffic fatalities. The program is guided by safety policies and actions in the Austin Strategic Mobility Plan, which was first adopted in 2019 and later updated in 2023.

CAMPO REGIONAL SAFETY ACTION PLAN: CAMPO received an SS4A Action Plan grant in 2022, the same year that Travis County did. CAMPO is using its grant to develop a Regional Safety Action Plan (RSAP) for the full six-county CAMPO service region, as well as county-specific plans for the other five counties in the CAMPO region: Bastrop, Burnet, Caldwell, Hays, and Williamson counties. Each of these plans will be integrated into the overarching RSAP, promoting a coordinated approach to safety across the region. Members of the CAMPO RSAP team participated in the Travis County Safety Task Force to facilitate coordination between plan development efforts. Once the Travis County Safety Action Plan is complete, it will be incorporated into the CAMPO RSAP.

TXDOT AUSTIN DISTRICT ANNUAL SAFETY PLAN: The TxDOT Austin District includes Travis County, the rest of the CAMPO region, and five other rural counties in Central Texas. Like other TxDOT districts, the TxDOT Austin District prepares an Annual Safety Plan. The Plan details the processes and procedures that the District follows as part of project delivery to support TxDOT's Road to Zero, a goal of reducing the number of deaths on Texas roadways in half by 2035 and to zero by 2050. The Plan also details proposed safety projects and safety project elements. Finally, the Plan includes the safety efforts being performed by local agency partners, TxDOT Traffic Safety Division behavioral specialists, and local non-profits. Since TxDOT operates roadways throughout Travis County, many of the recommendations and project listings included in the Austin District Annual Safety Plan are also incorporated into the Travis County Safety Action Plan.



Jonestown, TX

SAFETY ANALYSIS

The analysis methodology used in this Safety Action Plan includes two main aspects. The first aspect involves establishing a High Injury Network (HIN) of high crash locations on roadways and intersections. This network will be the primary focus for implementing targeted safety countermeasures, projects, and strategies. The second aspect involves reviewing county-wide trends for different types of crashes and their causes. This analysis aims to identify systemic safety issues that can be effectively addressed through broad policy and process changes. Additionally, these trend analysis results can guide the identification and widespread implementation of low-cost countermeasures across the entire roadway network in Travis County.

The full safety analysis, included in the Travis County Hot Spot Report, is included in Appendix A.

Travis County used a method for quantifying road safety need that is based on state and federal data and is consistent with previous local best practices. The safety analysis is based upon crash data from the Texas Crash Records Information System (CRIS) maintained by TxDOT for all traffic crashes reported in Travis County from 2019 to 2023. This dataset contains information for all public roadways, including county, city, and state roadways. The Travis County Safety Action Plan analysis uses both the CRIS dataset for the entire County and a subset of the County CRIS dataset that excludes the City of Austin. Analyses of these datasets provide a comprehensive assessment of county-wide roadway safety conditions.

These datasets also include crash information such as location, severity, contributing factors, date and time, and manner of collision, among other information. Since these datasets are reliant on law enforcement reporting, they may not include all roadway crashes and may underrepresent certain crash types that often do not receive a law enforcement response (such as run-off-the-road crashes where the driver is able to drive away from the scene).

The full crash dataset is also examined as a whole to assess systemic safety by looking at geography and chosen safety analysis focus areas. The analysis evaluates the frequency of crashes relating to each of the focus areas included in the Texas Strategic Highway Safety Plan (SHSP) as well as additional focus areas identified by Travis County staff to identify any patterns of interest. The project team conducts the same analysis for all crash severities together, as well as exclusively focusing on KA crashes. From this initial analysis,

1

Fatal (K) and Serious Injury (A) crashes, with a comprehensive cost of $6,745,000 per crash

2

Minor injury (B) and Non-serious Injury (C) crashes, with a comprehensive cost of $170,500 per crash

3

No Injury/Property Damage Only (N/O) crashes, with a comprehensive cost of $17,000 per crash

the project team identifies prioritized focus areas and segments for Travis County and Travis County excluding the City of Austin.

Using a methodology that aligns with the City of Austin's approach in establishing a HIN in 2019, the analysis groups crashes into categories for the purposes of assigning comprehensive crash costs to each crash location based upon the severity of each crash. The National Safety Council (NSC) and the U.S. Department of Transportation's Federal Highway Administration (FHWA) provide nationally recognized guidance regarding comprehensive crash cost calculation. To measure the total societal cost of a traffic crash, we combine its associated economic cost and quality of life cost. The resulting total figure represents the comprehensive crash cost. Economic costs resulting from traffic crashes can be quantified in financial terms (e.g., medical bills, lost wages). Quality of life costs resulting from traffic crashes (e.g., physical pain, emotional suffering) are inherently immeasurable. However, national guidance exists to help local transportation agencies quantify the estimated quality of life impacts of a crash in financial terms.





TRAVIS COUNTY HIGH INJURY NETWORK

One of the key aspects of the safety analysis is the establishment of an HIN that identifies locations with the greatest need for future safety investment. This analysis consists of two parts: identifying High Injury Intersections and identifying High Injury Segments. Together, the results of the intersection and segmentation analysis create the Travis County HIN.

The analysis includes all roads within the County (with the exception of those in the City of Austin since the City is conducting its own safety analysis) so that all stakeholders can utilize the results. County-wide (excluding the City of Austin) HIN results are provided in this section.

The map and table on pages 16 and 17 show the Travis County (excluding City of Austin) Intersection HIN. The map and table on pages 18 and 19 show the Travis County (excluding City of Austin) Segment HIN.

The comprehensive cost of all intersections in this analysis (with at least 2 crashes during the five-year period) is $2,608,972,000. The 47 intersections included in the County-wide (excluding City of Austin) Intersection HIN accounted for $1,359,146,000 of that total, or just over 50%. The comprehensive cost of crashes along all segments within Travis County (excluding City of Austin) over the five-year period is $5,411,689,500. The County Segment HIN includes 140 miles of roadway segments that made up $3,359,433,500 (60%) of this total.

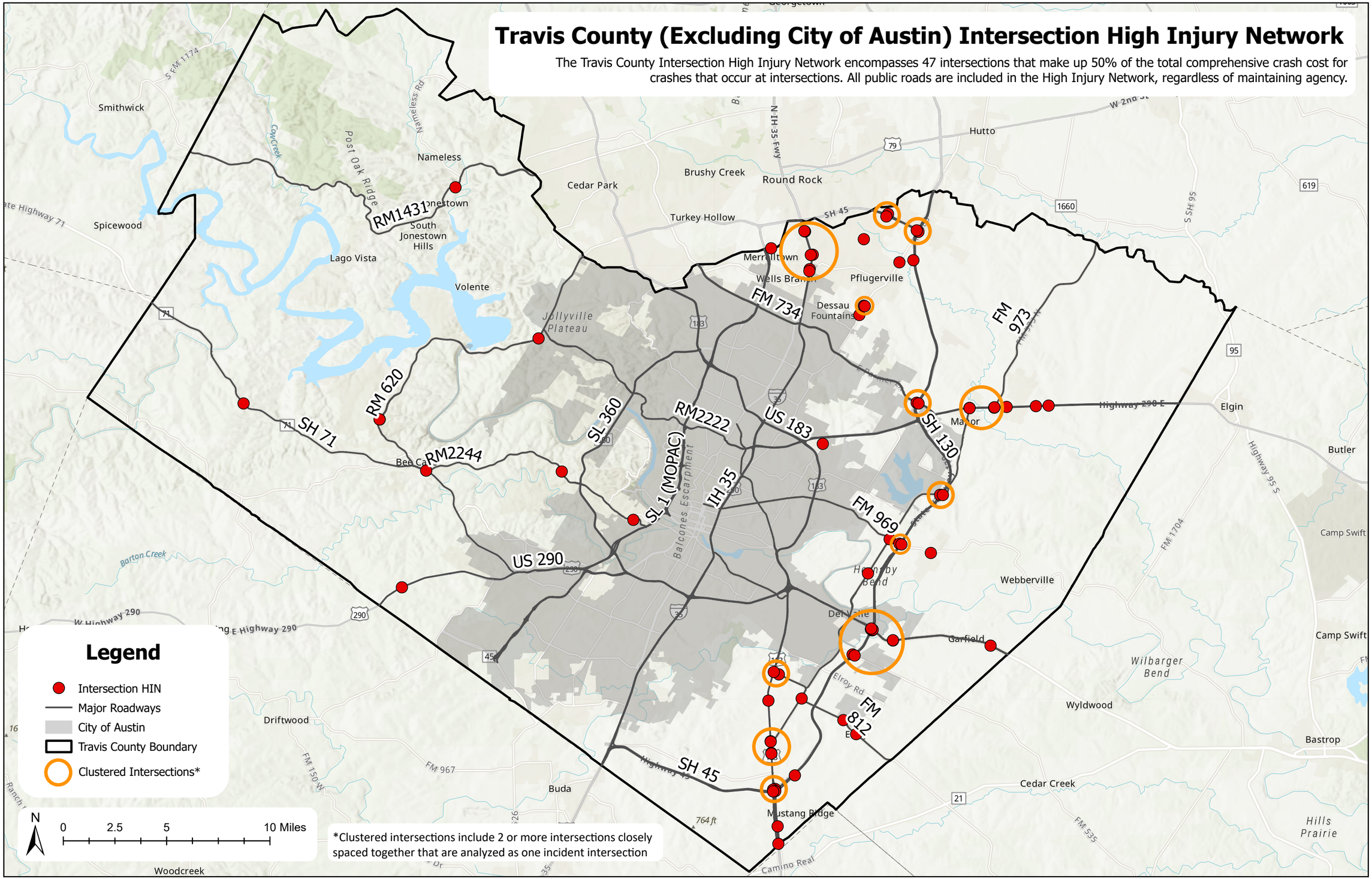
Additionally, specific HINs were developed for each partner jurisdiction. These separate HINs identify up to five roadway segments and five intersections within each jurisdictional boundary with the highest comprehensive crash costs.

Partner Jurisdiction HINs are available in Appendix D.

Precinct	Intersections included in the Intersection HIN	
1	FM 685/Kelly Ln (Wilke Ln) SH 130/E Pflugerville Pkwy W Pflugerville Pkwy/N Heatherwilde Blvd SH 130/FM 973/Gilbert Rd US 290 E/FM 973 US 290 E/Old Kimbro Rd FM 973/Platt Ln IH 35/Cheddar Loop SH 45 N/Heatherwilde Blvd SH 130/FM 969	US 290 E/Greenbury Dr US 290 E/Paseo De Presidente Dr US 290 E/Lexington St SH 130/E Parmer Ln Dessau Rd/Tudor House Rd Dessau Rd/St Patricks Pl IH 35/Greenlawn Blvd Springdale Rd/Tuscany Way IH 35/Grand Avenue Pkwy FM 685/E Pfenning Ln FM 969/N FM 973
2	FM 1325 (Burnet Rd)/Shoreline Dr	RM 620 N/FM 2222 SH 71/Bee Caves Rd (RM 2244)
3	RM 1431/Main St Bee Caves Rd (RM 2244)/ Barton Creek Blvd Bee Caves Rd (RM 2244)/Montebello Rd	W SH 71/Bob Wire Rd US 290 W/Circle Dr (Spring Valley Rd) RM 620 S/Lohmans Crossing Rd (Ameno Dr)
4	FM 812/Creedmoor Rd SH 130/Laws Rd SH 130/Maha Loop Rd US 183 S/Old Lockhart Rd US 183 S/FM 973/Shively Ln US 183 S/Mckenzie Dr FM 812/Piland Triangle FM 812/FM 973	SH 71/Buck Ln (Wolf Ln) SH 71/Ross Rd FM 812/Elroy Rd SH 130/Pearce Ln US 183 S/Maha Loop Rd/Maha Cir US 183 S/FM 812 SH 45/SH 130/US 183 S FM 969/Hunters Bend Rd (Delta Post Dr) SH 130/SH 71

Travis County (Excluding City of Austin) Intersection High Injury Network

The Travis County Intersection High Injury Network encompasses 47 intersections that make up 50% of the total comprehensive crash cost for crashes that occur at intersections. All public roads are included in the High Injury Network, regardless of maintaining agency.



Legend

- Intersection HIN
- Major Roadways
- City of Austin
- Travis County Boundary
- Clustered Intersections*

N

0 2.5 5 10 Miles

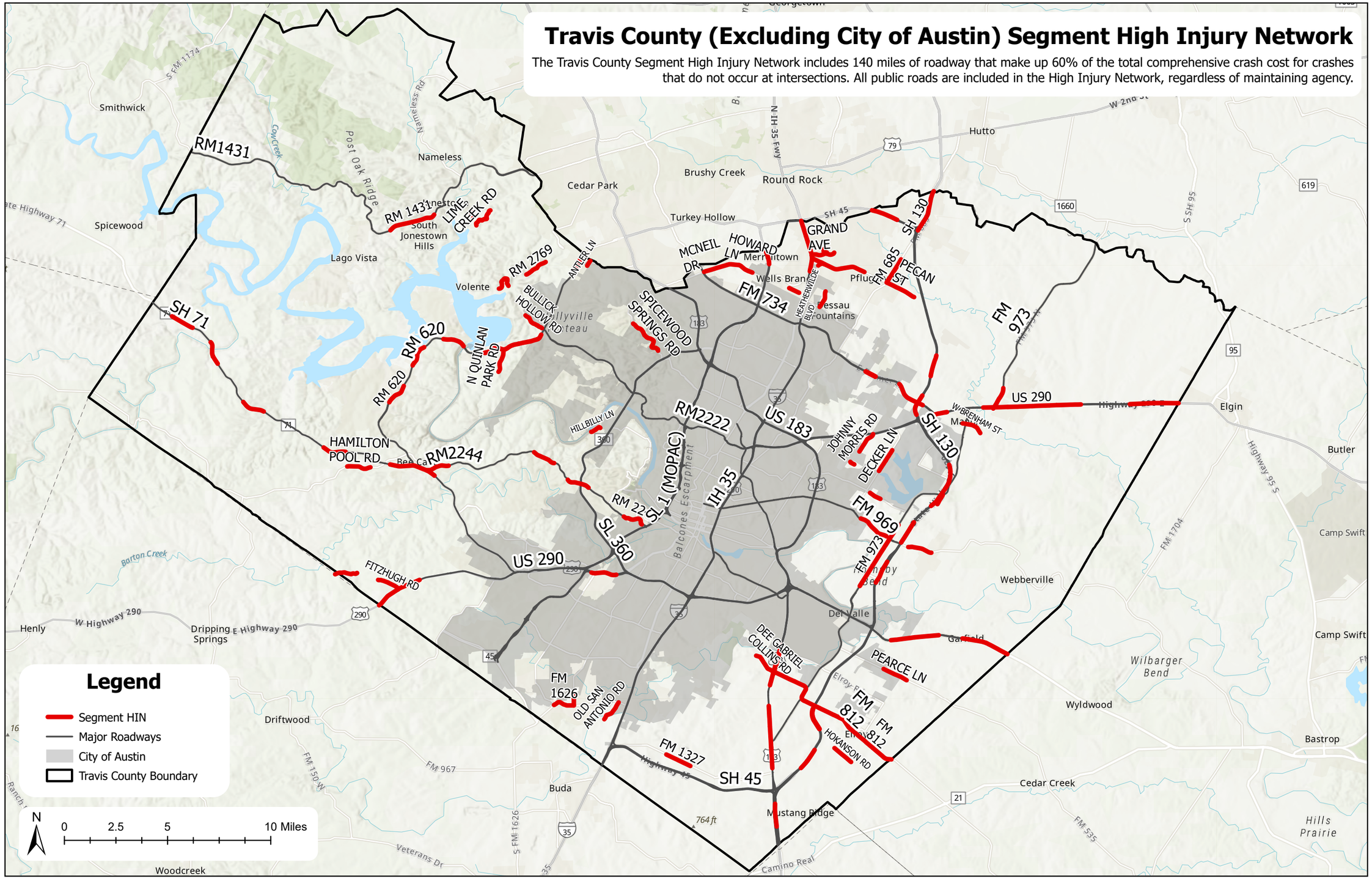
*Clustered intersections include 2 or more intersections closely spaced together that are analyzed as one incident intersection



Precinct	Roadways Included in The Segment HIN	
1	Johnny Morris Rd Breezy Hill Dr Decker Lake Rd Pecan St FM 685 SH 45 Blake Manor Rd SH 130 US 290 Parmer Ln	FM 973 Gilbert Rd FM 969 Grand Ave Pkwy Three Points Rd Heatherwilde Blvd Bench Mark Dr Viki Lynn Pl IH 35 Decker Ln
2	Loop 1 (Mopac) Parmer Ln Howard Ln Mcneil Dr Pecan St	Hillbilly Ln Bullick Hollow Rd RM 620 SH 71 Quilan Park Rd
3	US 290 RM 620 FM 2769 Spicewood Springs Rd Lime Creek Rd Antler Ln Trails End Rd	FM 1626 SH 71 RM 1431 RM 2244/Bee Caves Rd Fitzhugh Rd Hamilton Pool Rd Old San Antonio Rd
4	SH 71 SH 130 US 183 FM 812 Dee Gabriel Collins US 290	Manchaca Rd FM 969 FM 1327 Pearce Ln Hokanson Rd

Travis County (Excluding City of Austin) Segment High Injury Network

The Travis County Segment High Injury Network includes 140 miles of roadway that make up 60% of the total comprehensive crash cost for crashes that do not occur at intersections. All public roads are included in the High Injury Network, regardless of maintaining agency.





Del Valle, TX

644

SAFETY FOCUS AREA ANALYSIS

The systemic safety analysis reviews the crash data by looking at geography and chosen safety analysis focus areas. Crash data from Travis County is analyzed as a whole, and a subset of crash data excluding crashes in the City of Austin is analyzed separately. In both cases, the frequency of crashes relating to each of the focus areas included in the Texas Strategic Highway Safety Plan as well as additional focus areas identified by Travis County staff is analyzed to identify any patterns of interest. The analysis is conducted for all crash severities as well as exclusively focusing on fatal and serious injury crashes.

The Texas Strategic Highway Safety Plan (SHSP) is a document that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads in Texas. The following focus areas are identified in the Texas SHSP:

Travis County staff expressed interest in additional focus areas beyond the ones outlined in the Texas SHSP. The additional focus areas are meant to embody specific issues and interests in the County. The following focus areas identified by Travis County were also analyzed as part of the systemic safety analysis:

TEXAS SHSP SAFETY FOCUS AREAS

- ROADWAY DEPARTURES
- OLDER DRIVERS
- IMPAIRED DRIVING
- INTERSECTION RELATED
- PEDALCYCLIST
- OCCUPANT PROTECTION
- SPEED RELATED
- PEDESTRIAN
- DISTRACTED DRIVING
- YOUNGER DRIVERS

ADDITIONAL FOCUS AREAS STUDIED

- ACTIVE SCHOOL ZONES
- WORK ZONES
- LOW AMBIENT LIGHTING
- TIME OF DAY/DAY OF WEEK

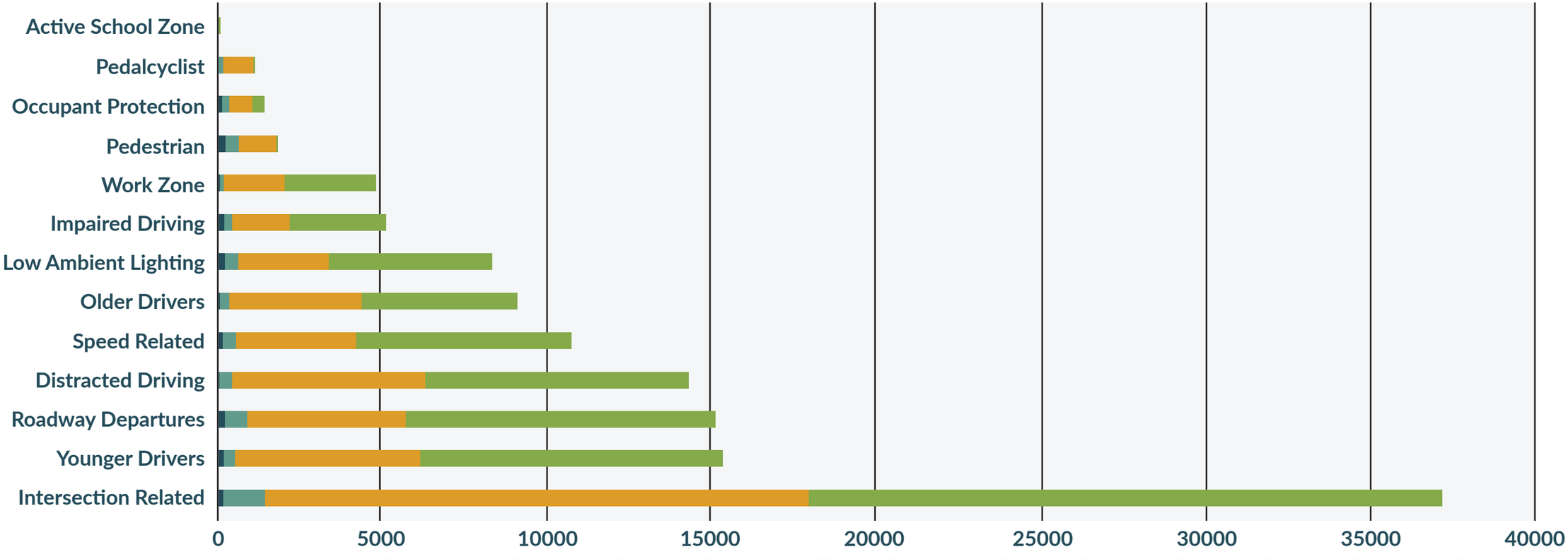
COUNTY-WIDE CRASH TREND ANALYSIS

A summary of the crash data from 2019 to 2023 for crashes in Travis County including the City of Austin for each of the systemic safety focus areas is shown below. The figure shows the breakdown of crashes in Travis County by focus area and severity.

Crash data from 2019 through 2023 was filtered to analyze crashes related to each focus area. Of the focus areas, crashes at intersections, crashes involving younger drivers, roadway departure crashes, and distracted driving crashes are the most common crash types over the past five years in Travis County. The three crash types that had the highest rate of increase in number of crashes from 2019 to 2023 were crashes involving distracted driving, lack of occupant protection, and speed related crashes. Crashes involving lack of occupant protection have been increasing since 2020.

Distracted driving crashes have increased each year from 2020 to 2023, with a 12.1% increase from 2019 to 2023. Work zone crashes have decreased by 31.8% from 2019 to 2023, the most significant decrease by percentage.

TRAVIS COUNTY CRASH TOTALS BY FOCUS AREA AND SEVERITY



	Intersections Related	Younger Drivers	Roadway Departures	Distracted Driving	Speed Related	Older Drivers	Low Ambient Lighting	Impaired Driving	Work Zone	Pedestrian	Occupant Protection	Pedalcyclist	Active School Zone
Fatal Crashes (K)	166	81	199	36	132	58	192	186	52	232	117	18	0
Serious Injury Crashes (A)	1257	433	678	380	410	283	411	232	121	384	226	142	2
Non Serious Injury Crashes (B, C)	16458	5612	4796	5851	3639	4019	2740	1746	1852	1151	689	902	26
No Injury Crashes (N/O)	19227	91373	9390	7985	6516	4698	4964	2916	2753	34	356	34	30
Total Crashes	37108	15299	15063	14252	10697	9058	8307	5080	4778	1801	1388	1096	58

Fatal Crashes (K) | Serious Injury Crashes (A) | Non Serious Injury Crashes (B, C) | No Injury Crashes (O/N)

When narrowing down the analysis to only KA crashes in Travis County, there are several notable differences compared to the analysis that includes all crash severities.

1. **34.2% of pedestrian crashes in Travis County are KA crashes, causing pedestrian crashes to move from the 10th highest number of crashes overall to the 3rd highest when looking at KA only.**

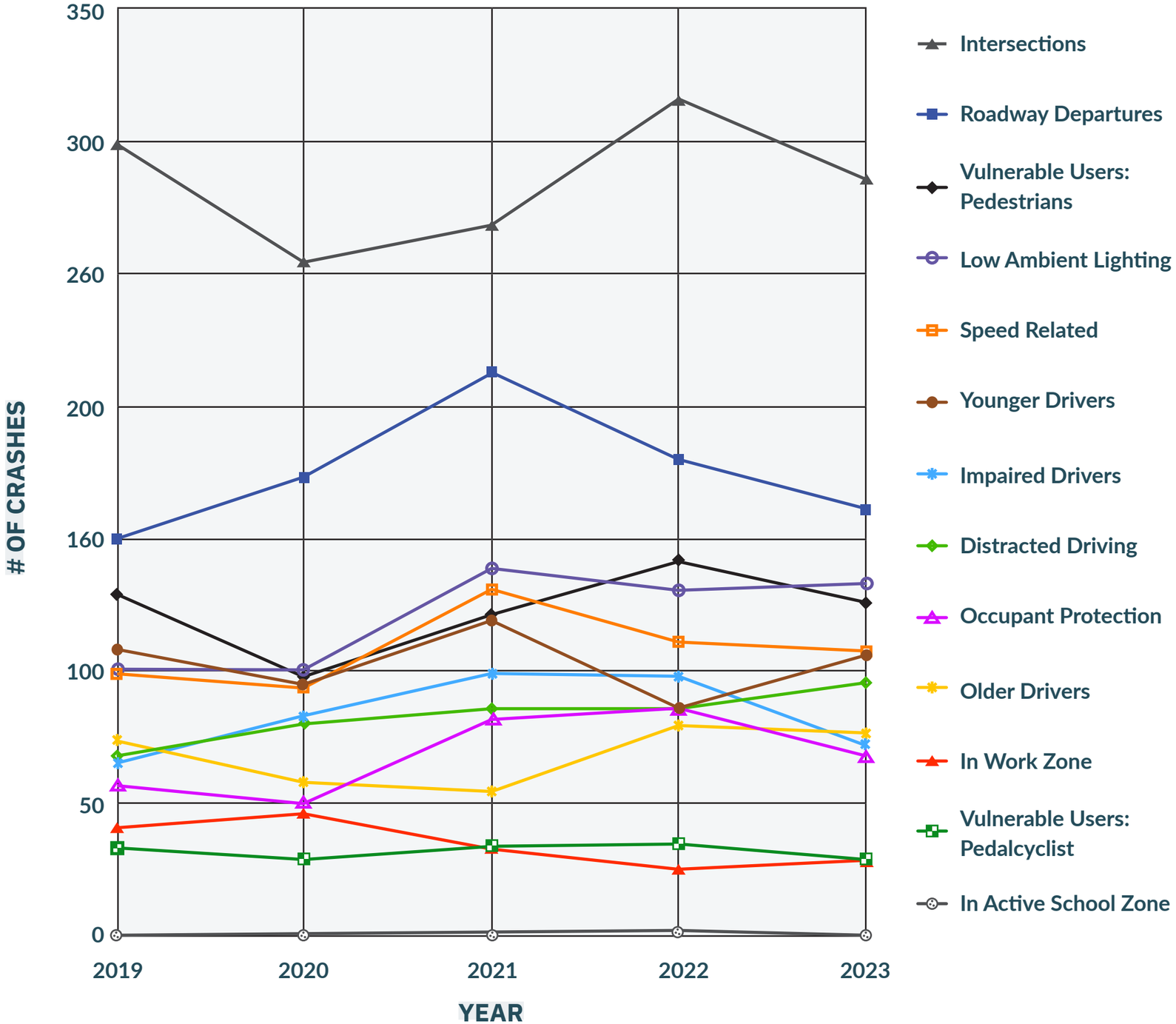
2. **Low Ambient Lighting crashes moved from 6th highest to 4th highest when looking at KA only.**

3. **Only 3.7% of older driver crashes are KA crashes, causing older driver crashes to drop from 5th to 9th highest when focusing only on KA crashes.**

4. **Only 3.4% of younger driver crashes are KA crashes, causing younger driver crashes to drop from 2nd to 5th highest when focusing only on KA crashes.**

Isolating the fatal and serious injury crashes within the dataset reveals more about which crash types and contributing factors have the highest incidence of severe outcomes. Of the focus areas, crashes at intersections, roadway departure, and crashes involving pedestrians are the most common KA crash types over the past five years in Travis County. Low ambient lighting, occupant protection, and distracted driving were the three crash types that had the highest rate of increase in number of KA crashes from 2019 to 2023.

TRAVIS COUNTY FOCUS AREA KA CRASH TOTALS BY YEAR



COUNTY-WIDE CRASH TREND EXCLUDING AUSTIN

As a comparison to county-wide KA crash trends, an analysis of the KA crash data over the last five years for crashes in Travis County excluding the City of Austin for each of the focus areas was also conducted. In this analysis, the trendline of crashes from 2019 to 2023 increased in every focus area except roadway departures and crashes involving pedalcyclists.

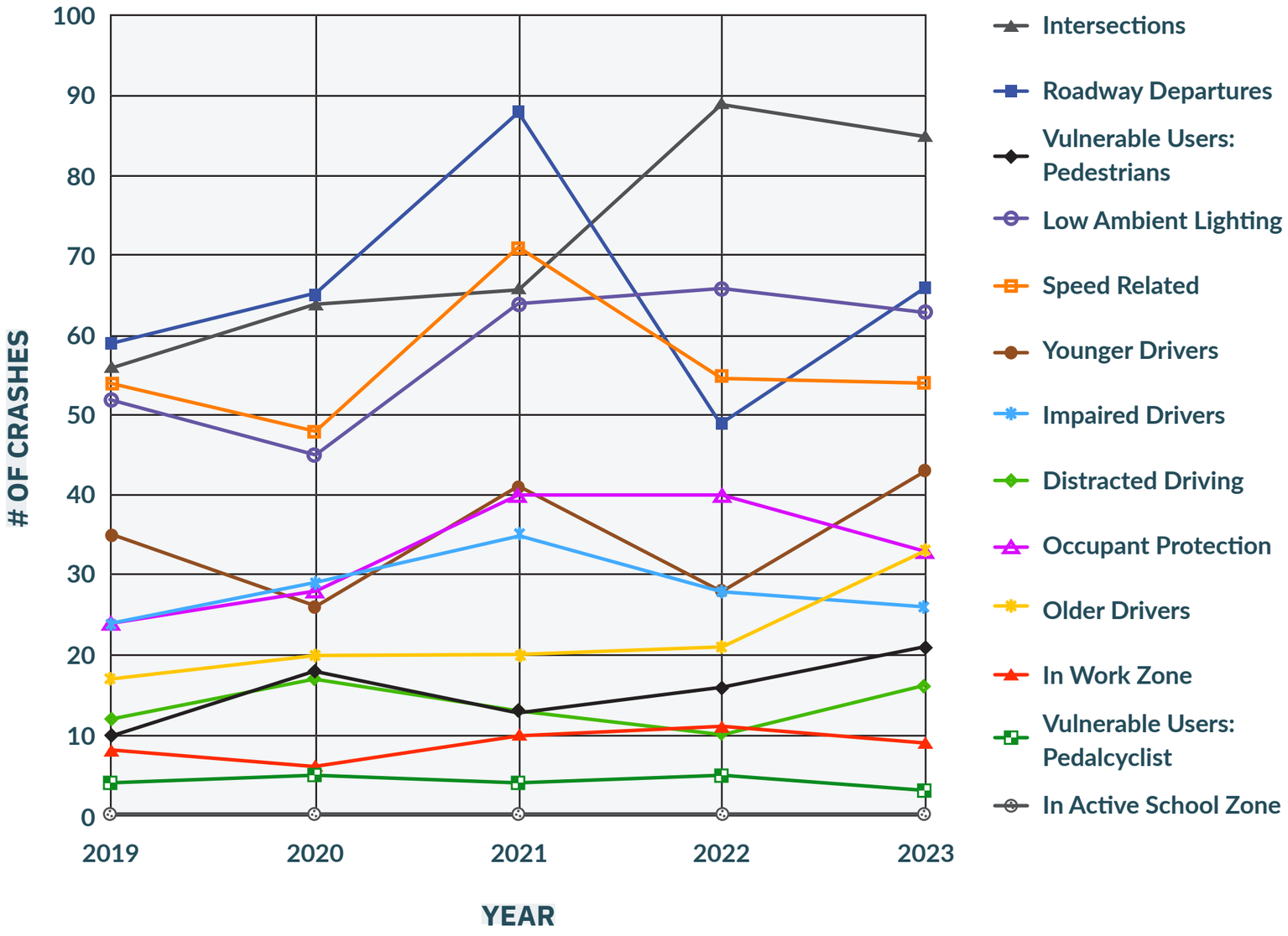
Of the focus areas, intersection related, roadway departures, and low ambient lighting crashes are the most common KA crash types over the past five years in Travis County excluding the City of Austin. Intersection related, low ambient lighting, and older drivers had the top three highest rates of increase in number of KA crashes from 2019 to 2023 in that area. There were no reported crashes in active school zones in Travis County when excluding the City of Austin from 2019 to 2023.

When narrowing down the analysis to only KA crashes in Travis County excluding the City of Austin, there are several notable differences compared to the analysis of all KA crashes in all of Travis County:

1. **Younger driver KA crashes show a declining trendline in all Travis County but an increasing trendline when excluding the City of Austin.**

2. **Occupant protection is 8th highest in terms of number of KA crashes in all Travis County, but this ranking moves to 6th highest when excluding the City of Austin.**

TRAVIS COUNTY EXCLUDING COA FOCUS AREA KA CRASH TOTALS BY YEAR



Based upon this systemic analysis, several focus areas should be prioritized for consideration of systemic safety countermeasures. Prioritized focus areas were determined by considering areas with the highest number of fatal and serious injury crashes, the highest trendline rate of increase of crashes from 2019 to 2023, and the highest percent of the likelihood for a fatal or serious injury to occur in crashes of that particular focus area. The table to the right outlines the prioritized focus areas for the area of Travis County excluding the City of Austin.

Prioritized Focus Area		Reason for Prioritization
	**Low Ambient Lighting**	• This focus area had the 3rd highest total number of KA crashes with 290 KA crashes. • This focus area had the 2nd highest trendline rate of increase with an average increase of 4 crashes per year. • This focus area experienced the highest number of fatal crashes.
	**Occupant Protection**	• This focus area had the 6th highest total number of KA crashes with 165 crashes. • This focus area had the 4th highest trendline rate of increase with an average increase of 3 crashes per year. • 33.3% of all occupant protection crashes from 2019 to 2023 in Travis County Excluding City of Austin are KA crashes.
	**Pedestrian**	• This focus area has more than doubled in number of crashes from 2019 to 2023. • 48.8% of all pedestrian crashes from 2019 to 2023 in Travis County Excluding City of Austin are KA crashes. • This focus area had an average increase of 2 crashes per year.

Prioritized Focus Area (All Travis County)		Reason for Prioritization
	**Intersection Related**	• This focus area experienced the highest total number of crashes, surpassing the next highest focus area by more than twice the amount. • This focus area has shown a county-wide increase in the number of KA crashes from 2019 to 2023.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Safety Action
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ENGAGEMENT AND COLLABORATION

Effective public engagement is a cornerstone of the SS4A program. Engaging with the community ensures that the voices of those who live and work in Travis County and other stakeholders are heard and considered in the decision-making process. This collaborative approach not only fosters trust and transparency but also helps to identify and address the unique safety needs and concerns of different communities.

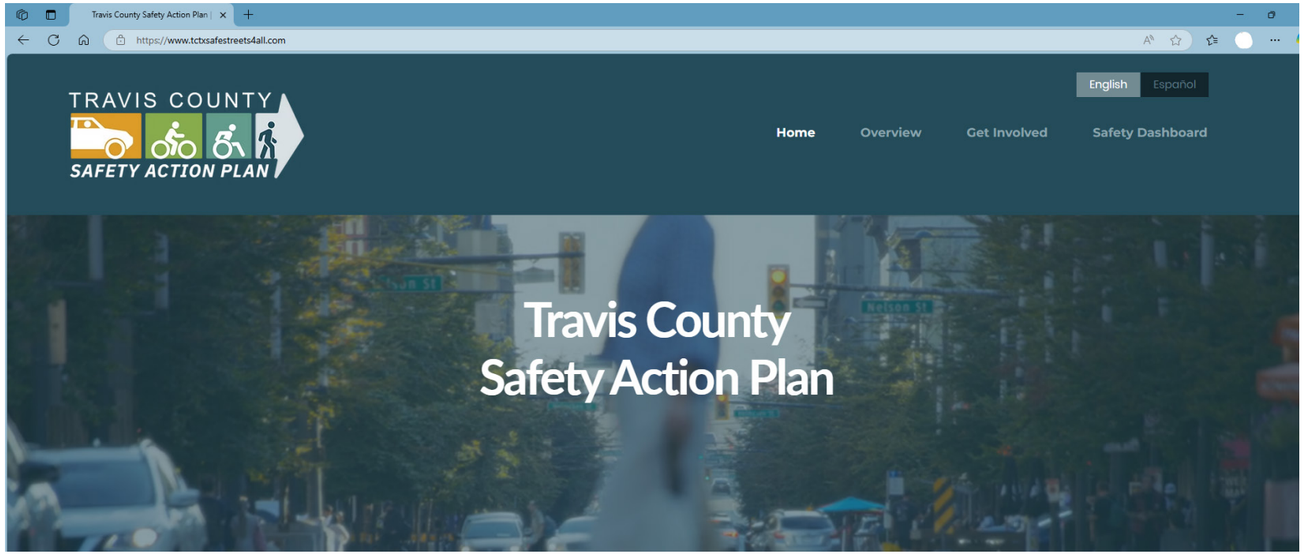
This section outlines the methods used to engage the public and the themes heard throughout the development of the Travis County SS4A Safety Action Plan. From pop-up booths and workshops to surveys and digital platforms, the project team's goal was to create inclusive and accessible opportunities for all community members to participate. By leveraging in-person and online engagement techniques, the project team was able to gather more comprehensive insights with the goal of creating safer, more equitable streets for everyone.

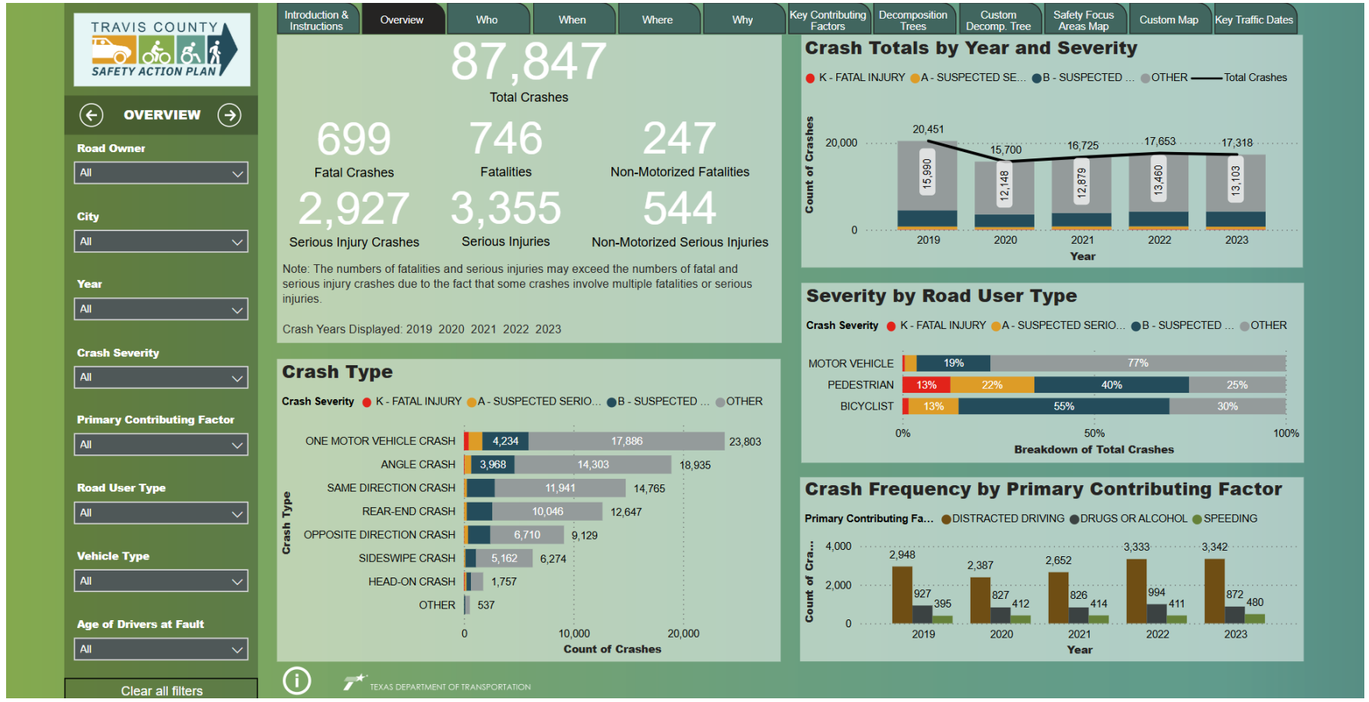
EVENT	LOCATION	DATE
Manor Night Out	Manor	October 25th, 2024
Lake Travis Public Safety Day	Lakeway	October 26th, 2024
West Lake Public Safety Day	West Lake Hills	October 27th, 2024
Del Valle Turkey Trot	Del Valle	November 9th, 2024
Lake Travis Brews and Balloons	Lago Vista	November 9th, 2024

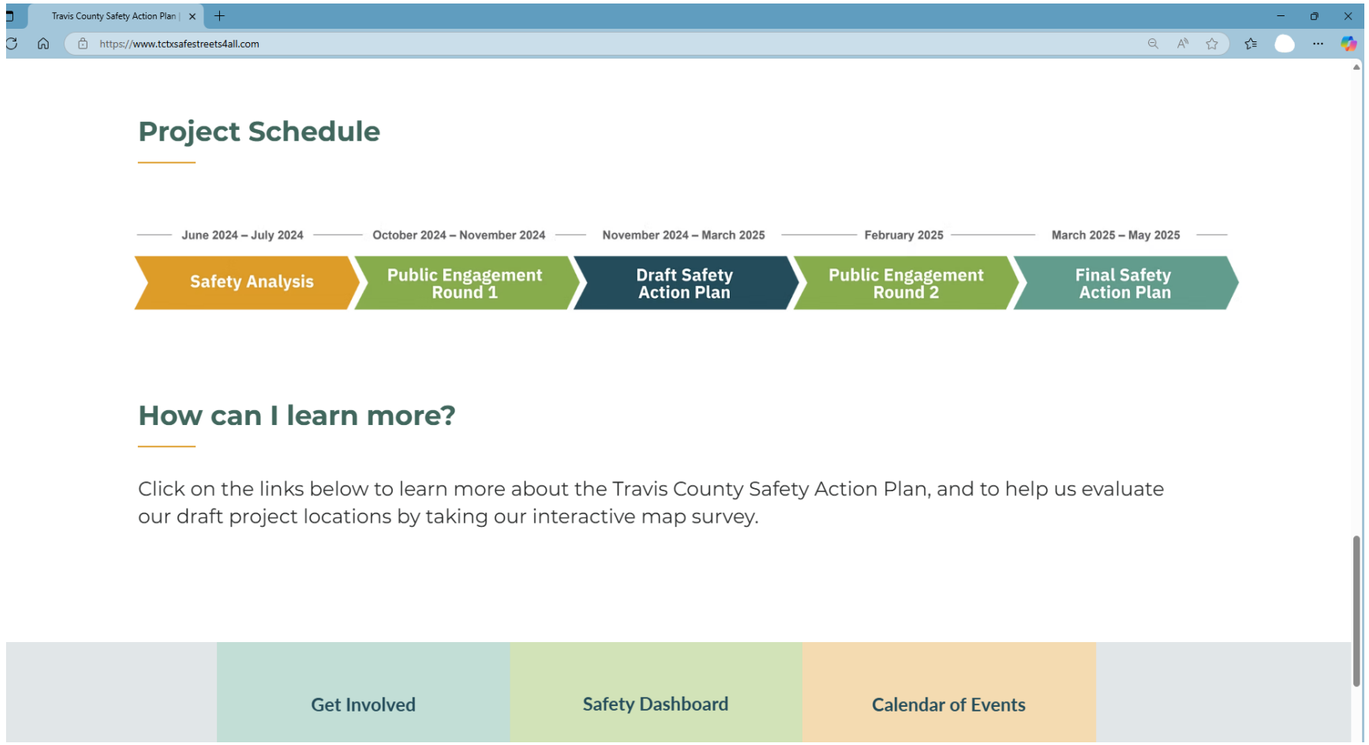
PUBLIC ENGAGEMENT ACTIVITIES

To facilitate transparent communication and foster community involvement, a comprehensive project website available in English and Spanish was developed: tctxsafestreets4all.com. The website, as well as direct links to surveys to gather feedback on safety needs and projects, were shared using social media, in-person events, and other channels by Travis County and its partner agencies. This online platform served as a hub for all project-related information, including project background information and schedule, opportunities for public feedback, and a safety data dashboard. The safety data dashboard allows users to view and analyze key safety outcomes in Travis County and included crash data from 2019 through 2023.

Public engagement was split into two phases, Phase 1 extended from September-November 2024 and focused on gathering the safety concerns of Travis County road users. Phase 1 included five in-person pop-up events. These events included a booth with project information, opportunities to give feedback, and materials directing attendees to the project website. Phase 2 extended from February-March 2025 and focused on gauging support for proposed safety project locations and details. ***The full Public Engagement Summary for this plan is included in Appendix B.***







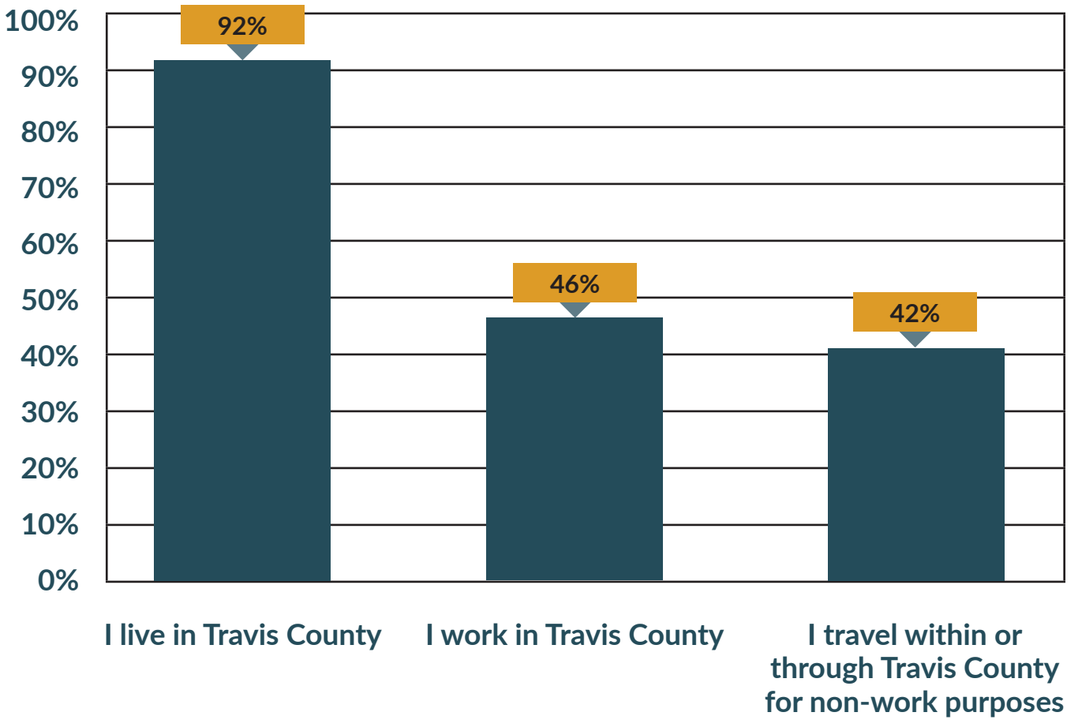
Phase 1 Public Engagement Themes

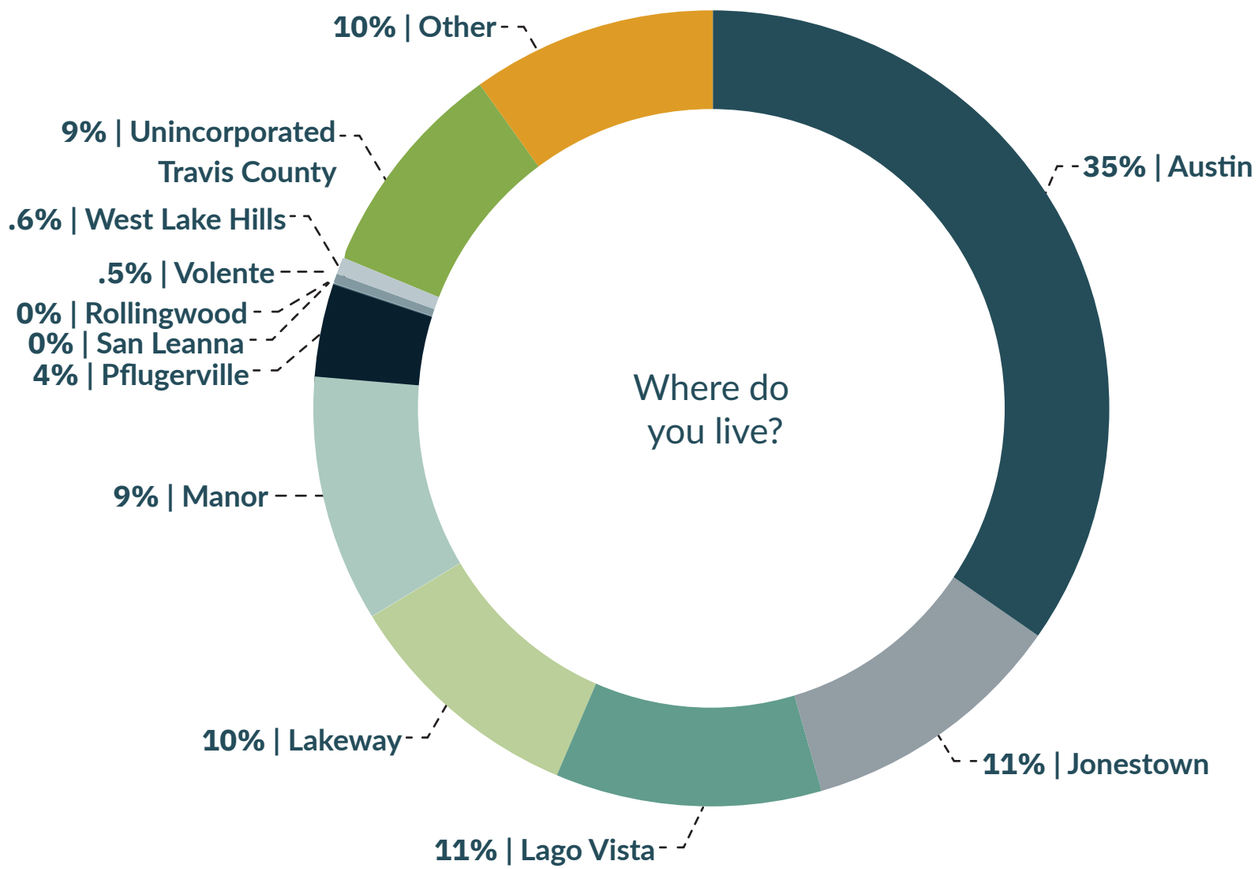
Phase 1 of public engagement began in September 2024 and ended in November. For this phase, respondents completed an online survey and pinned comments on an interactive map to share concerns over safety in Travis County and share preferred solutions.

The survey collected 1,177 responses. The survey indicated that a significant majority of respondents (92%) live in Travis County, with 46% working there and 42% traveling within or through the County for non-work purposes. Safety concerns were prominent, with over 43% of personal car users feeling unsafe or very unsafe on Travis County roads. For non-motorized transportation (primarily pedestrians, cyclists, and wheelchair users), 30% felt somewhat safe, but over 55% felt unsafe or very unsafe. When respondents were asked to list their top five roadway safety concerns, 83% cited speeding and aggressive driving, 55% cited road rage and reckless driving or walking, and 49% cited drunk or impaired driving and distracted driving. Other notable issues were road maintenance (47%), inadequate traffic law enforcement (43%), and narrow or hazardous roads and intersections (43%).

The interactive map allowed users to place points on a map indicating where they felt unsafe driving, walking, or biking, where they felt safe driving, walking, or biking, and ideas for how to improve specific locations. The interactive map received 1,284 comments across the County with some of the most common comments being about speeding and dangerous driving, pedestrian and cyclist safety, and road conditions.
Phase 1 response data is included in Appendix B.

Which of the following statement(s) describes you in Travis County? Please select all that apply.

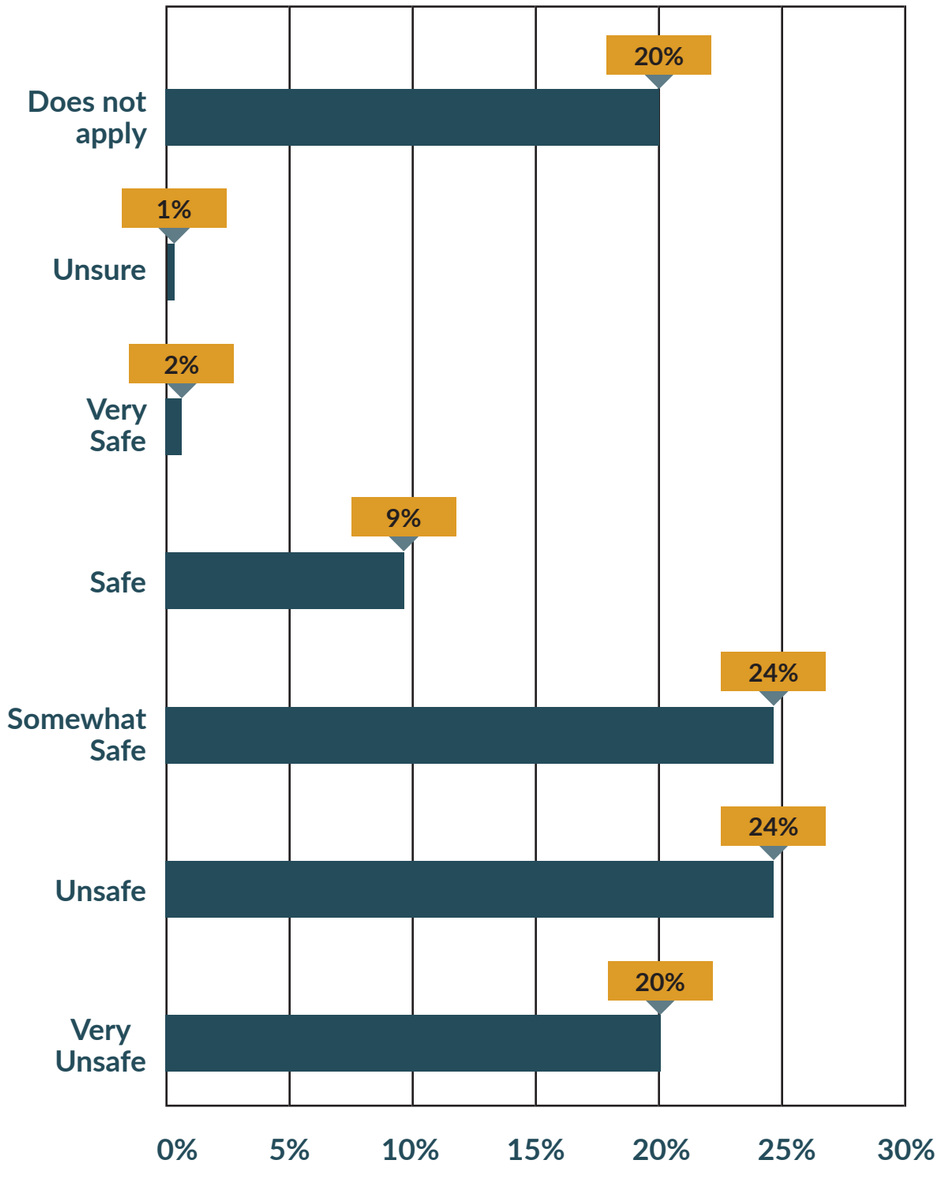




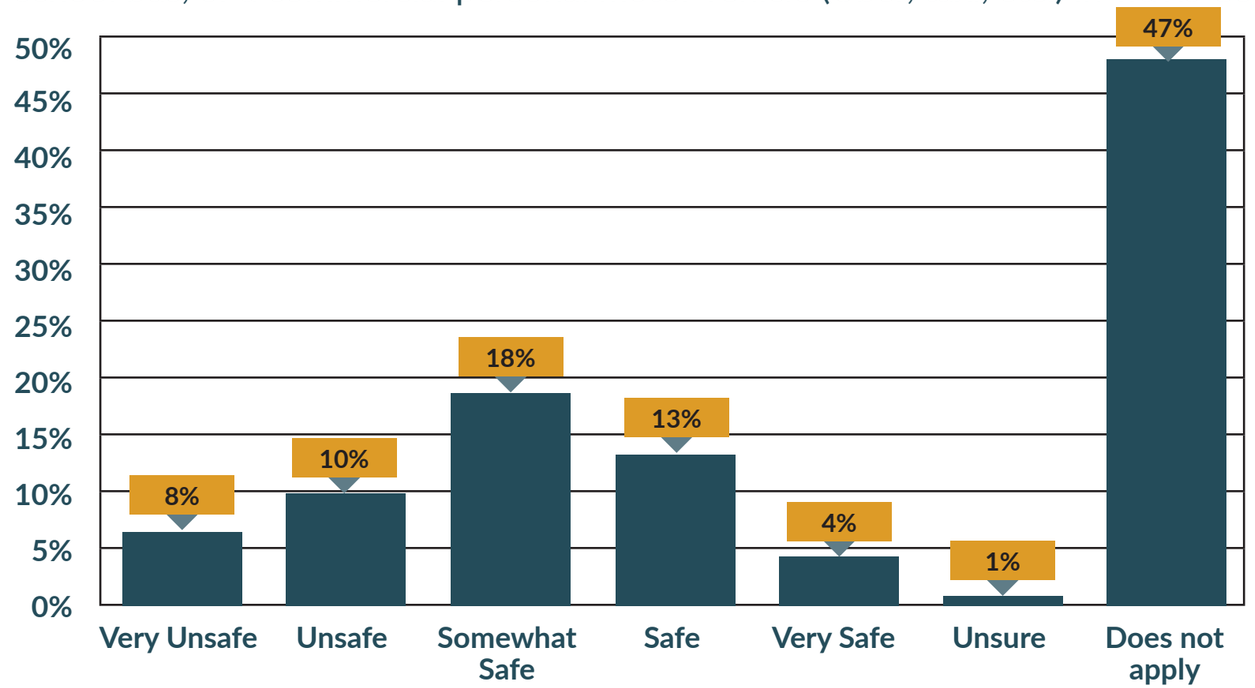


Jonestown, TX

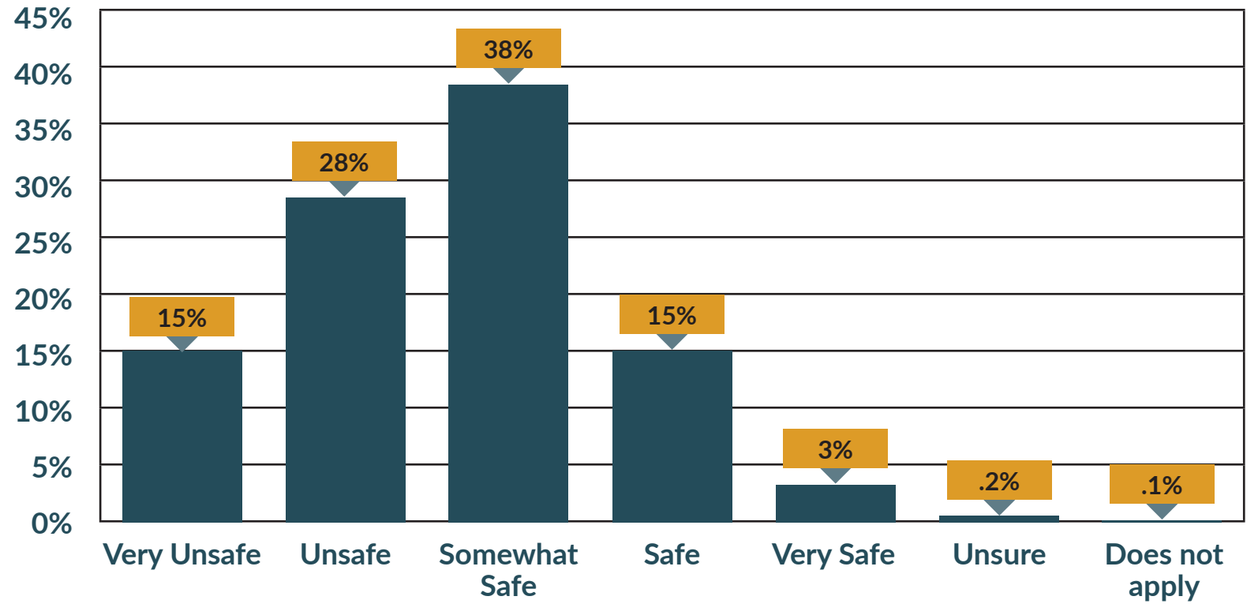
In general, how safe do you feel walking, biking, using a wheelchair or other non-motorized travel modes in Travis County?



In general, how safe do you feel when being a passenger in a public transit bus or train, school bus, or a commercial personal motor vehicle (Uber, taxi, etc.) in Travis County?



In general, how safe do you feel when driving or being a passenger in a personal motor vehicle in Travis County?



Considering your experiences, please identify your top five transportation safety concerns in Travis County from the following list.

1. **SPEEDING AND AGGRESSIVE DRIVING**
2. **ROAD RAGE AND RECKLESS DRIVING OR WALKING**
3. **DRUNK OR IMPAIRED DRIVING & DISTRACTED BEHAVIOR**
4. **ROAD MAINTENANCE**
5. **INADEQUATE TRAFFIC LAW ENFORCEMENT**

Please identify your top five solutions to address your concerns.

1. **WIDEN ROADS AND INSTALL MEDIANS**
2. **REDESIGNING DANGEROUS CURVES AND ADDING TURNING LANES**
3. **IMPROVE ROAD MAINTENANCE AND DRAINAGE**
4. **ENHANCE ROAD SIGNAGE, MARKINGS, AND LIGHTING**

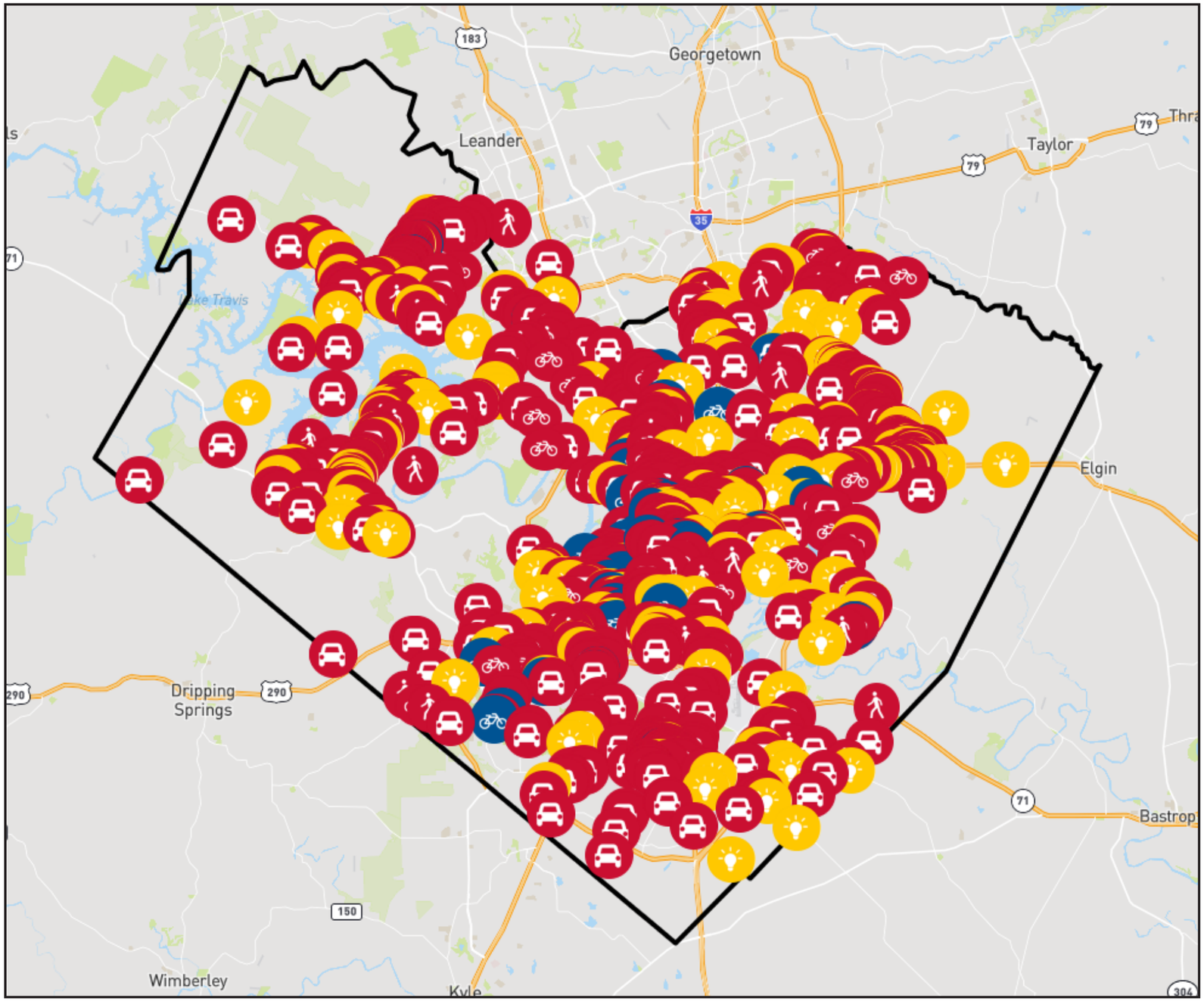
TIED FOR 5TH:

- **ENHANCE EMERGENCY RESPONSE AND TRAFFIC ENFORCEMENT**
- **BUILD PROTECTED SIDEWALKS, BIKE LANES, AND SHARED USE PATHS AND INCREASE UNIVERSAL ACCESSIBILITY**



Locations Most Noted in the Interactive Map

- RM 1431
- BRODIE LN
- SPRINGDALE RD
- CAMERON RD
- TOWER RD
- GEORGE BUSH ST
- GEORGE WASHINGTON ST
- DUVAL RD
- JOLLYVILLE RD
- FM 2222
- RM 620
- SH 71
- LIME CREEK RD





Community Engagement

Phase 2 Public Engagement Themes

Phase 2 of public engagement began in February 2025 and ended in March and focused on gathering feedback from the public on 59 proposed project locations.

An interactive map survey was distributed that allowed users to view project locations and a list of potential improvements for each location, as well as vote on which projects they supported and opposed.

The interactive map survey collected ***218 responses*** and additionally gathered feedback on support or opposition to the types of improvements proposed, other safety locations to be considered, and factors to be used in project scoring.

THE GREATEST NUMBER OF PHASE 2 SURVEY RESPONDENTS LIVED IN

- ***THE CITY OF AUSTIN*** ***28%***

THE NEXT MOST COMMON AREAS OF RESIDENCE BEING

- ***DEL VALLE INDEPENDENT SCHOOL DISTRICT (ISD)*** ***22%***
- ***OTHER UNINCORPORATED TRAVIS COUNTY*** ***20%***

SURVEY RESPONDENTS GENERALLY SUPPORTED THE PROPOSED PROJECT LOCATIONS WITH A TOTAL OF:

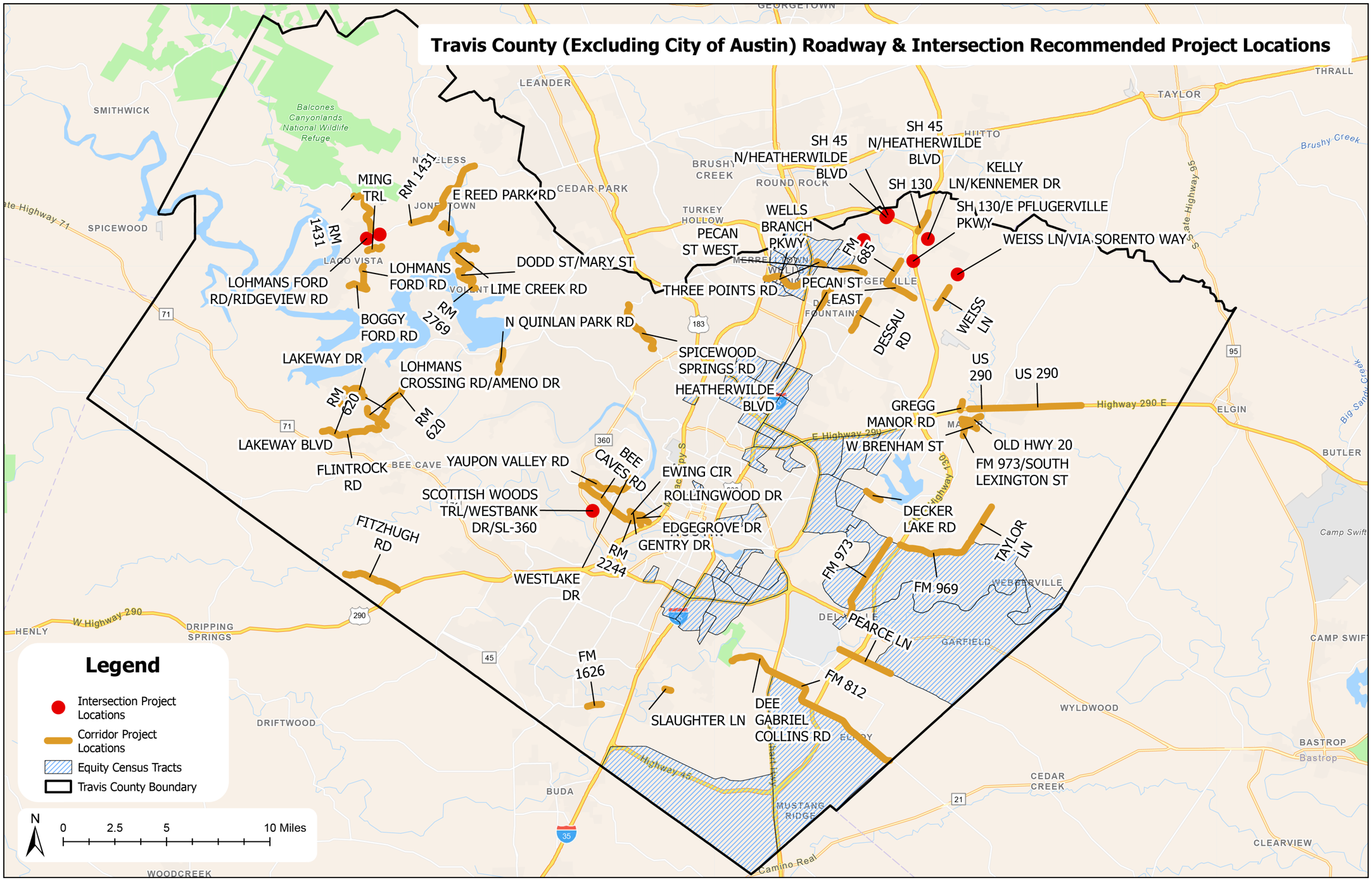
710 VOTES FOR SUPPORT 78%

ACROSS ALL PROPOSED PROJECT LOCATIONS:

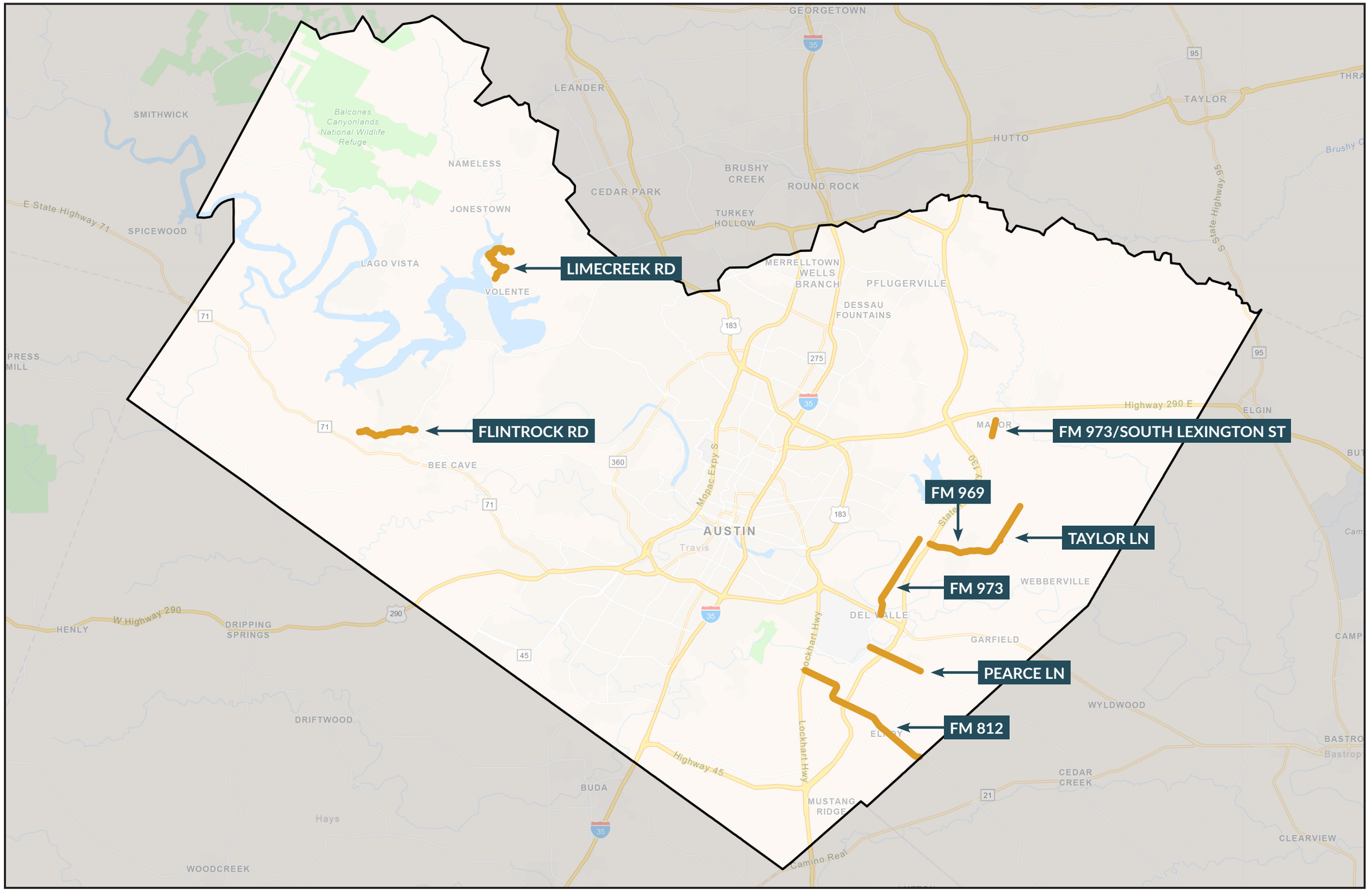
195 VOTES FOR OPPOSITION 22%

PROPOSED PROJECT LOCATIONS IN DEL VALLE ISD IN PARTICULAR RECEIVED SIGNIFICANT SUPPORT, WITH EVERY DEL VALLE ISD PROJECT LOCATION RECEIVING AT LEAST 85% SUPPORT. OTHER PROPOSED PROJECT LOCATIONS WITH HIGH LEVELS OF SUPPORT INCLUDED LIME CREEK RD IN VOLENTE, FM 973/LEXINGTON ST IN MANOR, AND FLINTROCK RD IN LAKEWAY.

CORRIDOR & INTERSECTION RECOMMENDED PROJECT LOCATIONS



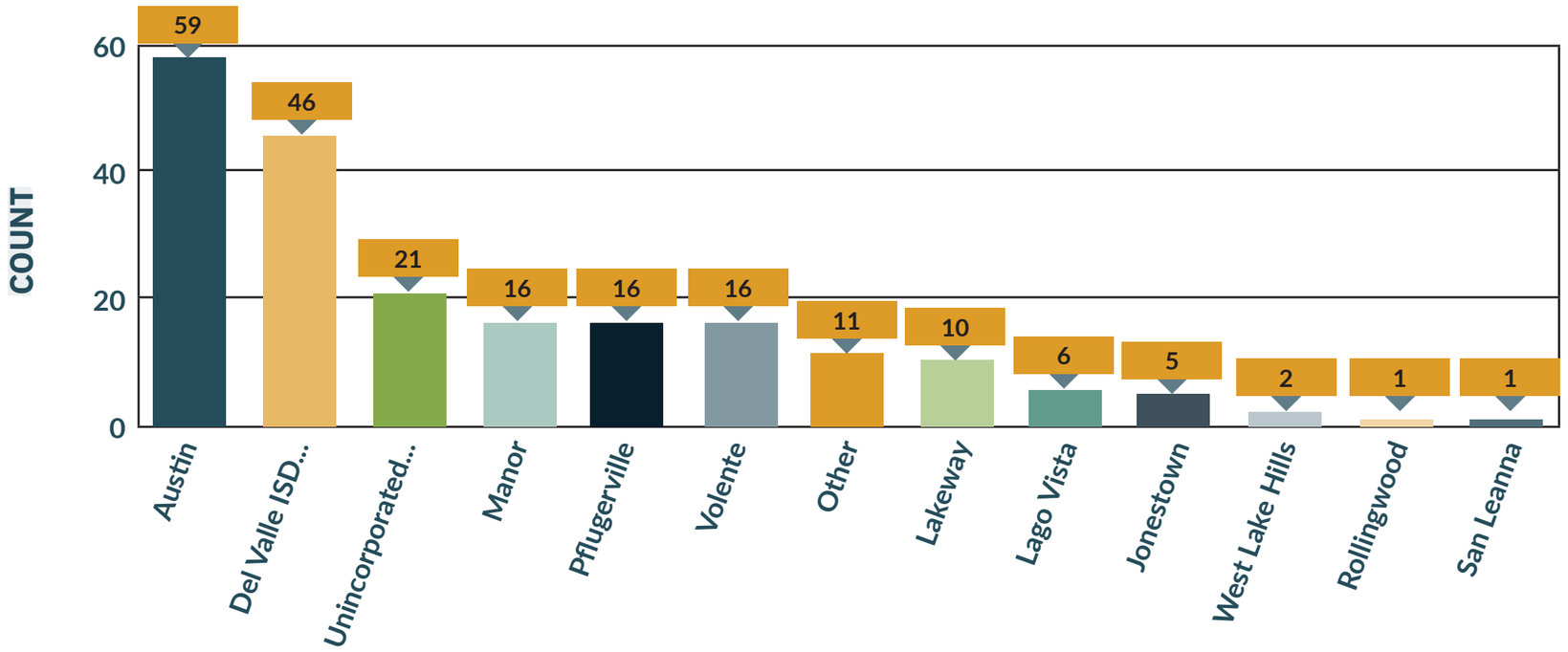
NOTABLE PROJECTS WITH HIGH PUBLIC SUPPORT



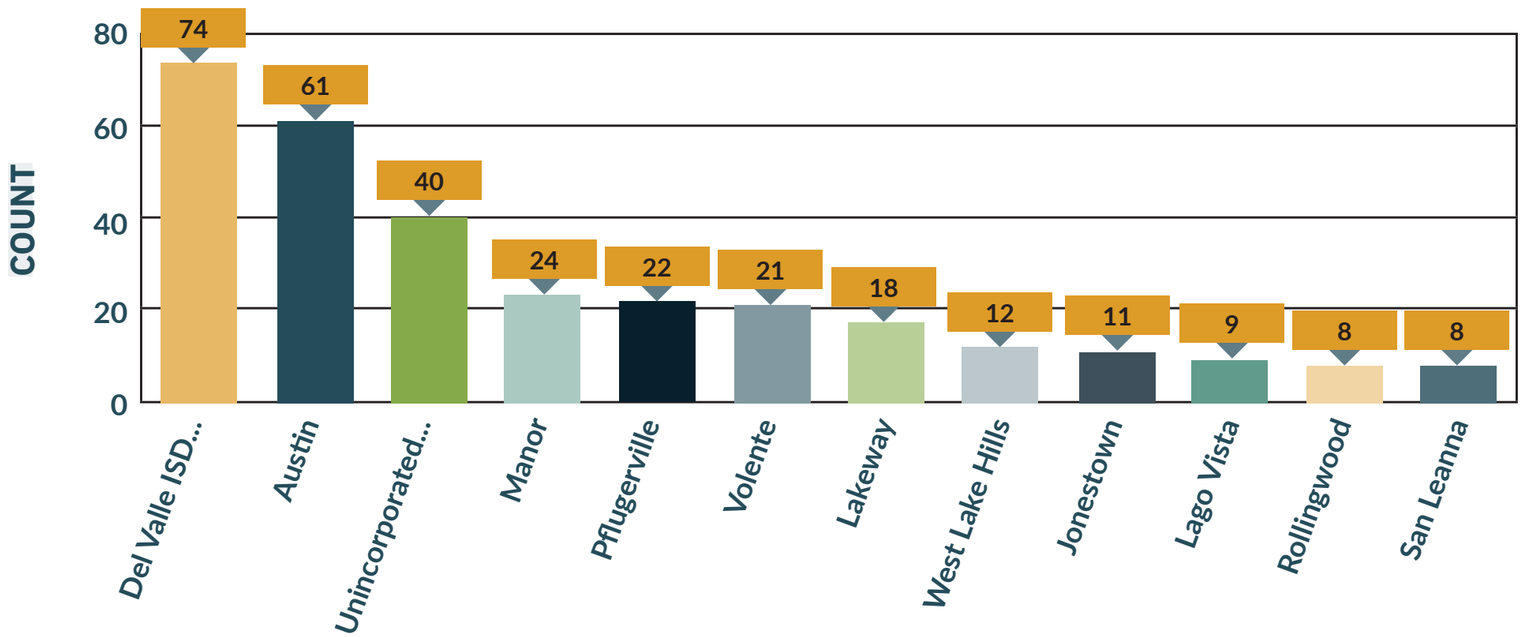


Pflugerville, TX

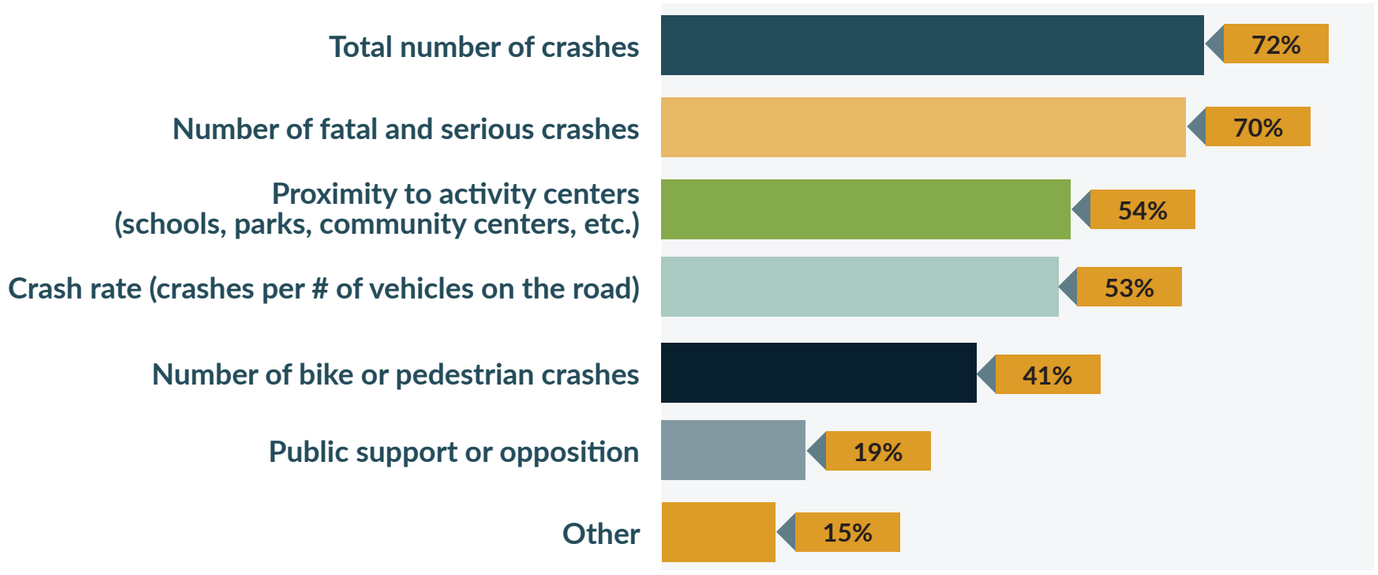
SURVEY #2 - WHERE DO YOU LIVE?



WHERE WOULD YOU LIKE TO PROVIDE FEEDBACK ON THE DRAFT PROJECT LOCATIONS?



WHICH FACTORS DO YOU FEEL ARE MOST IMPORTANT WHEN EVALUATING THESE SAFETY PROJECT LOCATIONS?





Pflugerville, TX

PARTNER COLLABORATION

Input from partners was essential in developing the Travis County Safety Action Plan. In addition to serving on the Travis County Safety Task Force, partners provided input through three sets of individual agency meetings over the course of the Plan development.

To see a full list of all partner meetings, see the table below.

The first set of partner meetings focused on gathering individualized input regarding existing roadway safety activities, needs, and future project and policy ideas within each partner's jurisdiction. Partners were also able to gather more information about the Plan development process as part of these meetings. All partner jurisdictions and other participating agencies provided input during the first set of partner meetings, which were conducted in September and October 2024 . Regional partner agencies included TxDOT, CTRMA, CARTS, CapMetro, Travis County Sheriff's Office, and Travis County Emergency Management.

The second set of partner meetings were road safety field reviews. The primary goal of these field reviews were to identify potential road safety issues in partnership with partner jurisdiction staff and suggest improvements to enhance safety for all road users, including pedestrians, cyclists, and motorists. Invitations to each field review were sent out to partner jurisdiction staff, Travis County Sheriff's Office, and TxDOT (for applicable field review locations that were on-system). All 10 road safety field reviews were conducted in November and December 2024.

The third set of partner meetings focused on gathering feedback from partner jurisdiction staff regarding draft policies, processes, and projects included in each partner jurisdiction plan within the Travis County Safety Action Plan. Only partner jurisdictions participated in the third set of partner agency meetings, which were conducted in January and February 2025.

In addition to partner meetings, coordination meetings were held with City of Austin and CAMPO staff to support concurrent safety action plan efforts across the three agencies. These coordination meetings occurred in September 2024.
Safety field review notes are included in Appendix C.

PARTNER AGENCY	DATE	DISCUSSION TOPIC
CITY OF JONESTOWN	September 18th, 2024	Project background and initial priorities
	December 5th, 2024	Field Review
	January 30th, 2025	Draft Project Locations Review
CITY OF LAGO VISTA	September 23rd, 2024	Project background and initial priorities
	December 3rd, 2024	Field Review
	January 27th, 2025	Draft Project Locations Review
CITY OF LAKEWAY	September 26th, 2024	Project background and initial priorities
	November 21st, 2024	Field Review
	January 28th, 2025	Draft Project Locations Review
CITY OF MANOR	October 3rd, 2024	Project background and initial priorities
	November 19th, 2024	Field Review
	January 27th, 2025	Draft Project Locations Review
CITY OF PFLUGERVILLE	October 24th, 2024	Project background and initial priorities
	November 22nd, 2024	Field Review
	February 4th, 2025	Draft Project Locations Review

PARTNER AGENCY	DATE	DISCUSSION TOPIC
CITY OF ROLLINGWOOD	September 19th, 2024	Project background and initial priorities
	November 18th, 2024	Field Review
	February 3rd, 2025	Draft Project Locations Review
VILLAGE OF SAN LEANNA	September 20th, 2024	Project background and initial priorities
	November 20th, 2024	Field Review
	February 23rd, 2025	Draft Project Locations Review
CITY OF WEST LAKE HILLS	September 23rd, 2024	Project background and initial priorities
	November 20th, 2024	Field Review
	January 29th, 2025	Draft Project Locations Review
DEL VALLE ISD	September 19th, 2024	Project background and initial priorities
	November 18th, 2024	Field Review
	January 29th, 2025	Draft Project Locations Review
CTRMA	October 14th, 2024	General Coordination
TxDOT	October 24th, 2024	General Coordination
	March 6th, 2025	Coordination for on-system recommended project locations
CITY OF AUSTIN	September 23rd, 2024	General Coordination
CARTS	September 17th, 2024	General Coordination
CAMPO	September 20th, 2024	General Coordination
TRAVIS COUNTY EMERGENCY MANAGEMENT	September 19th, 2024	General Coordination
TRAVIS COUNTY SHERIFF'S OFFICE	October 10th, 2024	General Coordination
	March 6th, 2025	General Coordination



San Leanna, TX

EQUITY CONSIDERATIONS

Equity corridors and focus areas within Travis County are identified as part of the overall safety analysis. To identify these corridors and potential roadway safety projects along them, three types of analysis are conducted. The first two analyses involved identification of equity data based upon equity-focused Census tracts from the USDOT Equitable Transportation Communities (ETC) dataset. The third analysis method involves projecting expected trips taken by vulnerable road users, such as pedestrians and cyclists.

EQUITY-FOCUSED CENSUS TRACTS

The USDOT ETC national census tract data identifies areas that have experienced historical underinvestment in transportation and other public infrastructure. The ETC Explorer, maintained by USDOT, is an interactive web application that allows users to explore underserved census tracts on a national and state level.

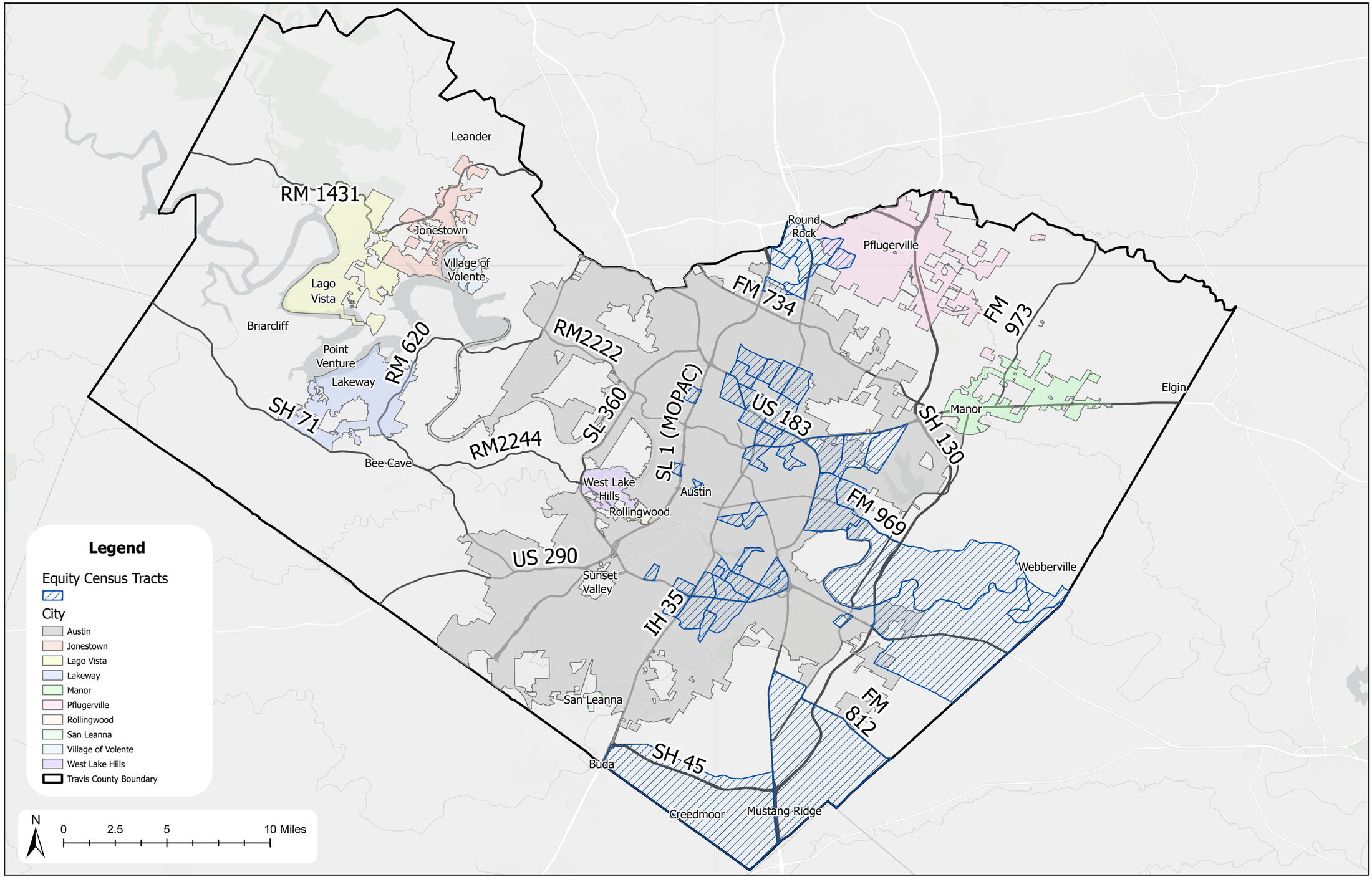
The ETC Explorer uses 2020 Census Tracts and data to analyze five components, each of which have numerous factors that make up their score: Transportation Insecurity, Climate and Disaster Risk Burden, Environmental Burden, Health Vulnerability, and Social Vulnerability. By examining these components, the ETC Explorer sheds light on the challenges faced by underserved communities. The ETC Explorer is a valuable tool for policymakers, researchers, and community members to gain insights into the specific needs and burdens of different communities. It helps identify areas that require targeted investment and support to promote equity and improve transportation safety. In 2025, the equity component was removed from the SS4A program for future safety action plans and the ETC Explorer was removed from public viewing.

The map to the right shows the equity-focused Census tracts identified in the ETC Explorer's national dataset within Travis County. Many of the County's equity-focused Census tracts are located within the City of Austin. Several are located in the western portions of the City of Pflugerville. The remaining equity-focused Census tracts are located in the eastern and southern portions of unincorporated Travis County. Historically, roadways and other transportation infrastructure within these Census tracts are more likely to have received lower levels of public investment.

It's important to note that in 2025 USDOT removed the equity component requirement for SS4A Safety Action Plans funded under the 2025 SS4A grant funding opportunity. The Travis County Safety Action Plan was funded under the 2022 SS4A grant. It is consistent with federal SS4A Safety Action Plan requirements from 2022-2024.

TRAVIS COUNTY EQUITY FOCUSED CENSUS TRACTS

Data Source: *Equity Transportation Community (ETC) Explorer*



EQUITY-FOCUSED TRANSPORTATION PATHS

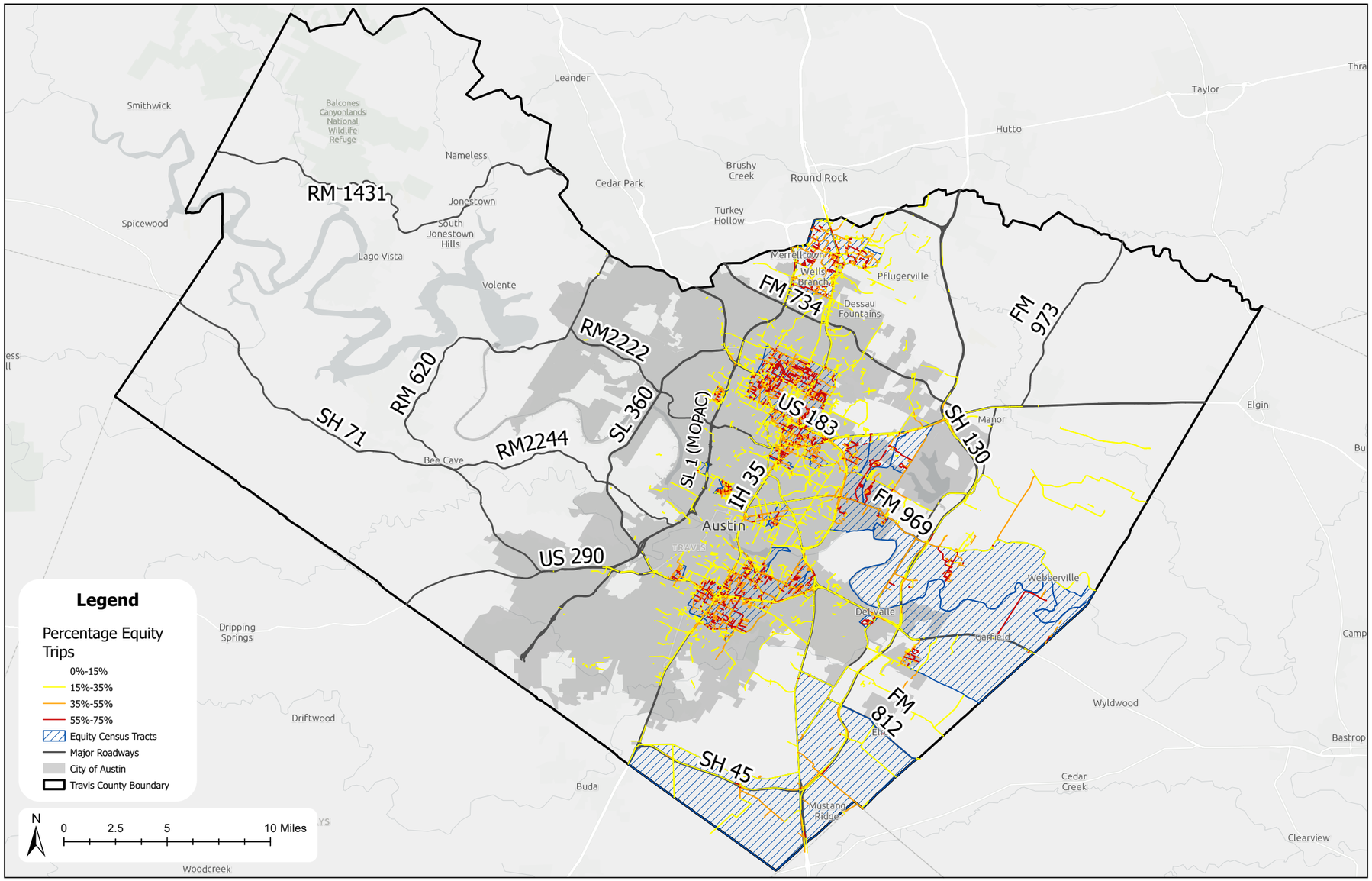
In addition to identifying equity-focused Census tracts within Travis County, a synthetic travel demand model dataset (Replica origin-destination data) was used to identify roads that have served high proportions of trips that originate within an equity-focused Census tract. These roads are located both within and outside of these tracts.

The Replica travel demand model dataset for an average Fall 2023 weekday was used for this equity analysis. Link volumes are summarized by mode for all roadways within Travis County as part of this dataset, which was gathered over a 13-week sampling period during Fall 2023. To understand the portion of trips from an equity-focused Census tract on each roadway, the analysis produced a model of all trips originating from an equity-focused Census tract in Travis County and compared that model to a model of total trips on a link-by-link basis.

The map to the right shows the results of this equity-focused transportation paths analysis. All major roadway links with at least 15 percent of daily weekday traffic originating from an equity-focused Census tract are shown on the map. Some roadways have as much as 75 percent of daily weekday traffic that originates within an equity-focused Census tract. The links with high proportions of trips originating in an equity-focused Census tract are concentrated within the City of Austin and in the eastern and southern portions of Travis County.

PERCENT EQUITY TRIPS BY ROADWAY

Data Source: *Replica*



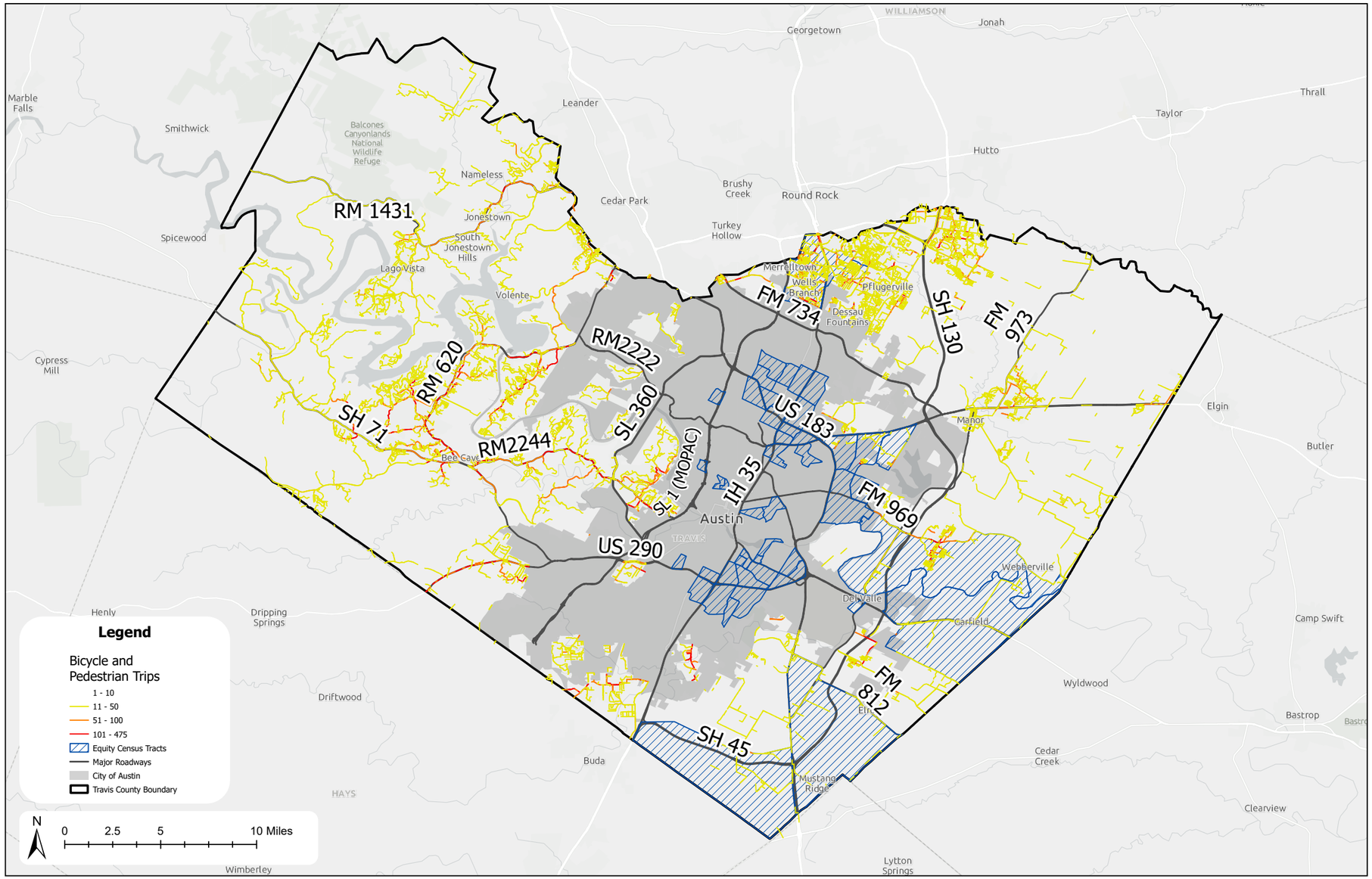
BICYCLE AND PEDESTRIAN TRANSPORTATION PATHS

The Replica synthetic travel demand model dataset for Fall 2023 was also analyzed by mode to identify roadways throughout Travis County that were expected to have the highest number of daily bicycle and pedestrian trips, regardless of whether those trips originated from an equity-focused Census tract. Isolating trips by bicycle and pedestrian users allows for analysis of a different measure of equity when considering transportation safety, as bicyclists and pedestrians are significantly overrepresented in per-trip fatal and serious injury crash rates across Travis County. While roads across many parts of the County have historically been designed primarily for motor vehicles, the SS4A program provides an opportunity to remediate many of these vehicle-centric roadways to better accommodate the needs of vulnerable road users.

The map to the right shows road segments throughout Travis County with the highest number of daily bicycle and pedestrian road user trips. To generate these estimates, a model was generated for Travis County roadways that identified only bicycle and pedestrian mode trips. These trip totals were then mapped on a link-by-link level for Travis County roadways. Unlike the previous two maps, links with high levels of bicycle and pedestrian trips appear throughout Travis County, since this dataset considered all trips within the County, regardless of Census tract of origin.

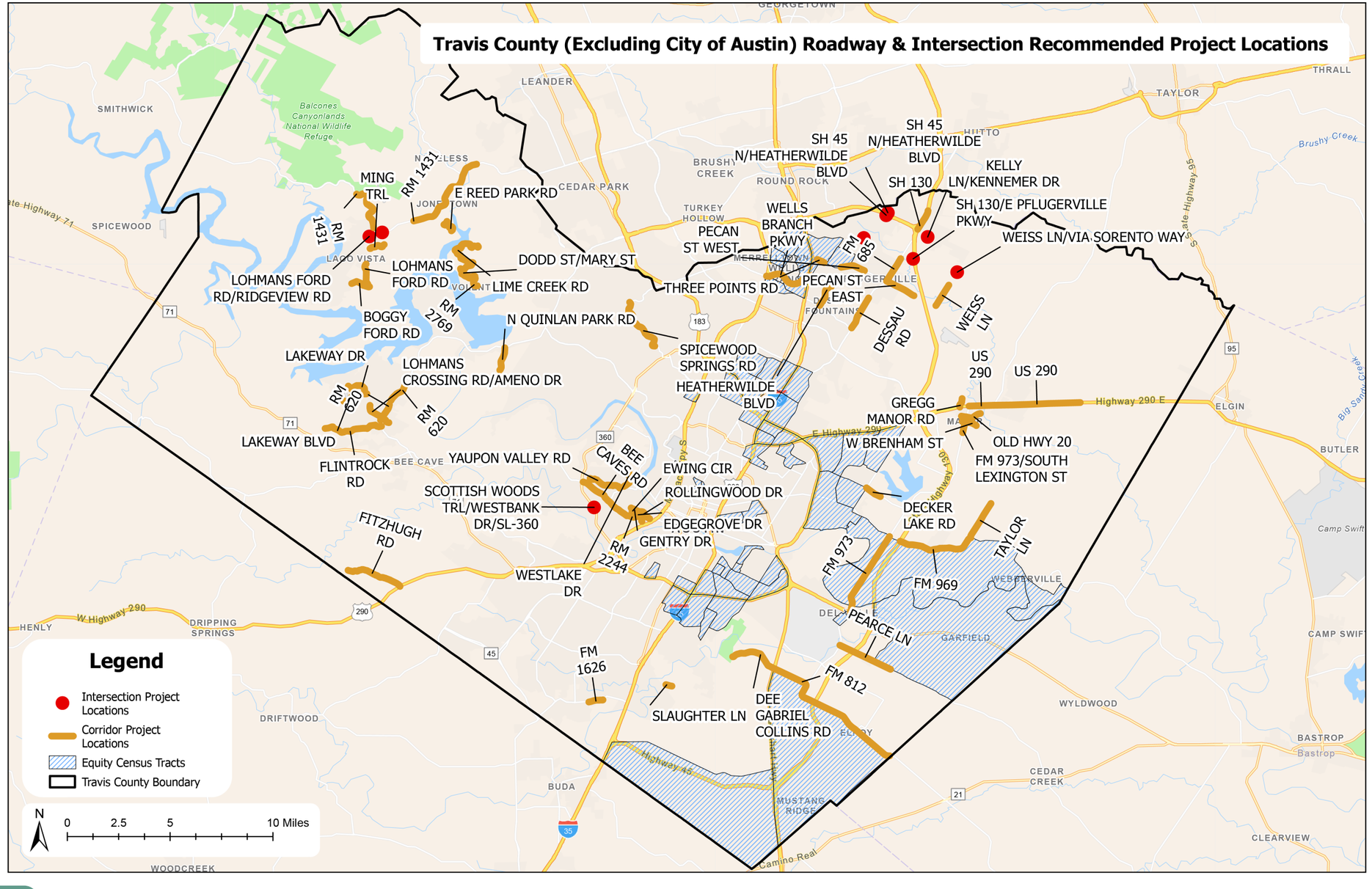
BICYCLE AND PEDESTRIAN TRIPS, EXCLUDING CITY OF AUSTIN

Data Source: *Replica*



CORRIDOR AND INTERSECTION RECOMMENDED PROJECT LOCATIONS

This map shows the corridor and intersection recommended project locations and equity-focuses Census tracts.
In total there are 8 intersections and 83.41 road miles of recommended projects. 17.5 road miles (21%) are in or along equity-focused census tracts. It is important to note that projects within the City of Austin are not precluded from receiving regional safety funding even though this plan did not specifically identify projects in the City of Austin.





Lakeway, TX



POLICY AND PROCESS CHANGES

Potential policy and process changes are identified to address broader safety needs across the County. A total of 74 policy and process recommendations are included in the Travis County Safety Action Plan. Policy recommendations are identified through a combination of safety data review, stakeholder agency input, and public feedback. While some recommended policies are identified by reviewing retroactive crash data, they can be applied across the County with the goal of proactively addressing similar risk factors elsewhere. Policy recommendations for the individual partner jurisdictions are included in the partner jurisdiction plans. Policy recommendations for the County as a whole and other county-wide agencies are included in the table on page 44. ***The full policy and process matrix with additional detail and reference information is included in Appendix F.***

COUNTY-WIDE POLICY AND PROCESS RECOMMENDATIONS

The table below shows county-wide policy and process recommendations. Agencies are encouraged to reference existing documentation on these policies and more using the resources to the right.

NHTSA Countermeasures That Work:

A collection of education and enforcement countermeasures with proven success at addressing behavioral roadway safety issues that contribute to crashes.

TxDOT Safety Resources:

A collection of resources that TxDOT and its partner agencies in Texas use to address roadway safety challenges.

Rural Unintentional Injury Prevention Toolkit:

An online tool designed to help agencies implement programs aimed at preventing unintentional injuries such as motor vehicle crashes in rural areas, including program recommendations for post-crash care.

In addition to the resources listed, partner jurisdictions are encouraged to reference the 2018 CAMPO Regional Incident Management Strategic Plan and Performance Assessment Report regarding policy and process recommendations for post crash care.

PLANNING AND DESIGN

TRANSIT

ENFORCEMENT

EMERGENCY MANAGEMENT

Policy Need	Responsible Parties	Relevant Best Practice Countermeasures and Design Solutions
Develop a local road safety plan to establish a framework for off-system road safety among Travis County and smaller municipalities.	Travis County and cities within	Local Road Safety Plan
Implement policies focused on improving driver behaviors of inexperienced drivers.	Travis County and cities within	Young Driver countermeasures such as Graduated Drivers' Licensing, Intermediate License Nighttime Restrictions,
Pilot a nighttime illumination program along FM 812, FM 969, and FM 973 in southeastern Travis County in partnership with TxDOT.	TxDOT	Corridor and Intersection Safety Lighting
Implement a high crash corridor signing program in both English and Spanish languages along FM 812 in southeastern Travis County (similar to the program Austin uses along Cameron Road).	TxDOT, Travis County Sheriff Office	High Crash Corridor Signage
Deploy high-saturation, high-visibility enforcement in designated high fatality and injury hotspot locations across Travis County as part of TxDOT's Selective Traffic Enforcement Program (STEP) 2025 grant program. As part of STEP participation, partner with local advocacy and education groups through TxDOT Crossroads meetings to support county-wide roadway safety education efforts.	TxDOT, Travis County Sheriff Office	High-Visibility Enforcement, Increasing Penalties
Set up recurring coordination meetings between staff from the Travis County Sheriff's Office, Emergency Services Division and Transportation & Natural Resources Division (Public Works, Planning) to collaborate on safety planning, crash reviews, and safety project implementation.	Travis County	N/A
Design and deploy an Intelligent Transportation System along Hamilton Pool Road in southwestern Travis County that detects truck and other vehicle length and activates flashers on a warning sign instructing drivers to stop and turn around, and notifies Travis County Sheriff Office patrols when an overheight or overlength vehicle approaches the low water crossing on Hamilton Pool Road.	Travis County	Safety Warning (Overheight/Overlength) Detection System

	Policy Need	Responsible Parties	Relevant Best Practice Countermeasures and Design Solutions
	Coordinate with local jurisdictions to improve vegetation maintenance on CapMetro routes: consider interagency agreement for vegetation maintenance.	CapMetro and the following local jurisdictions: Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Travis County, and Williamson County	Vegetation Maintenance Improvements
	Coordinate with local jurisdictions on design standards to accommodate buses on CapMetro or other service provider routes: minimum of 11 foot wide lanes when the ROW and site-specific conditions are compliable.	CapMetro and the following local jurisdictions: Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Travis County, and Williamson County	Transit Streets, COA TCM 2.2.1 Street Typology Ingredients - Table 2.2 Street Design Matrix
	Increase frequency of safety campaigns using bus wraps and social media to educate drivers on safe passing and stopping distances.	CapMetro	"Walk. Bike. Safe"
	Improve public awareness on safety around railroad crossings: coordinate with Operation Lifesaver.	CapMetro	Operation Lifesaver
	Participate in local advisory and stakeholder groups and provide input on long range plans and design for active transportation facilities.	CapMetro	N/A
	Coordinate with local jurisdictions on design standards to accommodate buses on CapMetro routes: left-turn pockets and signal warrants.	CapMetro and the following local jurisdictions: Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Travis County, and Williamson County	Dedicated Left- and Right-Turn Lanes at Intersections and Signal Warrant Analysis
	Coordinate with local jurisdictions on design standards to accommodate buses on CapMetro routes: improve bicycle facility design at intersections to allow for transit vehicle turning maneuvers, e.g. buses often run over delineators that push too far out into the intersection.	CapMetro and the following local jurisdictions: Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Travis County, and Williamson County	Transit Turn Radii
	Coordinate with local jurisdictions on design standards to accommodate buses on CapMetro routes: size roundabouts for transit vehicles and use rolled curbs.	CapMetro and the following local jurisdictions: Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Travis County, and Williamson County	Guide for Roundabouts (NCHRP Report 1043)
	Set up a notification protocol for construction: consider software packages that can be combined with 311 notifications.	CARTS	N/A
	Increase frequency of safety campaigns using bus wraps and posters to educate drivers on safety.	CARTS	“Walk. Bike. Safe”
	Develop materials and communications strategies using drivers as point of contact with customer base.	CARTS	“Walk. Bike. Safe”
	Plan for CARTS service at future planned mobility hubs by participating in long range planning efforts with cities and other transit agencies.	CARTS and jurisdictions within service area	N/A
	Install security systems at service yards.	CARTS	N/A
	Conduct an agency wide SWOT analysis focused on safety.	CARTS	N/A
	Increase enforcement of illegal speeding on Lime Creek Road.	Travis County Sheriff Office, Village of Volente	High-Visibility Enforcement, Dynamic Speed Display/Feedback Signs, Increasing Penalties
	Update the county-wide emergency evacuation plan including evacuation route planning, deployment of emergency operations centers, and traffic management strategies such as signal controls to manage sudden and increased demand for egress of neighborhoods and hazard zones.	Travis County and cities within	N/A
	Provide design guidance for signage, striping, wayfinding and access to neighborhoods to improve emergency management with consideration for navigating evacuation routes with no cell services.	Travis County and cities within	N/A
	Update hazard mitigation action plan regularly.	Travis County and cities within	N/A
	Provide community education on evacuation methods and routes as well as what to expect when an evacuation order is given.	Travis County and cities within	N/A



West Lake Hills, TX



RECOMMENDATIONS FROM CONCURRENT SAFETY PLANS

By aligning with other concurrent transportation safety plans in the Region, this Travis County Safety Action Plan fosters regional collaboration and consistency in safety practices. Travis County and its partners hope to create a safer transportation network through coordinated efforts, shared resources, and unified safety standards, ultimately contributing to the well-being and protection of all road users. The concurrent transportation-related safety plans developed by partner jurisdictions within Travis County are described and compared to the Travis County Safety Action Plan on pages 52 and 53.

TxDOT Austin District Annual Safety Plan

The TxDOT Austin District's 2024 Annual Safety Plan discusses several safety analysis tools, processes, and programs the district utilizes to identify factors impacting transportation safety, fatal crash hotspots, and both short-term and long-term solutions to the issues identified. These processes and programs include the district's routine speed management program to reevaluate the posted speed limits of TxDOT roadways, and post project safety assessments to verify implemented safety treatments reduce crashes as anticipated. Several policies identified in the Travis County Safety Action Plan for partner jurisdictions within Travis County target reducing crashes related to speed, such as determining appropriate speed limits. The Safety Action Plan also includes recommended policies related to education and enforcement, which align with the TxDOT Austin District's behavioral traffic safety program.

City of Austin 2023 Vision Zero Update

The 2023 update of the City of Austin's Vision Zero report provides a recap of safety initiatives led by the Austin Transportation and Public Works Department's Vision Zero program from 2021 and 2022 and compares recent crash trends to crash trends presented in previous updates of the report. The 2023 update highlights the City of Austin's approach to managing for safe speeds through its speed management program. This consists of reducing speed limits on arterial streets outside of the city's urban core and implementing traffic calming countermeasures, such as traffic circles, medians, speed cushions, and speed feedback signs. The Travis County Safety Action Plan recommends at least one policy related to speed limits and traffic calming countermeasures for nearly every partner jurisdiction involved in the development of the Safety Action Plan. The Safety Action Plan also identifies several recommended policies for partner agencies for education and awareness campaigns that address distracted driving, speeding, and other behavioral issues that are also targeted by the City of Austin's Vision Zero program campaigns.

austintexas.gov

Austin Strategic Mobility Plan (Chapter 1: Prioritizing our Safety)

The Austin Strategic Mobility Plan is a comprehensive multimodal transportation plan for the future of the City of Austin's transportation network. The Plan presents the policies needed to guide the actions necessary to create a safe, accessible, inclusive, and interconnected transportation network throughout the City of Austin. Chapter 1 describes the city's priority for a safe transportation network, summarizes the city's Vision Zero approach, and identifies policies related to safety culture, designing for safety, and safety behaviors. Many of these identified policies overlap with the policies recommended in the Travis County Safety Action Plan, such as managing for safe speeds, minimizing the potential for conflicts between transportation network users, and improving the ability of all transportation users to see and be seen. The Safety Action Plan recommends adjusting speed limits and implementing traffic calming countermeasures for nearly every partner agency involved in the development of the Safety Action Plan. The Safety Action Plan also recommends policies that involve consideration for transit in the design phase, developing sidewalk master plans and active transportation plans to provide dedicated facilities for pedestrian and bicyclists, and establishing safe crossings and access to schools by enhancing crossing visibility and warnings to drivers, all of which align with the Austin Strategic Mobility Plan policies.

austintexas.gov

City of Austin 2018 Pedestrian Safety Action Plan

The City of Austin developed its Pedestrian Safety Action Plan in 2018, which provides a comprehensive strategy for addressing pedestrian safety in service to a more walkable environment that contributes to the city's vision for a sustainable, socially equitable, affordable, and economically prosperous city. The Plan identifies key recommendations to reduce and eliminate serious injury and fatal pedestrian crashes in the City of Austin. The Plan includes a policy for developing a pedestrian master plan to promote pedestrianism by providing dedicated and safe pedestrian facilities, with pedestrian comfort as a principal consideration in addition to safety. Similarly, the Travis County Safety Action Plan recommends policies for improving pedestrian safety by establishing sidewalk connectivity through the development of sidewalk master plans and active transportation plans. Policies recommended in the Safety Action Plan that target adjusting speed limits, enhancing crosswalk visibility, and lighting support the City of Austin's goal of considering pedestrian comfort as well as safety.

austintexas.gov

CAMPO Safety Action Plan

CAMPO is developing a Regional Safety Action Plan to enhance traffic safety across its six-county region. The Plan aims to reduce fatal and serious-injury crashes while improving transportation systems for all users, including pedestrians, bicyclists, public transportation users, and drivers, with an emphasis on investments in vulnerable communities. The development of the CAMPO Regional Safety Action Plan is underway and being completed in coordination with the Travis County Safety Action Plan. Additional information regarding the CAMPO Regional Safety Action Plan can be found on CAMPO's website:

campotexas.org

Travis County 2021 Comprehensive Emergency Management Plan

The 2021 Travis County Comprehensive Emergency Management Plan is an all-hazards emergency operation plan that applies to incidents and events of significance throughout Travis County. The Plan describes the high-level responsibilities in identifying, mobilizing, and deploying resources to respond to incidents within Travis County. The Travis County Safety Action Plan recommends four policies specifically for Travis County Emergency Management, as well as policies related to emergency response for other partner jurisdictions, that align with the County's Comprehensive Emergency Management Plan. The policies recommended in the Safety Action Plan emphasize the importance of reviewing crash reports regularly to identify crash hotspots, trends, and countermeasures, which supports the emergency management plan's protocol for conducting after-action reviews. However, the emergency management plan primarily focuses on coordination, communication, and operating procedures during emergency response activities, while the Safety Action Plan's policies mostly target evacuation planning and wayfinding challenges.

traviscountytx.gov

NOTABLE ROADWAY SAFETY POLICY AND PROCESS EXAMPLES

Instituting policies, countermeasures, and processes that effectively change behavior is a complex challenge. These policies need to be consistently monitored and enforced to ensure adherence, which can be resource intensive. Additionally, the diverse needs and perspectives of different communities must be considered, making it difficult to design one-size-fits-all solutions. Considering the unique difficulties in enacting driver behavior interventions, and the responses from the public (over 43% of personal car users reported feeling unsafe or very unsafe, over 55% of non-motorized users felt unsafe or very unsafe, and 83% of respondents reported speeding and aggressive driving as a top concern), below are several notable case studies that address behavior change for drivers with the goal of improving road safety. It is important to note that effective communication and a clear demonstration of the benefits of these policies are an important part of implementing them.

City of San Antonio/ Bexar County, Texas

The nonprofit Community Alliance for Training and Safety (CATS) has been partnering with The City of San Antonio, Bexar County, and local law enforcement since 1998 to provide aggressive driving classes to those mandated by court order following road rage related traffic offenses. Class participants can be mandated to take between four to eight hours of class based on the discretion of the judge hearing their case. CATS estimates about 70 drivers a month go through the program and has been working with public agencies elsewhere who are looking to adopt a similar model. While no data exists on if CATS's program reduces aggressive driving, it is one of few formalized programs that attempts to address complex and pervasive behavioral issues in traffic safety.

"I am a better person after [attending this class].... thank you for what you have done for me!"
- Class Participant

Village of Volente, Texas

The Village of Volente installed speed tables on Lime Creek Rd during the spring of 2025, as this plan was in development, in response to high numbers of speeding and racing incidents. These incidents were particularly unique to Volente as Lime Creed Rd had become well known among car, motorcycle, and racing enthusiasts for its vertical and horizontal curves. While it is too early to assess through crash data if these countermeasures have reduced crashes or crash outcomes, initial feedback gathered during this plan's public engagement has been positive. Survey respondents indicated reduced street racing and a greater sense of safety on Lime Creek Rd. This effort highlights the use of a roadway feature countermeasure to address a behavioral problem in traffic safety.



"The speed tables added to Lime Creek have been a very positive game changer. I hope more are added."
-Comment from public engagement

City of Flint, Michigan

The City of Flint's City Council passed Reckless Driving Ordinance 220166.1 in June 2022. The ordinance declares that any motor vehicle used to engage in reckless driving within the City of Flint is a nuisance and the vehicle is subject to being forfeited to the City. "Reckless driving" is defined in the ordinance as operating a vehicle with willful disregard for the safety of persons or property, including but not limited to the use of stunt driving techniques such as drifting and donuts. The purpose of the ordinance is to emphasize the importance of safe driver behavior by making it clear that reckless driving will not be tolerated in the City of Flint, ultimately reducing crashes related to dangerous driver behavior.

" We have the opportunity to bring back safe streets in our neighborhoods and throughout the city..."
-Councilwoman Tonya Burns

STRATEGY AND PROJECT SELECTIONS

A total of 59 safety project recommendations are included in the Travis County Safety Action Plan. Project recommendations are identified through a combination of safety data review, stakeholder agency input, and public feedback. Project recommendations are included in the partner jurisdiction plans alongside potential applicable safety countermeasures for stakeholders to consider as part of project implementation. ***The full project matrix with all project information is included in Appendix E.***

Once project recommendations are identified, the Travis County Safety Task Force determined a consistent approach to evaluate each project. The prioritization process is consistently applied for all project recommendations, regardless of project location. Projects are then sorted to identify the highest-scoring roadway safety projects in Travis County overall, and within each partner jurisdiction in Travis County that participated in plan development..

For further information on recommended project locations in unincorporated Travis County, see the Partner Jurisdiction Plans section.

PROVEN SAFETY COUNTERMEASURES

The Federal Highway Administration (FHWA) has identified Proven Safety Countermeasures that have demonstrated the ability to enhance roadway safety by reducing crash frequency and severity. Safety countermeasures may include modifications to roadway geometry, operations, signage, pavement markings, or access management. The FHWA recommends that transportation agencies nationwide implement these countermeasures to accelerate the achievement of safety goals and move towards zero fatal and serious injury crashes. These countermeasures can also be applied to roadways with safety concerns not specified in this plan.

FHWA Proven Safety Countermeasures focus on the following areas: Speed Management, Pedestrian and Bicyclist Safety, Roadway Departure, and Intersections. Additionally, Crosscutting Strategies are identified as part of these countermeasures, addressing multiple safety focus areas. Each countermeasure includes information on expected crash reduction, relative ease of implementation, and relative level of cost. Note that this section of the Plan provides info only on countermeasures that were considered for projects.

SPEED MANAGEMENT:

As the speed of a crash increases, so does the potential for fatalities and serious. Therefore, it is crucial to understand the importance of proper speed management.

Countermeasure	Narrative	Crash Reduction Factor	Ease of Implementation	Cost
Appropriate Speed Limit for all Road Users	A driver traveling at 35 mph has a 45 percent chance of either killing or seriously injuring a pedestrian if hit, while that percentage drops to 5 percent if the speed is just 15 mph less, at 20 mph. This fact highlights the impact speed limits have on all road users and not just those in the vehicles.	26%	Easy	Very Low Cost



Volente, TX

PEDESTRIAN AND BICYCLIST:

Pedestrians and bicyclists are often the most vulnerable on the road. Transportation planners and engineers need to design beyond just vehicle mobility to account for these users. Proven safety countermeasures include making pedestrian and bicycle areas more visible and alerting drivers to their presence. These strategies are especially useful near schools, transit stops, and other busy pedestrian and cyclist areas.

Countermeasure	Narrative	Crash Reduction Factor	Ease of Implementation	Cost
Bicycle Lanes	By creating a dedicated lane for bicyclists, the number of crashes between vehicles and bicycles can be reduced while also encouraging and facilitating bicycles as a mode of transportation. FHWA's Bikeway Selection Guide and Incorporating On-Road Bicycle Networks into Resurfacing Projects can be used to assist agencies in determining which facilities provide the most benefit in various contexts, as bicycle lanes are not limited to additional pavement markings adjacent to vehicular lanes.	49%	Moderate	Medium Cost
Crosswalk Visibility Enhancements	The three main enhancements for crosswalk visibility are high-visibility crosswalks, improved lighting, and enhanced signing and pavement markings. These countermeasures do not just provide an increased potential for drivers to identify potential points of conflict, but they also assist in the decision-making of users trying to cross the road.	40%	Easy	Low Cost
Leading Pedestrian Interval	Leading pedestrian intervals allow for pedestrians to enter the intersection a few seconds before conflicting turning movements, like right or left turning vehicles, are given a green light. Pedestrians can establish their presence with the help of these intervals and reduce their risk of going unnoticed.	13%	Easy	Easy
Medians and Pedestrian Refuge Islands in Urban and Suburban Areas	Medians and pedestrian refuge islands can be installed to reduce the high number of pedestrian fatalities that occur at midblock locations in urban and suburban areas. These countermeasures protect pedestrians and bicyclists as they cross one direction of multi-lane traffic at a time.	46%	Moderate	Medium Cost
Pedestrian Hybrid Beacons (PHBs)	As stated in the previous countermeasure, many pedestrian fatalities occur at non-intersection locations, with one notable factor being the speed of vehicles in the area. PHBs are red-yellow signalizations that can be activated by a pedestrian to prompt approaching vehicles to stop and give the pedestrian the right-of-way for safe crossing.	55%	Somewhat Complex	Higer Cost
Rectangular Rapid Flashing Beacons (RRFBs)	Usually accompanied by a pedestrian warning sign, RRFBs flash with an alternating high-frequency and can increase the visibility of pedestrians when trying to use a crosswalk.	47%	Easy	Low Cost
Road Diets (Roadway Reconfiguration)	The common use of road diets involves converting an existing four-lane undivided roadway into a three-lane roadway with one through lane in each direction, access management medians and turn lanes, and potentially the installation of bike lanes. Road diets calm traffic which not only provides safer roads for pedestrians and non-motorized road users but also benefits motorized vehicles with regards to safer left-turns and consistent speeds.	47%	Somewhat Complex	Medium Cost
Walkways	Any space that is well-defined and intended for the use of a person traveling by foot or using a wheelchair may be considered a walkway, including sidewalks, multi-use paths, and roadway shoulders. Roadway shoulders are some of the least safe walkways, while elevated sidewalks provide significantly more protection for pedestrians.	89%	Moderate	Medium Cost

INTERSECTIONS:

Intersection areas are prone to accidents due to associated conflict points. Mitigating these crashes is crucial because intersections often account for large portions of all crashes, including fatalities and serious injuries. In Travis County for example, of all safety focus area crash types analyzed, intersection crashes made up the largest share of total crashes. The following countermeasures have each been shown to reduce intersection related crashes.

Countermeasure	Narrative	Crash Reduction Factor	Ease of Implementation	Cost
Backplates with Retroreflective Borders	With one inch to three inch wide yellow retroreflective borders, these types of backplates improve the visibility of a traffic signal. This treatment to traffic signals accounts for older and color vision deficient road users, not to mention its usefulness during blackouts in providing a visible cue for drivers to stop at the intersection ahead of them.	15%	Very Easy	Very Low Cost
Corridor Access Management	Access management strategies can be used individually or in combination to enhance safety for all modes of transportation, encourage and facilitate walking and biking, and reduce trip delay and congestion. Some strategies include tandem roundabouts that reduce left-turn conflicts, turn lanes, and reduction in density through driveway closure, consolidation, or relocation.	31%	Very Complex	Higher Cost
Dedicated Left- and Right-Turn Lanes at Intersections	Left- and Right-turn only lanes can provide physical separation for turning traffic and thus reduce the potential for crash types like rear-end collisions or left-turns across opposing traffic.	48%	Somewhat Complex	Highest Cost
Roundabouts	Roundabouts are intersections that move traffic through channelized approaches along a circular configuration. They allow for safe and efficient routes by eliminating left-turn conflicts and keeping the traffic along roadways moving, thus minimizing delays and queueing.	82%	Very Complex	Highest Cost

ROADWAY DEPARTURE:

Roadway departure crashes happen when a vehicle leaves their travel lane, crossing an edge line or center line. These crashes can be severe, leading to rollovers, collisions with objects, or head-on crashes. Mitigating these crashes is vital because they make up a large portion of traffic fatalities. The following countermeasures are all proven to reduce roadway departure crashes.

Countermeasure	Narrative	Crash Reduction Factor	Ease of Implementation	Cost
Enhanced Delineation for Horizontal Curves	Enhanced delineation for horizontal curves includes additional delineation along the approach to a curve and/or within the curve. A few countermeasures are the installation of chevron signs, delineators, or enhanced conspicuity such as larger, fluorescent, and/or retroreflective signs.	16%	Very Easy	Very Low Cost
Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Rumble strips are a series of grooves in the pavement or raised elements along the travel lane edges intended to alert drivers through vibration or sound that their vehicle has left the travel lane. White edge line or yellow center line stripes may be painted over rumble strips to increase lane visibility during non-ideal conditions. These countermeasures can be used to alert drifting drivers and reduce many head-on and roadway departure fatal and serious injury crashes.	51%	Moderate	Low Cost
Median Barriers	Longitudinal barriers that separate opposing traffic on a divided highway are used to redirect vehicles that have left the travel lane and are heading towards opposing traffic. Hotspots of head-on crashes can give a good idea of where median barriers may be of the most use. Median barriers installed on rural four-lane freeways have resulted in a 97 percent reduction in cross-median crashes.	97%	Easy	Medium Cost
Roadside Design Improvements at Curves	These countermeasures include treatments for the high-risk roadside environment along the outside of horizontal curves that reduce roadway departure fatalities and serious injuries. They may aim to give vehicles a chance to recover safely from roadway departures, such as removing obstructions along the roadside and implementing clear zones, flattening steep side slopes, and adding or widening shoulders. Cable barriers, metal-beam guardrails, and concrete barriers may reduce the severity of a crash in the instance a safe recovery is not possible.	12%	Somewhat Complex	Medium Cost
Wider Edge Lines	Without identifiable travel lanes and upstream road alignment, the risk of roadway departure is heightened. By increasing the width of edge lines from the minimum of four inches to the maximum of six inches, associated crashes can be reduced by 37 percent. Wider edge lines are relatively low cost with a benefit-cost ratio of 25:1.	37%	Very Easy	Very Low Cost

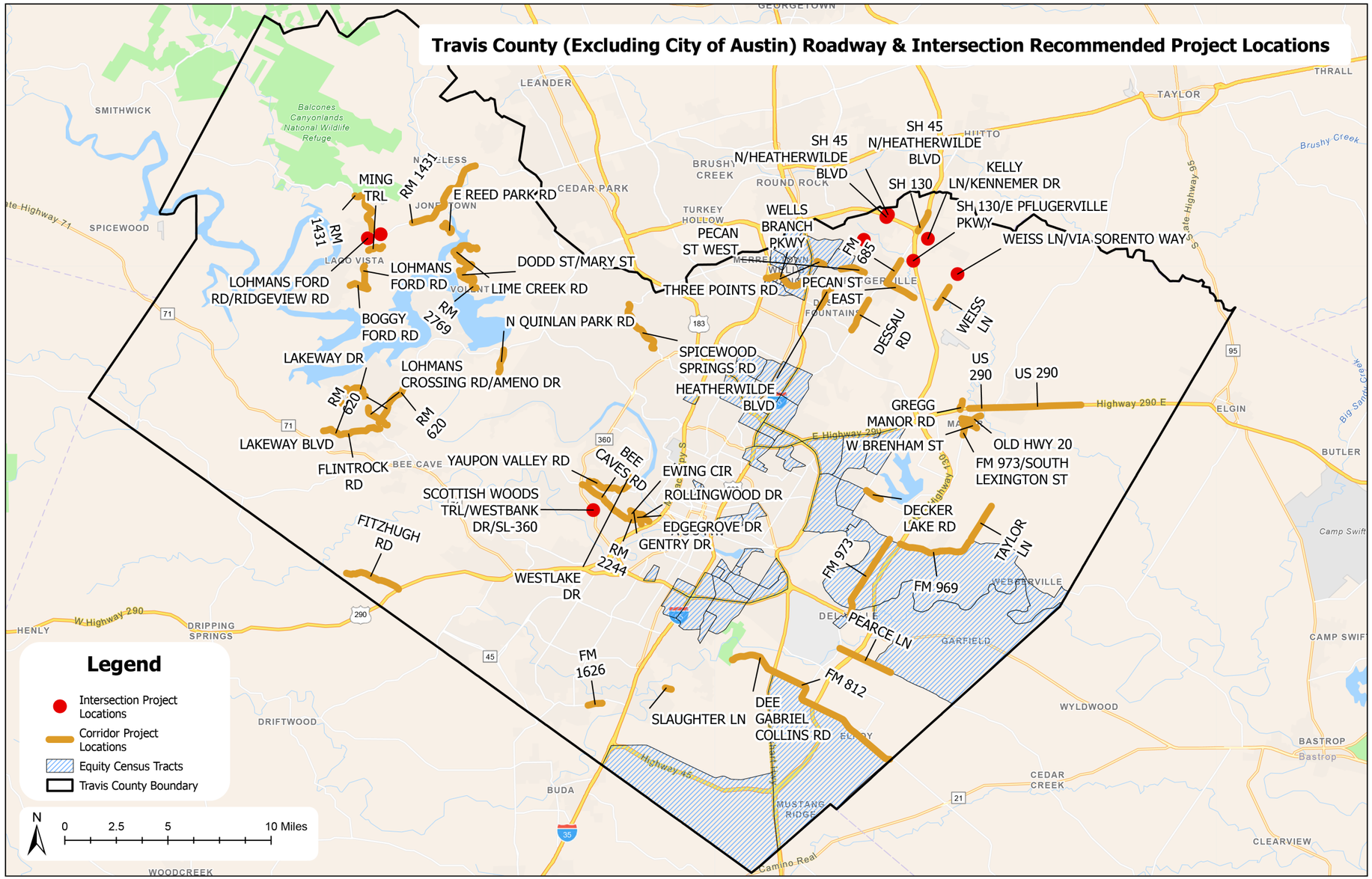
CROSSCUTTING:

While the previously listed countermeasures each target specific crash types, crosscutting countermeasures focus on reducing multiple crash types with a single countermeasure.

Countermeasure	Narrative	Crash Reduction Factor	Ease of Implementation	Cost
Lighting	While the number of fatal crashes occurring during the day and during the night are comparable, the nighttime fatality rate is higher due to less vehicles miles traveled at night. Therefore, improved lighting in area associated with turns, stoppage, or pedestrian crossings present ample safety benefits. All of the previously mentioned crash types can benefit from lighting in one form or another.	42%	Moderate	Higher Cost
Local Road Safety Plans	Local road safety plans provide framework for roadway safety improvements on local roads by identifying a list of prioritized action items that can be implemented at a low-cost and timely process. All crash types can be addressed as these plans use localized crash data that can determine the hotspot locations for each crash type.	17%	Moderate	Low Cost
Pavement Friction Management	With an emphasis on areas where vehicles make frequent turns, stops, and decelerations, the implementation of proper maintenance and treatment of pavement friction can prevent roadway departure, intersection, and pedestrian-related crashes.	48%	Somewhat Complex	Medium Cost
Road Safety Audit (RSA)	An audit or assessment that is performed to analyze the existing safety conditions of a road and identify potential improvements with consideration for all road users, factors, and capabilities. RSAs can reduce crashes anywhere in the range of 10 to 60 percent and may affect one, some, or all crash types.	60%	Moderate	Low Cost

CORRIDOR AND INTERSECTION RECOMMENDED PROJECT LOCATIONS

This map shows the corridor and intersection recommended project locations and equity-focuses Census tracts.
In total there are 8 intersections and 83.41 road miles of recommended projects. 17.5 road miles (21%) are in or along equity-focused census tracts. It is important to note that projects within the City of Austin are not precluded from receiving regional safety funding even though this plan did not specifically identify projects in the City of Austin.






Wayne Riddell
Loop
11300
SEAMLESS
RAIN GUTTERS
512-400-4381
San Leanna Dr

PROJECT PRIORITIZATION APPROACH:

Corridor and intersection projects were each evaluated to identify those projects that target locations with the greatest need for safety countermeasures. The scoring factors met key objectives of the SS4A program by prioritizing projects on corridors and intersections with:

- The highest occurrence of fatal and serious injury crashes
- High crash rates to highlight places where crashes are overrepresented
- Higher likelihood of pedestrian and bicycle users
- High potential impact with respect to their implementation cost

To determine a project's overall evaluation score, the evaluation process includes four scoring factors. The maximum score a project can receive is 100 points.

FACTOR 1

Fatal and Serious Injury Crashes Per Mile (35 points)

The count of all fatal and serious injury crashes per mile within each project area is the first factor. This factor is given the greatest weight because it is directly tied to the desired outcome of the Plan, which is the eventual elimination of all roadway fatalities and serious injuries. This factor awards points to projects on a sliding scale, with higher KA crash per mile values receiving a higher score. Intersection locations are analyzed for all approach segments within 500 feet of the intersection location.

FACTOR 2

Crash Costs Normalized by Traffic Volume (25 points)

The comprehensive costs of all crashes normalized by traffic volume is the second factor. This calculation estimates the societal impact of all crashes at a project location and then adjust those costs by Vehicle Miles Traveled (VMT) on each project segment. This calculation identifies locations with a disproportionately high number of crashes relative to the vehicular volumes at the location. Since the factor considers all crash types, it identifies many locations for safety improvement opportunities that Factor 1 does not. This component awards points to projects on a sliding scale, with higher normalized crash costs receiving a higher score.

FACTOR 3

Proximity to Activity Centers and Educational Facilities (25 points)

This factor considers whether each project is located near an activity center or an educational facility. By doing so, the scoring approach assigns value to improving roadway safety in the areas around schools, community centers, recreation centers, and medical facilities, as these locations are often where visitors are walking or rolling as their primary means of transportation. Many of these facilities also serve high proportions of vulnerable populations, such as children and the elderly. This factor also helps target project opportunities that could improve connectivity to the places that the public walks or rolls to. Projects receive points if they are within a mile of different types of activity centers, receiving more points the closer they are. Projects receive the full amount of points if they are less than a tenth of a mile away from each type of activity center.

FACTOR 4

Anticipated Project Impact (15 points)

This factor considers the countermeasures recommended at each project location and assesses them for their anticipated impact and ease of implementation. By doing so, the scoring approach assigns value to project locations that include high-benefit, low-cost, and quick-build strategies to reduce the likelihood of crashes based upon past studies and assessments of those countermeasures in similar locations. Projects receive more points if they include countermeasure recommendations that have as many of the following conditions as possible:

1. High expected crash reduction factors
2. Low expected implementation costs
3. High likelihood of quick-build implementation

Projects receive the highest amount of points if countermeasure recommendations meet all three of these conditions.



Jonestown, TX

PROGRESS AND TRANSPARENCY

Regular reporting and communication of progress towards Travis County's goals is an important part of getting to zero fatal and serious injury crashes. As the Plan was developed, Travis County gathered input and shared updates via a project website. The completed plan and future tracking efforts will be hosted directly on the County's website.

As part of the Travis County Safety Action Plan, a crash data **dashboard** was created to provide the public and partner agency staff with data to investigate roadway safety needs and to track progress on reducing fatalities and serious injuries. By providing this information through a user-friendly dashboard, the public can stay informed about the efforts being made to improve road safety in Travis County. This promotes transparency in achieving the goal of reducing and ultimately eliminating fatal and serious injury crashes, and transparency leads to results.

In addition to the dashboard reporting, fatal and serious injury crashes in Travis County will be tracked annually. The HIN will also be analyzed with each update of the Safety Action Plan to ensure safety priorities are aligned with the most current crash data. Travis County and its partner agencies will also continue to analyze and report progress and safety metrics. The following four activities are recommended to carry the Travis County Safety Action Plan toward implementation:

1

Annually Review County-wide Crash Statistics

Each year, once the previous year's crash statistics are finalized in April, review the overall crash totals for Travis County. Compare to previous year totals and update trendlines showing the updated measures of overall crashes, fatal and serious injury crashes, and priority focus area fatal and serious injury crashes. Track performance against Travis County targets set as part of the Safety Action Plan process. Identify any priority focus areas where crash trendlines are increasing and consider systemic investment in countermeasures that address these priority focus areas.

2

Track Impacts of Targeted Improvements

For the locations where roadway safety countermeasures are implemented, define a study area and track crash data for three years before and after the improvements are implemented. Quantify changes in crash statistics and related comprehensive crash costs and compare these changes to expected changes from crash modification factors. Use this comparison to identify countermeasures or project types that show the highest level of safety impact, so that these projects can be prioritized at other locations as well.

3

Involve Elected Officials and Community Leadership in Safety Planning

Share safety planning outcomes and updates with County Commissioners, local agency leadership, and community organization leaders. As safety needs or project opportunities are identified, involve these stakeholders in field visits and project discussions to incorporate their priorities into safety improvement designs and plans.

4

Update the Overall County Safety Plan Regularly

As projects are implemented and the nature of crash data changes, conduct a full update to the County safety study analysis every three to five years.

PARTNER JURISDICTION PLANS

The following section includes summaries of the relevant project outcomes for each partner jurisdiction. Each plan includes key safety statistics, a summary of the public comments received during engagement, recommended project locations map, recommended project locations table (including project specific crash data and recommended potential improvements), and the partner jurisdiction policy needs matrix.

- JONESTOWN
- LAGO VISTA
- LAKEWAY
- MANOR
- PFLUGERVILLE
- ROLLINGWOOD
- SAN LEANNA
- VOLENTE
- WEST LAKE HILLS
- DEL VALLE ISD / SOUTHEAST TRAVIS COUNTY
- UNINCORPORATED TRAVIS COUNTY





Lakeway, TX

JONESTOWN

TRAVIS COUNTY SAFETY ACTION PLAN



Jonestown, TX

Jonestown is a city in northwest Travis County with a population of 2,365 as of the 2020 census. RM 1431 is the major road passing through Jonestown, connecting it to Cedar Park to the east and Lago Vista to the west.

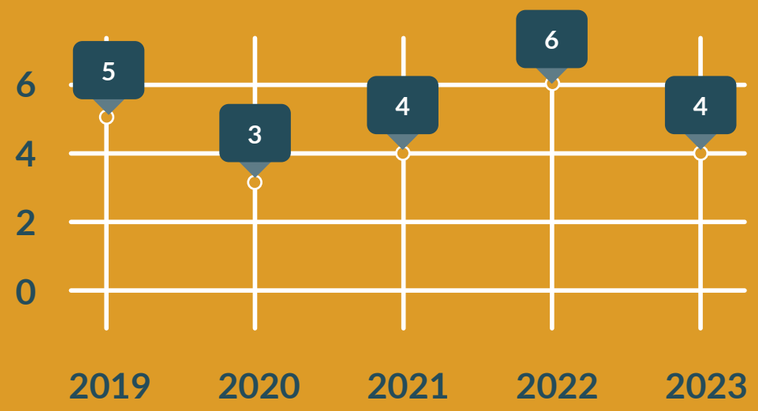
From 2019 through 2023, there were 22 total fatal and serious injury (KA) crashes: three crashes that resulted in one or more deaths and another 19 crashes that resulted in one or more serious injuries. These crashes were largely concentrated along RM 1431, with two serious injury crashes also occurring along Reed Park Road. Nine of these crashes were single vehicle crashes. An additional six crashes (all on RM 1431) involved one vehicle running into the back of another vehicle, and four other crashes involved cars colliding head on. Project recommendations for these locations are included in the project map and table in this partner jurisdiction plan.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- Adding a center turn lane along RM 1431 throughout the Jonestown city limits (timeframe of 2045)
- Overlay pavement project planned from Reed Park Rd to Trails End in 2028

JONESTOWN BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

60.84 MILES

NUMBER OF PED CRASHES

2

TOP PUBLIC COMMENTS

Respondents were overwhelmingly concerned with RM 1431.

Most respondents suggested adding more lights and turn lanes to RM 1431; some also suggested widening lanes and adding a median.

Respondents also mentioned dangerous traffic and the need for traffic law enforcement.

ROAD MILES WITH SAFETY PROJECTS

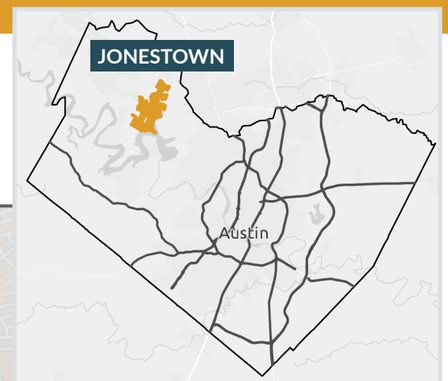
5.18 MILES

NUMBER OF BIKE CRASHES

2

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of Jonestown. For other projects outside the City of Jonestown, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/Lane Departure	Intersection Safety	Other
1	E Reed Park Rd	Clearwater Dr to Lighthouse Ln	0.90	Jonestown	52	4	2	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines	None	Lighting, Local Road Safety Plan
2	RM 1431	W Reed Park Rd to Travisso Pkwy/ Lonesome Creek Trl	4.28	TxDOT	43	208	17	1	1	Crosswalk Visibility Enhancements, Leading Ped Interval, Pedestrian Bridge	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Lighting

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Engagement + Engineering	Collaborate and coordinate safety improvements with TxDOT such as median barriers, widened shoulders, lighting, turn lanes, and intersection controls.	City of Jonestown and TxDOT	Median Barriers, SafetyEdge, Adequate Lighting, Reduced Left-Turn Conflict Intersections or Dedicated Left and Right Turn Lanes
Evaluation	Install cameras to collect near miss and collision data to identify issue areas.	City of Jonestown	Intersection Audits - Video Analytics, Safety Audits
Enforcement	Coordinate with police department to hire a motorcycle enforcement officer to monitor corridors with safety issues.	City of Jonestown	Intersection Audits - Video Analytics, High-Visibility Enforcement, Dynamic Speed Display/Feedback Signs, Increasing Penalties

LAGO VISTA

TRAVIS COUNTY SAFETY ACTION PLAN



Lago Vista, TX

Lago Vista is a city in northwest Travis County with a population of 8,896 as of the 2020 census. RM 1431 is the major road passing through Lago Vista, connecting it to Jonestown to the east and Marble Falls to the west.

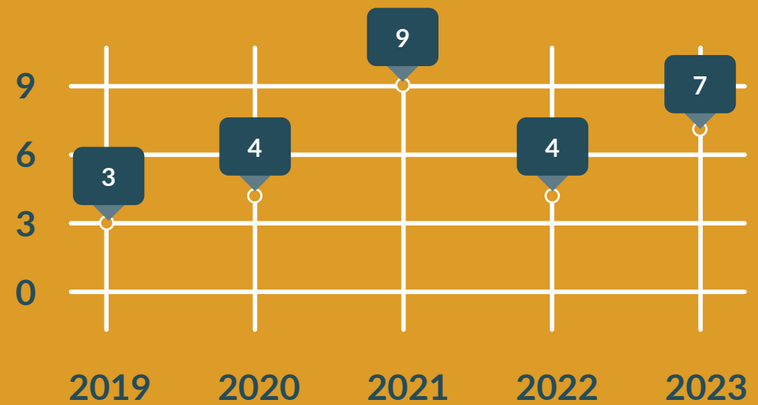
From 2019 through 2023, there were 27 total fatal and serious injury (KA) crashes: five crashes that resulted in one or more deaths and another 22 crashes that resulted in one or more serious injuries. These crashes were concentrated along RM 1431, Lohmans Ford Road, and Boggy Ford Road. Project recommendations for these locations are included in the project map and table in this partner jurisdiction plan. Of the 27 KA crashes, more than half involved a motorcycle. More than half also were single vehicle crashes. For 11 of these crashes, the primary contributing factor involved failure to stop or yield right of way.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- Adding a center turn lane along RM 1431 between East Reed Park Drive and Old RM 1431 (planned for 2025)

LAGO VISTA BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

177.46 MILES

NUMBER OF PED CRASHES

3

ROAD MILES WITH SAFETY PROJECTS

4.90 MILES

NUMBER OF BIKE CRASHES

1

TOP PUBLIC COMMENTS

Respondents identified RM 1431 as a challenging road and suggested adding turn lanes, a median, and traffic lights, as well as widening the road and reducing the speed limit.

Respondents specifically noted safety concerns at the intersections of RM 1431 and Bar-K Rd, RM 1431 and Lohmans Road, and 1431 and Destination Way.

Respondents suggested increased law enforcement to combat dangerous driving, as well as adding sidewalks and traffic lights.

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of Lago Vista. For other projects outside the City of Lago Vista, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/ Pedestrian Safety	Curve Treatment	Roadway/Lane Departure	Intersection Safety	Other
1	Lohmans Ford Rd/ Ridgeview Rd	Intersection And Vicinity	0.38	Lago Vista	74	12	2	0	0	None	None	Wider Edge Lines, Raised Median	Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Local Road Safety Plan, Road Safety Audit
2	RM 1431/ Destination Way	Intersection And Vicinity	0.38	TxDOT	58	11	1	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Corridor Access Management	Appropriate Speed Limits for All Road Users, Lighting, Local Road Safety Plan
3	RM 1431	Cactus Bend Cv to Dodge Trl	1.24	TxDOT	57	88	6	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Backplates with Retroreflective Borders, Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users, Lighting
4	Ming Trl	Entire	0.72	Lago Vista	48	3	1	0	0	None	Enhanced Curve Delineation for Horizontal Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	None	Lighting, Local Road Safety Plan
5	RM 1431	Tessera Pkwy to Cactus Bend Cv	1.07	TxDOT	39	10	2	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Roundabouts	Lighting
6	Boggy Ford Rd	Lindberg Ln to Lohmans Ford Rd	0.85	Lago Vista	36	27	2	0	0	Walkways	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines	Backplates with Retroreflective Borders, Roundabouts	Lighting, Local Road Safety Plan
7	Lohmans Ford Rd	Travis Dr to Austin Blvd	1.02	Lago Vista	26	9	1	0	0	Walkways	None	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines	None	Lighting, Local Road Safety Plan

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Evaluation	Identify and implement a system to track near misses and incidents to monitor safety before and after roadway safety improvements are implemented.	City of Lago Vista	Dynamic Speed Display/Feedback Signs, Intersection Audits - Video Analytics
Engineering	Incorporate existing project recommendations from traffic studies that impact safety, such as signalization, widening shoulders, reducing speeds, and pull out bays for school drop-offs.	City of Lago Vista	**Speed:** High Visibility Enforcement **Signals/Crossings:** Pedestrian Hybrid Beacons **Shoulders:** Wider Edge Lines **Schools:** SRTS Plan **Ped Safety:** Lower Speed Limits



696



From 2019 through 2023, there were 27 total fatal and serious injury crashes: five crashes that resulted in one or more deaths and another 22 crashes that resulted in one or more serious injuries.

Lago Vista, TX

LAKEWAY

TRAVIS COUNTY SAFETY ACTION PLAN



Lakeway, TX

Lakeway is a city in western Travis County with a population of 19,189 as of the 2020 census. RM 620 is the major road passing through Lakeway, connecting it to northwest Austin to the north and Bee Cave to the south.

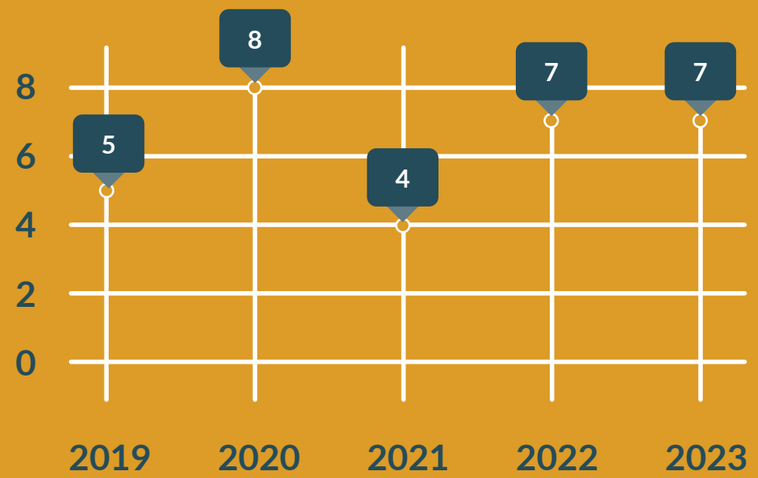
From 2019 through 2023, there were 31 total fatal and serious injury (KA) crashes: one crash that resulted in one or more deaths and another 30 crashes that resulted in one or more serious injuries. These crashes were concentrated along RM 620, Lohmans Crossing Road, and Lakeway Boulevard. Project recommendations for these and several other locations are included in the project map and table in this partner jurisdiction plan. Of the 31 KA crashes, 12 were single vehicle crashes. Six of the crashes (all along RM 620) involved a left turning vehicle colliding with a vehicle moving straight in the opposite direction. The fatal crash resulted in the death of a pedestrian.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- Expanding RM 620 to a six-lane cross-section with intermittent raised center medians to channelize left turns in specific locations, and including 10-foot shared use paths on both sides of the expanded road (planned for 2030)

LAKEWAY BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

131.94 MILES

NUMBER OF PED CRASHES

4

TOP PUBLIC COMMENTS

Respondents expressed support for more speed limit enforcement along RM 620.

Respondents supported updating traffic signal configurations and timings to improve flow of traffic.

Respondents asked for improved public transportation connections between Lakeway and Austin.

ROAD MILES WITH SAFETY PROJECTS

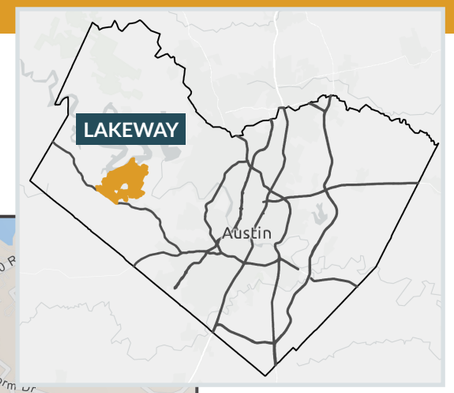
8.14 MILES

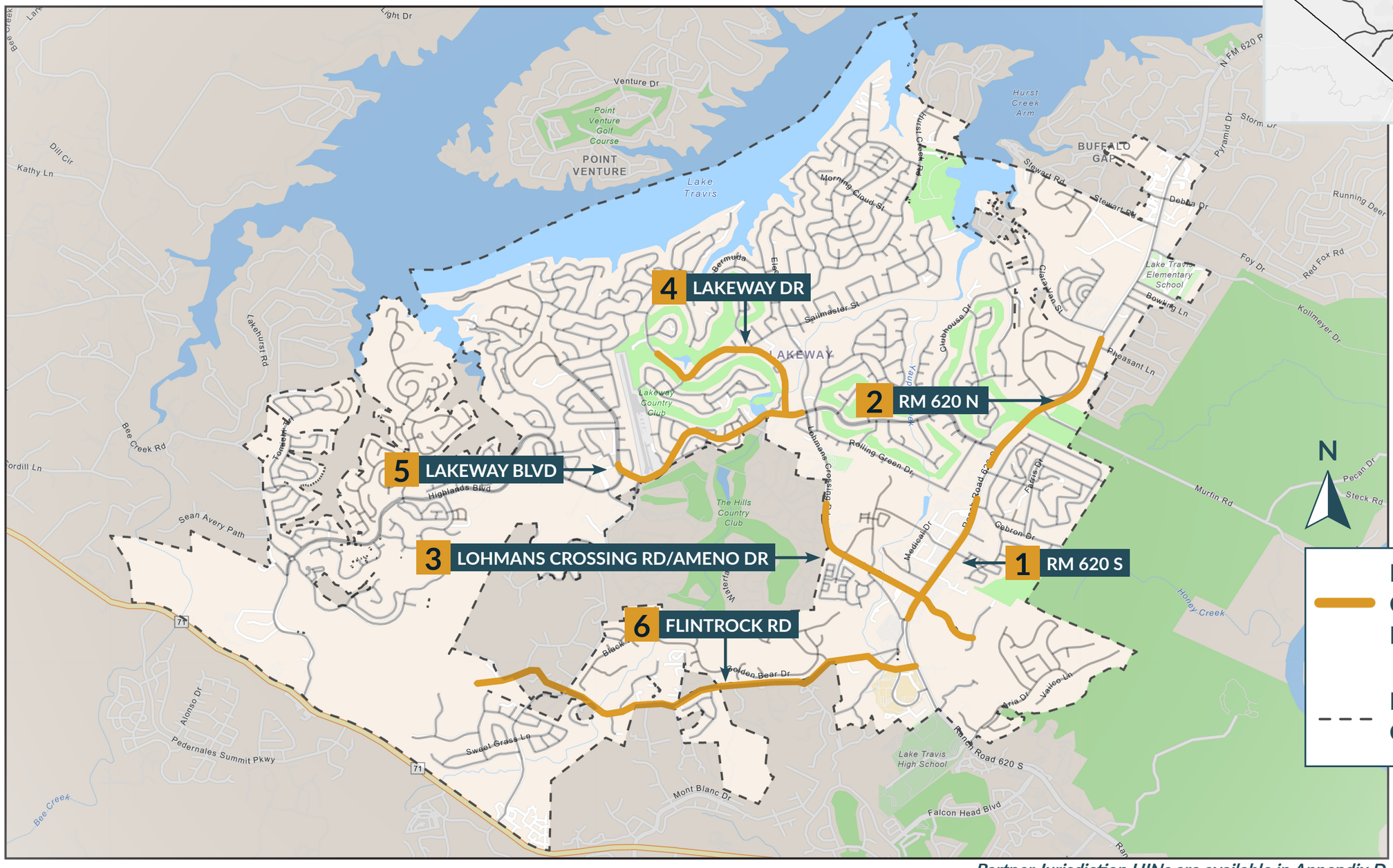
NUMBER OF BIKE CRASHES

7

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of Lakeway. For other projects outside the City of Lakeway, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

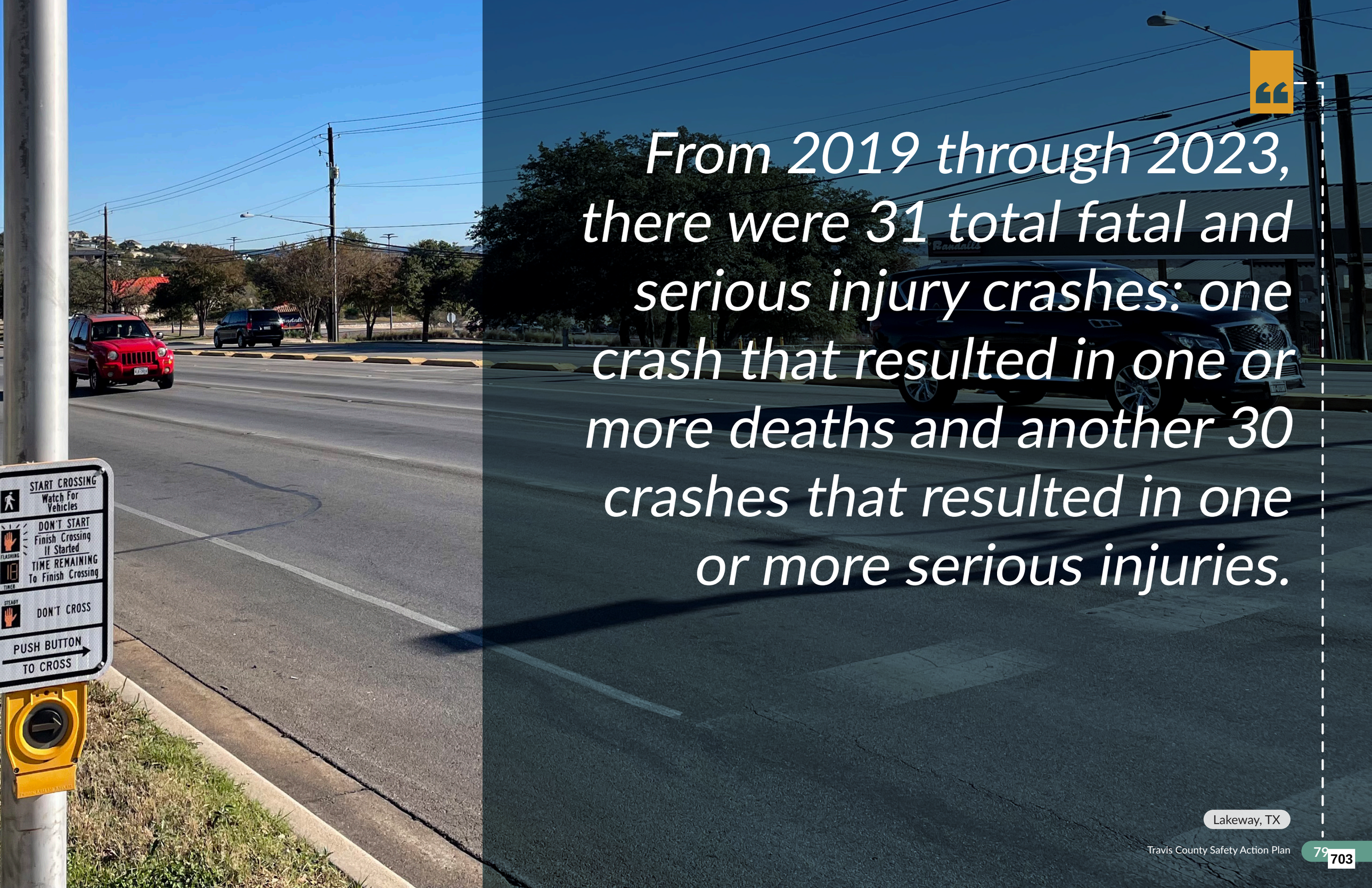
RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/Lane Departure	Intersection Safety	Other
1	RM 620 S	Gebron Dr to Lohmans Spur	0.84	TxDOT	76	412	8	1	2	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Shared Use Path	None	Median Barriers, Wider Edge Lines	Backplates with Retroreflective Borders, Corridor Access Management	Road Safety Audit
2	RM 620 N	Pheasant Ln to Dave Dr	1.03	TxDOT	70	159	8	2	1	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Shared Use Path	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Median Barriers, Wider Edge Lines	Backplates with Retroreflective Borders, Corridor Access Management	Road Safety Audit
3	Lohmans Crossing Rd/ Ameno Dr	Wingreen Loop To Far Vela Ln	1.25	Lakeway	67	243	7	0	1	Bicycle Lanes, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Rectangular Rapid Flashing Beacons, Walkways	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Backplates with Retroreflective Borders	Lighting, Local Road Safety Plan, Road Safety Audit
4	Lakeway Dr	Seawind St to Lakeway Blvd	1.14	Lakeway	35	22	1	0	0	Rectangular Rapid Flashing Beacons, Walkways	Enhanced Curve Delineation for Horizontal Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections, Roundabouts	Lighting, Pavement Friction Management, Local Road Safety Plan
5	Lakeway Blvd	Highlands Blvd to Lohmans Crossing Rd	1.25	Lakeway	34	34	1	0	0	Rectangular Rapid Flashing Beacons, Walkways, Fill in the gaps in the existing center median SUP at Yaupon Creek and Hurst Creek	Enhanced Curve Delineation for Horizontal Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines	Backplates with Retroreflective Borders, Roundabouts	Lighting, Local Road Safety Plan
6	Flintrock Rd	RM 620 to End	2.63	Lakeway	34	130	2	0	0	Crosswalk Visibility Enhancements	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections, Roundabouts	Pavement Friction Management, Local Road Safety Plan

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Engineering	Consider traffic calming solutions and limitations on truck traffic to address cut through traffic on local residential streets.	City of Lakeway and Travis County	Traffic Calming, Roundabouts and Innovative Intersections
Engineering	Implement design solutions to improve pedestrian safety at crossings prioritizing hot spot locations.	City of Lakeway	Lower Speed Limits, Ped Safety Zones, Crosswalk Visibility Enhancements, Pedestrian Hybrid Beacons, Leading Pedestrian Intervals
Enforcement	Improve speed monitoring and enforcement. Develop safety design solutions to be implemented as funding is available that reduce speeds and reduce human error and the need for enforcement.	City of Lakeway	Intersection Audits - Video Analytics, Dynamic Speed Display/Feedback Signs, Roadway Safety Audit, Pavement Friction Management, Roadside Design Improvements at Curves, Longitudinal Rumble Strips and Stripes on Two-Lane Roads
Evaluation	Improve data collection and analysis of safety related metrics such as speeding, crash data, and community concerns.	City of Lakeway	Intersection Audits - Video Analytics, Dynamic Speed Display/Feedback Signs, Roadway Safety Audit
Evaluation + Engineering	Establish permanent design solutions for safe crossings and access to schools.	City of Lakeway	SRTS Plan, Lower Speed Limits, Ped Safety Zones, Crosswalk Visibility Enhancements, Pedestrian Hybrid Beacons, Leading Pedestrian Intervals
Engineering	Investigate creative solutions to facilitate safe and multimodal connectivity throughout the City in places where right-of-way is constrained.	City of Lakeway	Separated bicycle and pedestrian facilities and trails
Evaluation + Engineering	Consider programmatic solutions to safety such as Vision Zero and Safe Routes to School to develop a comprehensive approach to safety throughout the City.	City of Lakeway	Vision Zero and Safety Action Plan as well as a SRTS Plan
Evaluation + Engineering	Implement a policy for access management of existing driveways and driveway consolidation and relocation when lots are redeveloped.	City of Lakeway	Corridor Access Management





From 2019 through 2023, there were 31 total fatal and serious injury crashes: one crash that resulted in one or more deaths and another 30 crashes that resulted in one or more serious injuries.

Lakeway, TX

MANOR

TRAVIS COUNTY SAFETY ACTION PLAN

Manor, TX

Manor is a city in northeast Travis County with a population of 13,652 as of the 2020 census. The City is growing rapidly and is bisected by US 290 running east-west, connecting Manor to Austin and to eastern Bastrop County.

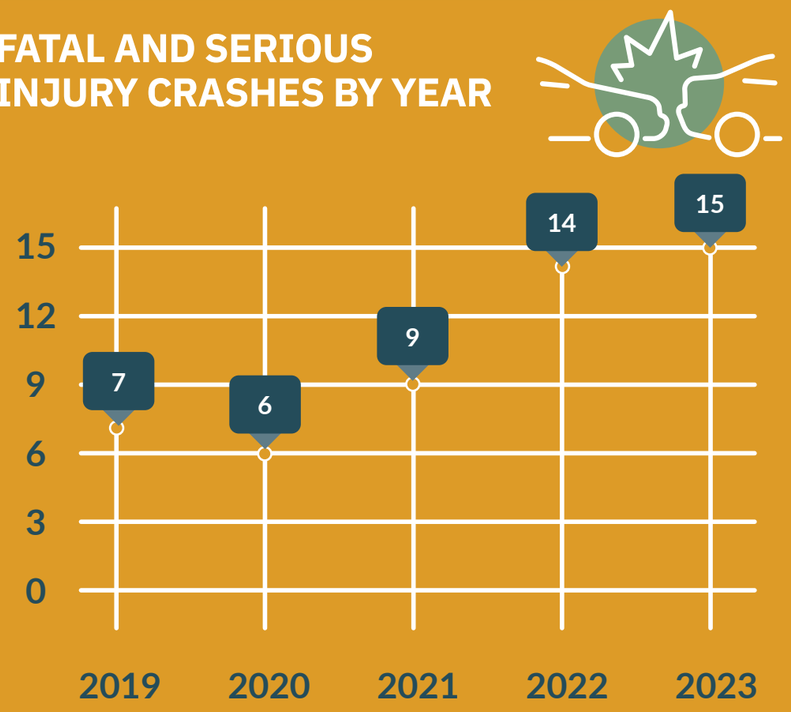
From 2019 through 2023, there were 51 total fatal and serious injury (KA) crashes: eight crashes that resulted in one or more deaths and another 43 crashes that resulted in one or more serious injuries. These crashes were largely concentrated along the County-wide High Injury Network (HIN) which includes US 290 and a segment of Brenham Street on the south side of Manor. Project recommendations for these locations, as well as other crash hot spots throughout the city, are included in the project map and table in this partner jurisdiction plan. More than half of the KA crashes analyzed occurred at night. Similarly, more than half of these crashes occurred at intersections.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- New traffic signals along US 290 at Shadowglen Blvd and related sidewalk improvements (planned for 2025)
- Restriped and realigned intersection with additional turn bays at US 290 and FM 973 (planned for 2026-2028)
- Proposed additional intersection reconfigurations (reduced-conflict U-turn intersections) along US 290
- Proposed widening of FM 973 north of US 290

MANOR BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

75 MILES

NUMBER OF PED CRASHES

3

TOP PUBLIC COMMENTS

Respondents felt more lighting and longer traffic signals would make roadways safer.

Respondents are concerned about overflow traffic using residential streets.

Respondents want increased speed enforcement in Manor to address speeding and red light running.

Respondents noted increasing community size will place more stress on already congested roads.

ROAD MILES WITH SAFETY PROJECTS

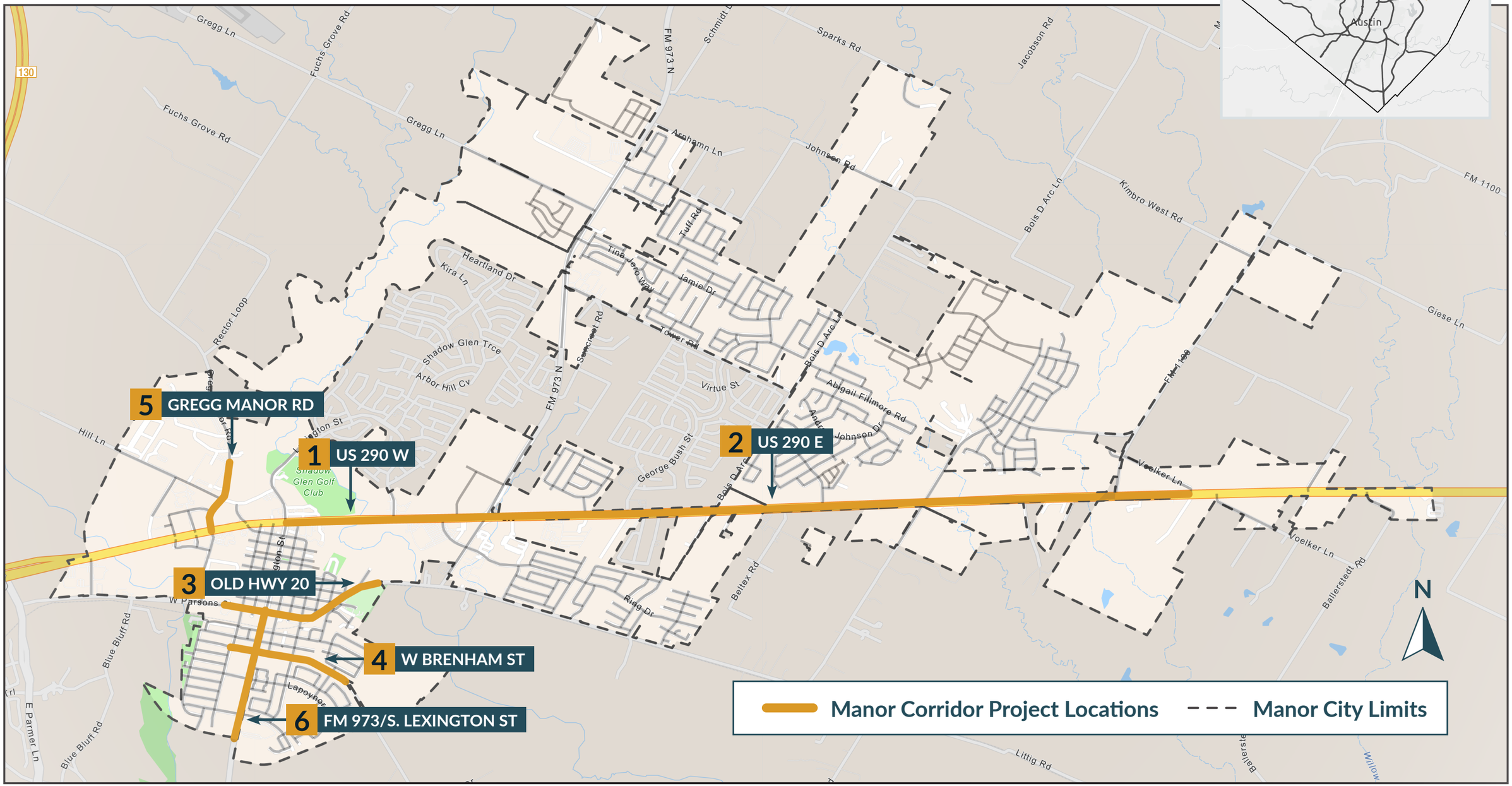
12.13 MILES

NUMBER OF BIKE CRASHES

2

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of Manor. For other projects outside the City of Manor, please see the County-wide Project Locations Map, page 60.



Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/Lane Departure	Intersection Safety	Other
1	US 290 W	Lexington St to Loop 212	1.03	TxDOT	71	450	12	0	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians And Pedestrian Refuge Islands In Urban And Suburban Areas, Pedestrian Bridge, Shared Use Path	None	None	Corridor Access Management	Appropriate Speed Limits For All Road Users, Road Safety Audit
2	US 290 E	Loop 212 to Voelker Ln	3.63	TxDOT	59	596	29	0	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians And Pedestrian Refuge Islands In Urban And Suburban Areas, Pedestrian Bridge, Shared Use Path	None	None	Corridor Access Management	Appropriate Speed Limits For All Road Users, Road Safety Audit
3	Old Hwy 20	Lexington St. to Manor City Boundary on Old Hwy 20	0.87	City of Manor	43	141	1	2	0	Bicycle Lanes, Crosswalk Visibility Enhancements, Leading Ped Interval, Walkways	None	Wider Edge Lines	Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	None
4	W Brenham St.	S Bastrop St. to Lagos Grandes Way	0.64	City of Manor	41	78	2	0	0	Crosswalk Visibility Enhancements, Walkways	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	Wider Edge Lines	Dedicated Left- and Right-Turn Lanes at Intersections, Roundabouts	Local Road Safety Plan
5	Gregg Manor Rd	Manor High School to Hill Ln. to Manor Downs Rd. to US 290	0.43	Manor	37	58	1	1	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Rectangular Rapid Flashing Beacons, Walkways, Pedestrian Bridge	None	Wider Edge Lines	Roundabouts	Local Road Safety Plan
6	FM 973 /S.Lexington St.	W Parsons St. / Old Hwy 20 to Lagos Elementary	0.78	TxDOT	27	118	0	1	2	Crosswalk Visibility Enhancements, Leading Ped Interval, Walkways	None	None	Dedicated Left- and Right-Turn Lanes at Intersections	Lighting, Road Safety Audit

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Engineering	Update the active transportation plan (ATP) to identify specific projects for bicyclists of all ages and abilities and incorporate the updated ATP into the comprehensive plan.	City of Manor	High-Visibility Enforcement, Lower Speed Limits, Medians and Pedestrian Refuge Islands, Crosswalk Visibility Enhancements including Beacons or HAWKs, Bicycle Facilities for all Ages and Abilities
Engineering	Coordinate with the nearby local jurisdictions and TxDOT at the planning and design phase as Travis County develops and implements policies and projects.	Travis County, City of Manor, TxDOT	
Engineering	Identify signal timing issues and prioritize projects to address safety issues due to inadequate crossing time or green time.	City of Manor	Leading Pedestrian Interval, Yellow Change Intervals
Evaluation + Engineering	Develop a sidewalk master plan, implement policy to require sidewalks as part of new development, and identify sidewalk gaps within a 2-mile radius of schools and prioritize construction of sidewalks to fill gaps such that students who are not eligible for school bus rides can safely walk to school.	City of Manor	Walkways, Medians and Pedestrian Refuge Islands, SRTS Plan
Evaluation + Enforcement	Increase speed indicators and monitoring mechanisms to understand where speeding issues are occurring, and implement a speed feedback sign program for deploying portable speed feedback signs throughout the City at rotating locations.	City of Manor	Intersection Audits - Video Analytics, Dynamic Speed Display/Feedback Signs
Evaluation + Enforcement	Update transportation element of comprehensive plan to address north-south connectivity and provide for safer facilities for all modes of transportation.	City of Manor	ATP, Walkways and Bicycle Lanes
Evaluation + Enforcement	Consider a consolidated contract for a speed monitoring vendor with other smaller cities and the County.	Travis County, cities within and TxDOT	Intersection Audits - Video Analytics, Dynamic Speed Display/Feedback Signs
Engineering	Improve and add additional lighting at intersections, in older neighborhoods and Downtown. Ensure that lighting is Dark Sky compliant.	City of Manor	Lighting
Enforcement	Increase nighttime traffic law enforcement, particularly for speeding, red light running, and drunk driving.	City of Manor	High Visibility Nighttime Traffic Enforcement



From 2019 through 2023, there were 51 total fatal and serious injury crashes: eight crashes that resulted in one or more deaths and another 43 crashes that resulted in one or more serious injuries.

Manor, TX

PFLUGERVILLE

TRAVIS COUNTY SAFETY ACTION PLAN



Pflugerville is a city in northeast Travis County with a population of 65,191 as of the 2020 census. The city is bisected by SH 130, connecting to Austin and Manor to the south and to Williamson County to the north.

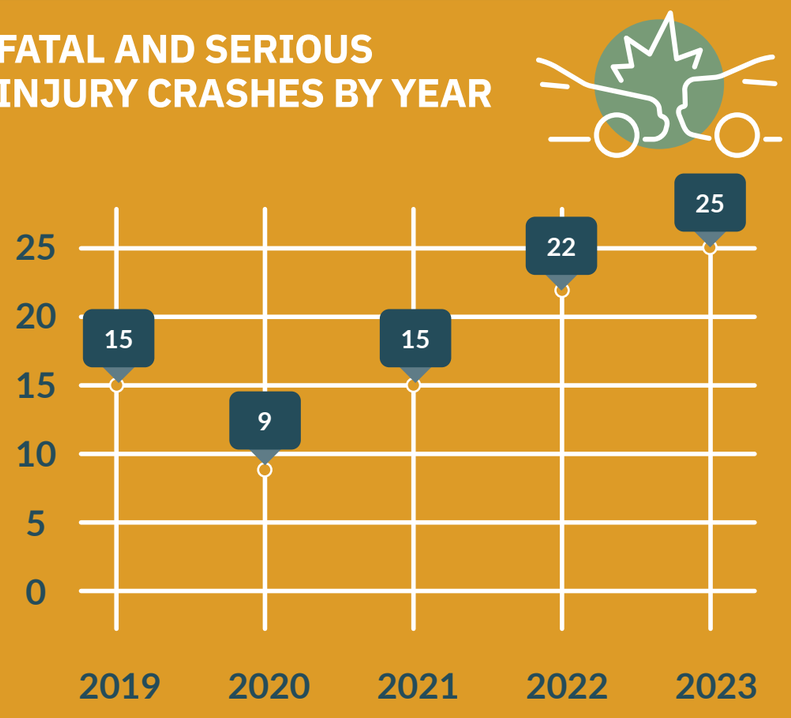
From 2019 through 2023, there were 86 total fatal and serious injury (KA) crashes: 16 crashes that resulted in one or more deaths and another 70 crashes that resulted in one or more serious injuries. These crashes were largely concentrated along SH 45, SH 130, FM 685, and FM 1825/Pecan Street. Project recommendations for these and several other locations are included in the project map and table in this partner jurisdiction plan. 36 of these crashes occurred at night, and 35 crashes occurred at intersections. Seven crashes involved pedestrians, and two crashes involved bicyclists.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- Intersection, access management, traffic signal, and sidewalk improvements are planned at the intersection of FM 685 and FM 1825/Pecan Street (planned for late 2025)

PFLUGERVILLE BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

326.63 MILES

NUMBER OF PED CRASHES

20

TOP PUBLIC COMMENTS

Respondents noted roadways around town needed resurfacing due to cracking and potholes.

One respondent noted cracks and unexpected barricades on the sidewalk made it hard for them to navigate the city in their wheelchair.

Respondents reported roadways with dangerous curves and roadways could be improved to handle Pflugerville's growing population.

ROAD MILES WITH SAFETY PROJECTS

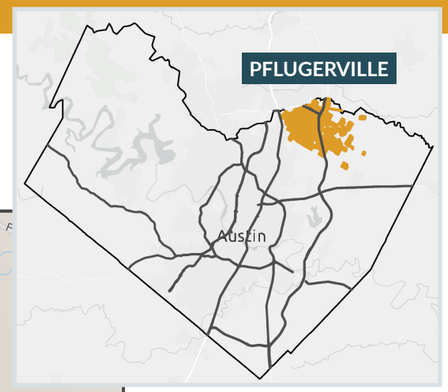
5.67 MILES

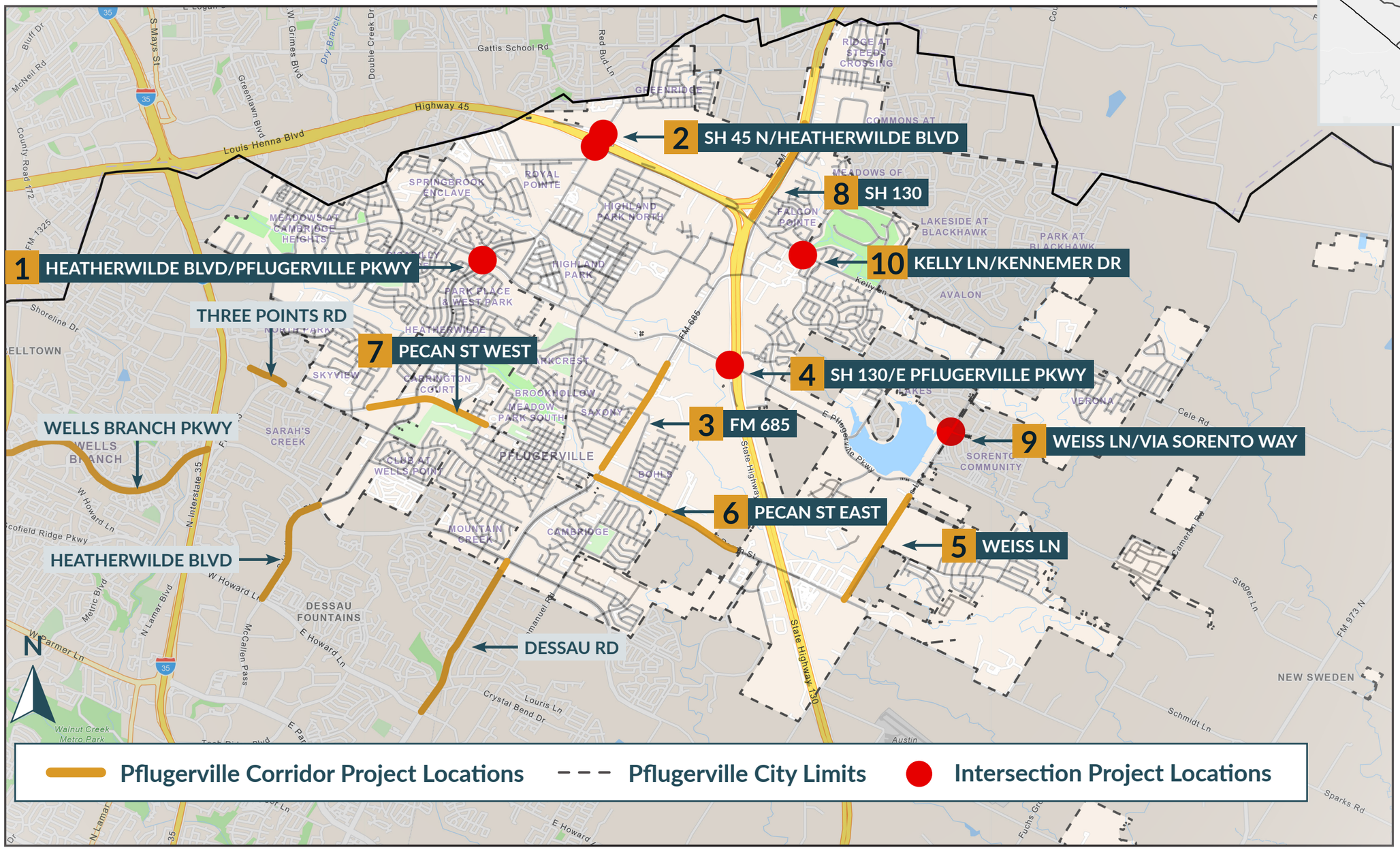
NUMBER OF BIKE CRASHES

19

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of Pflugerville. For other projects outside the City of Pflugerville, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/ Lane Departure	Intersection Safety	Other
1	Heatherwilde Blvd/ Pflugerville Pkwy	Intersection And Vicinity	0.38	Pflugerville	86	73	4	0	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas	None	Raised Median	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Local Road Safety Plan, Road Safety Audit
2	SH 45 N/ Heatherwilde Blvd	Intersection And Vicinity	0.38	TxDOT	85	110	5	0	0	Leading Ped Interval	None	None	Backplates with Retroreflective Borders	Local Road Safety Plan, Road Safety Audit
3	FM 685	Walmart To HEB	1.14	TxDOT	71	163	8	0	1	Crosswalk Visibility Enhancements, Walkways	None	Wider Edge Lines	Backplates with Retroreflective Borders	None
4	SH 130/E Pflugerville Pkwy	Intersection And Vicinity	0.38	TxDOT	53	9	0	0	0	None	None	None	Backplates with Retroreflective Borders	Local Road Safety Plan
5	Weiss Ln	Wolf Pack Dr to Pecan St	1.13	Pflugerville	53	44	4	0	1	Crosswalk Visibility Enhancements, Leading Ped Interval	None	Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Backplates with Retroreflective Borders	Local Road Safety Plan, Road Safety Audit
6	Pecan St East	FM 685 to Biltmore Ave	1.35	Pflugerville	47	158	3	0	0	Crosswalk Visibility Enhancements, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Walkways	None	Wider Edge Lines	Backplates with Retroreflective Borders, Corridor Access Management	Local Road Safety Plan, Road Safety Audit
7	Pecan St West	Parkway Dr to 12th St	1.04	TxDOT	53	201	5	2	1	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Walkways	Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Wider Edge Lines	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Pavement Friction Management, Road Safety Audit
8	SH 130	Rowe Ln to SH 45	1.00	TxDOT	45	42	3	0	0	None	None	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines	None	None
9	Weiss Ln/Via Sorento Way	Intersection And Vicinity	0.38	Pflugerville	27	8	0	0	0	Crosswalk Visibility Enhancements, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas	None	None	Roundabouts	Appropriate Speed Limits for All Road Users, Lighting, Local Road Safety Plan
10	Kelly Ln/ Kennemer Dr	Intersection And Vicinity	0.38	Pflugerville	25	17	0	0	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas	None	None	Backplates with Retroreflective Borders, Corridor Access Management	Lighting, Local Road Safety Plan, Road Safety Audit

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Evaluation	Improve data collection and analysis of safety related metrics such as speeding, crash data, and community concerns.	City of Pflugerville	Intersection Audits - Video Analytics, Dynamic Speed Display/Feedback Signs, Roadway Safety Audit
Engineering	Review TxDOT's Intersection Control Evaluation (ICE) methodology and adapt policy guidance to meet local needs so that all intersection projects follow a consistent intersection analysis process that prioritizes safety and operations.	City of Pflugerville	Roundabouts and Innovative Intersections
Education	Develop driver education and awareness campaigns that address distracted driving, speeding, inappropriate use of shoulders, and other behavioral issues.	City of Pflugerville	High-Visibility Cell Phone Enforcement, Enforcement of Impaired Driving Laws, Education
Education + Engineering	Conduct regular reviews of transportation safety best practices among public works staff to identify emerging strategies and policies to implement.	City of Pflugerville	
Engineering	Implement design solutions that first consider protected active transportation infrastructure before compromising for unprotected facilities.	City of Pflugerville	Protected Bicycle Facilities and Intersections



From 2019 through 2023, there were 86 total fatal and serious injury crashes: 16 crashes that resulted in one or more deaths and another 70 crashes that resulted in one or more serious injuries.

Pflugerville, TX

ROLLINGWOOD

TRAVIS COUNTY SAFETY ACTION PLAN

Rollingwood, TX

716

Rollingwood is a city in central Travis County with a population of 1,467 as of the 2020 census. RM 2244 (Bee Caves Road) is the major road passing through Rollingwood, connecting it to Austin and West Lake Hills.

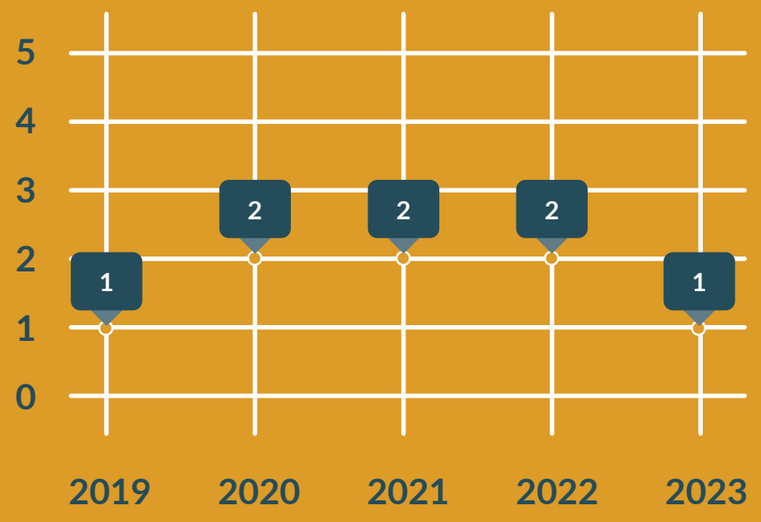
From 2019 through 2023, there were eight total serious injury (A) crashes, and no fatal (K) crashes. These crashes were all located along RM 2244 (Bee Caves Road). Project recommendations for RM 2244 and several other locations are included in the project map and table in this partner jurisdiction plan. Of the eight A crashes, all but one occurred on a weekday. Three of the crashes occurred at intersections, and one crash involved a bicyclist.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- Proposed expansion of RM 2244 (Bee Caves Road) to a five-lane section with center turn lane and shoulders on either side of Eanes Creek, including drainage improvements to reduce flooding

ROLLINGWOOD BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

13.29 MILES

NUMBER OF PED CRASHES

0

TOP PUBLIC COMMENTS

Respondents highlighted Bee Caves Road at Rollingwood Drive as an intersection with safety concerns.

Respondents noted concerns about Eanes Creek flooding onto Bee Caves Road and Edgegrove Drive during heavy rainstorms.

Respondents noted difficulties biking on Rollingwood Drive near the Mopac Expressway.

ROAD MILES WITH SAFETY PROJECTS

3.38 MILES

NUMBER OF BIKE CRASHES

3

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of Rollingwood. For other projects outside the City of Rollingwood, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/Lane Departure	Intersection Safety	Other
1	RM 2244	Rollingwood Dr to Dellana Ln	1.01	TxDOT	67	118	8	0	2	Crosswalk Visibility Enhancements	Enhanced Curve Delineation for Horizontal Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Pavement Friction Management
2	Edgegrove Dr	Rollingwood Dr to RM 2244	0.23	Rollingwood	32	26	0	0	0	Crosswalk Visibility Enhancements	None	None	Backplates with Retroreflective Borders	Local Road Safety Plan
3	Rollingwood Dr	Ewing Cir to Vale St	0.93	Rollingwood	30	8	0	0	0	None	None	Wider Edge Lines	None	Local Road Safety Plan
4	Gentry Dr	Sugar Creek Dr to Rollingwood Dr	0.66	Rollingwood	29	3	0	0	0	None	None	Wider Edge Lines	Roundabouts	Local Road Safety Plan
5	Ewing Cir	Gentry Dr to End	0.56	Rollingwood	23	4	0	0	0	None	None	None	Roundabouts	Local Road Safety Plan

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Evaluation + Engineering	Establish permanent design solutions for safe crossings and access to schools, including dedicated crossing guards at priority crossings.	City of Rollingwood	SRTS Plan, Crosswalk Visibility Enhancements, Pedestrian Hybrid Beacons, Leading Pedestrian Intervals
Engineering	Consider traffic calming solutions to address cut through traffic on local residential streets.	City of Rollingwood	Traffic Calming, Roundabouts and Innovative Intersections
Engineering	Consider low maintenance bicycle facility improvements for increased cyclist safety without substantially increasing maintenance costs of streets.	City of Rollingwood	Bicycle Lanes

SAN LEANNA

TRAVIS COUNTY SAFETY ACTION PLAN



San Leanna, TX

San Leanna is a village in south Travis County with a population of 522 as of the 2020 census. FM 1626 is the major road passing through San Leanna, connecting it to Austin and Manchaca.

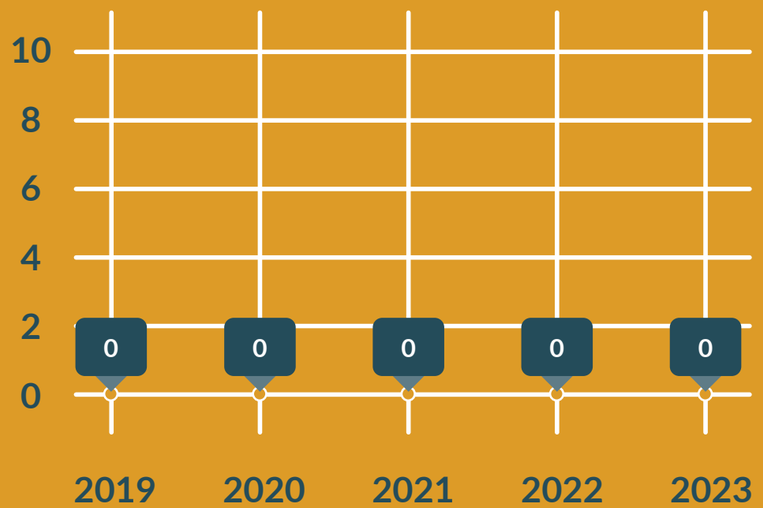
From 2019 through 2023, there were no fatal (K) or serious injury (A) crashes in San Leanna. There were, however, one K and one A crash along FM 1626 immediately adjacent to the San Leanna village boundary, and both were head-on crashes. Therefore, project recommendations for FM 1626 through San Leanna are included in the project map and table in this partner jurisdiction plan.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- No projects are currently planned

SAN LEANNA BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

6.30 MILES

ROAD MILES WITH SAFETY PROJECTS

0.61 MILES

NUMBER OF PED CRASHES

0

NUMBER OF BIKE CRASHES

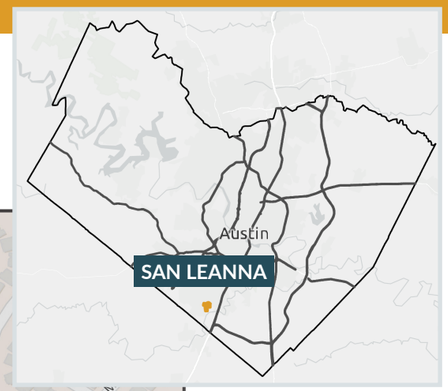
0

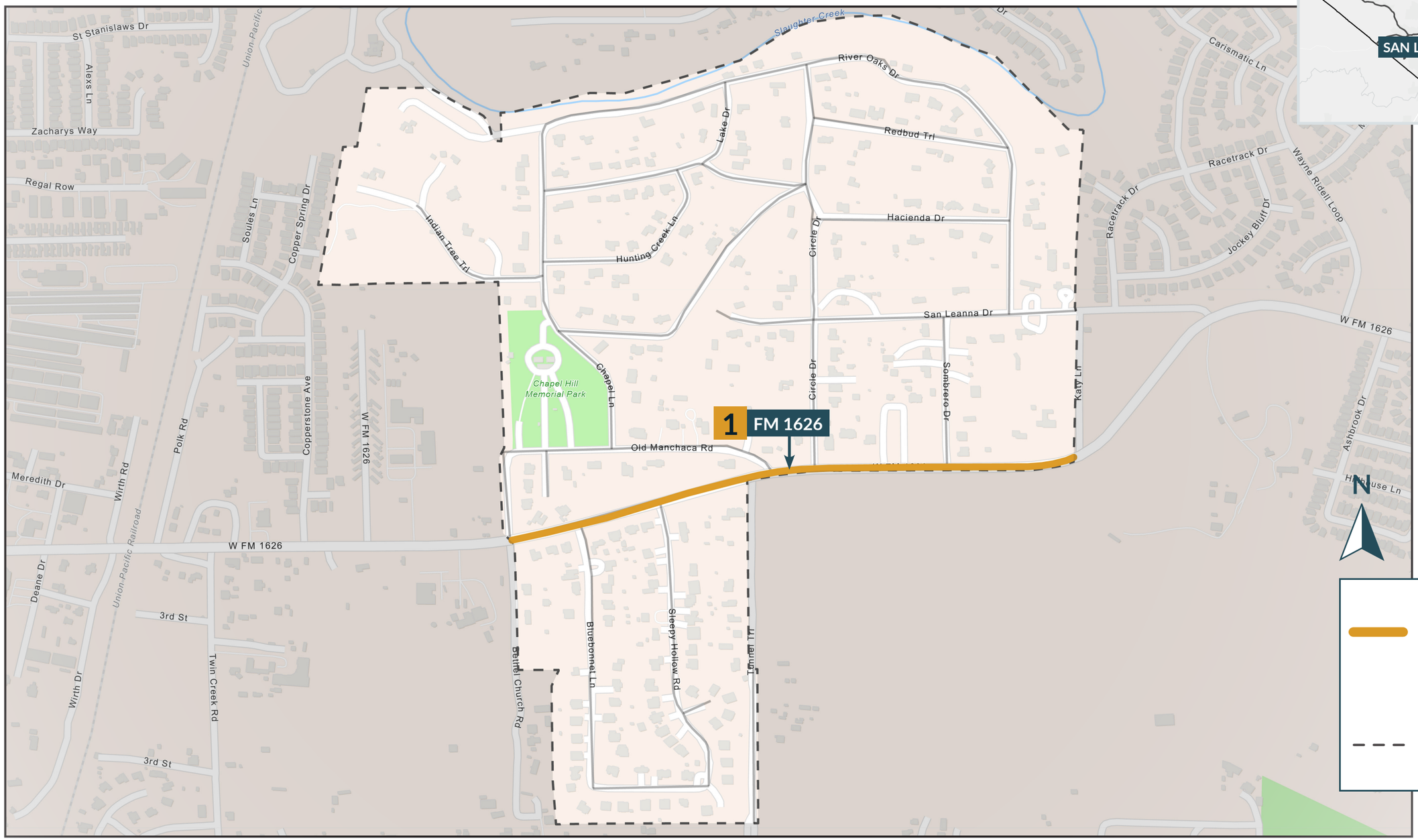
TOP PUBLIC COMMENTS

One respondent described dangerous driving on Menchaca Road and noted bar patrons as hazardous on roads.

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of San Leanna. For other projects outside the City of San Leanna, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/ Pedestrian Safety	Curve Treatment	Roadway/Lane Departure	Intersection Safety	Other
1	FM 1626	Bethel Church Rd to Katy Ln	0.61	TxDOT	35	15	2	0	0	Walkways	Roadside Design Improvements at Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines, Raised Median	Dedicated Left- and Right-Turn Lanes at Intersections	None

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Education	Develop driver education and awareness campaigns that address distracted driving, speeding, inappropriate use of center turn lanes, and other behavioral issues.	Village of San Leanna	High-Visibility Cell Phone Enforcement, Enforcement of Impaired Driving Laws, Education
Evaluation + Engineering	Provide pedestrian improvements for access to nearby facilities from school.	Village of San Leanna	SRTS Plan, Ped Safety Zones, Crosswalk Visibility Enhancements, Pedestrian Hybrid Beacons, Leading Pedestrian Intervals
Engagement + Education	Work with TxDOT to address challenging geometry and inappropriate use of center turn lanes which reduces sight distance and increases access hazards.	Village of San Leanna and TxDOT	Enhanced Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Corridor Access Management, Reduced Left-Turn Conflict Intersections, Pavement Friction Management
Emergency Response	Improve design features at low water crossings to warn drivers of the hazard.	Village of San Leanna and TxDOT	Retroreflective Pavement Markers
Engineering	Consider traffic calming solutions that go beyond speed bumps to address speeding on local residential roads.	Village of San Leanna	Traffic Calming, Roundabouts and Innovative Intersections

VOLENTE

TRAVIS COUNTY SAFETY ACTION PLAN

Volente, TX

Volente is a village in northwestern Travis County with a population of 561 as of the 2020 census. RM 2769 and Lime Creek Road are the major roads passing through Volente, connecting the Village to Austin to the east and Cedar Park to the north.

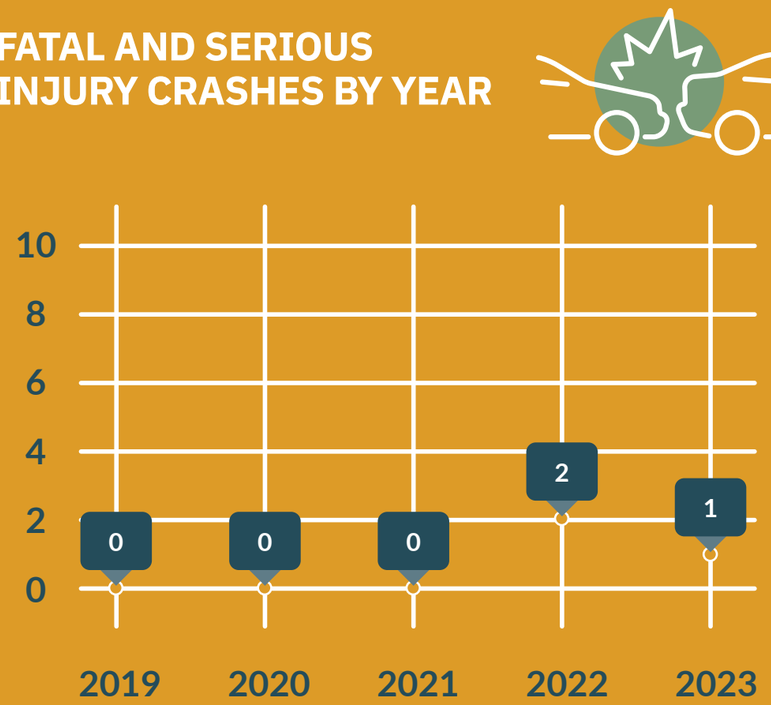
From 2019 through 2023, there were three total serious injury (A) crashes, and no fatal (K) crashes. These crashes were all located along Lime Creek Road. Project recommendations for Lime Creek Road and several other locations are included in the project map and table in this partner jurisdiction plan. Of the three A crashes, all were single vehicle crashes and two involved a motorcycle. Volente recently installed speed tables and other traffic calming devices along Lime Creek Road with the intent of reducing vehicle speeds along the road, especially at curves.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- No projects are currently planned

VOLENTE BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

15.47 MILES

NUMBER OF PED CRASHES

0

TOP PUBLIC COMMENTS

Respondents noted many issues with vehicles speeding and racing along Lime Creek Road.

Respondents also noted challenges with navigating the curves and blind spots along Lime Creek Road safely.

ROAD MILES WITH SAFETY PROJECTS

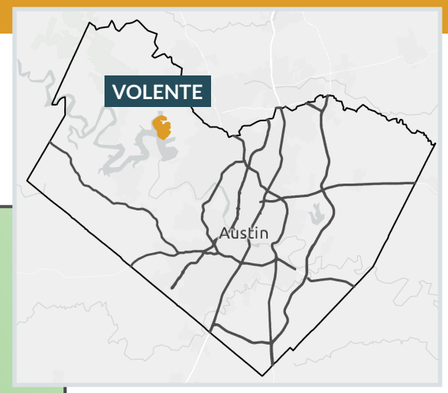
5.15 MILES

NUMBER OF BIKE CRASHES

1

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of Volente. For other projects outside the City of Volente, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/ Lane Departure	Intersection Safety	Other
1	Lime Creek Rd	RM 2769 to City Limits	3.29	Volente	48	55	3	0	1	Crosswalk Visibility Enhancements	Enhanced Curve Delineation for Horizontal Curves, Speed Reduction Pavement Markings	Wider Edge Lines	None	Appropriate Speed Limits for All Road Users, Pavement Friction Management, Local Road Safety Plan
2	RM 2769	Booth Cir to Macks Canyon Rd	1.04	TxDOT	23	12	0	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Wider Edge Lines	None	Appropriate Speed Limits for All Road Users
3	Dodd St/Mary St	Lakeview St to End of Road	0.81	Volente	23	3	0	0	0	Crosswalk Visibility Enhancements, Walkways	None	Wider Edge Lines	None	Local Road Safety Plan

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Evaluation + Education	Coordinate with party boat organizations to encourage carpooling and shuttles to reduce vehicle traffic at high pedestrian crossings.	Village of Volente	
Engineering	Incorporate speed tables and other design solutions for geometrically challenging sections of roadways, particularly in locations where crash incidents are high or where there is a higher rate of pedestrian activity.	Village of Volente	Traffic Calming, Roundabouts and Innovative Intersections
Evaluation + Education	Adopt curb management policies and updated parking lot design standards to manage parking, pedestrian flow, drop-off and pick-ups while reducing conflict points for pedestrians and vehicles.	Village of Volente	Event Traffic Management
Evaluation + Education	Establish a policy for business-related signage to reduce sign clutter and potential distractions to drivers.	Village of Volente	Sign Placement Policy
Engineering	Prioritize the development of protected facilities on high speed or high crash roadways for bicyclists and pedestrians. Where constraints such as right-of-way do not allow for protected facilities provide high visibility design features.	Village of Volente	Protected Bicycle Facilities and Intersections, Crosswalk Visibility Enhancements, Colored Paint
Evaluation	Improve data collection and analysis of safety related metrics such as speeding, crash data, and community concerns.	Village of Volente	Intersection Audits - Video Analytics, Dynamic Speed Display/Feedback Signs, Roadway Safety Audit
Enforcement	Increase enforcement of illegal speeding on Lime Creek Road.	Village of Volente	High-Visibility Enforcement, Dynamic Speed Display/ Feedback Signs, Increasing Penalties

WEST LAKE HILLS

TRAVIS COUNTY SAFETY ACTION PLAN

West Lake Hills, TX

West Lake Hills is a city in central Travis County with a population of 3,444 as of the 2020 census. RM 2244 (Bee Caves Road) is the major road passing through West Lake Hills, connecting it to Austin and Rollingwood.

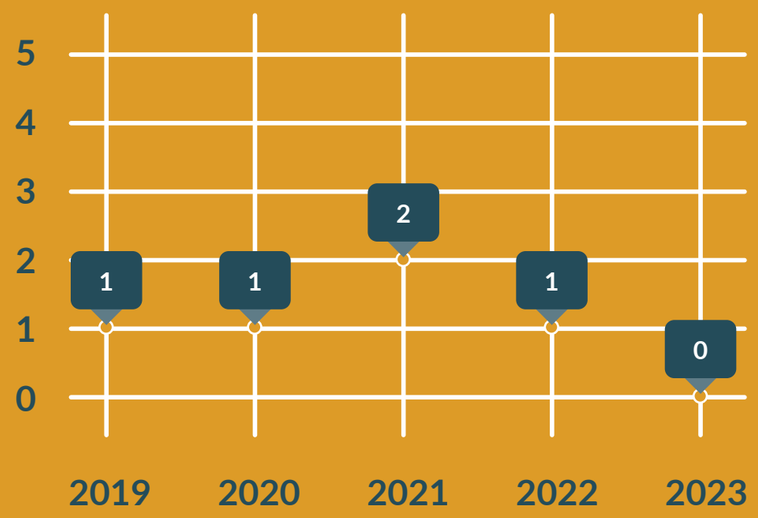
From 2019 through 2023, there were five total fatal and serious injury (KA) crashes: one crash that resulted in one or more deaths and another four crashes that resulted in one or more serious injuries. All but one of these crashes were located along RM 2244 (Bee Caves Road). Project recommendations for RM 2244 and several other locations are included in the project map and table in this partner jurisdiction plan. Of the five KA crashes, two occurred at intersections and two occurred at night. The fatal crash was a nighttime crash at an intersection that resulted in the death of a pedestrian.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- Resurfacing of RM 2244 (Bee Caves Road) with high-friction surface treatment between Loop 360 and Redbud Trail (planned for 2025)

WEST LAKE HILLS BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

38.08 MILES

NUMBER OF PED CRASHES

2

TOP PUBLIC COMMENTS

One respondent requested the County work with TxDOT to increase safety on state roadways for pedestrians and bicyclists.

Respondents highlighted Bee Caves Road at Buckeye Trail as an intersection with safety concerns.

Respondents noted a need for lower speeds and better pedestrian connectivity along Camp Craft Road between Bee Caves Road and SL 360.

ROAD MILES WITH SAFETY PROJECTS

4.83 MILES

NUMBER OF BIKE CRASHES

2

In April of 2025 the City of West Lake Hills reopened public engagement in response to citizens who missed the original rounds of engagement. Respondents noted a need for more pedestrian and bicycle facilities with particular safety concerns on Westlake Dr and Redbud Trail (It is important to note that Redbud Trail is currently maintained by the City of Austin and not the City of West Lake Hills).

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for the City of West Lake Hills. For other projects outside the City of West Lake Hills, please see the County-wide Project Locations Map, page 60.





Partner Jurisdiction HINs are available in Appendix D.

RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/Lane Departure	Intersection Safety	Other
1	Scottish Woods Trl/ Westbank Dr/SL 360	Intersection and Vicinity	0.38	West Lake Hills	65	30	1	0	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Walkways	Roadside Design Improvements at Curves	Wider Edge Lines	Backplates with Retroreflective Borders, Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users, Local Road Safety Plan
2	Yaupon Valley Rd	Redbud Trl to Westlake Dr	1.46	West Lake Hills	54	9	1	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines	None	Lighting, Local Road Safety Plan
3	RM 2244/ Bee Caves Rd	SL 360 to Rollingwood Dr.	2.34	TxDOT	38	224	4	2	5	Bicycle Lanes, Crosswalk Visibility Enhancements, Leading Ped Interval, Walkways	None	Raised Median	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	None
4	Westlake Dr	City Limits to Redbud Trl	1.03	West Lake Hills	27	33	0	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads, Wider Edge Lines	None	Lighting, Pavement Friction Management, Local Road Safety Plan

POLICY NEEDS MATRIX

SAFETY ACTIVITY TYPE	POLICY NEED	RESPONSIBLE PARTIES	RELEVANT BEST PRACTICE COUNTERMEASURES AND DESIGN SOLUTIONS
Engagement	Develop working group to address multijurisdictional intersections and roadway safety issues.	Travis County, cities within, and TxDOT	
Evaluation + Engineering	Establish permanent design solutions for safe crossings and access to schools.	City of West Lake Hills	SRTS Plan, Crosswalk Visibility Enhancements, Pedestrian Hybrid Beacons, Leading Pedestrian Intervals
Evaluation	Improve data collection and analysis of safety related metrics such as speeding, crash data, and community concerns.	City of West Lake Hills	Intersection Audits - Video Analytics, Dynamic Speed Display/Feedback Signs, Roadway Safety Audit
Evaluation + Engineering	Develop improved regional traffic management centers for large events or high demand occurrences.	Combined Transportation and Emergency Communications Center	
Education + Enforcement	Implement policies focused on improving driver behaviors of inexperienced drivers.	City of West Lake Hills	Young Driver countermeasures such as Graduated Drivers' Licensing, Intermediate License Nighttime Restrictions,
Evaluation + Engineering	Establish a process for routinely reviewing nighttime crash data and develop criteria for strategically selecting specific locations, such as hotspot intersections or curves, for illumination or lighting alternatives, such as LED signage and pedestrian level lighting.	City of West Lake Hills	Corridor and Intersection Safety Lighting

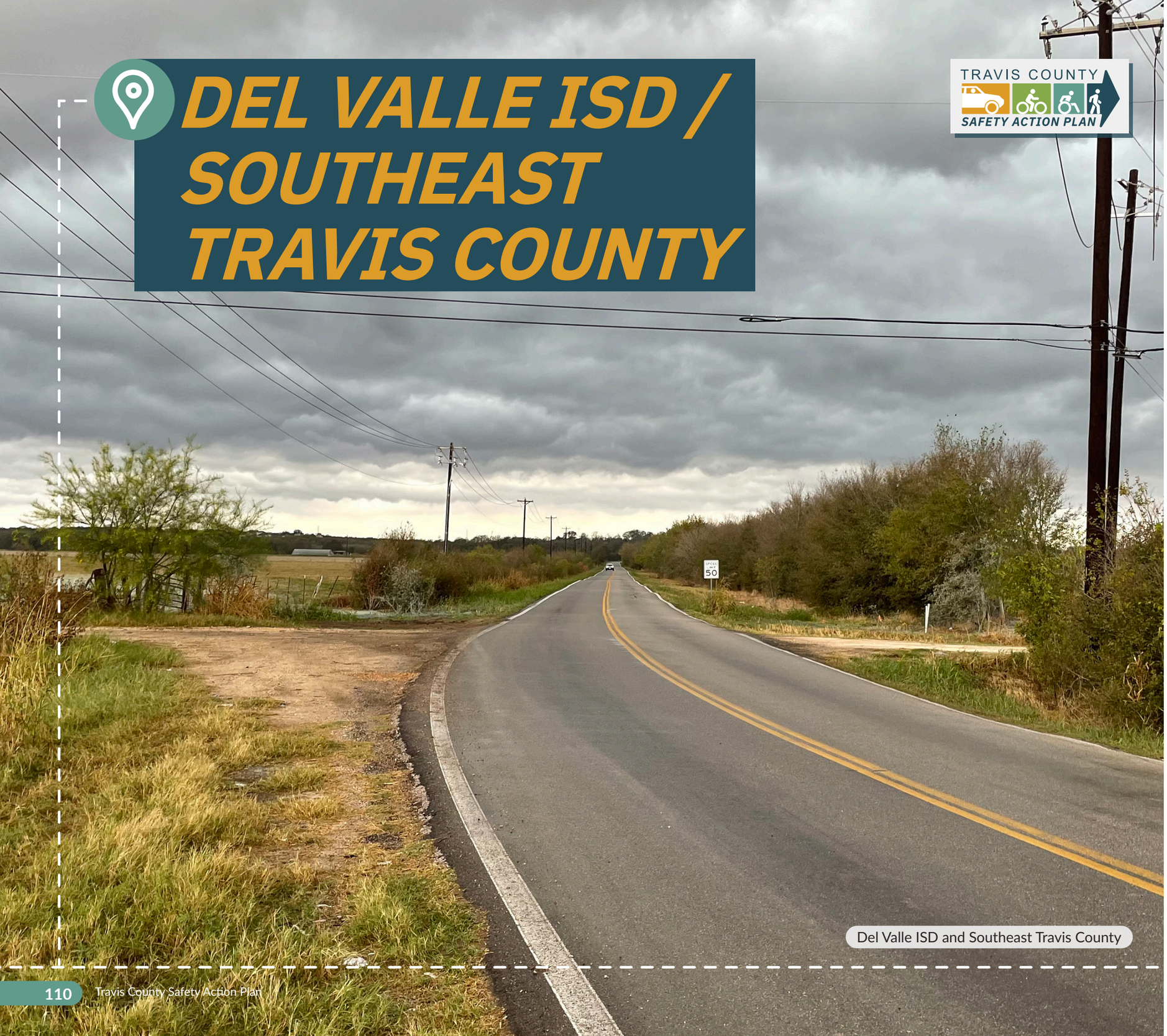




From 2019 through 2023, there were five total fatal and serious injury crashes: one crash that resulted in one or more deaths and another four crashes that resulted in one or more serious injuries.

West Lake Hills, TX

DEL VALLE ISD / SOUTHEAST TRAVIS COUNTY



Del Valle ISD and Southeast Travis County

The Del Valle Independent School District (ISD) is a public school district that serves residents of unincorporated portions of southeast Travis County.

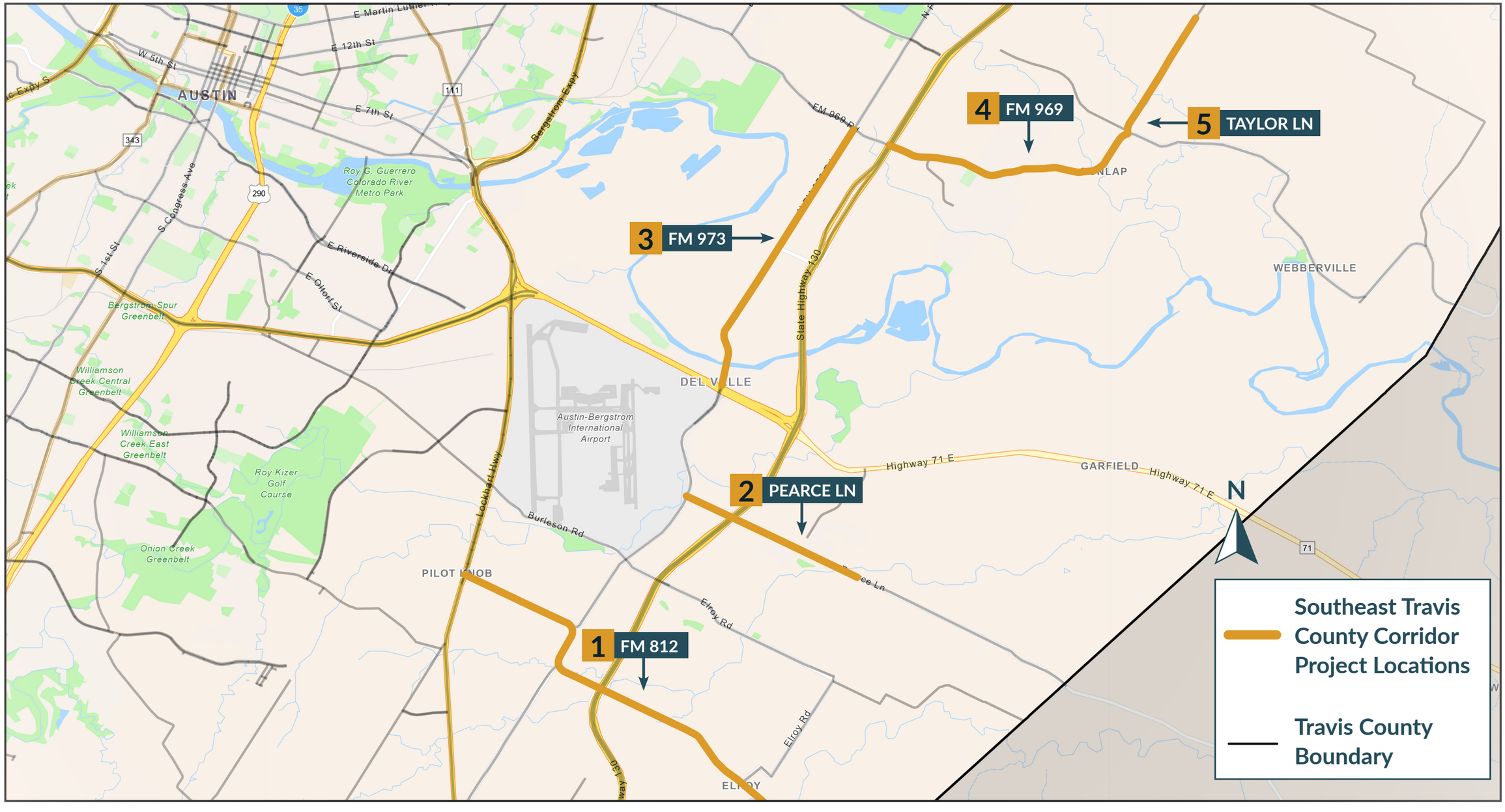
As of fall 2024, the ISD served 11,293 students. Since there were no participating municipalities in southeast Travis County at the time this safety action plan was developed, Del Valle ISD served as a regional stakeholder to communicate roadway safety needs for residents within the ISD service area, which extends as far north as Blake Manor Road, as far west as Pleasant Valley Road in the City of Austin, and to the southern and eastern borders of Travis County.

Key Roadway Improvements that are Currently Planned or Proposed Include:

- FM 973 between SH 71 and FM 969 is currently under construction to expand the roadway to a five-lane cross-section with a center turn lane and road shoulders.
- FM 812 between FM 973 and Circuit of the Americas will receive illumination improvements in the next few years
- FM 812 will expand to a three-lane cross-section in some locations and a five-lane cross section in others, with many portions of the road between US 183 and the Bastrop County line also receiving pedestrian facilities (work planned in three phases from 2027-2030)
- Proposed feasibility study for roadway safety and capacity improvements along FM 969 east of SH 130

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for Del Valle ISD and Southeast Travis County. For other projects outside Del Valle ISD and Southeast Travis County, please see the County-wide Project Locations Map, page 60.



RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/ Lane Departure	Intersection Safety	Other
1	FM 812	US 183 to Doyle Rd	6.93	TxDOT	67	763	55	6	1	Bicycle Lanes, Crosswalk Visibility Enhancements, Leading Ped Interval, Walkways	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves, Speed Reduction Pavement Markings	Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users, Road Safety Audit
2	Pearce Ln	FM 973 to Kellam Rd/Circuit of The Americas Blvd	2.43	Travis County, City of Austin	64	239	14	3	1	Bicycle Lanes, Crosswalk Visibility Enhancements, Leading Ped Interval, Pedestrian Hybrid Beacons, Rectangular Rapid Flashing Beacons, Walkways, Shared Use Path	None	Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Lighting, Local Road Safety Plan
3	FM 973	FM 969 to SH 71	4.11	TxDOT	63	380	18	4	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Walkways, Shared Use Path	None	None	Backplates with Retroreflective Borders, Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users, Lighting
4	FM 969	SH 130 to Taylor Ln	3.36	TxDOT	51	337	13	3	0	Crosswalk Visibility Enhancements, Leading Ped Interval, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Walkways	Enhanced Curve Delineation for Horizontal Curves	Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Backplates with Retroreflective Borders, Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users
5	Taylor Ln	Braker Ln to FM 969	1.88	Travis County	37	27	2	0	0	Bicycle Lanes, Crosswalk Visibility Enhancements, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Pedestrian Hybrid Beacons, Rectangular Rapid Flashing Beacons, Walkways, Shared Use Path	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	None	Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users, Local Road Safety Plan, Road Safety Audit

POLICY NEEDS MATRIX

For policy recommendations for Del Valle ISD and Southeast Travis County, please see County-wide Policy and Process Recommendations section.



Recommended Del Valle ISD projects had consistently high public support during this Plan's public engagement.

UNINCORPORATED TRAVIS COUNTY

Roadway safety project recommendations were developed for ten Travis County roadways throughout unincorporated portions of Travis County as part of the 2024 Travis County Safety Hotspot Study.

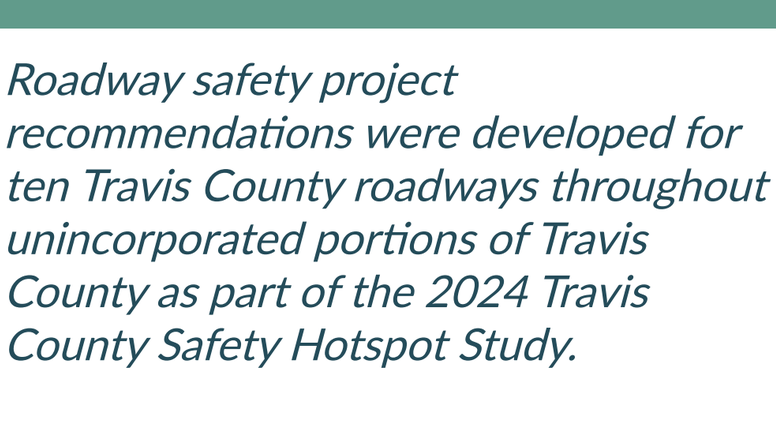
The project locations and recommended countermeasures are included in this section, and the full Hotspot Study report is included in ***Appendix A to the Travis County Safety Action Plan.***

Key Roadway Improvements that are Currently Planned or Proposed Include:

- Dee Gabriel Collins Rd gaurdrail improvement near Cottonmouth School Rd
- Dessau Rd sidewalk gap improvement at Tudor House Rd
- Spicewood Springs Rd low water crossing No. 1 improvements
- Fitzhugh Rd add 4ft shoulder from US 290 W to Long Branch Creek
- Slaughter Ln sidewalk improvement from Old Lockhart Rd to Orchard Ridge. Additional median improvement included at Raines Pass

UNINCORPORATED TRAVIS COUNTY BY THE NUMBERS

FATAL AND SERIOUS INJURY CRASHES BY YEAR



TOTAL ROAD MILES

1390.94 MILES

ROAD MILES WITH SAFETY PROJECTS (INCLUDING SE TRAVIS COUNTY/DEL VALLE)

33.42 MILES

NUMBER OF PED CRASHES

177

NUMBER OF BIKE CRASHES

61

TOP PUBLIC COMMENTS

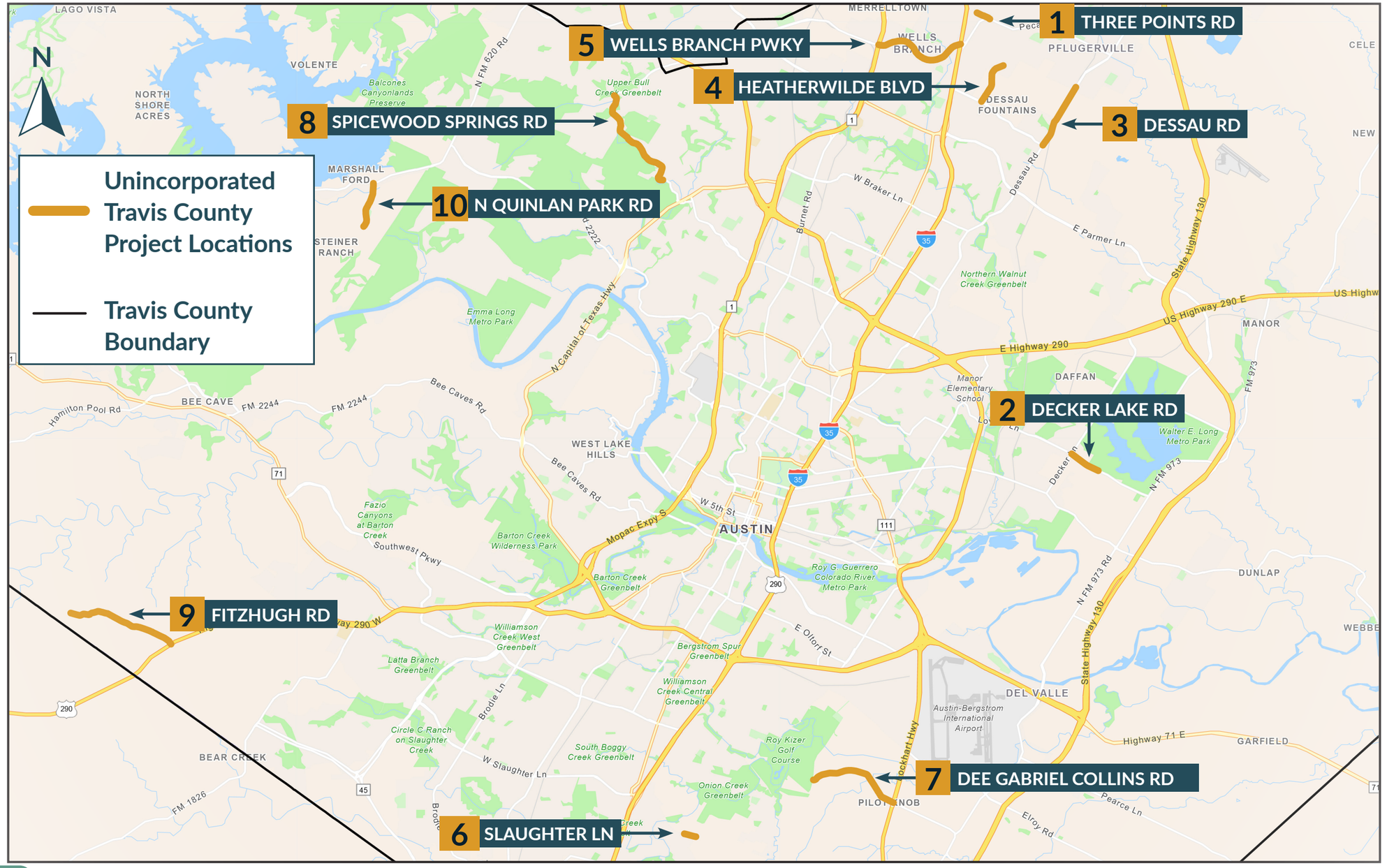
Respondents noted speeding and poor road condition on Wells Branch Pkwy

Respondents noted a need for bicycle and pedestrian facilities on Spicewood Springs Rd to access St Edwards Park. Respondents also noted concerns over low water crossing visibility

Respondents noted bicycle and pedestrian concerns on Decker Lake Rd as well as congestion at the intersection of Decker Lake Rd and Decker Ln

RECOMMENDED PROJECT LOCATIONS

The map below shows recommended project locations for Unincorporated Travis County. For other projects outside of Unincorporated Travis County, please see the County-wide Project Locations Map, page 60.



RECOMMENDED PROJECT INFORMATION

	PROJECT INFO					2019-2023 CRASH DATA BY CRASH TYPE				POTENTIAL IMPROVEMENTS SUMMARY				
	Road Name	Approximate Extents	Corridor Project Length (Miles)	Road Owner	Total Project Score (100 Points Max)	Total Crash Count	KA Count	Ped	Bike	Bicycle/Pedestrian Safety	Curve Treatment	Roadway/ Lane Departure	Intersection Safety	Other
1	Three Points Rd	FS 1825/Vision Dr to FM 1825/West Pecan St	0.32	Travis County	83	79	4	0	0	Shared Use Path	None	None	Corridor Access Management, Dedicated Left- and Right-Turn Lanes at Intersections, Roundabouts	Appropriate Speed Limits for All Road Users
2	Decker Lake Rd	FM 3177/Decker Ln to North Imperial Dr	0.72	Travis County	78	77	7	2	1	Crosswalk Visibility Enhancements, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Shared Use Path	None	Raised Median	None	Lighting
3	Dessau Rd	Wells Branch Pkwy to Howard Ln	1.63	Travis County	68	221	14	2	0	Crosswalk Visibility Enhancements, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas, Walkways	None	Raised Median	Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users, Lighting
4	Heatherwilde Blvd	Wells Branch Pkwy to West Howard Ln	1.09	Travis County	64	144	7	1	1	Crosswalk Visibility Enhancements	None	Raised Median	Backplates with Retroreflective Borders, Corridor Access Management	Appropriate Speed Limits for All Road Users, Lighting
5	Wells Branch Pkwy	Mopac Service Rd to IH 35 Service Rd	2.16	Travis County	55	414	12	7	2	Crosswalk Visibility Enhancements, Medians and Pedestrian Refuge Islands in Urban and Suburban Areas	None	Raised Median	Backplates with Retroreflective Borders, Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users, Road Diet (Roadway Reconfiguration), Lighting
6	Slaughter Ln	Orchard Rdg to Old Lockhart Rd	0.26	Travis County	52	88	2	1	0	Bicycle Lanes, Walkways	None	Raised Median	None	Appropriate Speed Limits for All Road Users, Road Diet (Roadway Reconfiguration), Lighting
7	Dee Gabriel Collins Rd	Mckinney Falls Pkwy to US 183	2.19	Travis County	47	149	6	0	1	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	None	Dedicated Left- and Right-Turn Lanes at Intersections	Appropriate Speed Limits for All Road Users
8	Spicewood Springs Rd	Old Lampasas Trl to Yaupon Dr	2.75	Travis County	47	47	5	1	0	None	Enhanced Curve Delineation for Horizontal Curves	None	None	Lighting
9	Fitzhugh Rd	Long Branch Dr to US 290	2.46	Travis County	46	85	7	0	0	None	Enhanced Curve Delineation for Horizontal Curves, Roadside Design Improvements at Curves	None	Dedicated Left- and Right-Turn Lanes at Intersections	Lighting
10	N Quinlan Park Rd	RM 620 to Portabella Dr	1.13	Travis County	44	69	5	1	0	Crosswalk Visibility Enhancements	None	Raised Median	Backplates with Retroreflective Borders, Dedicated Left- and Right-Turn Lanes at Intersections	None

For policy recommendations for Unincorporated Travis County, please see County-wide Policy and Process Recommendations section.



TRAVIS COUNTY
SAFETY ACTION PLAN

AGENDA ITEM NO. 10b

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Councilor Saum, City Council

SUBJECT: Discussion, consideration, and possible action to approve **Ordinance No. 2025-06-05-05** amending Chapter 1, Article 1.500 Purchasing, Section 1.503 Local Preference Program (LLP) of the Code of Ordinances and receive an initial report from staff on how the program has performed since implementation.

BACKGROUND: This item was postponed from the May 15, 2025 meeting.

The City of Lago Vista adopted a Local Preference Program (LPP) to support local businesses by providing a preference in City procurement processes. The program's intent is to maximize the positive economic impact of City spending by keeping more tax dollars within the local economy, supporting local jobs, and increasing sales tax revenue.

After implementation, staff and Council have identified opportunities to strengthen the LPP. Recent procurement experiences, including emergency purchases and routine bids, have highlighted that the current thresholds and procedures may not always provide a meaningful advantage to local businesses-particularly for smaller contracts or urgent needs.

FINDINGS: The proposed amendments to the LPP are designed to make the program more effective and better aligned with its original goals. The key changes include:

- Sliding Scale Preference:
  Adjusts the local preference thresholds to a sliding scale, providing a higher percentage or flat dollar preference for smaller contracts, ensuring local vendors have a real opportunity to compete for City business.
- Best Value Clause:
  Allows the City to award contracts to local businesses outside the standard thresholds when there is a clear long-term economic benefit to the City, such as increased sales tax revenue, local employment, or community investment.

- Emergency Purchase Preference:
  In emergency situations, gives preference to local vendors who can deliver goods or services more quickly, even at a higher cost, when timely response is critical to public health, safety, or property.
- Local Subcontractor Incentive:
  Encourages or requires non-local prime contractors on larger contracts to use local subcontractors or suppliers, further supporting the local economy.
- Enhanced Outreach and Transparency:
  Directs staff to proactively notify local businesses of procurement opportunities and to publish LPP-related decisions for public transparency.
- Annual Review and Reporting:
  Formalizes and strengthens the requirement for staff to provide an annual report to Council on LPP outcomes, including the number and value of contracts awarded to local businesses and the impact of the program.
  These changes are intended to maximize the economic benefit of City spending, support local job creation, and ensure the LPP is a meaningful tool for local business growth.

FINANCIAL IMPACT: Potential for increased local sales tax revenue and local economic activity. Some contracts may have a slightly higher cost in exchange for local preference, but the overall economic benefit is expected to outweigh these costs.

ATTACHMENTS:
Sec. 1.503 Local Preference Program Amendments.docx
Sec. 1.503 Local Preference Program (clean).docx
Ord No. 2025-06-05-05 REDLINE.docx

Sec. 1.503 Local Preference Program (Amended)

Declaration of Policy

(unchanged)

Definitions

(unchanged)

Purchases of Professional Services

(unchanged)

Purchases of Non-Professional Services and Personal Property

(d) Sliding Scale for Local Preference

1. For purchases of personal property or non-professional services:
    - $10,000 to under $50,000: If the city receives one or more bids/quotes from a local business and the bid/quote is within 10% or $3,000 (whichever is greater) of the lowest non-local bid/quote, the city shall enter into a contract with the local business.
    - $50,000 to under $100,000: If the city receives one or more bids from a local business and the bid is within 5% or $5,000 (whichever is greater) of the lowest non-local bid, the city shall enter into a contract with the local business.
    - $100,000 to under $500,000: If the city receives one or more bids from a local business and the bid is within 5% of the lowest non-local bid, the city shall enter into a contract with the local business.
    - $500,000 or more: If the city receives one or more bids from a local business and the bid is within 3% of the lowest non-local bid, the city shall enter into a contract with the local business.
2. This section does not apply to construction services contracts over $100,000.

(e) Best Value Determination

Notwithstanding the provisions above, the City Council or City Manager may award a contract to a local business outside the specified thresholds when it is determined in writing that the local business offers the municipality the best combination of contract price and additional economic development opportunities for the City created by the contract award, including but not limited to:

- The employment of residents of the City,
- Increased sales or property tax revenues to the City,
- Local supply chain benefits,
- Community investment, or
- Other long-term economic benefits.

Such determination shall be documented in the contract file, and the economic benefit analysis shall be included in the annual report to Council.

(f) Emergency Purchases – Local Vendor Priority

In emergency situations, as defined by state law or city policy, where immediate procurement of goods or services is required to protect public health, safety, or property, the City Manager or their designee may waive standard competitive bidding procedures to expedite the process. In such cases, a local business shall be given preference if they can provide the required goods or services within the necessary timeframe, even if their price is higher than a non-local vendor, provided the price is deemed reasonable

and the local vendor meets all other requirements. A written justification for the emergency purchase, including the preference given to the local vendor, shall be documented and reported to the City Council within 30 days.

(g) Local Subcontractor Incentive

For contracts exceeding $100,000, the City shall encourage or require non-local prime contractors to utilize local subcontractors or suppliers when feasible. The City may include evaluation points for bids or proposals that demonstrate a meaningful commitment to local subcontracting.

(h) Local Business Outreach

(1) The City Manager shall develop and implement a proactive outreach program to notify local businesses of upcoming procurement opportunities, including but not limited to:

i. Maintaining a voluntary registry of local vendors who wish to receive notifications of upcoming procurement opportunities,

ii. Hosting annual procurement workshops,

iii. Providing technical assistance for bid preparation.

(2) Registered local vendors will receive electronic notification of new solicitations at the same time as public posting, in accordance with state law. The City will make reasonable efforts to ensure local vendors are aware of and able to participate in all relevant procurement opportunities.

(F) Annual Review and Reporting

The City Manager shall submit an annual report to the City Council summarizing:

- The number and dollar value of contracts awarded to local businesses,
- Instances where the best value clause or emergency preference was invoked,
- The impact of the LPP on local economic development,
- Recommendations for further improvements.

(i) Transparency and Appeals

All LPP-related decisions, including use of the best value and emergency preference clauses, shall be published on the City's website for public transparency. Any local business not selected under this program may request a debriefing or submit a written appeal to the City Manager within fifteen (15) calendar days of award notification.

(j) Joint Venture Preference

For purposes of this section, when a bidder or respondent is a joint venture, each joint venture partner must meet the definition of a local business to be eligible for the preference described in this section. The City may award additional preference points for joint ventures where a local business holds at least 30% of the contract value and plays a substantial role in contract performance.

(k) Prompt Payment to Local Subcontractors

Prime contractors awarded contracts under this program shall pay local subcontractors within fifteen (15) days of receipt of payment from the City.

(l) Exceptions, Suspension, and Enforcement

(1) The City Manager or their designee shall produce annual reports each January:

i. The number and dollar value of contracts awarded to local businesses,
ii. Instances where the best value clause or emergency preference was invoked,

iii. The impact of the LPP on local economic development,
iv. The names of businesses that were procured through the program,
v. The total number of local businesses that were considered during procurements,
vi. How many times local businesses were not chosen and the reasoning,
vii. Recommendations for further improvements.

Table: Local Preference Sliding Scale

Contract Amount	Local Preference Threshold
$10,000–$50,000	10% or $3,000 (whichever is greater)
$50,000–$100,000	5% or $5,000 (whichever is greater)
$100,000–$500,000	5%
$500,000+	3%

Sec. 1.503 Local Preference Program

(a) Declaration of Policy

(1) It is the policy of the City of Lago Vista to use its spending powers to promote fiscal responsibility and maximize the amount of resident tax dollars that remain in the local economy for the benefits of its citizens by utilizing all available legal opportunities to contract with local businesses.

(2) It is the policy of the city to afford a bidding preference to local businesses, unless prohibited by granting agencies, exempted by federal or state laws/codes, local ordinances or city resolutions, or if doing so would be clearly disadvantageous to the city.

(3) It is the policy of the city to achieve the policy goal to support local business by utilizing a local business purchasing preference in the competitive and noncompetitive processes of procuring goods and services when those goods and services are available by a local business.

(4) Nothing in this article may be construed to require the city to enter into a contract with a bidder that is not a responsible bidder nor is the City required to find a local business if one is not available for that good or service.

(5) Except as provided by this article, Local Preference Program, the city's procurement shall otherwise remain unchanged.

(b) Definitions: The following words and phrases, when used in this article, have the meanings provided in this section:

(1) *Bid* means any response to a procurement issued by the City for nonprofessional services or for the purchase of personal property not affixed to real property.

(2) *Headquartered* means the place where a business entity's officers direct, control and coordinate the entity's activities.

(3) *Joint venture* means a collaboration of business entities, in response to a solicitation, which is manifested by a written agreement between two (2) or more independently owned and controlled business entities to form a third business entity solely for the purposes of undertaking distinct roles and responsibilities in the completion of a given contract. Under this business arrangement, each joint venture partner shares in the management of the joint venture and also shares in the profits or losses of the joint venture enterprise commensurately with its contribution to the venture.

(4) *Local business* means a business with a principal place of business within the incorporated limits of the City.

(5) *Managing department* means the department managing the procurement for a contract.

(6) *Principal place of business* means (1) a business headquartered for one (1) year or more in the incorporated limits of the city; or (2) a business having an established place or places of business in the incorporated limits of the city from which at least ten (10) of its employees or at least twenty (20) percent of its total number of full-time, part-time and contract employees are regularly based, and from which a substantial role in the business' performance of a service, retail or commercially useful function or a substantial part of its operations is conducted by those employees. A location utilized solely as a post office box, mail drop or telephone message center or any similar combination, with no other substantial work function, is not a principal place of business.

(c) Purchases of Professional Services

(1) In procuring professional services under this Article or Texas Government Code, § 2254.004, or its successor, the managing department may, when appropriate, award a predetermined number of additional points to a respondent based upon knowledge of, and experience regarding local conditions as part of the qualifications determination.

(2) In procuring professional services not governed by statute, the managing department may, when appropriate, award more points to a respondent that is a local business headquartered within the incorporated limits of the city, or half of the points awarded to a headquartered business to a respondent that is a local business not headquartered within the incorporated limits of the city.

(d) Purchases of Non-Professional Services and Personal Property

(1) Sliding Scale Local Preference: For purchases of personal property or non-professional services:

i. $10,000 to under $50,000: If the city receives one or more bids/quotes from a local business and the bid/quote is within 10% or $3,000 (whichever is greater) of the lowest non-local bid/quote, the city shall enter into a contract with the local business.

ii. $50,000 to under $100,000: If the city receives one or more bids from a local business and the bid is within 5% or $5,000 (whichever is greater) of the lowest non-local bid, the city shall enter into a contract with the local business.

iii. $100,000 to under $500,000: If the city receives one or more bids from a local business and the bid is within 5% of the lowest non-local bid, the city shall enter into a contract with the local business.

iv. $500,000 or more: If the city receives one or more bids from a local business and the bid is within 3% of the lowest non-local bid, the city shall enter into a contract with the local business.

(2) This section does not apply to construction services contracts over $100,000.

(e) Best Value Determination:

(1) Notwithstanding the provisions above, the City Council or City Manager may award a contract to a local business outside the specified thresholds when it is determined in writing that the local business offers the municipality the best combination of contract price and additional economic development opportunities for the City created by the contract award, including but not limited to:

i. The employment of residents of the City,
ii. Increased sales or property tax revenues to the City,
iii. Local supply chain benefits,
iv. Community investment, or
v. Other long-term economic benefits.

(2) Such determination shall be documented in the contract file, and the economic benefit analysis shall be included in the annual report to Council.

(f) Emergency Purchases – Local Vendor Priority

(1) In emergency situations, as defined by state law or city policy, where immediate procurement of goods or services is required to protect public health, safety, or property, the City Manager or their designee may waive standard competitive bidding procedures to expedite the process. In such cases, a local business shall be given preference if they can provide the required goods or services within the necessary timeframe, even if their price is higher than a non-local vendor, provided the price is deemed reasonable and the local vendor meets all other requirements. A written justification for the emergency purchase, including the preference given to the local vendor, shall be documented and reported to the City Council within 30 days.

(g) Local Subcontractor Incentive

(1) For contracts exceeding $100,000, the City shall encourage or require non-local prime contractors to utilize local subcontractors or suppliers when feasible. The City may include evaluation points for bids or proposals that demonstrate a meaningful commitment to local subcontracting.

(h) Local Business Outreach

(1) The City Manager, or their designee, shall develop and implement a proactive outreach program to notify local businesses of upcoming procurement opportunities, including but not limited to:

i. Maintaining a voluntary registry of local vendors who wish to receive notifications of upcoming procurement opportunities,
ii. Hosting annual procurement workshops,
iii. Providing technical assistance for bid preparation.

(2) Registered local vendors will receive electronic notification of new solicitations at the same time as public posting, in accordance with state law. The City will make reasonable efforts to ensure local vendors are aware of and able to participate in all relevant procurement opportunities.

(i) Transparency and Appeals

(1) All Local Preference Program-related decisions, including use of the best value and emergency preference clauses, shall be published on the City's website for public transparency. Any local business not selected under this program may request a debriefing or submit a written appeal to the City Manager within fifteen (15) calendar days of award notification.

(j) Joint Venture Preference

(1) For purposes of this section, when a bidder or respondent is a joint venture, each joint venture partner must meet the definition of a local business to be eligible for the preference described in this section.

(2) The City may award additional preference points for joint ventures where a local business holds at least 30% of the contract value and plays a substantial role in contract performance.

(k) Prompt Payment to Local Subcontractors

(1) Prime contractors awarded contracts under this program shall pay local subcontractors within fifteen (15) days of receipt of payment from the City.

(l) Exceptions: This Section 1.503 does not:

(1) apply to any contract funded in whole or in part by the federal government or where the city acts as a conduit for federal money.

(2) apply to contracts where the City Manager, managing department or city council has determined that it would not be in the best interest of the city.

(3) apply to contracts for federal or state lobbying services.

(4) apply to purchases made through a purchasing cooperative program.

(5) prohibit the City from rejecting all bids.

(6) in accordance with Local Government Code, § 271.0951, apply to the purchase of telecommunications services or information services, as those terms are defined by 47 U.S.C.A. Section 153.

(m) Suspension or Expulsion from the Program for Cause and Appeals Process

(1) Any local business may be suspended or expelled from the local preference program for cause by the City Manager for violations of federal, state, or local ordinance, rule, or regulation (including but not

limited to the City's Purchasing Policies and Procedures) related to a procurement made through the program.

(2) A determination by the City Manager that a suspension or expulsion from the program of a local business is warranted shall be written and include a list of all documented violations and any additional basis for the action taken. This written determination shall be forwarded to the local business by certified mail with a return receipt requested. If the delivery fails or is refused, the notice shall be deemed to have occurred on the date of the delivery attempt certified by the USPS. The required mailing may be waived by the local business pending a willingness to provide a signed copy of the written determination acknowledging its receipt.

(3) The determination by the City Manager that a suspension or expulsion from the program is warranted can be appealed to the City Council based on an alleged error or erroneous conclusion. The appeal shall consist of a formal letter to the Mayor alleging the specific errors made. The right to appeal the determination regarding a suspension or expulsion expires fifteen (15) calendar days following receipt of the written notice, or the next official business day of the City when the City offices are closed. Following this deadline, the suspension or revocation becomes final.

(n) Responsibilities and Enforcement

(1) The City shall be responsible for establishing the documentation necessary to establish a principal place of business in the city. Any entity claiming to be a local business shall submit to the city a form promulgated by the City Manager or their designee attested to by a duly authorized representative of the business. The City Manager or their designee shall make the final determination as to whether a business is a local business.

(2) The City Manager or their designee is directed to provide written guidance to departments, through the City's Purchasing Policies and Procedures upon implementation of this article and shall provide interpretative guidance and criteria related to joint ventures seeking preferences under this program to ensure uniform application that meets the intent of this article. The submission of documentation by a business entity that is required to establish a principal place of business, or to demonstrate the existence of and participation in a joint venture, that is found to contain false information is grounds for exclusion from the program.

(3) The City Manager or their designee shall produce annual reports each January:

i. The number and dollar value of contracts awarded to local businesses,

ii. Instances where the best value clause or emergency preference was invoked,
iii. The impact of the LPP on local economic development,
iv. The names of businesses that were procured through the program,
v. The total number of local businesses that were considered during procurements,
vi. How many times local businesses were not chosen and the reasoning,
vii. Recommendations for further improvements.

Table: Local Preference Sliding Scale

Contract Amount	Local Preference Threshold
$10,000–$50,000	10% or $3,000 (whichever is greater)
$50,000–$100,000	5% or $5,000 (whichever is greater)
$100,000–$500,000	5%
$500,000+	3%

~~Sec.1.503.Local.Preference.Program~~¶

Sec.·1.503·Local·Preference·Program¶

~~1.~~(a) → Declaration·of·~~policy~~Policy¶

~~1.~~(1) → It·is·the·policy·of·the·City·of·Lago·Vista·to·use·its·spending·powers·to·promote·fiscal·responsibility·and·maximize·the·amount·of·resident·tax·dollars·that·remain·in·the·local·economy·for·the·benefits·of·its·citizens·by·utilizing·all·available·legal·opportunities·to·contract·with·local·businesses.·¶

~~2.~~(2) → It·is·the·policy·of·the·city·to·afford·a·bidding·preference·to·local·businesses,·unless·prohibited·by·granting·agencies,·exempted·by·federal·or·state·laws/codes,·local·ordinances·or·city·resolutions,·or·if·doing·so·would·be·clearly·disadvantageous·to·the·city.·¶

~~3.~~(3) → It·is·the·policy·of·the·city·to·achieve·the·policy·goal·to·support·local·business·by·utilizing·a·local·business·purchasing·preference·in·the·competitive·and·noncompetitive·processes·of·procuring·goods·and·services·when·those·~~good~~goods·and·services·are·available·by·a·local·business.·¶

~~4.~~(4) → Nothing·in·this·article·may·be·construed·to·require·the·city·to·enter·into·a·contract·with·a·bidder·that·is·not·a·responsible·bidder·nor·is·the·City·required·to·find·a·local·business·if·one·is·not·available·for·that·good·or·service.·¶

~~5.~~(5) → Except·as·provided·by·this·article,·Local·Preference·Program,·the·city's·procurement·shall·otherwise·remain·unchanged.¶

~~2.~~(b) → Definitions:·The·following·words·and·phrases,·when·used·in·this·article,·have·the·meanings·provided·in·this·section:¶

~~1.~~(1) → *Bid*~~"~~means·any·response·to·a·procurement·issued·by·the·City·for·~~non-professional~~nonprofessional·services·or·for·the·purchase·of·personal·property·not·affixed·to·real·property.¶

~~2.~~(2) → *Headquartered*~~"~~means·the·place·where·a·business·entity's·officers·direct,·control·and·coordinate·the·entity's·activities.¶

~~3.~~(3) → *Joint·venture*~~"~~means·a·collaboration·of·business·entities,·in·response·to·a·solicitation,·which·is·manifested·by·a·written·agreement·between·two·(2)·or·more·independently·owned·and·controlled·business·entities·to·form·a·third·business·entity·solely·for·the·purposes·of·undertaking·distinct·roles·and·responsibilities·in·the·completion·of·a·given·contract.·Under·this·business·arrangement,·each·joint·venture·partner·shares·in·the·management·of·the·joint·venture·and·also·shares·in·the·profits·or·losses·of·the·joint·venture·enterprise·commensurately·with·its·contribution·to·the·venture.¶

~~4.~~(4) → *Local business* ~~"~~means a business with a principal place of business within the incorporated limits of the City.¶

~~5.~~(5) → *Managing department* ~~"~~means the department managing the procurement for a contract.¶

~~6.~~(6) → *Principal place of business* ~~"~~means (1) a business headquartered for one (1) year or more in the incorporated limits of the city; or (2) a business having an established place or places of business in the incorporated limits of the city from which at least ten (10) of its employees or at least twenty (20) percent of its total number of full-time, part-time and contract employees are regularly based, and from which a substantial role in the business' performance of a service, retail or commercially useful function or a substantial part of its operations is conducted by those employees. A location utilized solely as a post office box, mail drop or telephone message center or any similar combination, with no other substantial work function, is not a principal place of business.¶

~~3.~~(c) → Purchases of ~~professional services~~Professional Services¶

~~1.~~(1) → In procuring professional services under this Article or Texas Government Code, § 2254.004, or its successor, the managing department may, when appropriate, award a predetermined number of additional points to a respondent based upon knowledge of, and experience regarding local conditions as part of the qualifications determination. ¶

~~2.~~(2) → In procuring professional services not governed by statute, the managing department may, when appropriate, award more points to a respondent that is a local business headquartered within the incorporated limits of the city, or half of the points awarded to a headquartered business to a respondent that is a local business not headquartered within the incorporated limits of the city.¶

~~4.~~(d) → Purchases of ~~non-professional services between fifty thousand ($50,000)~~Non-Professional Services and ~~under five hundred thousand ($500,000) dollars.~~Personal Property¶

~~1. → In procuring non-professional services that require an expenditure of fifty thousand dollars ($50,000.00) to under five hundred thousand dollars ($500,000.00), if the city receives one (1) or more bids from a bidder that is a local business and whose bid is within five (5) percent of the lowest bid price received by the city, in the event of competitive, sealed bids, from a bidder who is not a local business, the city shall enter into a contract with the bidder~~

~~that is a local business. This section does not apply to construction services contracts over one hundred thousand dollars ($100,000).~~ ¶

~~5.~~(1) → ~~Purchases~~ Sliding Scale Local Preference: For purchases of personal property ~~that is not affixed to real property~~ or non-professional services: ¶

i. → ~~In purchasing any personal property that is not affixed to real property that requires an expenditure of ten thousand dollars ($$~~10,000~~)~~ to under ~~fifty thousand dollars ($$~~50,000~~), if:~~ ¶If the city receives one ~~(1)~~ or more bids/quotes from a ~~vendor that is a~~ local business and ~~whose~~ the bid/quote is within ~~three (~~10% or $3~~) percent~~ ,000 (whichever is greater) of the lowest non-local bid/quote ~~from a vendor that is not a~~, the city shall enter into a contract with the local business. ¶

~~1.~~ii. → $50,000 to under $100,000: ¶If the city receives one or more bids from a local business and the bid is within 5% or $5,000 (whichever is greater) of the lowest non-local bid, the city shall enter into a contract with the local business. ¶

~~2.~~iii. → ~~In purchasing any personal property that is not affixed to real property that requires an expenditure of fifty thousand dollars ($50~~$100,000~~.00)~~ to under ~~five hundred thousand dollars ($$~~500,000~~.00), if:~~ ¶If the city receives one ~~(1)~~ or more bids from a ~~bidder that is a~~ local business and ~~whose~~ the bid is within ~~five (~~5~~) percent %~~ of the lowest ~~bid price received by the city from a bidder who is not a~~ non-local ~~business~~ bid, the city shall enter into a contract with the ~~bidder that is a~~ local business. ¶

iv. → ~~In purchasing any personal property that is not affixed to real property that requires an expenditure of five hundred thousand dollars ($500,000.00)~~ $500,000 or more, ~~if:~~ ¶If the city receives one ~~(1)~~ or more bids from a ~~bidder that is a~~ local business and ~~whose~~ the bid is within ~~three (~~3~~) percent %~~ of the lowest ~~bid~~ non-local bid, the city shall enter into a contract with the local business. ¶

(2) This section does not apply to construction services contracts over $100,000. ¶

(e) Best Value Determination: ¶

(1) Notwithstanding the provisions above, the City Council or City Manager may award a contract to a local business outside the specified thresholds when it is determined in writing that the local business offers the municipality the best combination of contract price and additional economic development

opportunities for the City created by the contract award, including but not limited to:¶

i. The employment of residents of the City,¶

ii. Increased sales or property tax revenues to the City,¶

iii. Local supply chain benefits,¶

iv. Community investment, or¶

v. Other long-term economic benefits.¶

(2) Such determination shall be documented in the contract file, and the economic benefit analysis shall be included in the annual report to Council.¶

(f) Emergency Purchases—Local Vendor Priority¶

(1) In emergency situations, as defined by state law or city policy, where immediate procurement of goods or services is required to protect public health, safety, or property, the City Manager or their designee may waive standard competitive bidding procedures to expedite the process. In such cases, a local business shall be given preference if they can provide the required goods or services within the necessary timeframe, even if their price is higher than a non-local vendor, provided the price ~~received by the city from a bidder who is not~~ is deemed reasonable and the local vendor meets all other requirements. A written justification for the emergency purchase, including the preference given to the local vendor, shall be documented and reported to the City Council within 30 days.¶

(g) Local Subcontractor Incentive¶

(1) For contracts exceeding $100,000, the City shall encourage or require non-local prime contractors to utilize local subcontractors or suppliers when feasible. The City may include evaluation points for bids or proposals that demonstrate a meaningful commitment to local subcontracting.¶

(h) Local Business Outreach¶

(1) The City Manager, or their designee, shall develop and implement a proactive outreach program to notify local businesses of upcoming procurement opportunities, including but not limited to:¶

i. Maintaining a voluntary registry of local vendors who wish to receive notifications of upcoming procurement opportunities,¶

ii. Hosting annual procurement workshops,¶

iii. Providing technical assistance for bid preparation.¶

(2) Registered local vendors will receive electronic notification of new solicitations at the same time as public posting, in accordance with state law. The City will make reasonable efforts to ensure local vendors are aware of and able to participate in all relevant procurement opportunities.¶

(i) → Transparency and Appeals ¶

(1) » All Local Preference Program-related decisions, including use of the best value and emergency preference clauses, shall be published on the City's website for public transparency. Any local business not selected under this program may request a debriefing or submit a written appeal to the City Manager within fifteen (15) calendar days of award notification. ¶

(j) → Joint Venture Preference ¶

(1) » For purposes of this section, when a bidder or respondent is a joint venture, each joint venture partner must meet the definition of a local business, ~~the city shall enter into~~ to be eligible for the preference described in this section. ¶

~~3.~~(2) → The City may award additional preference points for joint ventures where a ~~contract with the bidder that is a local business~~ local business holds at least 30% of the contract value and plays a substantial role in contract performance. ¶

(k) » Prompt Payment to Local Subcontractors ¶

(1) » Prime contractors awarded contracts under this program shall pay local subcontractors within fifteen (15) days of receipt of payment from the City. ¶

~~6.~~(l) → Exceptions: This Section 1.503 does not: ¶

~~1.~~(1) → apply to any contract funded in whole or in part by the federal government or where the city acts as a conduit for federal money. ¶

~~2.~~(2) → apply to contracts where the City Manager, managing department or city council has determined that it would not be in the best interest of the city. ¶

~~3.~~(3) → apply to contracts for federal or state lobbying services. ¶

~~4.~~(4) → apply to purchases made through a purchasing cooperative program. ¶

~~5.~~(5) → prohibit the City from rejecting all bids. ¶

~~6.~~(6) → in accordance with Local Government Code, § 271.0951, apply to the purchase of telecommunications services or information services, as those terms are defined by 47 U.S.C.A. Section 153. ¶

~~7.~~(m) → Suspension or Expulsion from the Program for Cause and Appeals Process ¶

~~1.~~(1) → Any local business may be suspended or expelled from the local preference program for cause by the City Manager for violations of federal, state, or local ordinance, rule, or regulation (including but not limited to the City's Purchasing Policies and Procedures) related to a procurement made through the program. ¶

~~2.~~(2) → A determination by the City Manager that a suspension or expulsion from the program of a local business is warranted shall be written and include a list of all documented violations and any additional basis for the

action taken. This written determination shall be forwarded to the local business by certified mail with a return receipt requested. If the delivery fails or is refused, the notice shall be deemed to have occurred on the date of the delivery attempt certified by the USPS. The required mailing may be waived by the local business pending a willingness to provide a signed copy of the written determination acknowledging its receipt. ¶

~~3.~~(3) → The determination by the City Manager that a suspension or expulsion from the program is warranted can be appealed to the City Council based on an alleged error or erroneous conclusion. The appeal shall consist of a formal letter to the Mayor alleging the specific errors made. The right to appeal the determination regarding a suspension or expulsion expires fifteen (15) calendar days following receipt of the written notice, or the next official business day of the City when the City offices are closed. Following this deadline, the suspension or revocation becomes final. ¶

~~8.~~(n) → Responsibilities and ~~enforcement~~Enforcement ¶

~~1.~~(1) → The City shall be responsible for establishing the documentation necessary to establish a principal place of business in the city. Any entity claiming to be a local business shall submit to the city a form promulgated by the City Manager or their designee attested to by a duly authorized representative of the business. The City Manager or their designee shall make the final determination as to whether a business is a local business. ¶

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~~3.~~(2) → The submission of documentation by a business entity that is required to establish a principal place of business, or to demonstrate the existence of and participation in a joint venture, that is found to contain false information is grounds for exclusion from the program. ¶

(3)→The City Manager or their designee shall produce annual reports~~,~~ ~~summarizing the~~ each January: ¶

i.→The number and dollar ~~amount~~value of ~~procurements~~contracts awarded to local businesses ~~under this program, the~~, ¶

ii.→Instances where the best value clause or emergency preference was invoked, ¶

iii.→The impact of the LPP on local economic development, ¶

iv. The names of ~~the~~ businesses that were procured through the program ~~and the~~,¶

v. The total number of local businesses that were considered during procurements ~~and how~~,¶

~~4.~~vi. How many ~~times local businesses~~ were not chosen ~~and the~~ reasoning.¶

~~5. To award a contract to a bidder who is not the lowest bidder under this Section 1.503, the City Council must determine, in writing, that the local business offers the municipality the best combination of contract price and additional economic development opportunities for the City created by the contract award, including the employment of residents of the City and increased tax revenues to the City.~~ ¶

~~6. For purposes of this section 1.503, when a bidder or respondent is a joint venture, each joint venture partner must meet the definition of a local business to be eligible for the preference described in that section.~~ ¶

¶

~~HISTORY~~

~~*Adopted by Ord. 24-02-15-02 on 2/15/2024*~~¶

vii. Recommendations for further improvements.¶

¶

Table: Local Preference Sliding Scale¶

Contract Amount¤	Local Preference Threshold¤	¤
$10,000–$50,000¤	10% or $3,000 (whichever is greater)¤	¤
$50,000–$100,000¤	5% or $5,000 (whichever is greater)¤	¤
$100,000–$500,000¤	5%¤	¤
$500,000+¤	3%¤	¤

¶

AGENDA ITEM NO. 10c

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Councilor Roberts, City Council

SUBJECT: Discussion, consideration and possible action to direct staff to review and possibly suggest a potential amendment to the PID Policy relating to maintenance responsibilities for Public Parkland.

BACKGROUND:

The City's current Public Improvement District (PID) policy and related development agreements have historically allowed or required Homeowners Associations (HOAs) to assume responsibility for the maintenance and capital improvements of public parkland that has been dedicated to the City. While this practice is not uncommon in some Texas communities, questions have been raised about its fairness, long-term sustainability, and legal compliance.

Specific concerns include:

- Whether requiring HOAs to fund the operation, maintenance, and capital improvements of **City-owned, publicly accessible parkland** is equitable to HOA members.
- Whether HOA governing documents legally allow the maintenance of publicly owned property, or whether this creates exposure for HOA Board members.
- Whether Directors & Officers (D&O) liability insurance policies would even cover such an arrangement.

The current PID policy does not address these issues directly, nor does it specify who must maintain public parkland within a PID.

FINDINGS:

- Lago Vista's current model creates a hybrid structure in which the City owns public parkland but requires HOA funding of O&M and capex costs without financial limits.
- Industry best practices, particularly in MUD and PID developments, suggest that either the public entity (City or PID) should maintain dedicated parkland or the

developer should privately fund amenities.
- Feedback from residents and subject matter experts has highlighted the potential legal and insurance conflicts inherent in the current structure.

PROPOSED STAFF ACTION:

Staff is directed to consult with bond counsel and/or other legal advisors to evaluate:

1. Whether the City can **prohibit HOA maintenance of City-owned public parkland** within a PID as a condition of PID creation.
2. Whether the current model—requiring HOA maintenance of City-owned, publicly accessible parkland—is **legally compliant under Texas municipal and corporate law.**
3. Whether HOA corporate structures typically **allow HOA funds to be used** for the maintenance of public assets not owned or controlled by the HOA.
4. Whether **D&O liability insurance policies** would normally cover HOA Board members in these situations, or whether this arrangement could result in uninsured liability.
5. Whether a PID may establish assessments to fund the maintenance of public parkland instead of relying on the HOA.

Staff is further directed to bring back potential **amendments to the PID policy** for Council consideration based on the legal findings.

FINANCIAL IMPACT:

To be determined based on the need for outside legal consultation. May require staff time to review existing PID and HOA O&M agreements.

RECOMMENDATION:

A motion to direct staff to consult with bond counsel and legal advisors to evaluate the City's current practice of requiring HOA maintenance of public parkland within PIDs and to return with potential policy amendments and findings. The goal is to ensure legal compliance, fairness to HOA members, and the long-term sustainability of public parkland maintenance responsibilities.

ATTACHMENTS:

PID Policy 2022 (PDF).pdf

LAGO VISTA
TEXAS

Public Improvement District Policy Manual

A Public Improvement District ("PID") in accordance with Texas Local Government Code Chapter 372, provides the City of Lago Vista ("the City") an economic development tool for financing the costs of public improvements that benefit a definable part of the City or its extraterritorial jurisdiction ("ETJ"). PIDs allow the costs of public improvements to be borne by those who receive special benefits from the improvements.

The purpose of this PID policy is to outline the policies and procedures the City will use to consider whether creation of a PID, the levy of PID assessments, and issuance of PID bonds is in the best interest of the City. Any aspect not specifically addressed by this policy will be considered on an individual project basis.

The City may, on a case-by-case project basis, waive a requirement of this policy if it does not conflict with Texas or federal law. Any requirements waived shall be noted in the resolution approving the PID petition, or other relevant document, and must include a finding that the waiver is in the best interest of the City.

Except for the approval and issuance of special assessment revenue bonds or the approval of a reimbursement agreement, the City will not bear financial responsibility for PID improvements undertaken by a PID owner/developer.

General Requirements

The City will consider a petition for formation of a PID only within the City's corporate limits or within its ETJ provided that the ETJ property owners voluntarily agree to the City's annexation of such property into the City's corporate limits.

Property located within the boundaries of a proposed PID that is owned by the City or intended to be conveyed or dedicated to the City shall not be subject to any PID assessment.

For a proposed PID, the initial bond issue shall not be less than $3 million.

Petition Requirements

Each PID petition or application shall include:

1. Signatures from property owners of more than 50% of property within the proposed PID collected within the six-month period prior to the submission of the petition.

2. Payment of a non-refundable application fee of $15,000 at the time a petition is filed.
3. A current certified tax roll of all property within the proposed PID.
4. A map acceptable to City staff and a metes and bounds description of the property included in the proposed PID.
5. A description clearly identifying the benefits of the proposed PID to the affected property owners and to the City as a whole.
6. Evidence of insurance.
7. A description of the developer's previous experience developing projects of similar scale and type.
8. The proposed "not to exceed" maximum tax rate equivalent.
9. A sunset clause, and a pre-executed petition to dissolve the PID by the landowner in case the SAP is not approved, and assessments levied for either reimbursement or bond issuance within three years of the date of the Development Agreement.

Additional Documentation

An independently prepared market analysis or feasibility study will be required prior to the public hearing. The market analysis or feasibility study will assess the reasonableness of the public improvements and overall development plan considering market conditions. The City will order the study, and the costs will be paid by the PID petitioner.

Reimbursement for Costs and Expenses

If the City determines it is in its best interest to establish a proposed PID and accepts a PID Petition, the City will require the developer to execute a Reimbursement Agreement. The Reimbursement Agreement will require the developer to initially deposit funds in the amount of $50,000 to pay for (a) the City's costs for staff including the City Attorney, City Engineer and City Planning staff, and (b) professional fees and expenses of third-party consultants and advisors including, but not limited to, Bond Counsel, Financial Advisor, PID Administrator, Trustee, Underwriter, Appraiser, and Market Study Analysts.

An additional $25,000 deposit will be required to be deposited by the developer when the deposit balance reaches $10,000. The unused balance will be returned to the developer after the bond closing. The developer may recover deposit funds used for City costs and professional fees and expenses at bond closing.

Preferential Factors

Subject to the requirements of Chapter 372 of the Texas Local Government Code, inclusion of

one or more of the following preferential factors in a PID petition will increase the likelihood of approval by the City:

1. **Enhance Master Plan, Thoroughfare Plan and Water and Wastewater Plans.** The project includes improvements that enhance the City's Master Plan, including the City's Thoroughfare Plan and water and wastewater plans. Improvements must exceed current subdivision regulations. Projects that least impact City infrastructure or provide enhanced benefits to improve the public roadway network and/or water and wastewater infrastructure in the City.
2. **Advance Parks and Trail Plans and Preserve Open Space.** Preference will be given to projects that advance the City's trail and park plans and increase pedestrian and trail connectivity. This includes projects that provide for increased recreation, lake access and open space opportunities for public use. Preference will be given to projects that protect and preserve natural amenities and environmental assets such as the rivers, lakes, trees, creeks, ponds, floodplains, slopes, hills, viewscapes, aquifer recharge and/or contributing zones, and wildlife habitats.
3. **Exceed Development Requirements.** Preference will be given to projects that exceed City development requirements, including enhanced architectural standards, enhanced landscaping, low impact development (LID) features, greater impervious cover limitations, parking lot shading, floorplan variety, and which provide for a superior design of lots or buildings including green building ratings systems for energy efficiency. High quality projects that exceed the City's subdivision requirements for overall design, building standards and amenities with enhanced landscaping and appealing architecture throughout will be given preference.
4. **Meet Community Needs.** Preference will be given to projects that meet community needs such as enhanced drainage improvements, including land and infrastructure for re-irrigation of treated wastewater.
5. **Economic Development.** Preference will be given to projects that generate economic development benefits to the City beyond what a normal development would provide and satisfy the goals of the City's Economic Development Strategic Plan.
6. **Redevelopment and Historic Preservation.** Preference will be given to projects that create opportunities to redevelop older or underutilized areas of the City, e.g., entryways, gateways, landscaping, xeriscaping, street trees, fountains, specialty lighting, art, decorative and landscaped streets and sidewalks, bike lanes, multi-use trails, signage, terminating vistas, decorative pedestrian lighting, pedestrian safety elements, ADA accessibility, underground utilities, etc. Projects that protect and preserve existing historical buildings, structures, features, or places and preserve the rural and community amenities or features that further the look and feel of the hill country, or which establish a unified architectural or design theme throughout the development that complements the community's character and heritage.
7. **Access to Developer Finances.** Preference will be given to projects providing the City with access to records thereby enabling the City to confirm the developer's ability and financial capacity to deliver the project as proposed.

Development Standards

1. **Pre-Approved Off-Site Improvements.** Any improvements that are offsite or are part of the City's Master Plans must have obtained approval in principle from the City Engineer prior to being included in the PID.
2. **Phasing.** Projects that will be developed in phases must have a phasing schedule for infrastructure and utility needs.

Requirements for Development Agreement

A Development Agreement shall be in place before the PID is created. The Development Agreement shall include, but not be limited to, the following provisions, as the same may be applicable to the type of PID proposed:

1. A development plan that outlines, at a minimum, land use and thoroughfare connections and is consistent with the City's Master Plans, as amended.
2. The proposed PID will substantially contribute to funding the expansion of arterial streets, major collector roadways, and/ or trunk line or other utility infrastructure, as applicable when necessary to address the projected demand for services and impacts of the development.
3. The proposed PID will be located within the City's existing Water and Wastewater Certificates of Convenience and Necessity (CCNs) or expanded CCNs facilitated by the developer if, in the City's discretion, such expansion is feasible.
4. Plans for the proposed PID shall be prepared and reviewed by the City in compliance with the City's development regulations as relates to land use, infrastructure design, permitting, and inspections and applicants shall seek City development approvals prior to the commencement of any construction.

Collection of Assessments

Prior to the levy of assessments, the City will use its best efforts to enter into an agreement with Travis County to include the annual PID installments on the Travis County Tax Bill of each property owner within the PID.

Disclosure to Homeowners

To satisfy disclosure to homeowners, the City will require the developer to comply with the following:

1. Signage at major entryways and exits indicating the existence of the PID.
2. Signage and information flyers s (which will be updated at least annually to reflect any

changes in such information) in any sales centers within the PID that include:

a) Frequently Asked Questions

b) Total Assessment

c) Average Annual Installment

d) Equivalent Tax Rate

3. Homebuyer disclosure documents in accordance with Section 5.014 of the Texas Property Code, as may be amended, to be signed both at contract signing and at closing with such agreements maintained on file by each homebuilder and available for inspection by the City.
4. Developer contracts with homebuilders must require the homebuilder to disclose the PID on any MLS listing.

City Advisors and Consultants

The City will independently select a Bond Counsel, Financial Advisor, PID Administrator, Trustee, Market Study Analyst and Underwriter. With input by the developer, the City will select an Appraiser. The City's PID Administrator, in conjunction with the developer's PID Consultant, if any, will draft the Service and Assessment Plan and prepare all annual updates.

Maximum Assessment

As a result of the initial bond issue for a new PID, the annual PID assessment shall be the lesser of (1) $0.50 per $100 of assessed value, or (2) the rate per $100 of assessed value such that the combined PID assessment rate and the City's aggregate overlapping property tax rate (City, County, School District, Emergency Services District and any other special taxing district) do not exceed $3.00 per $100 of assessed value. A true-up calculation will be performed prior to each bond issuance and upon filing of a final plat to ensure that the maximum assessment is not exceeded, which may result in a reduction in the size of any proposed issuance of PID bonds.

Assessment Term/Bond Term

The maximum term for a PID and related PID assessment is 30 years, and the assessment term must equal the bond term.

PID Bonds; Financial Limitations and Performance Standards

The following minimum performance standards shall apply to PID bonds. Preference will be

given to proposed PIDs that exceed these minimum performance standards:

1. For the initial PID bond issue, a minimum appraised value to lien ratio of 3:1 for the proposed PID project.
2. All improvements to be funded with PID bonds must be fully engineered and competitively bid. A competitive bidding process with at least three bids will be required.
3. Developer is required to demonstrate committed capital in the form of cash deposit, proof of bank financing and/or equity capital, or letter of credit to the City with an amount confirmed by an engineer's opinion of probable cost, which represents the difference between budgeted cost to complete the public improvements assumed to be complete in the appraisal and the net proceeds of the PID bonds. The form of committed capital (cash deposit, letter of credit or bank/equity commitment) will be determined by the City on a case-by-case basis with input from its Bond Counsel and Financial Advisor.
4. All PID bonds issued by the City shall be approved by the Texas Attorney General and registered by the Comptroller of Public Accounts of the State of Texas.
5. The developer shall be current on all taxes, assessments, fees, and obligations to the City including without limitation payment of assessments.
6. The developer shall not be in default under any existing PID financing agreement or, with respect to the property within the PID, any other agreement to which developer and the City are parties.
7. No outstanding PID bonds are in default and no reserve funds established for outstanding PID Bonds have been drawn upon that have not been replenished.
8. No information regarding the City, including without limitation financial information, shall be included in any offering document relating to PID Bonds without the consent of the City.

Qualified Tax-Exempt Obligations

In any calendar year in which PID bonds are issued, the developer (the "Developer") agrees to pay the City its actual additional interest expense ("Additional Interest Expense"), as calculated by the City's financial advisor ("Financial Advisor"), that the City may incur in the issuance of its own public securities or obligations on its own taxing power or municipal revenues (the "City Obligations"), as described in this section, if the City Obligations are deemed not to qualify for the designation of qualified tax-exempt obligations ("QTEO"), as defined in section 265(b)(3) of the Internal Revenue Code, as amended, as a result of the issuance of PID bonds by the City in any given year.

Issuance of PID bonds prior to City Obligations. In the event the City issues PID bonds prior to the issuance of City Obligations, the City, with assistance from its Financial Advisor, shall estimate the Additional Interest Expense based on the market conditions as they exist approximately thirty (30) days prior to the date of the pricing of the PID Bonds. Such Additional Interest Expense is an estimate of the increased cost to the City of issuing its City Obligations

as non-QTEO instead of as QTEO. Promptly following the determination of such estimate, the City shall provide a written invoice to the Developer in an amount less than or equal to the estimated Additional Interest Expense. The Developer, in turn, shall remunerate to the City the amount shown on said invoice on or before the earlier of: (i) fifteen (15) business days after the date of said invoice, or (ii) five business days prior to pricing the PID Bonds. The City shall not be required to price or sell any series of PID bonds until the Developer has paid the invoice of estimated Additional Interest Expense related to the PID bonds proposed to be issued.

Upon the City's approval of the City Obligations, the Financial Advisor shall calculate the actual Additional Interest Expense to the City of issuing its City Obligations as non-QTEO. The City will, within five business days of the issuance of the City Obligations, provide written notice to the Developer of the amount of the actual Additional Interest Expense. In the event the actual Additional Interest Expense is less than the estimated Additional Interest Expense, the City will refund to the Developer the difference between the estimated and actual Additional Interest Expense within fifteen (15) business days of the date of the City's notice to the Developer required under this paragraph. If the actual Additional Interest Expense is more than the estimated Additional Interest Expense, the Developer will pay to the City the difference between the actual and estimated Additional Interest Expense within fifteen (15) business days of the date of the City's notice required under this paragraph. If the Developer does not pay the City such difference within fifteen (15) business days of the date of the City's notice required under this paragraph, the Developer shall not be paid any reimbursement amounts under any PID reimbursement agreement related to the development until such payment of excess Additional Interest Expense is made in full.

Issuance of City Obligations prior to PID Bonds. In the event the City issues City Obligations prior to the issuance of PID Bonds, the City, with assistance from its Financial Advisor, shall calculate the estimated Additional Interest Expense based on the market conditions as they exist 20 days prior to the date of the pricing of the City Obligations. Promptly following the determination of such estimated Additional Interest Expense, the City shall provide a written invoice to the Developer: (1) in an amount less than or equal to the Additional Interest Expense as calculated by the Financial Advisor, and (2) that includes the pricing date for such City Obligations. The Developer, in turn, shall remunerate to the City the amount shown on said invoice at least 15 days prior to the pricing date indicated on the invoice. If the Developer fails to pay the Additional Interest Expense as required under this paragraph, the City, at its option, may elect to designate the City Obligations as QTEO, and the City shall not be required to issue any PID Bonds in such calendar year.

Upon the City's approval of the City Obligations, the Financial Advisor shall calculate the Additional Interest Expense to the City of issuing non-QTEO City Obligations. The City will, within five business days of the issuance of the City Obligations, provide written notice to the Developer of the Additional Interest Expense. In the event the Additional Interest Expense are less than the estimated Additional Interest Expense, the City will refund to the Developer the difference between the actual Additional Interest Expense and the estimated Additional Interest Expense within fifteen (15) business days of the date of the City's notice to the Developer. If the actual Additional Interest Expense are more than the estimated Additional Interest Expense, the Developer will pay to the City the difference between the actual Additional Interest Expense and the estimated Additional Interest Expense within fifteen (15) business days of the date of

the City's notice. If the Developer does not pay to the City such difference as required under this paragraph, then the Developer shall not be paid any reimbursement amounts under any PID reimbursement agreement related to the development until such payment of excess Additional Interest Expense is made in full.

Dissolution Agreement

A dissolution agreement must be entered into at the time the City considers creation of the PID authorizing dissolution of the PID if assessments are not levied within three years after the creation of the PID, unless otherwise approved by Council.

Applicability

This PID Policy shall apply to PID applications filed after June 1, 2022.

CITY OF LAGO VISTA, TEXAS

By: Ed Tidwell
Ed Tidwell, Mayor
Date: 5/17/22

ATTEST:

Sandra Barton
Sandra Barton, City Secretary

AGENDA ITEM NO. 10d

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Councilor Saum, City Council

SUBJECT: Discussion, consideration and possible action on referring an ordinance that amends Chapter 14 of the Zoning Ordinance, Section 2 and Section 16, related to Home Based Business's, to change and ensure that the City of Lago Vista's regulations are in compliance with the recently passed HB 2464 which becomes effective January 1, 2026.

FINANCIAL IMPACT: N/A

RECOMMENDATION: Refer item to Planning and Zoning Commission

ATTACHMENTS:
No-Impact Home Based Business Cover Page.docx
No Impact Home Based Business Ordinance DRAFT SAUM item.docx

Item Cover Page

City Council Agenda Item Report

Date: July 17, 2025

Submitted By: Shane R. Saum, Council Member

Subject: Discussion, consideration, and possible action regarding to refer to the Planning and Zoning Commission an Ordinance amending Chapter 14 (Zoning Ordinance), Section 2 and Section 16, to bring the City's regulations on home-based businesses into compliance with HB 2464 and proactively support local home-based businesses and economic opportunity in Lago Vista.

Background: The 89th Texas Legislature passed House Bill 2464, codified in Section 229.902 of the Texas Local Government Code, limiting municipal regulation of "no-impact home-based businesses."

Findings: Under the new law, municipalities may not prohibit or require permitting for such businesses if they meet specific low-impact criteria (e.g., no visible activity, no on-street parking, minimal traffic or noise).

The City's current Zoning Ordinance, Section 16, requires permits for all home occupations and imposes additional restrictions and limitations that are now preempted by state law while also positioning Lago Vista as a supportive environment for small business and self-employed residents. To comply with HB 2464, this ordinance:

- Adds definitions for "home-based business" and "no-impact home-based business" to Section 2;
- Repeals and replaces Section 16 in full;

- Allows no-impact home-based businesses by right in all residential districts without a permit;
- Requires a Conditional Use Permit only for higher-impact home-based businesses;
- Retains municipal authority to regulate public safety, sanitation, and nuisance impacts.
- Creates a voluntary business registry to help connect local entrepreneurs with City resources and marketing opportunities;
- Allows optional signage to give local businesses visibility without disrupting neighborhoods;
- Establishes a streamlined Conditional Use Permit process for low-impact home businesses that slightly exceed “no-impact” thresholds;
- Promotes a “Homegrown Lago” initiative to recognize and support home-based enterprises across the city.

Financial Impact: n/a

Attachments:

- Ordinance Text
- HB 2464

ORDINANCE NO. 2025-07-07-01

AN ORDINANCE OF THE CITY OF LAGO VISTA, TEXAS, AMENDING CHAPTER 14 OF THE CODE OF ORDINANCES BY REVISING SECTION 2 AND SECTION 16 TO COMPLY WITH HOUSE BILL 2464 RELATING TO MUNICIPAL REGULATION OF HOME-BASED BUSINESSES, AND TO PROMOTE ENTREPRENEURIAL ACTIVITY IN RESIDENTIAL AREAS; PROVIDING FOR SEVERABILITY, REPEALER, AND AN EFFECTIVE DATE.

WHEREAS, The 89th Texas Legislature passed House Bill 2464, codified in Section 229.902 of the Texas Local Government Code, limiting municipal regulation of "no-impact home-based businesses.

WHEREAS, the City of Lago Vista desires to update Sections 14 and 16 of the Code of Ordinances to comply with state law while also supporting home-based businesses in the City.

NOW, THERFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS THAT:

SECTION 1. AMENDMENT TO DEFINITIONS

Section 2.10 of the Zoning Ordinance (Exhibit A to Chapter 14) is hereby amended to include the following definitions:

Home-Based Business means a business operated from a residential property by the property's owner or tenant for the purpose of manufacturing, providing, or selling a lawful good or service. A home-based business may include activities occurring inside the residence or in an accessory structure.

No-Impact Home-Based Business means a home-based business that:

1) Does not exceed the municipal occupancy limit for the property, including employees and patrons;
2) Does not generate on-street parking or a substantial increase in traffic through the neighborhood;
3) Has no activities visible from the street;
4) Does not substantially increase noise or violate the City's noise ordinance.

SECTION 2. REPEALED AND REPLACEMENT OF SECTION 16

Section 16 of the Zoning Ordinance is hereby repealed and replaced in its entirety with the following:

SEC 16 – HOME-BASED BUSINESSES

16.10 Intent and Purpose

The City of Lago Vista recognizes the growing role of home-based businesses in the modern economy. This section affirms the right to operate no-impact home-based businesses consistent with Texas Local Government Code § 229.902 and promotes a vibrant, entrepreneurial culture within residential neighborhoods. It also establishes a clear and streamlined pathway for permitting certain higher-impact home-based businesses in a manner compatible with residential character.

16.20 No-Impact Home-Based Businesses – Allowed by Right

1) A no-impact home-based business is permitted by right in all residential zoning districts and shall not be required to obtain a license, permit, zoning change, or special approval from the City.
2) The City shall not:
    a. Prohibit no-impact home-based businesses;
    b. Require a fire sprinkler system for a single-family or two-family structure operating such a business;
    c. Require the operator or property owner to obtain a permit or rezoning.
3) A no-impact home-based business must comply with all applicable federal, state, and local regulations including building, fire, health, traffic, waste disposal, and noise.
4) The following uses remain prohibited as home-based businesses:
    a. The sale or distribution of alcohol or illegal drugs;
    b. Operation of a structured sober living home;
    c. Sexually oriented businesses as defined by Texas Local Government Code § 243.002.

16.25 Voluntary Home-Based Business Registry

To foster economic development and community engagement, the City may establish a **voluntary, no-cost registry** for home-based businesses. The registry is intended to:

1) Connect entrepreneurs with City services and small business resources;
2) Support local marketing, promotion, and referral programs;
3) Encourage civic pride and networking among home-based operators.

No fee, inspection, or regulatory approval shall be required to participate.

16.30 Optional Signage for No-Impact Businesses

A no-impact home-based business may display **one non-illuminated sign not to exceed one (1) square foot**, mounted flush to the residence or displayed in a front-facing window. The sign may display:

1) The business name;
2) A logo or symbol;
3) Contact information.

No additional signage or lighting is permitted for no-impact home-based businesses.

16.40 Home-Based Businesses with Impact – Conditional Use Permit Required

1) A home-based business that does not meet the definition of "no-impact" must obtain a **Conditional Use Permit (CUP)** in accordance with Section 17 of this Zoning Ordinance.
2) Common examples include:
   a) Customer or employee traffic exceeding residential occupancy thresholds;
   b) Business activity visible from the street;
   c) On-street parking generation;
   d) Activities involving elevated noise, dust, odors, or materials storage.
3) CUP applications shall be evaluated based on:
   a) Compatibility with residential character;
   b) Traffic and parking impacts;
   c) Mitigation measures (e.g., hours of operation, buffers, screening).

16.45 Streamlined CUP for Qualified Low-Impact Businesses
The City may publish a list of **pre-qualified low-impact business types** that, while not qualifying as no-impact, are **eligible for expedited CUP approval**. These may include:

1) Music lessons, art studios, academic services or tutoring with limited hours;
2) Tax prep or professional consulting with low foot traffic;
3) Appointment-only personal services limited to only 1 or 2 clients at a time (e.g., haircutting, hairstyling, barbering, nail care);
4) Light manufacturing or creative work in enclosed spaces.

Staff shall develop administrative procedures to process these CUPs promptly and with minimal burden to the applicant.

16.50 Promotion of "Homegrown Lago" Businesses
The City encourages all residents to participate in Lago Vista's economic vitality. The City may:

1) Develop branding such as "Homegrown Lago" to promote local talent;
2) Create a directory of voluntarily registered businesses;
3) Partner with chambers, nonprofits, or state agencies to offer resources to home-based operators and remote workers.

16.60 Enforcement and Revocation
The City may investigate complaints regarding home-based businesses and may revoke any CUP or take enforcement action if a business:

1) Violates conditions of approval;
2) Presents health, safety, or nuisance risks to neighbors;
3) Operates outside the parameters of this section or other applicable law.

SECTION 3. REPEALER

All ordinances or parts of ordinances in conflict with this Ordinance are hereby repealed to the extent of conflict.

SECTION 4. SEVERABILITY

If any provision of this Ordinance is found to be invalid or unconstitutional, such invalidity shall not affect the remaining provisions, which can be given effect without the invalid portion.

SECTION 5. EFFECTIVE DATE

This Ordinance shall take effect upon adoption or as required by state law.

PASSED AND APPROVED this 17th day of July 2025.

CITY OF LAGO VISTA, TEXAS

_____
Kevin Sullivan, Mayor

ATTEST:

_____
Susie Quinn, Interim City Secretary

On a motion by Councilor _____, seconded by Councilor _____the above and foregoing instrument was passed and approved.

AGENDA ITEM NO. 10e

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Eric DeLaCruz, Finance

SUBJECT: Discussion, consideration, and possible action regarding **Resolution No. 25-2125**; A Resolution by the City Council of the City of Lago Vista, Texas, accepting the Fiscal Year 2024 Audit as prepared by Singleton, Clark & Company, PC.

BACKGROUND: Singleton, Clark & Company, PC was contracted to complete the City of Lago Vista's Annual Audit for Fiscal Year 2024. A copy of the Audit is included in the Council Packet for review. Robert Gattilia, CPA and shareholder in the firm, will be in attendance at the City Council Meeting to make a formal presentation and address any specific questions posed by Council Members.

FINANCIAL IMPACT: The data presented in the Audit represents all final numbers for the 2023-2024 Fiscal Year.

ATTACHMENTS:
CoLago Vista FY24 AFR.pdf
Resolution 25-2142_Accepting Audit FY24.pdf

CITY OF LAGO VISTA, TEXAS

ANNUAL FINANCIAL REPORT

FOR THE FISCAL YEAR ENDED
SEPTEMBER 30, 2024

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SINGLETON, CLARK
& COMPANY, PC CERTIFIED PUBLIC ACCOUNTANTS

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CITY OF LAGO VISTA, TEXAS
ANNUAL FINANCIAL REPORT
FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 2024

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FINANCIAL SECTION

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INDEPENDENT AUDITOR'S REPORT

To the Honorable Mayor and Members of the City Council of
City of Lago Vista, Texas

Report on the Audit of the Financial Statements

Opinions

We have audited the accompanying financial statements of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of City of Lago Vista, Texas (the "City"), as of and for the year ended September 30, 2024, and the related notes to the financial statements, which collectively comprise the City's basic financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of the City, as of September 30, 2024, and the respective changes in financial position, and, where applicable, cash flows thereof and the respective budgetary comparison for the General Fund for the year then ended in accordance with accounting principles generally accepted in the United States of America.

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Basis for Opinions

We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the City and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the City's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with generally accepted auditing standards and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the City's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the City's ability to continue as a going concern for a reasonable period of time.

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We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis section which precedes the basic financial statements and the pension and other post-employment benefits liabilities related schedules following the notes to the financial statements be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Supplementary Information

Our audit was conducted for the purpose of forming opinions on the financial statements that collectively comprise the City's basic financial statements. The accompanying schedules of governmental funds are presented for purposes of additional analysis and are not a required part of the basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the schedules of governmental funds are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

Other Information

Management is responsible for the other information included in the annual report. Our opinions on the basic financial statements do not cover the other information, and we do not express an opinion or any form of assurance thereon.

In connection with our audit of the basic financial statements, our responsibility is to read the other information and consider whether a material inconsistency exists between the other information and the basic financial statements, or the other information otherwise appears to be materially misstated. If, based on the work performed, we conclude that an uncorrected material misstatement of the other information exists, we are required to describe it in our report.

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Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated April 11, 2025 on our consideration of the City's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the City's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the City's internal control over financial reporting and compliance.

Singleton, Clark & Company, PC

Singleton, Clark & Company, PC
Cedar Park, Texas

April 11, 2025

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Management's Discussion and Analysis

The Management's Discussion and Analysis section of the City of Lago Vista, Texas's (hereafter the "City") Annual Financial Report offers readers this narrative overview and analysis of the financial activities of the City for the fiscal year ended September 30, 2024. Please read it in conjunction with the independent auditor's report beginning on page 1 of this report and the City's basic financial statements which follow this section.

Financial Highlights

- The City's net position for governmental activities increased by $6,775,527 to end at $17,729,982.
- The City's fund balance in the General Fund increased by 3,740,485 to end at $13,185,344.
- The City's net position in the Utility Fund increased by $2,820,224 to end at $74,234,837.

Overview of the Financial Statements

The discussion and analysis provided here is intended to serve as an introduction to the City's basic financial statements. The City's basic financial statements consist of three components: government-wide financial statements, fund financial statements, and the notes to financial statements. This report also includes required supplementary information intended to furnish additional detail to support the basic financial statements.

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Government-wide Financial Statements. The *government-wide financial statements* are designed to provide readers with a broad overview of the City's finances, in a manner similar to a private-sector business.

The *statement of net position* presents financial information on all of the City's assets, liabilities, and deferred inflows/outflows of resources, with the difference between assets and liabilities reported as net position. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the City is improving or deteriorating.

The *statement of activities* presents information showing how the City's net position changed during the most recent fiscal year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, *regardless of the timing of related cash flows*. Thus, revenues and expenses are reported for some items that will only result in cash flows in future fiscal periods (e.g., uncollected taxes and earned but unused vacation leave).

Both of the government-wide financial statements distinguish functions of the City that are principally supported by taxes and intergovernmental revenues (*governmental activities*) from other functions that are intended to recover all or a significant portion of their costs through user fees and charges (*business-type activities*). The governmental activities of the City include general government, public safety, public works, sanitation, culture and recreation, and economic development. The business-type activities of the City include aviation, golf, and utilities.

The government-wide financial statements include not only the City itself (known as the *primary government*), but also a legally separate economic development corporation for which the City financially accountable. Financial information for this component unit is reported separately from the financial information presented for the primary government itself.

Fund Financial Statements. A *fund* is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objectives. The City, like other state and local governments, uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. All of the City's funds can be divided into three categories: governmental funds, proprietary funds, and fiduciary funds as applicable.

Governmental Funds. *Governmental funds* are used to account for essentially the same functions reported as *governmental activities* in the government-wide financial statements. However, unlike the government-wide financial statements, governmental fund financial statements focus on *near-term inflows and outflows of spendable resources*, as well as on *balances of spendable resources* available at the end of the fiscal year. Such information may be useful in assessing a government's near-term financing requirements.

Because the focus of governmental funds is narrower than that of the government-wide financial statements, it is useful to compare the information presented for *governmental funds* with similar information presented for *governmental* activities in the government-wide financial statements. By doing so, readers may better understand the long-term impact of the government's near-term financing decisions. Both the governmental fund balance sheet and the governmental fund statement of revenues, expenditures, and changes in fund balances provide a reconciliation to facilitate this comparison between *governmental funds* and *governmental activities.*

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The City maintains five individual governmental funds. Information is presented separately in the governmental fund balance sheet and in the governmental fund statement of revenues, expenditures, and changes in fund balances for the General Fund, the Hotel Fund, the ARPA Grant Fund, the Capital Projects Fund, and the Debt Service Fund, which are considered to be major funds.

The City adopts an annual appropriated budget for its General Fund, Debt Service Fund, Capital Projects Fund, Aviation Fund, Golf Course Fund, and Utility Fund. A budgetary comparison statement has been provided for the General Fund and Debt Service Fund to demonstrate compliance with this budget.

Proprietary Funds. The City has the option of maintaining two different types of proprietary funds. *Enterprise funds* are used to report the same functions presented as *business-type activities* in the government-wide financial statements. The City uses an enterprise fund to account for aviation, golf, and utility operations. *Internal service funds* are an accounting device used to accumulate and allocate costs internally among a city's functions. The City is not currently utilizing an internal service fund. Because the services provided by internal service funds predominantly benefit governmental rather than business-type functions, they are usually included within *governmental activities* in the government-wide financial statements.

Proprietary funds provide the same type of information as the government-wide financial statements, only in more detail. The proprietary fund financial statements provide separate information for the aviation, golf, and utility funds, all of which are considered to be major funds of the City. Conversely, when internal service funds are utilized, they are combined into a single, aggregated presentation in the proprietary fund financial statements. Individual fund data for the internal service funds are then provided in the form of combining statements in the combining and individual fund statements and schedules section of this report.

Fiduciary Funds. Fiduciary funds are used to account for resources held for the benefit of parties outside of the government. Fiduciary funds are *not* reported in the government-wide financial statements because the resources of those funds *are* not available to support the City's own programs. The accounting used for fiduciary funds is much like that used for proprietary funds.

Basis of Reporting. The government-wide statements and the fund-level proprietary statements are reported using the full accrual basis of accounting. The governmental funds are reported using the modified accrual basis of accounting.

Notes to the Financial Statements. The notes provide additional information that is necessary to acquire a full understanding of the data provided in the government-wide and fund financial statements.

Other Information. In addition to the basic financial statements and accompanying notes, this report also presents *required supplementary information* concerning the City's progress in funding its obligation to provide pension and OPEB benefits to its employees. Required supplementary information can be found on page 62 of this report.

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Government-wide Overall Financial Analysis

As noted earlier, net position over time, may serve as a useful indicator of a government's financial position. In the case of the City, assets and deferred outflows of resources exceeded liabilities by $96,292,217 at the close of the most recent fiscal year.

Condensed Statement of Net Position
As of September 30

	Governmental Activities		Business-Type Activities		Total	
	2024	2023	2024	2023	2024	2023
Current assets	$ 48,178,927	$ 16,180,769	$ 25,900,881	$ 24,408,510	$ 74,079,808	$ 40,589,279
Capital assets	25,919,695	25,593,518	53,921,386	54,296,864	79,841,081	79,890,382
Total assets	74,098,622	41,774,287	79,822,267	78,705,374	153,920,889	120,479,661
Deferred outflows of resources	1,181,777	1,391,080	612,805	720,362	1,794,582	2,111,442
Current liabilities	2,268,126	901,076	705,908	2,441,157	2,974,034	3,342,233
Noncurrent liabilities	54,631,029	30,751,782	826,716	1,096,842	55,457,745	31,848,624
Total liabilities	56,899,155	31,652,858	1,532,624	3,537,999	58,431,779	35,190,857
Deferred inflows of resources	651,262	558,054	340,213	294,020	991,475	852,074
Net position:						
Net investment in capital assets	3,303,579	(3,318,210)	53,722,709	53,978,829	57,026,288	50,660,619
Restricted	2,116,185	5,817,568	8,231,580	6,690,635	10,347,765	12,508,203
Unrestricted	12,310,218	8,455,097	16,607,946	14,924,253	28,918,164	23,379,350
Total net position	$ 17,729,982	$ 10,954,455	$ 78,562,235	$ 75,593,717	$ 96,292,217	$ 86,548,172

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The largest portion of the City's net position (59.2%) reflects its investment in capital assets (e.g., land, buildings, machinery, equipment, vehicles, and infrastructure), less any related outstanding debt that was used to acquire those assets. The City uses these capital assets to provide a variety of services to its citizens. Accordingly, these assets are not available for future spending. Although the City's investment in capital assets is reported net of related debt, it should be noted that the resources used to repay this debt must be provided from other sources, since the capital assets themselves cannot be used to liquidate these liabilities.

A portion of the City's net position (10.7%) represents resources that are subject to external restrictions on how they may be used. The remaining balance of $28,918,164 is unrestricted and may be used to meet the government's ongoing obligations to its citizens and creditors. At the end of the current fiscal year, the City is able to report positive balances in all reported categories of net position, both for the government as a whole, as well as for its separate governmental and business-type activities. The same situation held true for the prior fiscal year.

The City's overall net position increased by $9,744,045 from the prior fiscal year. The reasons for this overall increase are discussed in the following sections for governmental activities and business-type activities.

Governmental Activities. During the current fiscal year, net position for governmental activities increased by $6,775,527 from the prior fiscal year for an ending balance of $17,729,982. The increase in overall net position of governmental activities is primarily due to revenues exceeding budgeted amounts and expenses coming in under budget.

Condensed Statement of Activities
For the Years Ended September 30

	Governmental Activities		Business-Type Activities		Total	
	2024	2023	2024	2023	2024	2023
Program Revenues:						
Charges for services	$ 4,744,311	$ 3,815,201	$ 11,706,805	$ 12,104,264	$ 16,451,116	$ 15,919,465
Operating grants & contributions	669,557	252,954	-	-	669,557	252,954
General Revenues:						
Property taxes	9,883,125	9,049,906	-	-	9,883,125	9,049,906
Other taxes	1,369,627	2,019,414	-	-	1,369,627	2,019,414
Grants and contributions not restricted to specific programs	652,880	-	-	105,765	652,880	105,765
Other	1,755,704	472,371	1,539,934	996,385	3,295,638	1,468,756
Total revenue	19,075,204	15,609,846	13,246,739	13,206,414	32,321,943	28,816,260
Expenses:						
General government	4,906,120	4,402,091	-	-	4,906,120	4,402,091
Public safety	3,757,717	3,404,892	-	-	3,757,717	3,404,892
Highways and streets	1,372,550	1,150,468	-	-	1,372,550	1,150,468
Sanitation	1,279,865	1,239,635	-	-	1,279,865	1,239,635
Culture and recreation	879,644	970,821	-	-	879,644	970,821
Economic development and assistance	514,236	437,455	-	-	514,236	437,455
Interest and bank fees	849,188	988,514	-	-	849,188	988,514
Aviation	-	-	366,924	329,206	366,924	329,206
Golf Course	-	-	1,316,137	1,355,445	1,316,137	1,355,445
Utility	-	-	7,335,517	6,968,104	7,335,517	6,968,104
Total expenses	13,559,320	12,593,876	9,018,578	8,652,755	22,577,898	21,246,631
Increase (decrease) in net position before transfers	5,515,884	3,015,970	4,228,161	4,553,659	9,744,045	7,569,629
Transfers	1,259,643	796,454	(1,259,643)	(902,219)	-	(105,765)
Increase (decrease) in net position	6,775,527	3,812,424	2,968,518	3,651,440	9,744,045	7,463,864
Net position - beginning	10,954,455	7,142,031	75,593,717	71,942,277	86,548,172	79,084,308
Net position - ending	$ 17,729,982	$ 10,954,455	$ 78,562,235	$ 75,593,717	$ 96,292,217	$ 86,548,172

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Business-type Activities. For the City's business-type activities, the results for the current fiscal year were positive in that overall net position increased to reach an ending balance of $78,562,235. The total increase in net position for business-type activities (Aviation, Golf Course, and Utility funds) was $2,968,518.

Financial Analysis of Governmental Funds

As noted earlier, the City uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements.

Governmental Funds. The focus of the City's *governmental funds* is to provide information on near-term inflows, outflows, and balances of spendable resources. Such information is useful in assessing the City's financing requirements. In particular, unassigned fund balance may serve as a useful measure of a government's net resources available for discretionary use as they represent the portion of fund balance which has not yet been limited to use for a particular purpose by either an external party, the City itself, or a group or individual that has been delegated authority to assign resources for use for particular purposes by the City's Council.

At September 30, 2024, the City's governmental funds reported combined fund balances of $45,526,431, an increase of $30,559,200 in comparison with the prior year. Approximately 29% of this amount, $12,991,777, constitutes *unassigned fund balance,* which is available for spending at the government's discretion. The remainder of the fund balance is either *restricted, or assigned* to indicate that it is 1) restricted for particular purposes $32,448,918; or 2) assigned for particular purposes $85,736.

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The General Fund is the chief operating fund of the City. At the end of the current fiscal year, unassigned fund balance of the general fund was $12,991,777, while total fund balance increased to $13,185,344. As a measure of the General Fund's liquidity, it may be useful to compare both unassigned fund balance and total fund balance to total general fund expenditures. Unassigned fund balance represents approximately 108% of total general fund expenditures, while total fund balance represents approximately 110% of that same amount.

The fund balance of the City's General Fund increased by $3,740,485 during the current fiscal year. The increase in fund balance was primarily due to revenues exceeding budgeted amounts, and lower than budgeted expenditures, specifically in general government and capital outlay, although all actual expenditures were lower than budgeted.

The Hotel Fund, a major fund, had a $44,868 increase in fund balance to end at $1,089,793. This fund uses hotel taxes to promote local economic development.

The ARPA Grant fund, a new major fund, had an $85,736 increase in fund balance to end at $85,736. The increase was related to investment earnings realized during the fiscal year.

The Debt Service Fund, the remaining major governmental fund, had an increase in fund balance during the current year of $107,154 to bring the year end fund balance to $692,764. The increase was due to revenues being slightly higher than anticipated revenues, and premiums received on bonds during the fiscal year.

The Capital Projects fund, a major fund, had a $26,580,957 increase in fund balance during the current fiscal year which put the overall fund balance at $30,472,794.

Proprietary Funds. The City's proprietary funds provide the same type of information found in the government-wide financial statements, but in more detail.

Unrestricted net position of the Aviation Fund at the end of the year was $191,340, the Golf Fund was $534,549 and the Utility Fund was $15,882,057. The total change in net position for these funds was ($23,440), $171,734, and $2,820,224, respectively.

The Aviation Fund had a $23,440 decrease in net position during the current fiscal year, which put the total net position at $1,853,502.

The Golf Course Fund had a $171,734 increase to put the overall ending net position at $2,473,896. The City strives for its proprietary funds to break even; however, the City did transfer $800,000 to the Golf Course Fund during the year.

The Utility Fund had a $2,820,224 increase in net position during the current fiscal year, which put the total ending net position at $74,234,837. The Utility Fund ended the year with an unrestricted net position of $15,882,057 which represents approximately 217% of the fund's operating expenses for the year ended. Additionally, the Utility Fund has a restricted net position balance of $8,231,580 related to future water and wastewater system obligations.

General Fund Budgetary Highlights

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Original budget compared to final budget. During the year there were significant budget amendments made to the general government, economic development & assistance, and capital outlay projected expenditures.

Capital Assets and Debt Administration

Capital assets. The City's investment in capital assets for its governmental and business-type activities as of September 30, 2024, amounts to $79,841,081 (net of accumulated depreciation). This investment in capital assets includes land, buildings, machinery, equipment, vehicles, park facilities, roads, highways, bridges, and the water treatment plant.

Capital Assets, Net of Accumulated Depreciation

	Governmental Activities 2024	Governmental Activities 2023	Change
Land	$ 1,525,470	$ 1,520,409	$ 5,061
Buildings and improvements	32,363,358	31,224,622	1,138,736
Machinery, equipment, and vehicles	4,606,579	3,983,940	622,639
Total	38,495,407	36,728,971	1,766,436
Less accumulated depreciation	(12,575,712)	(11,135,453)	(1,440,259)
Capital assets, net of depreciation	$ 25,919,695	$ 25,593,518	$ 326,177

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	Business-Type Activities 2024	Business-Type Activities 2023	Change
Land	$ 3,251,491	$ 3,251,491	$ -
Buildings and improvements	75,834,501	75,335,021	499,480
Machinery, equipment, and vehicles	6,838,792	6,388,572	450,220
Construction in progress	2,237,417	1,083,856	1,153,561
Total	88,162,201	86,058,940	2,103,261
Less accumulated depreciation	(34,240,815)	(31,762,076)	(2,478,739)
Capital assets, net of depreciation	$ 53,921,386	$ 54,296,864	$ (375,478)

Additional information on the City's capital assets can be found in Note III.D on pages 47-48 of this report.

Long-term Debt. At the end of the current fiscal year, the City had total bonded debt outstanding of $49,566,000. The remainder of the City long-term obligations comprises pension-and OPEB related debt, compensated absences and capital leases.

Outstanding Debt

	Governmental Activities 2024	Governmental Activities 2023	Change
General obligation bonds	$ 49,566,000	$ 28,911,728	$ 20,654,272
Premiums	3,522,910	1,171,728	2,351,182
Compensated absences	639,717	639,717	-
Net pension liability/(asset)	718,923	1,044,620	(325,697)
Other post-employment benefits	183,479	155,717	27,762
Total	$ 54,631,029	$ 31,923,510	$ 22,707,519

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	Business-Type Activities 2024	Business-Type Activities 2023	Change
Capital leases	$ 198,679	$ 318,037	$ (119,359)
Compensated absences	145,230	145,230	-
Net pension liability/(asset)	370,353	538,137	(167,784)
Other post-employment benefits	112,454	95,438	17,016
Total	$ 826,716	$ 1,096,842	$ (270,127)

The City's total debt increased by $22,437,393 during the current fiscal year. The reason for the increase was the issuance of a bond during the year. The new issuance was debt with governmental commitment with a face value of $23,465,000.

Economic Factors and Next Year's Budgets and Rates

The City considered many factors when setting the fiscal year 2025 budget. The City's General Fund budget for fiscal year 2025 includes expenditures of $15,561,650 which is an approximate increase of $2.3 million from fiscal year 2024 total adopted expenditures. The city increased the tax rate for 2024-2025 to $0.4231 for the General Fund and to $0.2081 for the Interest and Sinking Fund. The overall total tax rate increased to $0.6312 per $100 valuation.

Requests for Information

This financial report is designed to provide a general overview of the City's finances for all those interested in the City's finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the City's business office at the City of Lago Vista, Texas, 5803 Thunderbird Drive, P.O. Box 4727, Lago Vista, Texas 78645, or by calling (512) 267-1155, ext. 103.

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GOVERNMENT-WIDE FINANCIAL STATEMENTS

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CITY OF LAGO VISTA, TEXAS
STATEMENT OF NET POSITION
SEPTEMBER 30, 2024

	Primary Government		
	Governmental Activities	Business-Type Activities	Total
ASSETS			
Cash and cash equivalents	$ 154,994	$ 1,113,295	$ 1,268,289
Investments - current	41,509,449	28,418,153	69,927,602
Taxes receivable - delinquent	442,987	-	442,987
Accounts receivable, net	497,010	1,741,681	2,238,691
Intergovernmental receivable	182,313	-	182,313
Internal balances	5,392,174	(5,392,174)	-
Inventories	-	19,926	19,926
Capital assets, not being depreciated:			
Land	1,525,470	3,251,491	4,776,961
Construction in progress	-	2,237,417	2,237,417
Capital assets, being depreciated:			
Buildings and improvements	32,363,358	75,834,501	108,197,859
Machinery, equipment, and vehicles	4,606,579	6,838,792	11,445,371
Accumulated depreciation	(12,575,712)	(34,240,815)	(46,816,527)
Total assets	74,098,622	79,822,267	153,920,889
DEFERRED OUTFLOWS OF RESOURCES			
Deferred outflows NPL	1,140,727	587,648	1,728,375
Deferred outflows OPEB	41,050	25,157	66,207
Total deferred outflows of resources	1,181,777	612,805	1,794,582
LIABILITIES			
Accounts payable	387,024	356,389	743,413
Accrued salaries and benefits	24,744	9,659	34,403
Intergovernmental payable	1,359,445	-	1,359,445
Accrued interest payable	128,619	-	128,619
Other current liabilities	368,294	3,920	372,214
Customer deposits	-	335,940	335,940
Noncurrent liabilities:			
Due within one year	1,799,000	86,016	1,885,016
Due in more than one year	52,832,029	740,700	53,572,729
Total liabilities	56,899,155	1,532,624	58,431,779
DEFERRED INFLOWS OF RESOURCES			
Deferred inflows NPL	603,047	310,662	913,709
Deferred inflows OPEB	48,215	29,551	77,766
Total deferred inflows of resources	651,262	340,213	991,475
NET POSITION			
Net investment in capital assets	3,303,579	53,722,709	57,026,288
Restricted for parks	193,567	-	193,567
Restricted for tourism	1,089,793	-	1,089,793
Restricted for debt service	832,825	-	832,825
Restricted for capital improvements	-	8,231,580	8,231,580
Unrestricted	12,310,218	16,607,946	28,918,164
Total net position	$ 17,729,982	$ 78,562,235	$ 96,292,217

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The notes to the financial statements are an integral part of this statement.

CITY OF LAGO VISTA, TEXAS
STATEMENT OF ACTIVITIES
FOR THE YEAR ENDED SEPTEMBER 30, 2024

Functions/Programs:	Expenses	Program Revenues: Charges for Services	Program Revenues: Operating Grants and Contributions
Primary Government:			
Governmental activities:			
General government	$ 4,906,120	$ -	$ 636,714
Public safety	3,757,717	2,524,758	1,529
Highways and streets	1,372,550	803,012	31,314
Sanitation	1,279,865	1,395,521	-
Culture and recreation	879,644	21,020	-
Economic development and assistance	514,236	-	-
Interest and bank fees	849,188	-	-
Total governmental activities:	13,559,320	4,744,311	669,557
Business-type activities:			
Aviation Fund	366,924	329,324	-
Golf Course Fund	1,316,137	687,871	-
Utility Fund	7,335,517	10,689,610	-
Total business-type activities:	9,018,578	11,706,805	-
Total primary government	$ 22,577,898	$ 16,451,116	$ 669,557
General revenues:			
Property taxes			
Sales taxes			
Hotel/motel taxes			
Franchise taxes			
Investment earnings			
Miscellaneous			
Total general revenues			
Transfers			
Total general revenues, special/extraordinary item and transfers			
Change in net position			
Net position - beginning			
Net position - ending			

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Net (Expense) Revenue and Changes in Net Position		
Primary Government		
Governmental Activities	Business-Type Activites	Total
$ (4,269,406)	$ -	$ (4,269,406)
(1,231,430)	-	(1,231,430)
(538,224)	-	(538,224)
115,656	-	115,656
(858,624)	-	(858,624)
(514,236)	-	(514,236)
(849,188)	-	(849,188)
(8,145,452)	-	(8,145,452)
-	(37,600)	(37,600)
-	(628,266)	(628,266)
-	3,354,093	3,354,093
-	2,688,227	2,688,227
(8,145,452)	2,688,227	(5,457,225)
9,883,125	-	9,883,125
1,178,845	-	1,178,845
190,782	-	190,782
652,880	-	652,880
1,565,539	1,420,033	2,985,572
190,165	119,901	310,066
13,661,336	1,539,934	15,201,270
1,259,643	(1,259,643)	-
14,920,979	280,291	15,201,270
6,775,527	2,968,518	9,744,045
10,954,455	75,593,717	86,548,172
$ 17,729,982	$ 78,562,235	$ 96,292,217

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FUND BASIS FINANCIAL STATEMENTS

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CITY OF LAGO VISTA, TEXAS
BALANCE SHEET
GOVERNMENTAL FUNDS
SEPTEMBER 30, 2024

	General Fund	Hotel Fund	ARPA Grant Fund
ASSETS			
Cash and cash equivalents	$ 154,994	$ -	$ -
Investments - current	11,889,986	1,035,319	1,534,966
Taxes receivable - delinquent	302,926	-	-
Accounts receivable	357,126	69,884	-
Intergovernmental receivable	182,313	-	-
Due from other funds	1,958,183	-	-
Total assets	$ 14,845,528	$ 1,105,203	$ 1,534,966
LIABILITIES			
Accounts payable	$ 374,826	$ 12,000	$ -
Accrued payroll	24,744	-	-
Intergovernmental payable	9,394	-	1,350,051
Due to other funds	580,000	3,410	99,179
Other current liabilities	368,294	-	-
Total liabilities	1,357,258	15,410	1,449,230
DEFERRED INFLOWS OF RESOURCES			
Unavailable revenue	302,926	-	-
Total deferred inflows of resources	302,926	-	-
FUND BALANCES			
Restricted:			
Fund balance - restricted for parks	193,567	-	-
Fund balance - restricted for tourism	-	1,089,793	-
Fund balance - restricted for debt service	-	-	-
Fund balance - restricted for capital projects	-	-	-
Assigned:			
Fund balance - other assigned	-	-	85,736
Unassigned	12,991,777	-	-
Total fund balances	13,185,344	1,089,793	85,736
Total liabilities, deferred inflows, and fund balances	$ 14,845,528	$ 1,105,203	$ 1,534,966

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The notes to the financial statements are an integral part of this statement.

Debt Service Fund	Capital Projects Fund	Total Governmental Funds
$ -	$ -	$ 154,994
661,717	26,387,461	41,509,449
140,061	-	442,987
-	-	427,010
-	-	182,313
31,247	4,085,333	6,074,763
$ 833,025	$ 30,472,794	$ 48,791,516
$ 200	$ -	$ 387,026
-	-	24,744
-	-	1,359,445
-	-	682,589
-	-	368,294
200	-	2,822,098
140,061	-	442,987
140,061	-	442,987
-	-	193,567
-	-	1,089,793
692,764	-	692,764
-	30,472,794	30,472,794
-	-	85,736
-	-	12,991,777
692,764	30,472,794	45,526,431
$ 833,025	$ 30,472,794	$ 48,791,516

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CITY OF LAGO VISTA, TEXAS
RECONCILIATION OF THE GOVERNMENTAL FUNDS BALANCE SHEET TO THE STATEMENT OF NET POSITION
SEPTEMBER 30, 2024

Amounts reported for governmental activities in the statement of net position are different because:

Total fund balance of all governmental funds	$	45,526,431
Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds.		25,919,695
Warrants outstanding net of allowance are not an available resource and, therefore, are not reported in the funds.		70,000
Other long-term assets, such as uncollected property taxes, are not available to pay for and, therefore, are reported as unavailable revenue in the funds.		442,987
Long-term liabilities, including bonds payable, are not due and payable in the current period and, therefore, are not reported in the funds.		(53,857,246)
Additional long-term liabilities related to the recognition of the net pension liability and the net OPEB liability are not reported in the funds.		(371,885)
Net position of governmental activities	$	17,729,982

The notes to the financial statements are an integral part of this statement.

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CITY OF LAGO VISTA, TEXAS
STATEMENT OF REVENUES, EXPENDITURES, AND CHANGES IN FUND BALANCES
GOVERNMENTAL FUNDS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	General Fund	Hotel Fund	ARPA Grant Fund
REVENUES			
Property taxes	$ 7,016,916	$ -	$ -
Sales taxes	1,178,845	-	-
Hotel/motel taxes	-	190,782	-
Franchise taxes	652,880	-	-
Penalties and interest on taxes	74,428	-	-
Licenses and permits	2,359,840	-	-
Intergovernmental revenues	803,012	-	-
Charges for services	1,416,541	-	-
Fines	164,918	-	-
Investment earnings	489,631	55,057	85,736
Grants and contributions	150,064	-	524,069
Miscellaneous revenue	190,165	-	-
Total revenues	14,497,240	245,839	609,805
EXPENDITURES			
Current:			
General government	4,054,919	-	-
Public safety	3,331,611	-	-
Highways and streets	1,216,910	-	-
Sanitation	1,134,735	-	-
Culture and recreation	779,897	-	-
Economic development and assistance	254,953	200,971	-
Debt service:			
Bond principal	-	-	-
Interest - bonds	-	-	-
Interest - other debt	-	-	-
Capital outlay	1,243,373	-	524,069
Total expenditures	12,016,398	200,971	524,069
Excess (deficiency) of revenues over expenditures	2,480,842	44,868	85,736
OTHER FINANCING SOURCES (USES)			
Transfers in	2,059,643	-	-
Transfers out	(800,000)	-	-
General obligation bonds issued	-	-	-
Premium on bonds issued	-	-	-
Total other financing sources (uses)	1,259,643	-	-
Net change in fund balance	3,740,485	44,868	85,736
Fund balance - beginning	9,444,859	1,044,925	-
Fund balance - ending	$ 13,185,344	$ 1,089,793	$ 85,736

The notes to the financial statements are an integral part of this statement.

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Debt Service Fund	Capital Projects Fund	Total Governmental Funds
$ 2,704,369	$ -	$ 9,721,285
-	-	1,178,845
-	-	190,782
-	-	652,880
23,373	-	97,801
-	-	2,359,840
-	-	803,012
-	-	1,416,541
-	-	164,918
54,192	880,923	1,565,539
-	-	674,133
-	-	190,165
2,781,934	880,923	19,015,741
9,500	285,371	4,349,790
-	-	3,331,611
-	-	1,216,910
-	-	1,134,735
-	-	779,897
-	-	455,924
1,639,000	-	1,639,000
1,037,372	-	1,037,372
2,800	-	2,800
-	-	1,767,442
2,688,672	285,371	15,715,481
93,262	595,552	3,300,260
-	-	2,059,643
-	-	(800,000)
-	23,465,000	23,465,000
13,892	2,520,405	2,534,297
13,892	25,985,405	27,258,940
107,154	26,580,957	30,559,200
585,610	3,891,837	14,967,231
$ 692,764	$ 30,472,794	$ 45,526,431

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CITY OF LAGO VISTA, TEXAS
RECONCILIATION OF THE GOVERNMENTAL FUNDS STATEMENT OF REVENUES, EXPENDITURES, AND CHANGES IN FUND BALANCES TO THE STATEMENT OF ACTIVITIES
FOR THE YEAR ENDED SEPTEMBER 30, 2024

Amounts reported for governmental activities in the statement of activities are different because:

Net change in fund balances for total governmental funds	$	30,559,200
Governmental funds report capital outlays as expenditures. However, in the statement of activities, the cost of these assets is allocated over their estimated useful lives and reported as depreciation expense. This is the amount by which capital outlay exceeded depreciation expense in the current period.		326,177
Revenues in the statement of activities that do not provide current financial resources are not reported as revenues in the funds.		64,039
The issuance of long-term debt (e.g., bonds, leases) provides current financial resources to governmental funds, while the repayment of the principal of long-term debt consumes the current financial resources of governmental funds. Neither transaction, however, has any effect on net position. Also, governmental funds report the effect premiums, discounts, and similar items when debt is first issued, whereas these amounts are deferred and amortized in the statement of activities. This amount is the net effect of these differences in the treatment of long-term debt and related items.		(24,169,313)
The net effect of various transactions involving the net pension liability and the net OPEB liability is to decrease net position.		(4,576)
Change in net position for governmental activities	$	6,775,527

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The notes to the financial statements are an integral part of this statement.

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CITY OF LAGO VISTA, TEXAS
STATEMENT OF REVENUES, EXPENDITURES, AND CHANGES IN FUND BALANCES
BUDGET AND ACTUAL – GENERAL FUND
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	Budgeted Amounts			Variance With
	Original	Final	Actual	Final Budget
REVENUES				
Property taxes	$ 6,960,287	$ 6,960,287	$ 7,016,916	$ 56,629
Sales taxes	1,335,819	1,335,819	1,236,436	(99,383)
Franchise taxes	597,857	597,857	652,880	55,023
Penalties and interest on taxes	-	-	91,381	91,381
Licenses and permits	1,590,652	1,590,652	2,314,554	723,902
Intergovernmental revenues	42,000	42,000	803,012	58,303
Charges for services	1,338,935	1,338,935	1,432,133	93,198
Fines	135,193	135,193	164,918	29,725
Investment earnings	220,021	220,021	472,678	252,657
Contributions and donations, private sources	31,757	31,757	-	812,455
Miscellaneous revenue	20,278	20,278	170,828	150,550
Total revenues	12,272,799	12,272,799	14,497,239	2,224,440
EXPENDITURES				
Current:				
General government	4,690,637	4,926,561	4,054,919	871,642
Public safety	3,773,231	3,853,228	3,331,611	521,617
Highways and streets	1,550,034	1,606,169	1,216,910	389,259
Sanitation	1,228,371	1,238,371	1,134,735	103,636
Culture and recreation	1,019,562	1,059,563	779,897	279,666
Economic development and assistance	378,251	378,251	254,953	123,298
Capital outlay	770,252	1,801,424	1,243,373	558,051
Total Expenditures	13,410,338	14,863,567	12,016,398	2,847,169
Excess (deficiency) of revenues over expenditures	(1,137,539)	(2,590,768)	2,480,841	5,071,609
OTHER FINANCING SOURCES (USES)				
Transfers in	2,059,643	2,059,643	2,059,643	-
Transfers out	(1,048,044)	(1,048,044)	(800,000)	248,044
Total other financing sources (uses)	1,011,599	1,011,599	1,259,643	248,044
Net change in fund balances	(125,940)	(1,579,169)	3,740,484	5,319,653
Fund balance - beginning	9,444,859	9,444,859	9,444,859	-
Fund balance - ending	$ 9,318,919	$ 7,865,690	$ 13,185,343	$ 5,319,653

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The notes to the financial statements are an integral part of this statement.

CITY OF LAGO VISTA, TEXAS
STATEMENT OF NET POSITION
PROPRIETARY FUNDS
SEPTEMBER 30, 2024

	Business-Type Activities			
	Aviation Fund	Golf Course Fund	Utility Fund	Total Proprietary Funds
ASSETS				
Current Assets:				
Cash and cash equivalents	$ -	$ 1,300	$ 1,111,995	$ 1,113,295
Investments - current	-	-	28,418,153	28,418,153
Accounts receivable, net	-	-	1,741,681	1,741,681
Due from other funds	192,028	590,744	-	782,772
Inventories	-	19,926	-	19,926
Total current assets	192,028	611,970	31,271,829	32,075,827
Noncurrent Assets:				
Land	415,172	499,050	2,337,269	3,251,491
Buildings	186,081	863,164	486,885	1,536,130
Improvements other than buildings	1,274,092	1,602,957	71,421,322	74,298,371
Furnishings and equipment	-	2,365,251	4,473,541	6,838,792
Accumulated depreciation	(466,305)	(3,192,398)	(30,582,112)	(34,240,815)
Construction/development in progress	253,122	-	1,984,295	2,237,417
Total noncurrent assets	1,662,162	2,138,024	50,121,200	53,921,386
Total assets	1,854,190	2,749,994	81,393,029	85,997,213
DEFERRED OUTFLOWS OF RESOURCES				
Deferred outflows of resources	-	109,003	503,802	612,805
Total deferred outflows of resources	-	109,003	503,802	612,805
LIABILITIES				
Current liabilities:				
Accounts payable	688	25,010	330,691	356,389
Compensated absences payable	-	3,714	5,945	9,659
Due to other funds	-	-	6,174,946	6,174,946
Lease payable - current	-	86,016	-	86,016
Other current liabilities	-	-	3,920	3,920
Customer deposits	-	-	335,940	335,940
Total current liabilities	688	114,740	6,851,442	6,966,870
Noncurrent Liabilities:				
Lease payables	-	112,662	-	112,662
Net pension obligation	-	97,254	385,554	482,808
Other noncurrent liabilities	-	16,171	129,059	145,230
Total noncurrent liabilities	-	226,087	514,613	740,700
Total liabilities	688	340,827	7,366,055	7,707,570
DEFERRED INFLOWS OF RESOURCES				
Deferred inflows of resources	-	44,274	295,939	340,213
Total deferred inflows of resources	-	44,274	295,939	340,213
NET POSITION				
Net investment in capital assets	1,662,162	1,939,347	50,121,200	53,722,709
Restricted for capital improvements	-	-	8,231,580	8,231,580
Unrestricted	191,340	534,549	15,882,057	16,607,946
Total net position	$ 1,853,502	$ 2,473,896	$ 74,234,837	$ 78,562,235

The notes to the financial statements are an integral part of this statement.

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CITY OF LAGO VISTA, TEXAS
STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION
PROPRIETARY FUNDS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	Business-Type Activities			
	Aviation Fund	Golf Course Fund	Utility Fund	Total Proprietary Funds
REVENUES				
Operating revenues:				
Charges for services:				
Water	$ -	$ -	$ 6,212,697	$ 6,212,697
Wastewater/sewer	-	-	4,476,913	4,476,913
Other charges	329,324	687,871	-	1,017,195
Miscellaneous revenue	14,160	-	105,741	119,901
Total operating revenues	343,484	687,871	10,795,351	11,826,706
EXPENSES				
Operating expenses:				
Salaries and wages	16,051	685,996	2,150,691	2,852,738
Purchased services	33,190	91,716	693,166	818,072
Purchased property services	24,758	118,606	1,488,401	1,631,765
Materials and supplies	219,823	127,667	372,151	719,641
Other operating expenses	11,365	34,170	371,118	416,653
Depreciation	60,812	231,971	2,256,563	2,549,346
Miscellaneous	925	13,151	3,427	17,503
Total operating expenses	366,924	1,303,277	7,335,517	9,005,718
Operating income (loss)	(23,440)	(615,406)	3,459,834	2,820,988
Nonoperating revenues (expenses)				
Investment earnings	-	-	1,420,033	1,420,033
Interest expense	-	(12,860)	-	(12,860)
Total nonoperating revenues (expenses)	-	(12,860)	1,420,033	1,407,173
Income before transfers in (out)	(23,440)	(628,266)	4,879,867	4,228,161
Transfers in	-	800,000	-	800,000
Transfers out	-	-	(2,059,643)	(2,059,643)
Change in net position	(23,440)	171,734	2,820,224	2,968,518
Net position-beginning	1,876,942	2,302,162	71,414,613	75,593,717
Net position-ending	$ 1,853,502	$ 2,473,896	$ 74,234,837	$ 78,562,235

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The notes to the financial statements are an integral part of this statement.

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CITY OF LAGO VISTA, TEXAS
STATEMENT OF CASH FLOWS
PROPRIETARY FUNDS
SEPTEMBER 30, 2024

	Business-Type Activities			
	Aviation Fund	Golf Course Fund	Utility Fund	Total Proprietary Funds
CASH FLOWS FROM OPERATING ACTIVITIES				
Receipts from customers	$ 386,484	$ 687,871	$ 10,189,395	$ 11,263,750
Receipt (return) of customer deposits	-	-	2,020	2,020
Payments to suppliers and service providers	(370,433)	(653,332)	(2,725,946)	(3,749,711)
Payments to employees for salaries and benefits	(16,051)	(702,929)	(2,188,897)	(2,907,877)
Net cash provided by (used for) operating activities	-	(668,390)	5,276,572	4,608,182
CASH FLOWS FROM NONCAPITAL FINANCING ACTIVITIES				
Transfers from other funds	-	800,000	(2,059,643)	(1,259,643)
Net cash provided by (used for) capital and financing activities	-	800,000	(2,059,643)	(1,259,643)
CASH FLOWS FROM CAPITAL AND RELATED FINANCING ACTIVITIES				
Principal paid on capital debt	-	(132,218)	-	(132,218)
Long-term employee costs	-	-	(1,417,648)	(1,417,648)
Proceeds from sale of assets	-	608	-	608
Net cash provided by (used for) capital and related financing activities	-	(131,610)	(1,417,648)	(1,549,258)
CASH FLOWS FROM INVESTING ACTIVITIES				
Purchases of investments	-	-	(2,590,736)	(2,590,736)
Interest on investments	-	-	1,420,033	1,420,033
Net cash provided by investing activities	-	-	(1,170,703)	(1,170,703)
Net increase (decrease) in cash and cash equivalents	-	-	628,578	628,578
Cash and cash equivalents-beginning	-	1,300	483,417	484,717
Cash and cash equivalents-ending	$ -	$ 1,300	$ 1,111,995	$ 1,113,295
Reconciliation of operating income (loss) to net cash provided (used for) operating activities:				
Operating income (loss)	$ (23,440)	$ (615,406)	$ 3,459,834	$ 2,820,988
Adjustments to reconcile operating income (loss) to net cash provided by (used for) operating activities:				
Depreciation expense	60,802	231,971	2,256,563	2,549,336
(Increase) decrease in accounts receivable	43,000	-	1,183,394	1,226,394
(Increase) decrease in due from other funds	(79,369)	(258,690)	84,771	(253,288)
(Decrease) increase in deposits payable	-	-	2,020	2,020
(Decrease) increase in accounts payable	(993)	(9,332)	202,317	191,992
(Decrease) increase in accrued liabilities	-	(16,933)	(38,206)	(55,139)
(Decrease) increase in other current liabilities	-	-	(1,874,121)	(1,874,121)
Total adjustments	23,440	(52,984)	1,816,738	1,787,194
Net cash provided by (used for) operating activities	$ -	$ (668,390)	$ 5,276,572	$ 4,608,182

The notes to the financial statements are an integral part of this statement.

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NOTES TO THE FINANCIAL STATEMENTS

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I. Summary of Significant Accounting Policies

This section describes the significant accounting and reporting guidelines of the City.

A. Reporting Entity

The City is a municipal corporation governed by an elected mayor and six-member governing council. The accompanying financial statements present the government and its component units, entities for which the government is considered to be financially accountable. Blended component units are, in substance, part of the primary government's operations, even though they are legally separate entities. Thus, blended component units are appropriately presented as funds of the primary government. However, there were no component units identified that would require inclusion in this report.

C. Government-Wide Financial Statements

While separate government-wide and fund financial statements are presented, they are interrelated. The governmental activities column incorporates data from governmental funds and internal service funds, while business-type activities incorporate data from the government's enterprise funds. Separate financial statements are provided for governmental funds, proprietary funds, and fiduciary funds, even though the latter are excluded from the government-wide financial statements.

D. Fund Financial Statements

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The fund financial statements provide information about the government's funds, including its fiduciary funds and blended component units. The emphasis of fund financial statements is on major governmental and enterprise funds, each displayed in a separate column. All remaining governmental and enterprise funds are aggregated and reported as nonmajor funds. Major individual governmental and enterprise funds are reported as separate columns in the fund financial statements.

The government reports the following major governmental funds:

The General Fund is the government's primary operating fund. It accounts for all financial resources of the general government, except those accounted for in another fund.

The Hotel Fund accounts for fees received in relation to hotel and motel taxes and are spent in relation to economic development and assistance.

The ARPA Grant Fund accounts for funding received in relation to the America Rescue Plan Act of 2021 (ARPA). The funds are intended to support various aspects of recovery efforts.

The Debt Service Fund is used to account for the accumulation of resources that are restricted, committed, or assigned for the payment of principal and interest on long-term obligations of governmental funds.

The Capital Projects Fund accounts for the acquisition and construction of the government's major capital facilities, other than those financed by proprietary funds.

The government reports the following major enterprise funds:

The Aviation Fund accounts for the government's aviation services, including aviation equipment, supplies, and facilities.

The Golf Course Fund accounts for the government's municipal golf course services, including the pro shop, snack bar, and golf course.

The Utility Fund accounts for the government's utility services, including water and sewer services.

During the course of operations the government has activity between funds for various purposes. Any residual balances outstanding at year end are reported as due from/to other funds or advances to/from other funds. While these balances are reported in fund financial statements, certain eliminations are made in the preparation of the government-wide financial statements. Balances between the funds included in governmental activities (i.e., the governmental and internal service funds) are eliminated so that only the net amount is included as internal balances in the governmental activities column. Similarly, balances between the funds included in business-type activities (i.e., the enterprise funds) are eliminated so that only the net amount is included as internal balances in the business-type activities column.

Further, certain activity occurs during the year involving transfers of resources between funds. In fund financial statements these amounts are reported at gross amounts as transfers in/out. While reported in fund financial statements, certain eliminations are made in the preparation of the government-wide financial statements. Transfers between the funds included in governmental activities are eliminated so that only the net amount is included as transfers in the governmental activities column. Similarly, balances between the funds included in business-type activities are eliminated so that only the net amount is included as transfers in the business-type activities column.

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E. Measurement Focus and Basis of Accounting

The accounting and financial reporting treatment is determined by the applicable measurement focus and basis of accounting. Measurement focus indicates the type of resources being measured such as *current financial resources* or *economic resources.* The basis of accounting indicates the timing of transactions or events for recognition in the financial statements.

The government-wide financial statements are reported using the *economic resources measurement focus* and the *accrual basis of accounting*. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows. Property taxes are recognized as revenues in the year for which they are levied. Grants and similar items are recognized as revenue as soon as all eligibility requirements imposed by the provider have been met.

Property taxes, sales taxes, franchise taxes, licenses, and interest associated with the current fiscal period are all considered to be susceptible to accrual and so have been recognized as revenues of the current fiscal period. Entitlements are recorded as revenues when all eligibility requirements are met, including any time requirements, and the amount is received during the period or within the availability period for this revenue source (within 60 days of year end). Expenditure-driven grants are recognized as revenue when the qualifying expenditures have been incurred and all other eligibility requirements have been met, and the amount is received during the period or within the availability period for this revenue source (within 60 days of year end). All other revenue items are considered to be measurable and available only when cash is received by the government.

Proprietary, pension and other postemployment benefit trust, and private-purpose trust funds are reported using the *economic resources measurement focus* and the *accrual basis of accounting*. Agency funds have no measurement focus but utilize the *accrual basis of accounting* for reporting its assets and liabilities.

F. Budgetary Information

1. Budgetary basis of accounting

Annual budgets are adopted on a basis consistent with generally accepted accounting principles for the General Fund and Debt Service Fund. The capital projects are appropriated on a project-length basis. Other special revenue funds and the permanent fund do not have appropriated budgets since other means control the use of these resources (e.g., grant awards and endowment requirements) and sometimes span a period of more than one fiscal year.

The appropriated budget is prepared by fund and department. The government's department heads may make transfers of appropriations within a department. Transfers of appropriations between departments require the approval of the council. The legal level of budgetary control (i.e., the level at which expenditures may not legally exceed appropriations) is the department level.

Appropriations in all budgeted funds lapse at the end of the fiscal year even if they have related encumbrances. Encumbrances are commitments related to unperformed (executory) contracts for goods or services (i.e., purchase orders, contracts, and commitments). Encumbrance accounting is utilized to the extent necessary to assure effective budgetary control and accountability and to facilitate effective cash planning and control. While all appropriations and encumbrances lapse at year end, valid outstanding encumbrances (those for which performance under the executory contract is expected in the next year) are re-appropriated and become part of the subsequent year's budget pursuant to state regulations.

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2. Excess of expenditures over appropriations

For the year ended September 30, 2024, expenditures did not significantly exceed appropriations in any of the City's legally adopted budgets.

2. ***Investments***

Investments for the government are reported at fair value (generally based on quoted market prices) except for positions in Local Government Investment Pools (e.g. Logic) when applicable. In accordance with state law, these investment pools operate in conformity with all of the requirements of the Securities and Exchange Commission's (SEC) Rule 2a7 as promulgated under the Investment Company Act of 1940, as amended. Accordingly, the pools qualify as 2a7-like pools and are reported at the net asset value per share (which approximates fair value) even though it is calculated using the amortized cost method. The pools are subject to regulatory oversight by the State Treasurer, although it is not registered with the SEC.

3. Inventories and prepaid items

Inventories are valued at cost using the weighted cost method and consist of the golf course's pro shop inventory. The cost of such inventories is recorded as expenditures/expenses when consumed rather than when purchased. Certain payments to vendors reflect costs applicable to future accounting periods and are recorded as prepaid items in both the government-wide and fund financial statements. The cost of prepaid items is recorded as expenses when consumed rather than when purchased. The City does not currently have any prepaid items.

4. Capital assets

Capital assets, which include property, plant, equipment, and infrastructure assets (e.g. roads, bridges, sidewalks, and similar items), are reported in the applicable governmental or business-type activities column in the government-wide financial statements. Capital assets, except for infrastructure assets, are defined by the government as assets with an initial, individual cost of more than $5,000 and an estimated useful life of more than one year.

As the government constructs or acquires additional capital assets each period, including infrastructure assets, they are capitalized and reported at historical cost. The reported value excludes normal maintenance and repairs which are essentially amounts spent in relation to capital assets that do not increase the capacity or efficiency of the item or increase its estimated useful life. Donated capital assets are recorded at their estimated fair value at the date of donation.

Land and construction in progress are not depreciated. The other property, plant, equipment, and infrastructure of the primary government are depreciated using the straight line method over the following estimated useful lives:

Capital asset classes	Lives
Buildings	10-50
Machinery and equipment	5-20
Vehicles	5-10
Improvements	10-20

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5. Deferred outflows/inflows of resources

In addition to assets, the statement of financial position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, *deferred outflows of resources*, represents a consumption of net position that applies to a future period(s) and so will *not* be recognized as an outflow of resources (expense/ expenditure) until then. The government currently does not have any financial transactions that qualify for reporting in this category. In addition to liabilities, the statement of financial position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, *deferred inflows of resources,* represents an acquisition of net position that applies to a future period(s) and so will *not* be recognized as an inflow of resources (revenue) until that time. The government currently has deferred inflows related to net pension liability and other postemployment benefits. The governmental funds report unavailable revenues related to property taxes. These amounts are deferred and recognized as an inflow of resources in the period that the amounts become available.

6. Net position flow assumption

Sometimes the government will fund outlays for a particular purpose from both restricted (e.g., restricted bond or grant proceeds) and unrestricted resources. In order to calculate the amounts to report as restricted – net position and unrestricted – net position in the government-wide and proprietary fund financial statements, a flow assumption must be made about the order in which the resources are considered to be applied. It is the government's policy to consider restricted – net position to have been depleted before unrestricted – net position is applied.

7. Fund balance flow assumptions

Sometimes the government will fund outlays for a particular purpose from both restricted and unrestricted resources (the total of committed, assigned, and unassigned fund balance). In order to calculate the amounts to report as restricted, committed, assigned, and unassigned fund balance in the governmental fund financial statements a flow assumption must be made about the order in which the resources are considered to be applied. It is the government's policy to consider restricted fund balance to have been depleted before using any of the components of unrestricted fund balance. Further, when the components of unrestricted fund balance can be used for the same purpose, committed fund balance is depleted first, followed by assigned fund balance. Unassigned fund balance is applied last.

8. Fund balance policies

Fund balance of governmental funds is reported in various categories based on the nature of any limitations requiring the use of resources for specific purposes. The government itself can establish limitations on the use of resources through either a commitment (committed fund balance) or an assignment (assigned fund balance). The committed fund balance classification includes amounts that can be used only for the specific purposes determined by a formal action of the government's highest level of decision-making authority. The governing council is the highest level of decision-making authority for the government that can, by adoption of an ordinance prior to the end of the fiscal year, commit fund balance. Once adopted, the limitation imposed by the ordinance remains in place until a similar action is taken (the adoption of another ordinance) to remove or revise the limitation. Amounts in the assigned fund balance classification are intended to be used by the government for specific purposes but do not meet the criteria to be classified as committed.

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The council may also assign fund balance as it does when appropriating fund balance to cover a gap between estimated revenue and appropriations in the subsequent year's appropriated budget. Unlike commitments, assignments generally only exist temporarily. In other words, an additional action does not normally have to be taken for the removal of an assignment. Conversely, as discussed above, an additional action is essential to either remove or revise a commitment.

H. Revenues and Expenditures/Expenses

1. Program revenues

Amounts reported as *program revenues* include 1) charges to customers or applicants who purchase, use, or directly benefit from goods, services, or privileges provided by a given function or segment and 2) grants and contributions (including special assessments) that are restricted to meeting the operational or capital requirements of a particular function or segment. All taxes, including those dedicated for specific purposes, and other internally dedicated resources are reported as general revenues rather than as program revenues.

2. Property taxes

Property taxes are considered available when collected within the current period or expected to be collected soon enough thereafter to be used to pay liabilities of the current period. The City levies its taxes on October 1 in conformity with Subtitle E, Texas Property Tax Code. Taxes are due upon receipt of the tax bill and are past due and subject to interest if not paid by February 1 of the year following the October 1 levy date. The assessed value of the property tax roll of January 1, 2023 upon which the levy for the 2023-2024 fiscal year was based, was $2,415,816,139. Taxes are delinquent if not paid by February 1st of the following calendar year. Delinquent taxes are subject to both penalty and interest charges plus 15% delinquent collection fees for attorney costs.

The tax rates assessed for the year ended September 30, 2024, to finance General Fund and Debt Service Fund operations were $0.2989 and $0.1150, respectively, for a total tax rate of $0.4139 per $100 valuation. The total tax levy for the General Fund and Debt Service Fund for the 2023-2024 fiscal year was $9,999,063. Tax collections, including collections of prior year delinquent balances, for the year ended September 30, 2024, were 97% of the year end adjusted tax levy. Delinquent taxes are prorated between maintenance and debt service based on rates for the year of the levy. Allowances for uncollectible taxes within the General and Debt Service Funds are based on historical experience in collecting taxes.

3. Compensated absences

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Vacation

Upon termination, all regular employees who resign or are terminated after a 90-day probation period will be compensated for unused vacation leave up to a max of 30 days. Payment is based on the employee's salary at time of termination. Two-week notice required.

Sick Leave

If employed before July 1, 2016, 50% of accrued sick leave is paid upon termination or resignation up to a max of 90 days. Any employee employed after July 1, 2016 will not be eligible for paid accrued sick leave at termination or resignation.

4. Proprietary funds operating and nonoperating revenues and expenses

Proprietary funds distinguish *operating* revenues and expenses from *nonoperating* items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's principal ongoing operations. The principal operating revenues of the water fund and electric fund are charges to customers for sales and services. The water fund also recognizes as operating revenue the portion of tap fees intended to recover the cost of connecting new customers to the system. Operating expenses for enterprise funds and internal service funds include the cost of sales and services, administrative expenses, and depreciation on capital assets. All revenues and expenses not meeting this definition are reported as nonoperating revenues and expenses.

II. Stewardship, Compliance and Accountability

A. Violations of Legal or Contractual Provisions

No violations of legal or contractual provisions were noted during the current year.

B. Deficit Fund Equity

For the year ended September 30, 2024 there were no funds reported with deficit fund equity.

III. Detailed Notes on All Activities and Funds

A. Cash Deposits with Financial Institution

Custodial credit risk-deposits. In the case of deposits, this is the risk that in the event of a bank failure, the government's deposits may not be returned to it. The government does not have a deposit policy for custodial credit risk. As of September 30, 2024, the government's bank balance was $1,428,046 and $-0- of that amount was exposed to custodial credit risk because it was uninsured and collateralized with securities held by the pledging or financial institution's trust department or agent, but not in the government's name.

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B. Investments

The State Treasurer's Investment Pool (Pool) operates in accordance with state law, which requires it to meet all of the requirements of Rule 2a-7 of the Securities and Exchange Commission. See note I.G.2, *Investments*, for a discussion of how the shares in the Pool are valued. The Pool has a credit rating of AAA from Standard & Poor's Financial Services. Local government investment pools in this rating category meet the highest standards for credit quality, conservative investment policies, and safety of principal. The Pool invests in a high quality portfolio of debt securities investments legally permissible for municipalities and school districts in the state.

The government utilizes a pooled investment concept for all its funds to maximize its investment program. Investment income from this internal pooling is allocated to the respective funds based upon the sources of funds invested. State statutes authorize the government to invest in obligations of the U.S. Treasury, commercial paper, corporate bonds, repurchase agreements, and the State Treasurer's Investment Pool.

As of September 30, 2024, the government had the following investments:

	Maturity Time in Years	
		Less than
Investment Type		1
Logic (local government investment pool)	$	69,927,602
Total investments	$	69,927,602

Interest rate risk. In accordance with its investment policy, the government manages its exposure to declines in fair values by limiting the weighted average maturity of its investment portfolio to less than ten months.

Credit risk. State law limits investments in commercial paper and corporate bonds to the top two ratings issued by nationally recognized statistical rating organizations (NRSROs). It is the government's policy to limit its investments in these investment types to the top rating issued by NRSROs. As of September 30, 2024, the government's investment in the State Treasurer's investment pool was rated AAA by Standard & Poor's and AAA by Moody's Investors Service.

Concentration of credit risk. The government's investment policy does not allow for an investment in any one issuer that is in excess of 5 percent of the government's total investments. This restriction however does not apply to government investment pools due to the low risk nature of this type of investment.

Custodial credit risk-investments. For an investment, this is the risk that, in the event of the failure of the counterparty, the government will not be able to recover the value of its investments or collateral securities that are in the possession of an outside party.

C. Receivables

Amounts are aggregated into a single accounts receivable (net of allowance for uncollectibles) line for certain funds and aggregated columns. Below is a detail of receivables for the major and nonmajor funds of both the governmental and proprietary funds of the government, including the applicable allowances for uncollectible accounts:

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Governmental Funds:

Receivables	General Fund	Hotel Fund	Debt Service Fund	Total Governmental Funds
Property taxes	$ 302,926	$ -	$ 140,061	$ 442,987
Accounts receivable	231,249	-	-	231,249
Franchise taxes	145,738	69,884	-	215,622
Gross receivables	679,913	69,884	140,061	889,858
Less: Allowance for uncollectibles	(19,861)	-	-	(19,861)
Net receivables	$ 660,052	$ 69,884	$ 140,061	$ 869,997

Proprietary Funds:

Receivables	Utility Fund
Accounts receivable	$ 2,040,533
Gross receivables	2,040,533
Less: Allowance for uncollectibles	(298,852)
Net receivables	$ 1,741,681

D. Capital Assets

Capital assets activity for the year ended September 30, 2024, was as follows:

Governmental Activities:

	Balance 10/1/23	Increases	Decreases	Balance 9/30/24
Capital assets, not being depreciated:				
Land	$ 1,520,409	$ 5,061	$ -	$ 1,525,470
Total capital assets, not being depreciated	1,520,409	5,061	-	1,525,470
Capital assets, being depreciated:				
Autos and trucks	1,177,441	83,193	-	1,260,634
Buildings & streets	23,238,438	952,957	-	24,191,395
Furniture and fixtures	109,627	4,789	-	114,416
Improvements	7,986,184	185,779	-	8,171,963
Machinery and equipment	2,696,872	535,663	(1,006)	3,231,529
Total capital assets, being depreciated	35,208,562	1,762,381	(1,006)	36,969,937
Less accumulated depreciation for:				
Autos and trucks	(1,177,441)	(16,639)	-	(1,194,080)
Buildings & streets	(5,197,500)	(824,333)	-	(6,021,833)
Furniture and fixtures	(100,091)	(1,053)	-	(101,144)
Improvements	(2,925,619)	(279,135)	-	(3,204,754)
Machinery and equipment	(1,734,802)	(320,105)	1,006	(2,053,901)
Total accumulated depreciation	(11,135,453)	(1,441,265)	1,006	(12,575,712)
Total capital assets being depreciated, net	24,073,109	321,116	-	24,394,225
Governmental activities capital assets, net	$ 25,593,518	$ 326,177	$ -	$ 25,919,695

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Business-type Activities:

	Balance 10/1/23	Increases	Decreases	Balance 9/30/24
Capital assets, not being depreciated:				
Land	$ 3,251,491	$ -	$ -	$ 3,251,491
Construction in progress	1,083,856	1,153,561	-	2,237,417
Total capital assets, not being depreciated	4,335,347	1,153,561	-	5,488,908
Capital assets, being depreciated:				
Buildings	1,536,130	-	-	1,536,130
Improvements	73,798,891	499,480	-	74,298,371
Furniture and equipment	6,388,572	520,827	(70,607)	6,838,792
Total capital assets, being depreciated	81,723,593	1,020,307	(70,607)	82,673,293
Less accumulated depreciation for:				
Buildings	(593,479)	(44,906)	-	(638,385)
Improvements	(25,877,638)	(2,014,141)	-	(27,891,779)
Furniture and equipment	(5,290,959)	(490,299)	70,607	(5,710,651)
Total accumulated depreciation	(31,762,076)	(2,549,346)	70,607	(34,240,815)
Total capital assets being depreciated, net	49,961,517	(1,529,039)	-	48,432,478
Business-type activities capital assets, net	$ 54,296,864	$ (375,478)	$ -	$ 53,921,386

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Depreciation expense was charged to the functions/programs of the governmental activities of the primary government as follows:

Governmental activities:	
General government	$ 556,330
Public safety	426,106
Highways and streets	155,640
Sanitation	145,130
Culture and recreation	99,747
Economic development and assistance	58,312
Total depreciation expense - governmental activities	$ 1,441,265

E. Defined Benefit Pension Plan

Plan Description

The City participates as one of more than 930 in the defined benefit cash-balance plan administered by the Texas Municipal Retirement System (TMRS). TMRS is a statewide public retirement plan created by the State of Texas and administered in accordance with the TMRS Act, Subtitle G, Title 8, Texas Government Code (the TMRS Act) as an agent multiple-employer retirement system for employees of Texas participating cities. The TMRS Act places the general administration and management of TMRS with a six-member, Governor-appointed Board of Trustees; however, TMRS is not fiscally dependent on the State of Texas. TMRS issues a publicly available Annual Comprehensive Financial Report (Annual Report) that can be obtained at tmrs.com.

All eligible employees of the city are required to participate in TMRS.

Benefits Provided

TMRS provides retirement, disability, and death benefits. Benefit provisions are adopted by the governing body of the city, within the options available in the state statutes governing TMRS.

At retirement, the Member's benefit is calculated based on the sum of the Member's contributions, with interest, and the city-financed monetary credits with interest. The retiring Member may select one of seven monthly benefit payment options. Members may also choose to receive a portion of their benefit as a lump sum distribution in an amount equal to 12, 24 or 36 monthly payments, which cannot exceed 75% of the total Member contributions and interest.

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Employees Covered by Benefit Terms

At the December 31, 2023 valuation and measurement date, the following employees were covered by the benefit terms:

Inactive employees or beneficiaries currently receiving benefits	53
Inactive employees entitled to but not yet receiving benefits	85
Active employees	106
	244

Contributions

Member contribution rates in TMRS are either 5%, 6% or 7% of the Member's total compensation, and the city matching percentages are either 100%, 150% or 200%, both as adopted by the governing body of the city. Under the state law governing TMRS, the contribution rate for each city is determined annually by the actuary, using the Entry Age Normal (EAN) actuarial cost method. The city's contribution rate is based on the liabilities created from the benefit plan options selected by the city and any changes in benefits or actual experience over time.

Employees for the City were required to contribute 6% of their annual gross earnings during the fiscal year. The contribution rates for the City of Lago Vista, Texas were 8.28% and 9.08% in calendar years 2023 and 2024, respectively. The City’s contributions to TMRS for the year ended September 30, 2024 were $569,987, and were equal to the required contributions.

Net Pension Liability

The City's Net Pension Liability (NPL) was measured as of December 31, 2023, and the Total Pension Liability (TPL) used to calculate the Net Pension Liability was determined by an actuarial valuation as of that date.

Actuarial Assumptions

The Total Pension Liability in the December 31, 2023 actuarial valuation was determined using the following actuarial assumptions:

Inflation	2.50% per year
Overall payroll growth	2.75% per year, adjusted down for population declines, if any
Investment rate of return	6.75%, net of pension plan investment expense, including inflation

Salary increases are based on a service-related table. Mortality rates for active members are based on the PUB(10) mortality tables with the Public Safety table used for males and the General Employee table used for females. Mortality rates for healthy retirees and beneficiaries are based on the Gender-distinct 2019 Municipal Retirees of Texas mortality tables. The rates for actives, healthy retirees and beneficiaries are projected on a fully generational basis by Scale UMP to account for future mortality improvements. For disabled annuitants, the same mortality tables for healthy retirees are used with a 4- year set-forward for males and a 3-year set-forward for females. In addition, a 3.5% and 3.0% minimum mortality rate is applied, for males and females respectively, to reflect the impairment for younger members who become disabled. The rates are projected on a fully generational basis by Scale UMP to account for future mortality improvements subject to the floor.

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The actuarial assumptions were developed primarily from the actuarial investigation of the experience of TMRS over the four-year period from December 31, 2014 to December 31, 2018. The assumptions were adopted in 2019 and first used in the December 31, 2109, actuarial valuation. The post-retirement mortality assumption for Annuity Purchase Rates (APRs) is based on the Mortality Experience Investigation Study covering 2009 through 2011 and dated December 31, 2013. Plan assets are managed on a total return basis with an emphasis on both capital appreciation as well as the production of income to satisfy the short-term and long-term funding needs of TMRS.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. In determining their best estimate of a recommended investment return assumption under the various alternative asset allocation portfolios, GRS focused on the area between (1) arithmetic mean (aggressive) without an adjustment for time (conservative) and (2) the geometric mean (conservative) with an adjustment for time (aggressive). The target allocation and best estimates of real rates of return for each major asset class in fiscal year 2024 are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Arithmetic)
Global Public Equity	35.0%	6.70%
Core Fixed Income	6.0%	4.70%
Non-Core Fixed Income	20.0%	8.00%
Other Public & Private Markets	12.0%	8.00%
Real Estate	12.0%	7.60%
Hedge Funds	5.0%	6.40%
Private Equity	10.0%	11.60%
Total	100%	

Discount Rate

The discount rate used to measure the Total Pension Liability was 6.75%. The projection of cash flows used to determine the discount rate assumed that employee and employer contributions will be made at the rates specified in statute. Based on that assumption, the pension plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments of current active and inactive employees. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability.

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	Increase (Decrease)		
	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
	(a)	(b)	(a) - (b)
Balance at 12/31/2022	$ 14,815,145	$ 13,232,388	$ 1,582,756
Changes for the year:			
Service cost	877,168	-	877,168
Interest	1,006,901	-	1,006,901
Change of benefit terms	-	-	-
Difference between expected and actual experience	106,274	-	106,274
Changes of assumptions	(56,266)	-	(56,266)
Contributions - employer	-	514,294	(514,294)
Contributions - employee	-	391,593	(391,593)
Net investment income	-	1,531,481	(1,531,481)
Benefit payments, including refunds of employee contr.	(673,358)	(673,358)	-
Administrative expense	-	(9,743)	9,743
Other changes	-	(68)	68
Net changes	1,260,719	1,754,199	(493,480)
Balance at 12/31/2023	$ 16,075,864	$ 14,986,587	$ 1,089,277

Sensitivity of the net pension liability to changes in the discount rate

The following presents the net pension liability of the City, calculated using the discount rate of 6.75%, as well as what the City's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower 5.75% or 1-percentage-point higher 7.75% than the current rate:

	1% Decrease in Discount Rate 5.75%	Current Discount Rate 6.75%	1% Increase in Discount Rate 7.75%
City's net pension liability	$ 3,201,210	$ 1,089,277	$ (660,997)

Pension Plan Fiduciary Net Position

Detailed information about the pension plan's Fiduciary Net Position is available in a separately-issued TMRS financial report. That report may be obtained on the Internet at *www.tmrs.com*.

Pension Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

For the year ended September 30, 2024, the city recognized pension expense of $2,716.

At September 30, 2024, the city reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

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	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between projected and actual investment earnings	$ 1,229,249	$ 846,228
Differences between expected and actual economic experience	73,836	28,635
Difference in assumption changes	-	38,846
Contributions subsequent to the measurement date	425,290	-
Total	$ 1,728,375	$ 913,709

$425,288 reported as deferred outflows of resources related to pensions resulting from contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability for the year ending September 30, 2024. Other amounts reported as deferred outflows and inflows of resources related to pensions will be recognized in pension expense as follows:

Measurement Year Ended Dec 31st:	Net Deferred Outflows (Inflows) of Resources
2024	$ 91,756
2025	139,629
2026	285,649
2027	(127,659)
Total	$ 389,375

F. Other Post-Employment Benefit (OPEB) Obligations

Benefits Provided

The City also participates in the cost sharing multiple-employer defined benefit group-term life insurance plan operated by the Texas Municipal Retirement System (TMRS) known as the Supplemental Death Benefits Fund (SDBF). The City elected, by ordinance, to provide group-term life insurance coverage to both current and retired employees. The City may terminate coverage under and discontinue participation in the SDBF by adopting an ordinance before November 1 of any year to be effective the following January 1.

The death benefit for active employees provides a lump-sum payment approximately equal to the employee's annual salary (calculated based on the employee's actual earnings, for the 12-month period preceding the month of death); retired employees are insured for $7,500; this coverage is an other post-employment benefit, or OPEB.

Employees Covered by Benefit Terms

At the December 31, 2023 valuation and measurement date, the following employees were covered by the benefit terms:

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Inactive employees currently receiving benefits	41
Inactive employees entitled to but not yet receiving benefits	19
Active employees	106
	166

Contributions

The City contributes to the SDBF at a contractually required rate as determined by an annual actuarial valuation. The rate is equal to the cost of providing one-year term life insurance. The funding policy for the SDBF program is to assure that adequate resources are available to meet all death benefit payments for the upcoming year; the intent is not to pre-fund retiree term life insurance during employees' entire careers.

The City's contributions to the TMRS SDBF for the years September 30, 2024 and 2023 were $27,457 and $22,405 respectively, which equaled the required contributions each year.

Plan Assets

At the December 31, 2023 valuation and measurement date, there are no assets accumulated in trust.

Actuarial Assumptions

The Total OPEB Liability in the December 31, 2023 actuarial valuation was determined using the following actuarial assumptions:

Inflation	2.50% per year
Salary increases	3.50%-11.50% including inflation per year
Discount rate	1.84% based on Fidelity Index's 20-year Municipal GO AA Index
Retirees' share of benefit costs	$0

All administrative expenses are paid through the Pension Trust and accounted for under reporting requirements under GASB No. 68. Mortality rates for service retirees are calculated using the RP2000 Combined Mortality Table with Blue Collar Adjustment with male rates multiplied by 109% and female rates multiplied by 103% and projected on a fully generational basis with scale BB; while the mortality rate for disabled retirees are calculated using the RP2000 Combined Mortality Table with Blue Collar Adjustment with male rates multiplied by 109% and female rates multiplied by 103% with a 3 year set-forward for both males and females and projected on a fully generational basis with scale BB to account for future mortality improvements subject to the 3% floor. The actuarial assumptions used in the December 31, 2017 valuation were based on the results of an actuarial experience study for the period December 31, 2010 to December 31, 2014.

Schedule of Changes in the Total OPEB Liability

	Increase (Decrease)		
	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability
	(a)	(b)	(a) - (b)
Balance at 12/31/2022	$ 251,155	$ -	$ 251,155
Changes for the year:			
Service cost	16,316	-	16,316
Interest	10,357	-	10,357
Change of benefit terms	-	-	-
Difference between expected and actual experience	10,903	-	10,903
Changes of assumptions	14,381	-	14,381
Contributions - employer	-	-	-
Contributions - employee	-	-	-
Net investment income	-	-	-
Benefit payments, including refunds of employee contr.	(7,179)	-	(7,179)
Administrative expense	-	-	-
Other changes	-	-	-
Net changes	44,778	-	44,778
Balance at 12/31/2023	$ 295,933	$ -	$ 295,933

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Sensitivity of the net OPEB liability to changes in the discount rate

The following presents the net OPEB liability of the City, calculated using the discount rate of 3.77% as well as what the City's net OPEB liability would be if it were calculated using a discount rate that is 1-percentage-point lower 2.77% or 1-percentage-point higher 4.77% than the current rate:

	1% Decrease in Discount Rate 2.77%	Current Discount Rate 3.77%	1% Increase in Discount Rate 4.77%
City's net OPEB liability	$ 348,575	$ 295,933	$ 253,972

Pension Plan Fiduciary Net Position

Detailed information about the OPEB plan's Fiduciary Net Position is available in a separately-issued TMRS financial report. That report may be obtained on the Internet at *www.tmrs.com*.

Pension Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB

For the year ended September 30, 2024, the city recognized OPEB expense of $10,273.

At September 30, 2024, the city reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual economic experience	$ 12,146	$ 6,440
Difference in assumption changes	33,951	71,326
Contributions subsequent to the measurement date	20,110	-
Total	$ 66,207	$ 77,766

$20,112 reported as deferred outflows of resources related to OPEB resulting from contributions subsequent to the measurement date will be recognized as a reduction of the net OPEB liability for the year ending September 30, 2024. Other amounts reported as deferred outflows and inflows of resources related to pensions will be recognized in OPEB expense as follows:

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Measurement Year Ended Dec 31st:	Net Deferred Outflows (Inflows) of Resources
2024	$ (4,296)
2025	(11,183)
2026	(17,599)
2027	1,412
Total	$ (31,666)

G. Risk Management

The government is exposed to various risks of loss related to torts: theft of, damage to, and destruction of assets; errors and omissions; and natural disasters. During the year, the City purchased commercial insurance to cover general liabilities. There are no significant reductions in coverage in the past fiscal year and no settlements exceeding insurance coverage for each of the past three fiscal years.

H. Lease Obligations

1. Capital Leases

Leases are defined by the general government as the right to use an underlying asset. As lessee, the City recognizes a lease liability and an intangible right-of-use lease asset at the beginning of a lease unless the lease is considered a short-term lease or transfers ownership of the underlying asset. Right-of-use lease assets are measured based on the net present value of the future lease payments at inception, using the weighted average cost of capital, which approximate the incremental borrowing rate. Remeasurement of a lease liability occurs when there is a change in the lease term and/or other changes that are likely to have a significant impact on the lease liability.

The future minimum lease obligations and the net present value of these minimum lease payments as of September 30, 2024, were as follows:

Year Ending September 30,	Business-type Activities
2024	$ 132,218
2025	122,771
2026	255,747
2027	9,170
2028	1
Total minimum lease payments	519,907
Less: amount representing interest	(27,462)
Present value of minimum lease payments	$ 492,445

I. Long-Term Liabilities

General Obligation Bonds

The government issues general obligation bonds and certificates of obligation to provide funds for the acquisition and construction of major capital facilities. General obligation bonds and certificates of obligation have been issued for both governmental and business-type activities. These long-term debt instruments are direct obligations and pledge the full faith and credit of the government. General obligation bonds and certificates of obligation generally are issued with repayment scheduled to occur as equal amounts of principal maturing each year with maturities that range from 5 to 30 years.

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Details of long-term debt obligations outstanding at September 30, 2024 are as follows:

Governmental Activities:

Type	Sale Date	Original Borrowing	Interest Rates to Maturity	Final Maturity	Outstanding 9/30/24
Bonds Payable					
Certificates of Obligation, Series 2006	2006	$ 6,515,000	4.13%	2027	$ 1,365,000
Certificates of Obligation, Series 2008	2008	2,000,000	3.87%	2028	526,000
Certificates of Obligation, Series 2014	2014	7,655,000	2-4.5%	2035	7,315,000
General Obligation Refunding Bond, Series 2015	2015	6,955,000	2-4%	2035	6,095,000
General Obligation Refunding Bond, Series 2016A	2016	1,810,000	2-4%	2037	1,440,000
General Obligation Refunding Bond, Series 2016B	2016	3,875,000	1.22-3.739%	2037	3,195,000
Certificates of Obligation, Series 2017	2017	7,725,000	3-4%	2047	6,165,000
Certificates of Obligation, Series 2024	2024	23,465,000	3-5%	2049	23,465,000
Total Bonds Payable					$ 49,566,000

Business-type Activities:

Type	Sale Date	Original Borrowing	Interest Rates to Maturity	Final Maturity	Outstanding 9/30/24
Leases Payable					
Wells Fargo, Mowers	2019	$ 96,450	4.32%	2025	$ 17,848
Wells Fargo, Mowers	2022	184,054	0.00%	2026	92,026
Yamaha, Golf Carts	2019	309,474	4.20%	2023	57,004
John Deere, Maintenance Vehicles	2021	65,598	3.75%	2027	31,800
Total Leases Payable					$ 198,678

Changes in Long-Term Liabilities

Changes in the government's long-term liabilities for the year ended September 30, 2024 are as follows:

Governmental Activities:

Description	Balance 10/1/23	Additions	Deletions	Balance 9/30/24	Due in One Year
Bonds Payable					
General obligation bonds	$ 11,465,000	$ -	$ (735,000)	$ 10,730,000	$ 760,000
Certificates of obligation	16,275,000	23,465,000	(904,000)	38,836,000	1,039,000
Premium	1,171,728	2,534,298	(183,116)	3,522,910	-
Total bonds payable	28,911,728	25,999,298	(1,822,116)	53,088,910	1,799,000
Compensated absences	639,717	-	-	639,717	-
Net pension liability/(asset)	1,044,620	-	(325,697)	718,923	-
Net other postemployment benefit obligation	155,717	27,762	-	183,479	-
Governmental activities long-term liabilities	$ 30,751,782	$ 26,027,060	$(2,147,813)	$ 54,631,029	$1,799,000

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Business-type Activities:

Description	Balance 10/1/23	Additions	Deletions	Balance 9/30/24	Due in One Year
Capital leases	$ 318,037	$ -	$ (119,359)	$ 198,679	$ 112,662
Compensated absences	145,230	-	-	145,230	-
Net pension liability/(asset)	538,137	-	(167,784)	370,353	-
Net other postemployment benefit obligation	95,438	17,016	-	112,454	-
Governmental activities long-term liabilities	$ 1,096,842	$ 17,016	$ (287,143)	$ 826,716	$ 112,662

The debt service requirements for the government's bonds, loans, and notes are as follows:

Governmental Activities:

	Governmental Activities	
	Bonds Payable	
Year Ended September 30,	Principal	Interest
2025	$ 1,799,000	$ 2,694,771
2026	2,284,000	2,051,281
2027	2,384,000	1,954,805
2028	2,399,000	1,856,558
2029	2,500,000	1,756,945
2030-2034	14,185,000	7,118,230
2035-2039	8,640,000	4,459,643
2040-2044	7,095,000	2,873,669
2045-2049	8,280,000	1,011,974
Totals	$49,566,000	$25,777,876

J. Fund Balance

Minimum fund balance policy. The governing council has adopted a financial policy to maintain a minimum level of unrestricted fund balance (the total of the committed, assigned, and unassigned components of fund balance) in the general fund. The target level is set at 90 days of general fund annual revenues (approximately 25%). This amount is intended to provide fiscal stability when economic downturns and other unexpected events occur. In rare circumstances, it is allowed to drop further below target provided a plan is in place to restore the funds.

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K. Interfund Receivables and Payables

The composition of interfund balances as of September 30, 2024 is as follows:

Due to/from other funds:

Receivable Fund	Payable Fund	Amount
General Fund	Utility Fund	$ 1,958,182
Debt Service Fund	Utility Fund	31,247
Capital Projects Fund	General Fund	4,085,333
Aviation Fund	General Fund	192,028
Golf Fund	General Fund	590,745
Total		$ 6,857,535

The outstanding balances between funds result mainly from the time lag between the dates that (1) interfund goods and services are provided or reimbursable expenditures occur, (2) transactions are recorded in the accounting system, and (3) payments between funds are made. These amounts also include balances of working capital loans made to several nonmajor governmental funds which the general fund expects to collect in the subsequent year.

L. Interfund Transfers

The composition of interfund transfers for the year ended is September 30, 2024 as follows:

	Transfer in to:		
	Governmental Funds	Enterprise Funds	
	General Fund	Golf Course Fund	Total
Transfer out from:			
General Fund	$ -	$ 800,000	$ 800,000
Utility Fund	2,059,643	-	2,059,643
Total	$ 2,059,643	$ 800,000	$ 2,859,643

During the year, recurring transfers are used to 1) move revenues from a fund with collection authority to another fund with related expenditure requirements, 2) move general fund resources to provide subsidies to other funds as needs arise, and 3) move resources from the utility fund to the general fund to subsidize governmental activities.

N. Contingencies

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The government participates in various federal grant programs, the principal of which are subject to program compliance audits pursuant to the Single Audit Act as amended. Accordingly, the government's compliance with applicable grant requirements will be established at a future date. The amount of expenditures which may be disallowed by the granting agencies cannot be determined at this time, although the government anticipates such amounts, if any, will be immaterial.

The government is a defendant in various lawsuits. Although the outcome of these lawsuits is not presently determinable, in the opinion of the government's legal counsel, the resolution of these matters will not have a material adverse effect on the financial condition of the government.

O. Subsequent Events

As of April 11, 2025, there were no items noted requiring recording and/or disclosure.

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REQUIRED SUPPLEMENTARY INFORMATION
OTHER REPORTING

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CITY OF LAGO VISTA, TEXAS
SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	Measurement Year 2023	Measurement Year 2022	Measurement Year 2021	Measurement Year 2020
A. Total pension liability				
1. Service cost	$ 877,168	$ 730,430	$ 682,299	$ 663,096
2. Interest (on the Total Pension Liability)	1,006,901	947,701	896,817	817,904
3. Changes of benefit terms	-	-	-	-
4. Difference between expected and actual experience	106,274	1,047	(120,024)	159,695
5. Changes of assumptions	(56,266)	-	-	-
6. Benefit payments, including refunds of employee contributions	(673,358)	(1,077,659)	(380,988)	(581,439)
7. Net change in total pension liability	$ 1,260,719	$ 601,519	$ 1,078,104	$ 1,059,256
8. Total pension liability - beginning	14,815,145	14,213,626	13,135,522	12,076,266
9. Total pension liability - ending	$ 16,075,864	$ 14,815,145	$ 14,213,626	$ 13,135,522
B. Plan fiduciary net position				
1. Contributions - employer	$ 514,293	$ 452,036	$ 425,964	$ 427,060
2. Contributions - employee	391,593	341,589	325,162	315,600
3. Net investment income	1,531,481	(1,064,647)	1,639,567	876,098
4. Benefit payments, including refunds of employee contributions	(673,358)	(1,077,659)	(380,988)	(581,439)
5. Administrative expense	(9,743)	(9,209)	(7,586)	(5,671)
6. Other changes	(67)	10,989	52	(222)
7. Net change in plan fiduciary net position	$ 1,754,199	$ (1,346,901)	$ 2,002,171	$ 1,031,426
8. Plan fiduciary net position - beginning	13,232,388	14,579,289	12,577,118	11,545,692
9. Plan fiduciary net position - ending	$ 14,986,587	$ 13,232,388	$ 14,579,289	$ 12,577,118
C. Net pension liability [A.9 - B.9]	$ 1,089,277	$ 1,582,757	$ (365,663)	$ 558,404
D. Plan fiduciary net position as a percentage of the total pension liability [B.9 / A.9]	93.22%	89.32%	102.57%	95.75%
E. Covered-employee payroll	$ 6,526,550	$ 5,693,144	$ 5,419,370	$ 5,258,495
F. Net position as a percentage of covered employee payroll [C / E]	16.69%	27.80%	-6.75%	10.62%

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Measurement Year 2019	Measurement Year 2018	Measurement Year 2017	Measurement Year 2016	Measurement Year 2015	Measurement Year 2014
$ 595,954	$ 557,697	$ 530,359	$ 498,365	$ 431,114	$ 362,015
759,830	687,882	623,948	569,842	527,056	489,774
-	-	-	-	-	-
(74,546)	160,240	101,262	43,293	20,443	(73,396)
37,949	-	-	-	212,906	-
(403,363)	(314,744)	(329,404)	(322,425)	(302,417)	(258,266)
$ 915,824	$ 1,091,075	$ 926,165	$ 789,075	$ 889,102	$ 520,127
11,160,442	10,069,367	9,143,202	8,354,127	7,465,025	6,944,898
$ 12,076,266	$ 11,160,442	$ 10,069,367	$ 9,143,202	$ 8,354,127	$ 7,465,025
$ 361,957	$ 344,782	$ 316,030	$ 249,566	$ 234,864	$ 215,450
279,353	262,858	245,916	231,081	212,546	203,575
1,515,340	(293,885)	1,166,782	523,318	11,202	402,356
(403,363)	(314,744)	(329,404)	(322,425)	(302,417)	(258,266)
(8,562)	(5,678)	(6,044)	(5,907)	(6,822)	(4,200)
(257)	(297)	(306)	(318)	(338)	(345)
$ 1,744,468	$ (6,964)	$ 1,392,974	$ 675,315	$ 149,035	$ 558,570
9,801,224	9,808,188	8,415,215	7,739,900	7,590,865	7,032,295
$ 11,545,692	$ 9,801,224	$ 9,808,189	$ 8,415,215	$ 7,739,900	$ 7,590,865
$ 530,574	$ 1,359,218	$ 261,178	$ 727,987	$ 614,227	$ (125,840)
95.61%	87.82%	97.41%	92.04%	92.65%	101.69%
$ 4,655,888	$ 4,380,966	$ 4,098,600	$ 3,851,351	$ 3,542,430	$ 3,392,918
11.40%	31.03%	6.37%	18.90%	17.34%	-3.71%

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CITY OF LAGO VISTA, TEXAS
SCHEDULE OF EMPLOYER CONTRIBUTIONS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	Fiscal Year			
	2024	2023	2022	2021
Actuarially Determined Contribution	$ 569,987	$ 501,112	$ 442,626	$ 421,203
Contributions in relation to the actuarially determined contribution	(569,987)	(501,112)	(442,626)	(421,203)
Contribution deficiency (excess)	$ -	$ -	$ -	$ -
Covered employee payroll	$ 6,526,550	$ 5,693,144	$ 5,590,282	$ 5,311,019
Contributions as a percentage of covered employee payroll	8.73%	8.80%	7.92%	7.93%

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Fiscal Year						
2020	2019	2018	2017	2016	2015
$ 401,349	$ 357,036	$ 334,163	$ 300,205	$ 254,860	$ 235,583
(401,349)	(357,036)	(334,163)	(300,205)	(254,860)	(235,583)
$ -	$ -	$ -	$ -	$ -	$ -
$ 4,993,558	$ 4,580,879	$ 4,266,109	$ 4,042,094	$ 3,911,628	$ 3,491,490
8.04%	7.79%	7.83%	7.43%	6.52%	6.75%

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CITY OF LAGO VISTA, TEXAS
NOTES TO SCHEDULE OF EMPLOYER CONTRIBUTIONS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

Valuation Date:

Notes	Actuarially determined contribution rates are calculated as of December 31 and become effective in January 13 months later.

Methods and Assumptions Used to Determine Contribution Rates:

Actuarial cost method	Entry Age Normal
Amortization method	Level Percentage of Payroll, Closed
Remaining amortization period	21 Years (longest amortization ladder)
Asset valuation method	10 Year smoothed market; 12% soft corridor
Inflation	2.50% per year
Salary increases	3.60% to 11.85%, including inflation
Investment rate of return	6.75%
Retirement age	Experience-based table of rates that vary by age. Last updated for the 2023 valuation pursuant to an experience study of the period ending 2022.
Mortality	Post-retirement: 2019 Municipal Retirees of Texas Mortality Tables. Male rates are multiplied by 103% and female rates are multiplied by 105%. The rates are projected on a fully generational basis by the most recent Scale MP-2021 (with immediate convergence). Pre-retirement: PUB(10) mortality tables, with the 110% of the Public Safety table used for males and the 100% of the General Employee table used for females. The rates are projected on a fully generational basis by the most recent Scale MP-2021 (with immediate convergence).

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Other Information:

Notes	There were no benefit changes during the year.

CITY OF LAGO VISTA, TEXAS
SCHEDULE OF CHANGES IN OPEB LIABILITY AND RELATED RATIOS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	Measurement Year 2023	Measurement Year 2022	Measurement Year 2021	Measurement Year 2020
A. Total pension liability				
1. Service cost	$ 16,316	$ 28,466	$ 26,013	$ 23,137
2. Interest on Total OPEB Liability	10,357	6,454	6,406	6,645
3. Changes of benefit terms	-	-	-	-
4. Difference between expected & actual experience	10,903	(826)	(7,961)	11,968
5. Changes of assumptions	14,381	(116,903)	9,523	38,398
6. Benefit payments	(7,179)	(5,124)	(4,335)	(1,578)
7. Net changes	$ 44,778	$ (87,933)	$ 29,646	$ 78,570
8. Total OPEB Liability - beginning of the year	251,155	339,088	309,442	230,872
9. Total OPEB Liability - end of the year	$ 295,933	$ 251,155	$ 339,088	$ 309,442
E. Covered-employee payroll	$ 6,526,550	$ 5,693,144	$ 5,419,371	$ 5,258,495
F. Total OPEB Liability as a Percentage of Covered Payroll	4.53%	4.41%	6.26%	5.88%

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Measurement Year 2019	Measurement Year 2018	Measurement Year 2017
$ 14,899	$ 16,210	$ 13,116
7,093	6,388	6,000
-	-	-
(12,980)	(9,763)	-
38,814	(12,846)	14,459
(1,397)	(876)	(820)
$ 46,429	$ (887)	$ 32,755
184,443	185,330	152,575
$ 230,872	$ 184,443	$ 185,330
$ 4,655,888	$ 4,380,966	$ 4,098,600
4.96%	4.21%	4.52%

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CITY OF LAGO VISTA, TEXAS
SCHEDULE OF EMPLOYER CONTRIBUTIONS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	Fiscal Year			
	2024	2023	2022	2020
Actuarially Determined Contribution	$ 27,457	$ 22,405	$ 12,143	$ 11,587
Contributions in relation to the actuarially determined contribution	(27,457)	(22,405)	(12,143)	(11,587)
Contribution Deficiency (Excess)	$ -	$ -	$ -	$ -
Covered employee payroll	$ 6,526,550	$ 6,346,680	$ 5,590,282	$ 5,311,019
Contributions as a percentage of covered employee payroll	0.42%	0.35%	0.22%	0.22%

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Fiscal Year		
2019	2018	2017
$ 11,867	$ 10,994	$ 9,385
(11,867)	(10,994)	(9,385)
$ -	$ -	$ -
$ 4,993,558	$ 4,580,879	$ 4,266,109
0.24%	0.24%	0.22%

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CITY OF LAGO VISTA, TEXAS
NOTES TO SCHEDULE OF EMPLOYER CONTRIBUTIONS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

Summary of Actuarial Assumptions:

Inflation	2.50%
Salary increases	3.60% to 11.85%; including inflation
Discount rate*	3.77%
Retirees' share of benefit-related costs	$0
Administrative expenses	All administrative expenses are paid through the Pension Trust and accounted for under reporting requirements of GASB Statement No. 68.
Mortality rates - service retirees	2019 Municipal Retirees of Texas Mortality Tables. Male rates are multiplied by 103% and female rates are multiplied by 105%. The rates are projected on a fully generational basis by the most recent Scale MP-2021 (with immediate convergence).
Mortality rates - disabled retirees	2019 Municipal Retirees of Texas Mortality Tables with a 4 year set-forward for males and a 3 year set-forward for females. In addition, a 3.5% and 3% minimum mortality rate will be applied to reflect the impairment for younger members who become disabled for males and females, respectively. The rates are projected on a fully generational basis by the most recent Scale MP-2021 (with immediate convergence) to account for future mortality improvements subject to the floor.

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Other Information:

Notes	*The discount rate was based on the Fidelity Index's "20-Year Municipal GO AA Index" rate as of December 31, 2023. The Actuarial assumptions used in the December 31, 2023 valuation were based on the results of an actuarial experience study for the period ending December 31, 2022.

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CITY OF LAGO VISTA, TEXAS
STATEMENT OF REVENUES, EXPENDITURES, AND CHANGES IN FUND BALANCE
BUDGET AND ACTUAL – DEBT SERVICE FUND
FOR THE YEAR ENDED SEPTEMBER 30, 2024

	Budgeted Amounts			Variance With
	Original	Final	Actual	Final Budget
REVENUES				
Property taxes	$ 2,676,372	$ 2,676,372	$ 2,704,369	$ 27,997
Penalties and interest on taxes	-	-	23,373	23,373
Investment earnings	46,695	46,695	54,192	7,497
Total revenues	2,723,067	2,723,067	2,781,934	58,867
EXPENDITURES				
Current:				
General government	8,000	8,000	9,500	(1,500)
Debt service:				
Bond principal	1,639,000	1,639,000	1,639,000	-
Interest - bonds	1,037,372	1,037,372	1,040,172	(2,800)
Total Expenditures	2,684,372	2,684,372	2,688,672	(4,300)
Excess (deficiency) of revenues over expenditures	38,695	38,695	93,262	54,567
OTHER FINANCING SOURCES (USES)				
Premium on bonds issued	-	-	13,892	13,892
Total Other Financing Sources (Uses)	-	-	13,892	13,892
Net Change in Fund Balances	38,695	38,695	107,154	68,459
Fund balance - beginning	585,610	585,610	585,610	-
Fund balance - ending	$ 624,305	$ 624,305	$ 692,764	$ 68,459

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INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

To the Honorable Mayor, Members of the City Council and Citizens of
the City of Lago Vista, Texas

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the governmental activities, the business-type activities, each major fund, and the aggregate remaining fund information of City of Lago Vista, Texas ('the City'), as of and for the year ended September 30, 2024, and the related notes to the financial statements, which collectively comprise the City's basic financial statements and have issued our report thereon dated April 11, 2025.

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Report on Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the City's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the City's internal control. Accordingly, we do not express an opinion on the effectiveness of the City's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies and therefore, material weaknesses or significant deficiencies may exist that were not identified. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. We identified a deficiency in internal control, described in the accompanying schedule of findings and questioned costs as items [2024-001 that we consider to be a significant deficiency.

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Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether the City's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards.*

Purpose of This Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Singleton, Clark & Company, PC

Singleton, Clark & Company, PC
Cedar Park, Texas

April 11, 2025

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CITY OF LAGO VISTA, TEXAS
SCHEDULE OF FINDINGS AND QUESTIONED COSTS
FOR THE YEAR ENDED SEPTEMBER 30, 2024

SECTION I – SUMMARY OF AUDITOR'S RESULTS

FINANCIAL STATEMENTS

Type of auditor's report issued:		Unmodified		
Internal control over financial reporting:				
• Material weakness(es) identified?	☐	Yes	☒	No
• Significant deficiencies identified that are not considered to be material weaknesses?	☐	Yes	☒	None reported
Noncompliance material to financial statements noted?	☐	Yes	☒	No

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SECTION II – FINANCIAL STATEMENT FINDINGS

Findings Related to Financial Statements Which are Required to be Reported in Accordance with *Government Auditing Standards*:

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2024-001 Payroll Procedures

Criteria: The City's Employee Manual, Purchasing Procurement Policy and Home Rule Charter detail approved payroll and purchasing procedures and controls.

Condition Found: During the year ended September 30, 2024, a director was separated from the City through an agreement rather than through Council approval per policy and in three instances of leave time payout at employee separation amounts were paid in excess of policy including a conversion of leave time asserted as policy when no such policy existed. This condition has been classified as a significant deficiency.

Cause: Given that all employees involved in the condition discussed above are no longer employees of the City, the auditor was unable to interview them through the audit process and determine what happened and why. And so, in regard to the question of whether policies were clearly known or the former City Manager exercised purchasing authority related to these transaction could not be firmly established.

Recommendation: We make the following recommendations with the understanding that the City has already undertaken changes related to its policies. We recommend that the City align all approved policy documents and set specifics about what may be done or not done. The policy in place for payout of leave was expressed in days and hours as if to specify eight hour days but it appears that due to the weekly schedule kept by the City a ten hour day was used. As to whether the former City Manager had authority related to any transaction including those related to payroll are unclear and this should be addressed.

No findings or questioned costs required to be reported in accordance with *Government Auditing Standards* for the year ended September 30, 2023.

SECTION III – FEDERAL AWARDS FINDINGS AND QUESTIONED COSTS

Not applicable.

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CITY OF LAGO VISTA, TEXAS

RESOLUTION NO. 25-2142

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS ACCEPTING FROM SINGLETON, CLARK & COMPANY, PC, THE AUDIT FOR FISCAL YEAR 2023

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAGO VISTA, TEXAS:

THAT, the City Council of the City of Lago Vista, Texas, hereby accepts the audit for Fiscal Year 2024 prepared by Singleton, Clark & Company PC, the City's official auditor.

AND, IT IS SO RESOLVED. PASSED AND APPROVED this 17th day of July 2025.

ATTEST: _____
Kevin Sullivan, Mayor

_____
Eric De La Cruz, Assistant City Secretary

On a motion by Councilor _____, seconded by Councilor _____, the above and foregoing instrument was passed and approved.

AGENDA ITEM NO. 10f

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE:	July 17, 2025
SUBMITTED BY:	Councilor Roberts, City Council
SUBJECT:	Discussion, consideration, and possible action directing the Planning and Zoning Commission and staff to review Parkland Dedication requirements, including but not limited to impact fees, fee's in lieu of, amount of land to be dedicated, as related to Chapter 5 of the Subdivision Ordinance.
BACKGROUND:	See attached
FINANCIAL IMPACT:	Unknown
RECOMMENDATION:	Refer item to Planning and Zoning Commission and staff.

ATTACHMENTS:
Referral to the Planning and Zoning Commission for Review of Parkland Dedication Requirements and Direction to Initiate a Nexus .docx

CITY COUNCIL AGENDA ITEM REPORT

DATE: May 15, 2025
SUBMITTED BY: Councilor Roberts, City Council
SUBJECT: Referral to the Planning and Zoning Commission for Review of Parkland Dedication Requirements and Direction to Initiate a Nexus Study

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BACKGROUND:
Chapter 5 of the City's Subdivision Ordinance (Sections 5.10–5.14) establishes parkland dedication or fee-in-lieu requirements for new residential subdivisions. Currently, developers must dedicate one (1) acre of parkland for every thirty (30) dwelling units or pay a fee-in-lieu of $1,050 per unit. These standards have not been revised in many years, despite rapid development and increasing parkland acquisition and development costs.

The Draft 2025 Comprehensive and Parks Master Plan recommends a full review of these requirements in light of growing population pressure and rising demand for public park access. Specifically, page 108 of the plan states:

"A parkland dedication ordinance is a vital tool for ensuring that there is a mechanism to preserve and enhance accessible green spaces for current and future residents. This ordinance requires new residential developments to set aside land or pay fees specifically allocated toward parks. Such an ordinance not only balances urban growth with environmental stewardship but also supports the city's long-term vision of cultivating parkland for current and future generations.

Parkland dedication ordinances may be structured to require new developments to include land for public parkland and/or trails, options to accept fees in lieu of land, and consider development fees that would pay for amenities in addition to land. While less common, several cities in Texas also have trail dedication ordinances, which require development to build trails if identified on a Trails Master Plan.

Lago Vista's current parkland dedication ordinance requires dedication to the City of one acre of parkland for every 30 dwelling units or the developer may choose to pay a per unit fee instead of dedicating land. Due to increased interest in development and public demand for more parks, it could be time for a review to ensure the ordinance is meeting the community vision for parkland. While the current ordinance is strong, the City could consider adding a park development fee or incorporating trail dedication requirements."

Additionally, under Texas law, any changes to parkland dedication formulas or fee amounts must satisfy the constitutional "rough proportionality" standard (see *Town of*

Flower Mound v. Stafford Estates), typically supported by a Nexus Study or Parkland Impact Fee Analysis.

This agenda item formally refers the matter to the Planning and Zoning Commission (P&Z) for review and recommendation, and concurrently directs City staff to initiate a Nexus Study to ensure legal defensibility and data-supported planning.

FINDINGS:

- The current ratio and fee amounts may no longer reflect true land acquisition costs or community recreational needs.
- Page 108 of the Draft 2025 Comprehensive Plan supports ordinance review and potential expansion of dedication options.
- The Planning and Zoning Commission has purview over subdivision-related ordinances.
- A Nexus Study is the standard legal tool for substantiating proportionality and defending policy updates.
- Early coordination between staff, P&Z, and any consultant will allow for a timely recommendation and ordinance update.

AGENDA ITEM NO.: [To be assigned]

PROPOSED STAFF ACTION:
Staff is directed to coordinate with a qualified consultant to initiate a Nexus Study or Parkland Impact Fee Analysis. Staff will also provide P&Z with relevant ordinance sections, growth data, and findings from the 2025 Draft Comprehensive Plan to support its review.

FINANCIAL IMPACT:
To be determined based on consultant scope and procurement. May require budget allocation or contract amendment.

RECOMMENDATION:
I move to refer to the Planning and Zoning Commission a review and recommendation

regarding potential amendments to Chapter 5 of the Subdivision Ordinance relating to parkland dedication and fee-in-lieu requirements, including but not limited to revised land dedication ratios, updated monetary fee rates per dwelling unit, and incorporation of trail or park development cost adjustments.

Further, I move to direct staff to initiate a qualified Nexus Study or Parkland Impact Fee Analysis to evaluate rough proportionality and establish legally supportable standards to accompany the Commission's review. Results of the study shall be presented to the Planning and Zoning Commission prior to final recommendation to Council.

AGENDA ITEM NO. 10g

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Eric DeLaCruz, Finance

SUBJECT: Discussion and possible action on RFP No. 25-03 Effluent Pond #17 Repairs & Pond #2 Improvements Change Order #1 & #2 and authorizing the City manager to approve the change orders.

BACKGROUND: During the design phase of the project, it was determined that the City would be responsible for obtaining the tree removal permit, while the contractor would be responsible for replanting trees in accordance with the City's Tree Preservation Ordinance. The tree removal permit has since been submitted, and the required mitigation has been calculated at 295 caliper inches of trees, equating to a fee of $73,750 if paid directly.

Upon review of the project bid tabulation, staff identified that the cost for replanting the required trees had not been included in the contractor's original bid. To fulfill the ordinance requirement through replanting, the cost would total $160,666.50—significantly higher than the mitigation fee.

Change Order #2 addresses necessary modifications to the intake screen for wet well, which will pull effluent to supply the golf course irrigation pump house.

During review, City staff identified deficiencies in the original intake screen design, noting that it lacked adequate protection to prevent debris from entering the wet well. This posed a potential risk to the long-term integrity and performance of the pump equipment.

Additionally, this change order includes preparatory work for connecting the new transmission line associated with design Amendment #1. The revised approach allows for this connection to be completed without excavating or disturbing the newly constructed pond berm and liner, preserving the integrity of those improvements.

FINDINGS: Both change orders are considered essential to maintain

project compliance, reduce long-term maintenance costs, and ensure operational reliability.

FINANCIAL IMPACT: Change order #1 cost of paying to replanting the removed tree far exceed the cost of paying the mitigation fee assess during the removal permit process. The City will either need to pay these mitigation fees in the amount of $73,750 or the cost of replanting these trees in the amount of $160,660.50.

Change order #2 cost is $13,624.91 which will be paid from the utility reserve fund.

RECOMMENDATION: Staff is requesting Council direction on whether to proceed with payment of the mitigation fee or to issue a change order for the contractor to perform the full replanting as originally intended.

ATTACHMENTS:
Change Order No. 1.pdf
Change Order No. 2 Cost .pdf

Change Order Request 01

Project Name: Lago Vista Effluent Ponds #17 Repairs and Pond #2 Improvements

Project No: 5637
Date: May 16, 2025

Description: Replant 295" of trees per tree mitigation plan.

Sub-Contractor and Material Description	Unit	Qty	Unit $	Ext. $
Plant Trees - Tree Mann Solutions	LS	1	$ 134,100.00	$ 134,100.00
Water Meter Tap for Irrigation Meter Allowance	LS	1	$ 5,000.00	$ 5,000.00
				$ -
				$ -
				$ -
		Total Material		**$ 139,100.00**

Labor Description	Hours	Rate	Total
			$ -
			$ -
			$ -
			$ -
	Sub-Total		$ -
	Burden	55%	$ -
	Total Labor		**$ -**

Equipment Description	Hours	Rate	Total
			$ -
			$ -
			$ -
			$ -
			$ -
	Total Equipment		**$ -**

	LABOR TOTAL:	$ -
	MATERIAL TOTAL:	$ 139,100.00
	EQUIPMENT TOTAL:	$ -
	SUB TOTAL:	$ 139,100.00
10%	**OVERHEAD:**	$ 13,910.00
	SUB TOTAL:	$ 153,010.00
5%	**G.C. MARK-UP:**	$ 7,650.50
	GRAND TOTAL:	**$ 160,660.50**

Tree Mann Solutions
723 West University Ave. #273
Georgetown, TX 78626
(888) 433-6040

Proposal #10768

Created: 05/13/2025
From: Joe Zaniewski

Proposal For

Jerdon Enterprise, LP
13403 Redfish Ln
Stafford, TX 77477

main: 281-261-5000
mobile: 832-474-2553
john@jerdonlp.com

Location

Park Cir
Lago Vista, TX 78645

Lago Vista Effluent Pond Tree Planting

Terms
Due Upon Receipt

ACCEPT	SCOPE OF WORK	QUANTITY	UNIT PRICE	AMOUNT
☑	1) Mobilization *Included* Single mobilization, staging, logistics, coordination, job setup, site evaluation, etc.	1	$ 1,800.00	$ 1,800.00
☑	2) Tree Planting *Included* Team to supply, install, stake, and mulch 3" caliper trees for effluent pond project mitigation. EXCLUDES: Maintenance and warranty, irrigation, rock excavation, haul off, badging, OCIP, surveying, additional contract requirements.	98	$ 1,050.00	$ 102,900.00
☐	3) Tree Irrigation *Optional* If existing irrigation system present and expandable, team to install bubblers on installed trees.	98	$ 300.00	$ 29,400.00

Client Notes

PAYMENT DUE UPON PROJECT COMPLETION

Please use the checkbox to mark items as accepted.

Tree Mann Solutions
723 West University Ave. #273
Georgetown, TX 78626
(888) 433-6040

Proposal #10768
Created: 05/13/2025
From: Joe Zaniewski

Thank you for the opportunity to serve you on this task. Tree identification, measurement, inspection, and arboriculture consultation will be performed by a board-certified master arborist team whom through related training and on-the-job experience are familiar with the techniques and equipment used in such operations.

Please execute the signature line with your acceptance. Services will be invoiced upon item/visit completion with Net 45 terms. If you have any questions about tree inspection scope, timing, or pricing on this site, please contact us at 512-710-0643 or by email at info@treemannsolutions.com. We look forward to being of further service.

Signature

x Date:

Please sign here to accept the terms and conditions

Sales Reps

Joe Zaniewski
Mobile: 512-470-9073
joe@treemannsolutions.com

1. **Nature of Relationship.** Tree Mann Solutions, LLC ("Consultant") shall perform all services under this Agreement as an "independent contractor" and not as an employee or agent of Client. The Consultant is not authorized to assume or create any obligation or responsibility, express or implied, on behalf of, or in the name of, Client or to bind Client in any manner.
1.1 *Right of Entry.* Consultant shall be permitted to enter upon the Property [during normal business hours] for the purpose of completing the Services. The Client acknowledges that such Services to be provided to Client will not necessarily be performed by any particular person, however, the assigned project manager will be Client's primary contact person with respect to the Services. Client (if not Owner) is responsible for notifying any owner/client for access for Consultant and providing relevant access procedures (gate codes, combinations, notifications, etc.) prior to authorizing proposal.
1.2 *Client acknowledgement.* Client acknowledges and specifically authorizes Contractor to retain a Subcontractor to perform some or all of the services. Contractor's retention of a Subcontractor is within its sole discretion. Contractor will be responsible for services performed by any Subcontractor.

2. Arborists Disclosure / Performance of Services.

2.1 *Disclosure.* Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of the trees and attempt to reduce the risk of targets present near trees. Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Since trees are living organisms, conditions are often hidden within the tree and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specific period of time. Likewise, remedial treatments cannot be guaranteed. Trees can be managed but they cannot be controlled. Proximity to trees creates some degree of risk and the only way to eliminate all risk associated with trees is to eliminate all trees.
2.2 *Performance of Services / No Warranty.* Consultant shall (i) perform its services in a manner consistent with the standard of care and skill ordinarily exercised by members of the profession practicing under similar conditions in the geographic vicinity and at the time the services are performed, and (ii) use reasonable efforts to comply with all laws, rules and regulations of any governmental or regulatory agency applicable to the Services. No warranty, representation or guarantee, express or implied, is intended by this Agreement and are expressly waived. Consultant is not responsible for the completion or quality of work that is dependent upon or performed by Client or third parties not under the direct control of Consultant or for their acts or omissions or for any damages resulting therefrom.
2.3 *Assessment Limitations.* Tree condition assessment and related recommendations are based on Consultant's professional opinion from a single observation and limited to the point in time observed. Consultant cannot be responsible for acts of God, environmental factors, or any other external factors outside the control of Consultant.
2.4 *Location Limitations.* If location services are requested, tree inventory is to include general tree point location data per client provided approximated property boundaries. Consultant to GPS locate points, per agreed scope, within approximately 60 centimeters circular error probable (CEP) from the trunk as visibly displayed on GIS rover collector equipment Consultant recommends locations and ownership of critical trees (dictated by design and/or local ordinance) to be verified by design team and a Registered Professional Land Surveyor at the expense of Client.
2.5 *Tree Care Operations.* If tree care services are included within the proposal, Consultant reserves the right to refer tree care services to established vendor partners and/or subcontract any work at Consultant's discretion. Defined requirements by Client will need to be met directly by external vendor if contracted directly by Client and per applicable industry standards. If Consultant subcontracts the tree care services, the following defined requirements will be met by Consultant:

- **Insurance:** Our employees and subcontractors are covered by applicable Worker's Compensation requirements. The company is insured for personal injury and property damage liability. Proof of insurance can be verified by requesting a copy of our Certificate of Insurance.
- **Working with Living Things:** Trees are living organisms and can be affected by factors outside of Consultant's control. No guarantee on safety, health, or condition is expressed or implied under these terms. Arborists are unable to detect or anticipate every condition, event, or possibility leading to structural failure of trees. When high-risk situations are identified, Consultant will make reasonable effort to prioritize scheduling of work. However, no assumption of liability is accepted by Consultant prior to starting work on site.
- **Tree Care Standards:** Work to be performed in accordance with American National Standards Institute (ANSI) Standard Practices for Tree Care Operation.
- **Ownership of Trees/Property:** Authorization of approval serves as acceptance that trees and/or property within scope is owned by Client or that written permission from Owner has been received to work on trees that are not within the Client's property.
- **Billing, Sales Tax, and Payment:** Invoice terms are defined above. Services may be cancelled or delayed due to outstanding account balances. Sales tax will be applied per local jurisdiction. Clients claiming tax exempt status shall submit appropriate documentation prior to invoicing to waive applicable taxes.
- **Underground Property:** Client is responsible for locating and notifying Consultant of any underground utilities and advising on procedures to minimize/avoid damage.
- **Scheduling:** Job scheduling is dependent upon Consultant's work load and weather conditions.

3. Compensation.

3.1 *Consulting and Tree Care Fees.* The Consultant shall submit to Client invoices for the services performed for Client during the previous month. The Client shall pay to Consultant consulting fees and expense reimbursement in accordance with the Scope of Work and/or Fee Schedule attached hereto and made a part hereof as Exhibit A for the services actually performed and shown on such statement and payment shall be made in accordance with the Scope of Work and/or Fee Schedule.

3.2 *Interest / Collection.* Unless prior arrangements have been made, all overdue invoices will result in a 1.5% monthly late charge assessed at 15 days after due date and monthly thereafter. Payment of interest shall not foreclose any other right that Consultant may have as a consequence of such late payment. Client agrees to Consultant's employment of whatever collection methods it deems reasonable and expedient, including but not limited to garnishment (pre and post judgment), sequestration, attachment or any other legal method. Client agrees to waive any and all bond requirements associated therewith. In the event that Consultant is required to take legal action to collect unpaid amounts, and Consultant is successful in such action, Client shall reimburse all costs and reasonable attorney's fees incurred by Consultant in such collection.

4. **Termination.** Either party may terminate this Agreement at any time, without cause and for convenience, by giving 10 business days' written notice to the other. In the event of such termination, Consultant shall (i) cease performing any and all services hereunder and/or incurring any new expenses (unless such services are reasonably necessary, as determined by Consultant, to clean up or remedy any unsafe condition on the Property) and (ii) be entitled to payment for services performed and expenses paid or incurred prior to the effective date of termination.

5. **Insurance.** Consultant hereby agrees to maintain in full force and effect at all times during the term of this Agreement policies of insurance in such types and amounts as are required by the Governing Law and/or customarily maintained by members of the profession practicing under similar conditions in the geographic vicinity and at the time the services are performed. Upon request, Consultant shall provide Client with appropriate certificates of insurance.

6. **Ownership of Property and Trees.** Where the location, treatment, pruning and/or removal of trees is involved, it is Client's responsibility to advise Consultant of any issues with respect to property boundaries, property ownership, site lines, disputes between neighbors and other related issues. The Client represents, acknowledges and agrees that Consultant may assume that any legal description of the Property or information provided to Consultant with respect to the foregoing is complete and accurate. CLIENT HEREBY RELEASES CONSULTANT FROM LIABILITY AND AGREES TO DEFEND, INDEMNIFY AND HOLD CONSULTANT HARMLESS FROM ANY AND ALL CLAIMS, LIABILITIES, DAMAGES OR EXPENSES ARISING, IN WHOLE OR IN PART, FROM THE FOREGOING, INCLUDING, WITHOUT LIMITATION, CLAIMS OF NEGLIGENCE, TRESPASS, AND CONVERSION.

7. **Use of Reports.** Services provided under this Agreement, including all reports, information or recommendations prepared or issued by Consultant, are for the exclusive use of Client for the Project specified herein. No other use is authorized under this Agreement. Client will not distribute or convey Consultant's reports or recommendations to any other person or organization other than those identified in the project description without Consultant's written authorization. CLIENT HEREBY RELEASES CONSULTANT FROM LIABILITY AND AGREES TO DEFEND, INDEMNIFY AND HOLD CONSULTANT HARMLESS FROM ANY AND ALL CLAIMS, LIABILITIES, DAMAGES OR EXPENSES ARISING, IN WHOLE OR IN PART, FROM SUCH UNAUTHORIZED DISTRIBUTION.

8. INDEMNIFICATION. CLIENT AGREES TO INDEMNIFY, DEFEND AND HOLD CONSULTANT HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS, LIABILITIES, SUITS, DEMANDS, LOSSES, COSTS AND EXPENSES, INCLUDING, BUT NOT LIMITED TO, REASONABLE ATTORNEYS' FEES AND ALL LEGAL EXPENSES AND FEES INCURRED THROUGH APPEAL, AND ALL INTEREST THEREON, ACCRUING OR RESULTING TO ANY AND ALL PERSONS, FIRMS OR ANY OTHER LEGAL ENTITIES ON ACCOUNT OF ANY DAMAGES OR LOSSES TO PROPERTY OR PERSONS, INCLUDING INJURIES OR DEATH, OR ECONOMIC LOSSES, ARISING OUT OF THE SERVICES AND/OR THIS AGREEMENT, EXCEPT TO THE EXTENT THAT SAID DAMAGES OR LOSSES ARE CAUSED BY CONSULTANT'S GROSS NEGLIGENCE OR WILLFUL MISCONDUCT. CONSULTANT IN ITS SOLE DISCRETION AND AT ITS SOLE OPTION MAY DEFEND ANY AND ALL OF THE INDEMNIFIED CLAIMS OR TENDER TO CLIENT THE DEFENSE OF ANY OR ALL OF THE INDEMNIFIED CLAIMS. THIS INDEMNITY, AND THE INDEMNIFICATIONS SET FORTH IN SECTIONS 6 AND 7, SHALL SURVIVE ANY EXPIRATION OR TERMINATION OF THIS AGREEMENT FOR A PERIOD OF FOUR (4) YEARS WITH REGARD TO ANY CLAIMS ARISING DURING, OR RELATED TO, FACTS OR CIRCUMSTANCES THAT OCCURRED DURING THE TERM OF THIS AGREEMENT OR ANY EXTENSION THEREOF.

9. LIMITATION OF LIABILITY. CLIENT UNDERSTANDS AND ACKNOWLEDGES THAT THE SERVICES PROVIDED HEREIN POSE CERTAIN RISKS TO CONSULTANT AND CLIENT. CLIENT FURTHER UNDERSTANDS AND ACKNOWLEDGES THAT THE AMOUNT OF RISK THAT CONSULTANT CAN ACCEPT IS TIED, IN PART, TO THE AMOUNT OF COMPENSATION RECEIVED FOR THE SERVICES RENDERED. CONSULTANT'S FEE FOR THE SERVICES OFFERED IS BASED ON CLIENT'S AGREEMENT TO LIMIT CONSULTANT'S LIABILITY. CLIENT FURTHER ACKNOWLEDGES THAT WERE IT NOT FOR THIS PROMISE TO LIMIT CONSULTANT'S LIABILITY, CONSULTANT'S FEE FOR SERVICES WOULD NEED TO BE INCREASED TO ADDRESS THE INCREASED RISKS. BASED THEREON, CLIENT AGREES THAT, TO THE FULLEST EXTENT PERMITTED BY THE GOVERNING LAW, CONSULTANT'S TOTAL LIABILITY TO CLIENT FOR ANY AND ALL INJURIES, CLAIMS, LIABILITIES, LOSSES, COSTS, EXPENSES OR FROM ANY CAUSE OR CAUSES INCLUDING, BUT NOT LIMITED, CONSULTANT'S NEGLIGENCE, ERRORS, OMISSIONS OR BREACH OF CONTRACT, SHALL NOT EXCEED $50,000, OR THE AMOUNT OF CONSULTANT'S FEE, WHICHEVER IS LESS. THIS LIMITATION OF LIABILITY SHALL APPLY TO CLIENT'S DIRECT CLAIMS AND CLIENT'S CLAIMS ARISING OUT OF OR RELATED TO THIRD PARTIES. THIS LIMIT APPLIES TO ALL SERVICES ON THIS PROJECT, WHETHER PROVIDED UNDER THIS OR SUBSEQUENT

AGREEMENTS. CLIENT ACKNOWLEDGES AND AGREES THAT THIS LIMITATION OF LIABILITY PROVISION IS A SPECIFIC AND MATERIAL ASPECT OF THE AGREEMENT BETWEEN THE PARTIES AND THAT CONSULTANT WOULD NOT ENTER INTO THE TRANSACTION WITH CLIENT IF THIS PROVISION WERE NOT PART OF THEIR AGREEMENT.

10. **Waiver of Damages**. Client and Consultant waive all claims to incidental, consequential, or special damages for any claims or disputes arising out of or relating to this Agreement.

11. **Changed Circumstances.** If, during the course of performance of this Agreement, conditions or circumstances are discovered which were not contemplated by the parties hereto at the commencement of this Agreement, the party shall notify the other in writing of the newly discovered conditions or circumstances, and the parties shall renegotiate, in good faith, the terms and conditions of this Agreement. If amended terms and conditions cannot be agreed upon within fifteen (15) days after receipt of such notice, either party may terminate this Agreement and Consultant shall be compensated in accordance with Section 4 hereof.

12. **Mediation.** The parties agree to mediate any claims or disputes arising out of this Agreement, before initiating any litigation. The mediation shall be conducted by a mediator acceptable to the parties. The parties shall make a demand for mediation within a reasonable time after a claim or dispute arises and the parties agree to mediate in good faith. In no event shall any demand for mediation be made after such claim or dispute would be barred by the Governing Law. Mediation fees would be shared equally.

13. **Governing Law and Mandatory Forum Clause**. Purchaser and Merchant agree that this Agreement is accepted and performed in Texas. This Agreement and all claims shall be governed by, and construed in accordance with, the laws of the State of Texas without regard to principles of conflicts of laws. All litigation, suits, court proceedings and other actions relating to, arising out of, or in connection with this Agreement, whether founded in contract, tort or otherwise, shall be submitted to the in personam jurisdiction of the state courts of Texas, and the exclusive venue for all such suits, proceedings and other actions shall be in Travis County, Texas. No action may be brought in any other state or jurisdiction. Consultant and Client hereby waive any claim against or objection to the in personam jurisdiction and venue of the state courts of Travis County, Texas. Consultant and Client hereby irrevocably waive any objection and any right of immunity on the ground of venue or the convenience of the forum, to the jurisdiction of such courts, and from the execution of judgments resulting therefrom. CLIENT HEREBY WAIVES TRIAL BY JURY IN ANY SUCH SUIT, ACTION OR PROCEEDING. CLIENT ACKNOWLEDGES AND AGREES THAT THIS WAIVER OF JURY TRIAL IS A SPECIFIC AND MATERIAL ASPECT OF THE AGREEMENT BETWEEN THE PARTIES AND THAT CONSULTANT WOULD NOT ENTER INTO THE
TRANSACTION WITH CLIENT IF THIS PROVISION WERE NOT PART OF THEIR AGREEMENT. This Section shall survive any termination of transfer of this Agreement.

14. **Remedies Cumulative.** Each right, power, and remedy under this Agreement or now or hereafter existing at law or in equity or by statute or otherwise shall be cumulative and concurrent. The exercise by Consultant of any one or more of such rights, powers or remedies shall not preclude the simultaneous or later exercise by Consultant of any other rights, powers or remedies.

Change Order Request 02A

Project Name: Lago Vista Effluent Ponds #17 Repairs and Pond #2 Improvements

Project No: 5637
Date: May 22, 2025

Description: New intake screen mesh and 3x5 rock around intake per Field Order No. 1.

Sub-Contractor and Material Description	Unit	Qty	Unit $	Ext. $
Oiginal Intake Screen Credit	LS	1	$ (3,476.00)	$ (3,476.00)
New Intake Screen	LS	1	$ 6,594.00	$ 6,594.00
3x5 Bull Rock	TONS	12	$ 30.00	$ 360.00
				$ -
				$ -
		Total Material		**$ 3,478.00**

Labor Description	Hours	Rate	Total
Superintendent	0.5	$ 60.00	$ 30.00
Install Bull Rock	3	$ 24.00	$ 72.00
			$ -
			$ -
	Sub-Total		$ 102.00
	Burden	55%	$ 56.10
	Total Labor		**$ 158.10**

Equipment Description	Hours	Rate	Total
Backhoe	0.5	$ 50.00	$ 25.00
			$ -
			$ -
			$ -
			$ -
	Total Equipment		**$ 25.00**

LABOR TOTAL:	$	158.10
MATERIAL TOTAL:	$	3,478.00
EQUIPMENT TOTAL:	$	25.00
SUB TOTAL:	$	3,661.10
15% OVERHEAD & MARK-UP:	$	549.17
GRAND TOTAL:	**$**	**4,210.27**

P.O. Box 328
Hockley, TX 77447

Phone: 832-831-3691

BENNINGFIELD STEEL FABRICATION, LLC

December 17, 2024

Re: Lago Vista Pond #2 Intake Structure

Enrique,

Thank you for giving us the opportunity to provide you with this quote. We propose to furnish the labor and material required to fabricate the following:

BID ITEM	QTY	UNIT	UNIT PRICE	EXTENSION
1. 3'X'3'X3' Trash Screen (304SS)	1	EA	$3,476.00	$3,476.00

The trash screen will be fabricated using L3X3X1/4 angle and 1"X1" opening, 0.120 thick wire mesh.

Any steel discrepancies requiring correction must be verified by Benningfield Steel Fabrication, LLC and handled in accordance with the latest edition of the A.I.S.C. Code of Standard Practices.

Exclusions:

1. Field dimensions
2. AISC Certification
3. Installation
4. Design or engineering stamp
5. Testing

Note:

1. All material is quoted F.O.B. – Benningfield Steel Fabrication, LLC.
2. No local, state, or federal taxes are included in the price.
3. All invoices are due 100% in thirty days, no retainage deducted.
4. All overdue invoices are subject to a 1-1/2% penalty per month.
5. This proposal is good for 15 days.

Feel free to give me a call should you have any questions or need any further information.

Regards,

Keith Benningfield

Benningfield Steel Fabrication, LLC
keith@benningfieldsteel.com

P.O. Box 328
Hockley, TX 77447

Phone: 832-831-3691

BENNINGFIELD STEEL FABRICATION, LLC

May 21, 2025

Re: Lago Vista Pond #2 Intake Structure

John,

Thank you for giving us the opportunity to provide you with this quote. We propose to furnish the labor and material required to fabricate the following:

BID ITEM	QTY	UNIT	UNIT PRICE	EXTENSION
1. 3'X'3'X3' Trash Screen (304SS)	1	EA	$6,594.00	$6,594.00

The trash screen will be fabricated using L3X3X1/4 angle and .25"X.25" opening, 0.120" wire diameter, woven wire mesh.

Any steel discrepancies requiring correction must be verified by Benningfield Steel Fabrication, LLC and handled in accordance with the latest edition of the A.I.S.C. Code of Standard Practices.

Exclusions:

1. Field dimensions
2. AISC Certification
3. Installation
4. Design or engineering stamp
5. Testing

Note:

1. All material is quoted F.O.B. – Benningfield Steel Fabrication, LLC.
2. No local, state, or federal taxes are included in the price.
3. All invoices are due 100% in thirty days, no retainage deducted.
4. All overdue invoices are subject to a 1-1/2% penalty per month.
5. This proposal is good for 15 days.

Feel free to give me a call should you have any questions or need any further information.

Regards,

Keith Benningfield

Benningfield Steel Fabrication, LLC
keith@benningfieldsteel.com

Change Order Request 02B

Project Name: Lago Vista Effluent Ponds #17 Repairs and Pond #2 Improvements

Project No: 5637
Date: May 22, 2025

Description: Replace additional 40 LF of pipe with HDPE DR 11 per Field Order No. 1.

Sub-Contractor and Material Description	Unit	Qty	Unit $	Ext. $
Pipeing Material	LS	1	$ 4,025.34	$ 4,025.34
Fuise MJs	LS	1	$ 1,750.00	$ 1,750.00
Haul Off Spoils	LOADS	2	$ 300.00	$ 600.00
Dispose of Pipe	LS	1	$ 250.00	$ 250.00
				$ -
		Total Material		**$ 6,625.34**

Labor Description	Hours	Rate	Total
Superintendent	0.5	$ 60.00	$ 30.00
Excavate	6	$ 24.00	$ 144.00
Intall Piping	16	$ 24.00	$ 384.00
Backfill	12	$ 24.00	$ 288.00
	Sub-Total		$ 846.00
	Burden	55%	$ 465.30
	Total Labor		**$ 1,311.30**

Equipment Description	Hours	Rate	Total
Backhoe	5	$ 50.00	$ 250.00
			$ -
			$ -
			$ -
			$ -
	Total Equipment		**$ 250.00**

	LABOR TOTAL:	$ 1,311.30
	MATERIAL TOTAL:	$ 6,625.34
	EQUIPMENT TOTAL:	$ 250.00
	SUB TOTAL:	$ 8,186.64
15%	**OVERHEAD & MARK-UP:**	$ 1,228.00
	GRAND TOTAL:	**$ 9,414.64**

FERGUSON WATERWORKS

FERGUSON ENTERPRISES, LLC
FERGUSON WATERWORKS #1254
200 PARK CENTRAL BLVD
GEORGETOWN, TX 78626
Phone: 512-930-2262
Fax: 512-930-2388

Deliver To:
From: **Alexander Torres**
alexander.torres1@ferguson.com
Comments:

FERGUSON WATERWORKS #1106
Price Quotation
Phone: 512-930-2262
Fax: 512-930-2388

Bid No: B554427
Bid Date: 05/09/25
Quoted By: ART

Cust Phone: 281-261-5000
Terms: NET 10TH PROX

Customer:
JERDON ENTERPRISE L P
13403 REDFISH LANE
5637 LAGO VISTA POND 17
STAFFORD, TX 77477

Ship To:
JERDON ENTERPRISE L P
13403 REDFISH LANE
5637 LAGO VISTA POND 17
STAFFORD, TX 77477

Cust PO#: C/O 1

Job Name: 5637 LAGO VISTA POND 17

Item	Description	Quantity	Net Price	UM	Total
	10" DR11 IPS HDPE PIPE				
	**PIPE DELIVERED TO SITE				
	**INCLUDES FREIGHT				
PEI11A1040	10X40 IPS DR11 HDPE PIPE	40	6608.900	C	2643.56
P744120532	12GA SLD HFCCS PE30 WIRE GREE 500	500	122.940	M	61.47
	SUBTOTAL				2705.03

	TIE INTO EFFLUENT LINE				
	FROM WALL				
MJLSLA10	10X12 MJ C153 LONG SLV L/A	1	276.140	EA	276.14
SSGDPS10N	10 SBOND DI SGRIP SER 3000	1	97.450	EA	97.45
IMJBGP10	10 MJ C153 BLT GSKT PK L/ GLAND	1	51.160	EA	51.16
PEI11MJAWS10	10 IPS PC200 DR11 MJ ADPT W/STIFF	1	169.360	EA	169.36
IMJAPHDI10	10 HDPE DIPS IPS ACCY MJ PK W/GLND	1	129.160	EA	129.16
	SUBTOTAL				723.27

	TIE INTO 10" VALVE MTRL				
PEI11MJAWS10	10 IPS PC200 DR11 MJ ADPT W/STIFF	2	169.360	EA	338.72
IMJAPHDI10	10 HDPE DIPS IPS ACCY MJ PK W/GLND	2	129.160	EA	258.32
	SUBTOTAL				597.04

	TOTAL				4025.34

Net Total:	$4025.34
Tax:	$0.00
Freight:	$0.00
Total:	$4025.34

HOW ARE WE DOING? WE WANT YOUR FEEDBACK!
Scan the QR code or use the link below to
complete a survey about your bids:
https://survey.medallia.com/?bidsorder&fc=1106&on=62666

FERGUSON WATERWORKS

FERGUSON WATERWORKS #1106
Price Quotation

Fax: 512-930-2388

14:43:05 MAY 16 2025
Reference No: B554427

Quoted prices are based upon receipt of the total quantity for immediate shipment (48 hours). SHIPMENTS BEYOND 48 HOURS SHALL BE AT THE PRICE IN EFFECT AT TIME OF SHIPMENT UNLESS NOTED OTHERWISE. QUOTES FOR PRODUCTS SHIPPED FOR RESALE ARE NOT FIRM UNLESS NOTED OTHERWISE.

Due to the uncertain impact of potential tariffs, Ferguson's quotation/proposal has not included any provision or contingency for future tariffs or increase of existing tariffs. Ferguson reserves the right to adjust prices to reflect the impact of any new or increased tariffs that affect our costs at the time of shipment. Ferguson will provide notice of any such adjustments along with documentation supporting the changes.

CONTRACTOR CUSTOMERS: IF YOU HAVE DBE/MBE/WBE//VBE/SDVBE/SBE GOOD FAITH EFFORTS DIVERSITY GOALS/ REQUIREMENTS ON A FEDERAL, STATE, LOCAL GOVERNMENT, PRIVATE SECTOR PROJECT, PLEASE CONTACT YOUR BRANCH SALES REPRESENATIVE IMMEDIATELY PRIOR TO RECEIVING A QUOTE/ORDER.

Seller not responsible for delays, lack of product or increase of pricing due to causes beyond our control, and/or based upon Local, State and Federal laws governing type of products that can be sold or put into commerce. This Quote is offered contingent upon the Buyer's acceptance of Seller's terms and conditions, which are incorporated by reference and found either following this document, or on the web at https://www.ferguson.com/content/website-info/terms-of-sale
Govt Buyers: All items are open market unless noted otherwise.

LEAD LAW WARNING: It is illegal to install products that are not "lead free" in accordance with US Federal or other applicable law in potable water systems anticipated for human consumption. Products with *NP in the description are NOT lead free and can only be installed in non-potable applications. Buyer is solely responsible for product selection.

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AGENDA ITEM NO. 10h

Item Cover Page

CITY COUNCIL AGENDA ITEM REPORT

DATE: July 17, 2025

SUBMITTED BY: Eric DeLaCruz, Finance

SUBJECT: Discussion and possible action on Amendment No. 2 to the Effluent Pond Repairs design, which includes plans for a pump house, wet wells, electrical, SCADA, and pumps for Ponds #2, #14, and #17, and to authorize the City Manager to approve the amendment.

BACKGROUND: This item represents the second amendment to the design scope for the Effluent Pond Improvement Project. The original scope included repairs to Pond #17 and improvements to Pond #2. Subsequently, Addendum #1 expanded the scope to include repairs to Pond #14 and the addition of a new transmission main running from the pump house at Pond #17 to Pond #2.

Amendment #2 proposes further expansion of the project to include the redesign of the golf course irrigation system, replacement of the pump house at Pond #2, and the addition of observation wet wells pump at Ponds #2, #14, and #17. Each of these components will also require the installation of additional power infrastructure and the integration of SCADA systems at each site.

FINDINGS: City staff have determined that these improvements are critical to the operation and functionality of the effluent system. The golf course irrigation system is essential for the proper disposal of effluent water, and the current system is in urgent need of redesign. The observation wet wells are key safety features that will enable early detection of potential leaks, providing staff with timely notifications and allowing for quicker response to any issues.

The inclusion of SCADA components will further enhance monitoring capabilities by allowing remote observation of effluent conditions at each pond and immediate alerts if irregularities or leaks are detected. These upgrades are vital for maintaining environmental compliance, protecting public safety, and ensuring reliable operation of the effluent disposal

system.

FINANCIAL IMPACT: The original scope design cost was $483,830, Amendment #1 in the amount of $504,673 and Amendment #2 if approved will be in the amount of $553,745.

ATTACHMENTS:

Attachment A - Lago Vista Effluent Pond Repairs - Amendment No. 2 - DRAFT Scope of Work.pdf
Attachment B - Lago Vista Effluent Pond Repairs - Amendment No. 2 - Hines Inc. Proposal Dated July 9 2025.pdf
Attachment C - Lago Vista Effluent Pond Repairs - Amendment No. 2 - DRAFT Detailed Fee Estimate.pdf

ATTACHMENT – A

CITY OF LAGO VISTA
EFFLUENT POND #17 REPAIRS AND POND #2 DESIGN
ADDITIONAL ENGINEERING SERVICES ("AMENDMENT NO. 2") – DESIGN, PERMITTING, BIDDING AND CONSTRUCTION PHASE SERVICES

SCOPE OF SERVICES

PROJECT BACKGROUND

The City of Lago Vista ("City" or "the City") contracted FNI to perform the Effluent Pond #17 Repairs and Pond #2 Design/Improvements (Project) on November 28, 2023. The City contracted FNI to perform additional tasks supplementary to the original contract ("Amendment No. 1") on October 22, 2024.

On February 12, 2025, the City asked FNI to prepare a scope and fee proposal for irrigation design services to improve the City's golf course irrigation system. During a follow-up meeting on February 19, 2025, the City expressed its need to renovate the design and integration of the Lago Vista Effluent Storage supervisory control and data acquisition (SCADA) system. The City of Lago Vista appointed an irrigation committee to investigate specific items needed to bring the system into operation. On May 5th, 2025, the committee was in agreement on the needed items and the information was forwarded via email.

The following summarizes the City's request to be completed for Amendment No. 2 (supplementary to the original contract and Amendment No. 1).

1. Design irrigation system improvements for the Lago Vista Golf Course, referred to hereinafter as the "Lago Vista Golf Course Irrigation Renovation". The scope of work includes the design of a new irrigation system, including pipelines, sprinkler heads, a new pump station/house and related equipment, which will be required for Pond #2 only. In addition to the design, the scope of this work will also include bid support, and construction phase support services. The Lago Vista Golf Course Irrigation Renovation work will be performed by Hines Inc. (HI) as a subconsultant to FNI.
2. Design a supervisory control and data acquisition (SCADA) system for the Lago Vista Effluent Storage System and coordinate integration with the SCADA integration firm (to be designated by the City). The effluent storage system involves a series of pipelines, pumps and pump stations that convey flow between Pond #2, Pond #14, and Pond #17. The scope of work includes the design of the electrical and SCADA components. In addition to the design, the scope of work will also include bid support and construction phase support services. The SCADA system design work will be performed by FNI.
3. Investigate the feasibility of having an effluent pipeline between Pond #2 and Pond #14.

This document highlights the additional fee and scope of work ("Amendment No. 2") for the Effluent Pond #17 Repairs Project. FNI shall render the following professional services, in addition to the listed services specified in the original contract:

BASIC SERVICES:

TASK 1. PROJECT MANAGEMENT

Project management activities will include coordination with the City's Public Works department, coordination with subconsultants, FNI sub-discipline groups, and coordination with reviewing and permitting agencies. This task will include meetings, implementation of quality control plan and tracking Project budget, schedule and progress.

1. Meetings will include:
    i. Project Kickoff Meeting (virtual via Microsoft Teams) with the City's staff, HI leads, and key discipline leaders at FNI.
    ii. Internal Project Kickoff Meeting (FNI only) to review the Project scope, objectives and schedule.
    iii. One (1) site visit to understand and document the existing condition of the pump station building/house and related equipment at Pond #2, Pond #14 and Pond #17.
    iv. Monthly Progress Meetings (12 virtual meetings) to discuss the progress, schedule, budget, and technical aspects of the Project. FNI will facilitate these meetings, prepare and distribute meeting notes/minutes. Key action items and decisions will be included in the meeting minutes.
    v. Submittal Review Meetings (4 – 50%, 95%, IFB, Pipeline Memo)
2. Provide document control throughout the life of the Project. Provide written Project status reports with monthly invoices, one per month throughout the duration of the Project. Implement Quality Control and Quality Assurance Plan on the design submittals.
3. Coordinate and perform constructability reviews.

TASK 2. IRRIGATION DESIGN

The irrigation design scope of work is included in ATTACHMENT B. Irrigation design for the Lago Vista Golf Course and Green Shore Park will be performed by HI. FNI will *not perform irrigation design* but will perform the following tasks to coordinate with HI:

1. Prepare for, facilitate and document no more than seven (7) virtual meetings via Microsoft Teams with the irrigation designer(s) to coordinate irrigation design deliverables.
2. Prepare for, facilitate and document no more than two (2) site visits during the design to determine existing features, constraints and access for HI to implement in their deliverables. Coordinate the site visits with the City and HI.
3. Prepare for, facilitate and document no more than four (4) irrigation design submittal review meetings with the City and irrigation design subconsultant. The comments will be recorded into a log, and responses will be provided for concurrence with the City.

TASK 3. ELECTRICAL AND SCADA SYSTEM DESIGN

The following basic services are included as part of this task:

1. Design of electrical and SCADA system for Lago Vista Effluent Ponds #2, #14 and #17. The electrical and SCADA system design will include the following components:
    i. Pond #2:
        a. Power:

b. Design for a permanent power source for 2 new sump pumps inside the existing outfall structure. Power will be provided via a new panelboard. This new panelboard will be on a new electrical equipment rack with a canopy. The existing pump house will be abandoned in place. Determine whether or not it is possible to intercept the existing power source via the existing electrical disconnect switch or if a new power source needs to be provided via Utility Coordination with PEC.
c. Providing power to a new effluent irrigation pump and the associated electrical equipment inside the new pump house (such as the irrigation controller).
d. SCADA:
    - Connecting of a level sensor (specified by HI) that monitors the level at pond #2 to a new Programmable Logic Controller (PLC) mounted inside a new PLC cabinet located on the new electrical equipment rack. This level sensor will be used to send control inputs to the irrigation controller via the PLC (e.g., if the level at pond #2 is below a certain threshold, the irrigation controller will prevent the irrigation system from operation).

ii. Pond #14:
a. Power: Design a permanent power source for 2 new sump pumps inside the existing outfall structure. Power will be provided via a new panelboard. Coordinate with City regarding the new panelboard installation on either a nearby equipment rack, or inside the existing pump house. Determine whether or not it is possible to power the panelboard via the existing electrical infrastructure or if a new power source needs to be provided via Utility Coordination with PEC.

iii. Pond #17:
a. Power: Design for a permanent power source for two (2) new sump pumps inside the existing outfall structure. Power will be provided via the existing panelboard circuits inside the existing pump station.

2. Task Deliverable(s) to be provided by FNI include:
    i. Prepare 50% design drawings and a preliminary opinion of probable construction cost ("OPCC") based on a Class 3 estimate described by the Association for the Advancement of Cost Engineering (AACE) Recommended Practice No. 17R-97. A (virtual) review meeting will be held to receive City's feedback on the design after 50% submittal.
    ii. Prepare 95% design drawings and OPCC based on a Class 2 estimate described by the AACE Recommended Practice No. 17R-97. A (virtual) review meeting will be held to receive City's feedback on the design after 95% submittal.
    iii. Prepare 100% Issued-for-Bid (IFB) design drawings, specifications, front end documents, and OPCC based on a Class 2 estimate described by the AACE Recommended Practice No. 17R-97. A (virtual) review meeting will be held to receive City's feedback on the design after 100% submittal.
3. The preferred SCADA system integrator for the City is Control Panels, USA. FNI will perform the SCADA system design while coordinating with Control Panels, USA on the

City's' preferred equipment and project-relevant City networking information. FNI will prepare for, facilitate and document no more than three (3) virtual coordination meetings with the SCADA system integrator.

TASK 4. PIPELINE FEASIBILITY/ROUTE STUDY

Develop a feasibility study to connect Pond #2 and Pond #14 with a pipeline, necessary pumps, and related improvements.

1. Develop high level review of routing a pipeline to connect Pond #14 and Pond #2. FNI will review up to three (3) routes.
2. Coordinate with the irrigation subconsultant on whether the planned irrigation pumps would be suitable for pumping the effluent between the ponds or if additional pumps and related facilities would be needed.
3. Develop a Class 5 preliminary opinion of probable construction cost (OPCC) for all improvements.
4. No survey, SUE or geotechnical services will be included as part of the feasibility study. FNI will utilize City's provided utility information for this effort.
5. Task deliverables to include:
    i. A plan view alignment exhibit of the recommended pipeline alignment between Pond #14 and Pond #2
    ii. Technical memo to summarize findings and recommendations
    iii. Class 5 OPCC

TASK 5. BID PHASE SERVICES

Bid phase support services will be provided by FNI for the electrical/SCADA bid package. Bid phase support services will be provided by HI. for the irrigation system design bid package. The bid phase period is anticipated to end six (6) weeks after the issuance of the IFB Contract Documents. Upon completion of the design services and approval of IFB Contract Documents by the City, FNI shall provide professional services in this phase as follows:

1. Coordinate with HI during bidding of the irrigation system bid package.
2. Assist City in conducting a pre-bid conference for the construction project and coordinate responses with City. Attend a tour of the Project site after the pre-bid conference.
3. Assist City by responding to questions and interpreting bid documents. Prepare and issue addenda to the bid documents to plan holders.
4. Assist City in opening, tabulating, and analyzing the bids received. It is assumed that City will use **Competitive Sealed Proposals** for soliciting bids. Review the qualification information provided and evaluate, based on the information available, the Contractor's qualifications to construct the Project.
5. Perform a ranking evaluation and develop a Recommendation of Award memorandum for the contract.
6. Prepare Issued for Construction (IFC) Contract Documents, including incorporation of addenda. Furnish the City one (1) electronic copy (*.pdf format) of IFC Contract Documents for execution.

TASK 6. CONSTRUCTION PHASE SERVICES

Upon completion of the bid phase services and selection of Contractor, FNI will proceed with

the performance of construction phase general representation support services as described below. The construction support effort connected to Tasks 1 to 4 as described herein will be in addition to what had already been assumed for work covered under the original and Amendment No. 1 scopes of work.

The overall construction schedule for the Amendment #2 scope of work is assumed to be twelve (13) months from the construction notice to proceed. The construction duration assumes 5 months for the irrigation system construction and 8 months for electrical/SCADA construction duration. The irrigation system construction and electrical/SCADA work will be bid in separate bid packages and will have separate construction schedules.

Construction support services for the irrigation system design work will be provided by HI, utilizing FNI's construction management software platform. FNI will not review submittals for the irrigation system construction work, but will track RFIs and other submittals and coordinate with HI for the responses. FNI will not perform site visits or document construction activities during the irrigation system construction.

FNI will review submittals, perform site visits, and document construction activities during the electrical and SCADA construction. If the Project construction duration extends beyond this assumed duration, additional budget will be required.

In performing these services, it is understood that FNI does not guarantee the Contractor's performance, nor is FNI responsible for the supervision of the Contractor's operation and employees. FNI shall not be responsible for the means, methods, techniques, sequences, or procedures of construction selected by the Contractor, or any safety precautions and programs relating in any way to the condition of the premises, the work of the Contractor or any Subcontractor. FNI shall not be responsible for the acts or omissions of any person (except its own employees or agents) at the Project site or otherwise performing any of the work of the Project.

FNI assumed that the City will secure a qualified construction contractor to perform the work in accordance with the construction documents. The City will also provide a qualified inspector (Resident Project Representative) to oversee the work. It is assumed that the City's Resident Project Representative (RPR) will inform FNI of construction progress, coordinate progress meetings, advise on timing for engineering inspections, coordinate quality control testing, review payment requests, and oversee the Contractor's as-built drawings update.

City's Resident Project Representative will coordinate with the City regarding its testing laboratories required for the testing or inspection of materials, witnessed tests, factory testing, etc., for quality control of the Project. The cost of such quality control shall be paid by the City and is not included in the services to be performed by FNI.

FNI's construction phase support services will include:

1. Assist the City in conducting an onsite pre-construction conference with the Contractor and review construction schedules prepared by the Contractor pursuant to the requirements of the construction contract.
2. Assist the City in monthly progress in-person meetings with the Contractor. Assist with the review of meeting minutes prepared by the City. It is anticipated that eight (8)

meetings will be held in person during construction of electrical/SCADA work. Site visits will be performed during these meetings and site observation reports documenting the construction progress will be prepared. Reports will describe construction progress in general terms, descriptive narrative of progress identified to date, contract and/or design deviations noted, and site photographs. The purpose of these visits will be to determine if the work is proceeding in general accordance with the IFC Contract Documents. In this effort FNI will endeavor to protect the City against defects and deficiencies in the work of Contractor(s) and will report any observed deficiencies to the City.

3. In addition to eight (8) site visits described above, an additional two (2) site visits were assumed for substantial completion and final completion inspections. A punch list will be prepared during the substantial completion inspection.
4. Establish and maintain a project documentation system consistent with the requirements of the IFC Contract Documents. Monitor the processing of Contractor's submittals and provide for filing and retrieval of project documentation using FNiManager construction management software.
5. Review Contractor's requests for information (RFI's) and submittals (up to 15) including modification requests, shop drawings, schedules, and other RFI's and submittals in accordance with the requirements of the IFC Contract Documents for the Project. Monitor the progress of the Contractor in sending and processing submittals to see that documentation is being processed in accordance with schedules.
6. Notify the City of non-conforming work observed on site visits. Review quality-related documents provided by the Contractor such as test reports, equipment installation reports, or other documentation required by the IFC Contract Documents.
7. Prepare change order documentation, for the City's approved changes, for execution by the City. One (1) change order requests are assumed. Investigations, analyses, studies, or design for substitutions of equipment or materials, corrections of defective or deficient work of the Contractor or other deviations from the IFC Contract Documents requested by the Contractor and approved by the City are an additional service. Substitutions of materials or equipment or design modifications requested by the City or requested by the Contractor are an additional service.
8. Prepare documentation for contract modifications required to implement modifications in the design of the Project. Receive and evaluate notices of Contractor claims and make recommendations to the City on the merit and value of the claim on the basis of information submitted by the Contractor or available in project documentation. Providing these services to review or evaluate the construction Contractor claim(s), supported by causes not within the control of FNI, are an additional service.
9. Conduct, in company with the City, a final review of the Project for conformance with the design concept of the Project and general compliance with the IFC Contract Documents. Prepare a list of deficiencies to be corrected by the Contractor before recommendation of final payment.
10. Revise the construction drawings in accordance with the information furnished by the construction Contractor reflecting changes in the Project made during construction. Furnish the City two (2) sets of printed copies and one (1) electronic copy (*.pdf and *.dwg format) of "Record Drawings."

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TIME OF COMPLETION:
The schedule for completing the Amendment No. 2 scope of work is shown below.

Project Milestones	**Duration**
Notice to Proceed, NTP (Amendment No. 2)	
50% Design Submittal	10 Weeks after NTP (Amendment No. 2)
City Review and Comments	2 Weeks after 50% Design Submittal
95% Design Submittal	8 Weeks after Receipt of City Comments
City Review and Comments	2 Weeks after 95% Design Submittal
100 IFB% Design Submittal	6 Weeks after Receipt of City Comments
Bid Phase	Assumed 6-week duration
IFC Design Documents Submittal	2 Weeks after Contract Award
Construction Phase	Estimated 13 months total (i.e., 5 months for Irrigation System Construction and 8 months for Electrical & SCADA work)

If FNI's services are delayed through no fault of FNI, FNI shall be entitled to adjust contract schedule consistent with the number of days of delay. These delays may result in an adjustment to compensation upon written approval by the City.

RESPONSIBILITIES OF THE CITY:

City shall perform the following in a timely manner so as not to delay the services of FNI:

1. Secure a qualified construction contractor to perform the work in accordance with the construction documents.
2. Provide a qualified inspector (Resident Project Representative) to oversee the work through the construction via daily observations and documentation (i.e., uploading photos in FNiManager software) of construction progress for irrigation and SCADA system installation.
3. Designate in writing a person to act as the City's representative with respect to the services to be rendered under this Agreement. Such a person shall have contract authority to transmit instructions, receive information, interpret, and define the City's policies and decisions with respect to FNI's services for the Project.
4. Assist in coordination with the Golf Course Management.
5. Provide all criteria and full information as to the City's requirements for the Project, including design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and any budgetary limitations; and furnish copies of all design and construction standards which the City will require to be included in the drawings and specifications.
6. Assist FNI by placing at FNI's disposal all available information pertinent to the Project including previous reports and any other data relative to design or construction of the Project.
7. Arrange for access to and make all provisions for FNI to enter upon public and private property as required for FNI to perform services under this Agreement.
8. Examine all studies, reports, sketches, drawings, specifications, proposals, and other documents presented by FNI, obtain advice of an attorney, insurance counselor and other

consultants as the City deems appropriate for such examination and render in writing decisions pertaining thereto within a reasonable time so as not to delay the services of FNI.

9. Furnish approvals and permits from all governmental authorities having jurisdiction over the Project and such approvals and consents from others as may be necessary for completion of the Project.
10. Provide such accounting, independent cost estimating and insurance counseling services as may be required for the Project, such legal services as the City may require or FNI may reasonably request with regard to legal issues pertaining to the Project including any that may be raised by Contractor, such auditing service as the City may require to ascertain how or for what purpose any Contractor has used the moneys paid under the construction contract, and such inspection services as the City may require to ascertain that the Contractor is complying with any law, rule, regulation, ordinance, code or order applicable to their furnishing and performing the work.
11. Give prompt written notice to FNI whenever the City observes or otherwise becomes aware of any development that affects the scope or timing of FNI's services.
12. Furnish, or direct FNI to provide, Additional Services as required.
13. Bear all costs to comply with requirements and responsibilities in this section.
14. Provide construction oversight, management, and inspection services for the complete installation of the Project to ensure the Contractor completes the construction of the Project in accordance with the design of the Project. Use FNiManager construction management and documentation software to track and document construction activities and submittals.

ADDITIONAL SERVICES:

Additional services to be performed by FNI, if authorized by the City of Lago Vista, are described as follows:

1. SCADA system design to include a float switch to be placed inside the existing outfall structures at Pond #2, #14, or #17, which will be connected to the existing outfall structure SCADA panel located inside the existing pump station. In the event the float switch is triggered, this will send an alarm to the operator workstation to indicate an overflow at the outfall structure has occurred.
2. Pond #2:
    a. SCADA:
        i. SCADA monitoring of a level sensor (specified by HI) to monitor the level at pond #2.
        ii. Design to include one (1) antenna pointed towards Pond #17 with ancillary devices needed to support this radio communication to be provided within the new SCADA panel at Pond #2. The radio path between Pond #2 & #17 will be evaluated to determine the height needed for the antenna at Pond #2, possibly necessitating the need for a radio tower.
        iii. Design to include the new irrigation controller (specified by HI) such that it is installed at pond #2 and connected to SCADA for remote monitoring and control capability.
3. Pond #14:
    a. POWER:
        i. Providing a power source for a new effluent pump and new pump house for

Pond #14.

b. SCADA:
    i. Design including an antenna pointed towards Pond #17 with ancillary devices needed to support this radio communication to be provided within the new SCADA panel. During design, evaluating the radio path between Pond #14 & #17 to determine the height needed for the antenna at Pond #14, possibly necessitating the need for a radio tower.
    ii. SCADA monitoring of a level sensor (specified by HI) to monitor the level at pond #14.
    iii. Design to include the new irrigation controller (specified by HI) such that it is installed at pond #14 and connected to SCADA for remote monitoring and control capability.

4. Pond #17:
    a. SCADA:
        i. Design will include one (1) antenna to be provided, pointed towards Pond #2 with ancillary devices needed to support this radio communication to be provided within the existing SCADA panel. This antenna will be used for Pond #2 to have the ability to transmit the water level at Pond #2 to the existing SCADA panel PLC at Pond #17 and the level will be monitored and displayed at both the operator workstation & at the existing HMI located on the existing SCADA Panel at Pond #17. As part of design effort, address changes necessary to the PLC programming with regards to the automatic operation of pumps BP1 & BP2 in order to facilitate the pumping of water from Pond #17 to Pond #2.
5. Pond #2 to Pond #14 Pipeline Design
    a. Design the pipeline to connect Pond 2 and Pond 14 using the alignment proposed in Task 2. If the planned irrigation pumps are not suited to pump effluent between the ponds, additional pumps and facilities will be designed. Up to two site visits during the design process.
6. Pond #2 to Pond #14 Pipeline Survey
    a. The full Right of Way will be surveyed along the route. If the route utilizes easements, the easement will be surveyed. If the route utilizes the City/golf course property, a fifty (50) foot wide corridor will be surveyed along the proposed route on the City/golf course property. The total length of the survey would be limited to 1.2 miles.
7. Pond #2 to Pond #14 Pipeline Subsurface Utility Exploration (SUE)
    a. SUE to QL-B along the survey route. The total length of the SUE would be limited to 1.2 miles. Up to 18 potholes to determine location and depth of existing utilities.
8. Pond #2 to Pond #14 Pipeline Bid Phase Services
9. Pond #2 to Pond #14 Pipeline Construction Phase Services

PROPOSAL ASSUMPTIONS:

The following assumptions are associated with this proposal:

1. Irrigation system design will be for the Lago Vista Golf Course.
2. The minimum operating pressure of the irrigation system will be 60 psi to activate the

sprinkler system. Typical operating pressure will be between 60 psi and 80 psi.

3. Irrigation system design proposal by Hines Inc. (HI) is included as part of this proposal. FNI assumes that the City has reviewed this proposal, including HI's proposal, and agrees with the assumptions.
4. Topographic or SUE surveys or geotechnical explorations are not required for the irrigation system design. Thus, no effort is included in the fee.
5. Amendment #2 scope of work will be designed, bid, and constructed as two separate bid packages (1-Irrigation System and 2- Electrical and SCADA). Irrigation Subconsultant will prepare design deliverables listed in HI proposal for the irrigation system design services. FNI will prepare separate design deliverables for the electrical and SCADA system design services.
6. The Lago Vista Effluent Storage System involves a series of pipelines, pumps and pump stations that convey flow between Pond #2, Pond #14 and Pond #17. Cedar Breaks Effluent Pond (to the north of Lago Vista Golf Course) and the ponds at Highland Lakes Golf Course (to the south of Lago Vista Golf Course) may also be connected to this effluent storage system, but they are ***excluded*** from the Amendment No. 2 scope of work.
7. SCADA integration will be performed by others and not included as part of Amendment #2 scope of services. FNI will coordinate with the SCADA integration subconsultant (designated by the City) to receive SCADA integration requirements.
8. The existing pump station building/house and related equipment at Pond #2 are insufficient for the proposed irrigation and SCADA design services. HI will be responsible for the design of a replacement pump station building/house and equipment.
9. Once operational, the new pump station at Pond #2 will operate the entire golf course irrigation system. A temporary pumping system will not be required, therefore there is no design effort assumed for a temporary pumping system.
10. The existing pump station building/house and related equipment at Pond #14 and Pond #17are currently abandoned and are insufficient for the proposed irrigation and SCADA system design services. No efforts will be made to salvage the existing building or any equipment located inside the buildings.
11. The radio connection between Pond #17 and the operator workstation is operational and does not require any improvements or modification.
12. The existing pumps (BP1 & BP2) at Pond #17 are used to pump to Pond #2 and these existing pumps (BP1 & BP2), when placed in auto mode, have contact from SCADA which turns on these pumps. The SCADA programming of that contact will be modified by Control Pannels USA (and is capable of such modification) to incorporate the water level received from Pond #2.
13. Pond #14 is gravity fed from Pond #17.
14. This amendment will not change the environmental permitting requirements assumed in the original and/or Amendment No. 1 scopes of work. No TCEQ review is required for the Amendment #2 scope of work.
15. No permit preparation or application required for the Amendment #2 scope of work.

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16. City shall be responsible for coordinating the necessary easement and Right-of-Way acquisitions for the Project, including any necessary temporary construction easements.
17. Storm Water Pollution Prevention Plan(s) will be provided by the Contractor.

ATTACHMENTS:

Attachment B: Hines Inc. Proposal Dated July 9, 2025

Attachment C: Detailed Fee Estimate

DRAFT

Hines Inc

7.9.2025

Mr. Bryce Todd
Freese and Nichols
10431 Morado Circle
Ste 300
Austin, TX 78759

Dear Bryce,

Hines Inc is honored to partner with Freese and Nichols to provide Irrigation System Design for the Lago Vista Golf Course Renovation project, located in Lago Vista, TX. It is assumed that the existing 18-hole course will undergo complete irrigation system and pump station renovation. Our detailed scope of work & general conditions are attached for your review & approval.

Base Scope & Fee Summary	Fee
Task 1: Project Meetings & Coordination 4 design meetings allowed *	$16,500
Task 2: Sprinkler Coverage plan	$7,500
Task 3: Pump Station Evaluation for Two vs. One Station	$3,000
Task 4: Irrigation Plan Design, Details and Specifications	$38,500
Task 5: Pump Station Design Includes one (1) Pump Station *Added Fee for two (2) pump station designs - see optional fee below*	$17,500
Task 6: Bidding Support	
One (1) Pre-Bid meeting *	$3,500
Addendums and Clarifications	$2,500
Task 7: Construction Support Services	
Submittal Reviews	$2,500
Coordination, field questions during installation	$5,000
Site Observations/Visit 1 Pre-Construction Visit allowed *	$3,500
Staking Review Visits 6 visits allowed for staking. Note: This potentially could be reduced some if more staking can be completed per trip. Staking visits require more time on-site than a meeting visit.	$38,000
Floating Visits During Installation 2 visits allowed *	$7,000
Punch list Visits 2 visits allowed *	$7,500
Final Acceptance Visits 2 visits allowed *	$7,500
Estimated expense budget for travel *Expenses * 18 trips to the site - trip expenses in estimated travel budget	$27,000
As-Built Cadd Generation	$7,500
Total	**$194,500**

Optional Scope & Fee (add to base fee above)	Fee
Task 8: GPS Irrigation Data collection by Hines versus contractor	$30,000
Estimated expenses for two (2) trips	$4,000
Task 9: Central Control Programming Assistance Programming assistance of Mainline Pipe Tree In Irrigation Central Controller	$3,500
Task 10: Design Second Pump Station	$10,000

We strive to be as specific as possible in all aspects of our work to ensure complete understanding of scope & our ability to meet the proposed schedule. Should anything require further clarification, please do not hesitate to contact me.

Kind Regards,
Matt Hall

Hines Inc

BASE SCOPE-OF-WORK

Task 1 – Project Meetings & Coordination

- Obtain any design drawings or as-builts for existing system.
- Obtain base files from golf course architect or client in cadd format- it is assumed these files will include all course bunkers, fairways, tees, greens, lakes, other features, cart paths, and contour information.
- Attend four (4) in-person site visits during pre-design and design.
    - The course superintendent and other key personnel will be key attendees of the meetings.
    - Visit #1 will include the review of existing equipment and course condition. A hole-by-hole review will be conducted with the client and golf course superintendent and will include:
        - Verification of owner preferences regarding strategy, equipment, and maintenance preferences.
        - Discussion of past challenges or issues with the previous system.
        - Review widths and features of each hole, paying special attention to coverage concerns and site conditions.
    - Between the first two visits, Hines will develop a preliminary coverage plan for the golf course.
    - Visit #2 will include an in-person review of the preliminary coverage plan. This visit will function as the final coverage plan review & fine-tuning exercise. After this step, full irrigation system design will commence.
    - Visit #3 will include an in-person review of the 50%CD plan set.
    - Visit #4 will include an in-person review of the 95%CD plan set.

Task 2 - Sprinkler Coverage Plan

- Once the initial on-site visit #1 is complete and we have received feed back from the client and maintenance personnel with a design direction, we will develop an initial coverage plan showing the location sprinklers throughout the course. Once completed, we will send the coverage plan to the client and superentendent for review. At this time, we will schedule a follow up on-site meeting to go over the coverage plan on a hole by hole basis. This is the time we will make and adjustments that may need to be made.
- The coverage plan will provide us with the required GPM and PSI for the system.
    - Once the coverage plan is updated and agreed upon, we will proceed into the system design.
    - The coverage plan will provide us preliminary water usage on a daily basis to ensure we are falling within the permitted water use allowance of the permit.
    - We will have a goal to follow the committees recommendations and make adjustments as needed.
    - We will also be able to develop preliminary cost estimates for the system.

Task 3 – Preliminary Pump Station Evaluation for Two vs. One Station

- A Conceptual Memorandum of Design to include a review of:
    - Water source options, feasibility analysis, impacts to system approach, infrastructure requirements, key details related to the storage, pumping system, controls, and distribution piping to initial phases of development.
    - Refine costs to develop a one station versus two station approach. This estimate will allow the client to choose which option is best suited for their goals.

- **Deliverables:**
    - Conceptual estimates and cost Information in the required format.

Task 4 - Irrigation Plan Design, Details & Specifications

- Site irrigation water usage will be developed to estimate future annual water usage. Water use information will detail the following:
    - The system will
    - Peak season water use estimates.
    - Annual & monthly water use
- Irrigation controller location(s), electrical power source locations and water source information will be documented.
- Design will comply with applicable City or local equipment specification and design standards. Irrigation components will be identified with purple non-potable water designation where possible.
- Review projected peak pond drawdown based on anticipated irrigation withdrawals and make-up water source capacity.
- Hines will develop routing of the mainline pipe based on pump station flow requirements for the future automatic system to irrigate the site within a predetermined watering “window” of time. The sizing will reflect mainline pipe sizes and routing required to accommodate a fully automatic system, and pump station flow and pressure adequate for the proposed system.
    - Analyze pressure and flow characteristics within the proposed piping network for proper operation of equipment and longevity of fittings.
    - Pipe size optimization of mainline. The design will compare various pipe size options for the system.
- Develop a AACE Class 2 opinion of probable cost (OPCC) to be provided at 50%CD milestone and updated in subsequent submittals
- Detailed irrigation design will include; valve-in-head rotors, distribution and sub-main routing.
- The control package will be a 2-wire system or 24v system depending on what the maintenance wants to pursue.
- Prepare irrigation details in required format.
  Prepare irrigation specifications in CSI format.
- Attend as needed, 30 minute virtual bi-weekly meetings during the design process, prepare meeting agenda and provide meeting notes.
- Bidding support
    - Attend one (1) onsite pre-bid meeting with owners and contractors to review design and answer questions.
      • Assist in bid review and provide responses to bidder questions.
    - Issue addendums, including responses to bidders questions, highlight changes, if any, to plans and issue a For Construction (IFC) set of drawings.
- **Deliverables:**
    - Golf Irrigation: drawing sheets will be developed at 200 and 100 scale
    - Details & Specifications
    - AACE Class 2 OPCC estimates will be updated.
    - This proposal assumes a total of four (4) submittals:
        - Preliminary Golf Course Coverage Plan
        - 50% Construction Documents
        - 95% Construction Documents
        - 100% Construction Documents
        - Submit 100% deliverable to FNI and City for review, address review comments. Two weeks are assumed for client review.
        - Issued for construction (IFC)
        - All front end documents, assembly and advertising by the client.

Task 5 - Irrigation Pump Station Design - One Pump Station Option

(See fee schedule for costs if two pump stations are required.)

- Hines will provide design of the pump station prefabricated enclosure and pump mechanical system construction documents. These documents will detail the mechanical system equipment including pump & filter station installation, location, & electrical requirements for one (1) prefabricated pumping & filtration station and skid enclosure.
- Confirm flow and pressure requirements of the proposed pumping system. CAD generated construction design will be developed incorporating the pump size, type, filtration requirements & equipment, and all major associated piping.
- Mechanical equipment plan & profile design will include size & location of new prefabricated pump station enclosure, new wet well and pad (by civil), intake pipe, & elevation points for all major pieces of equipment.
- Design of a pond water level sensor and automated refill valve to be installed on a pressurized non-potable or potable refill pipe.
    - It is assumed that an existing refill pipe exists and is of adequate size.
- Coordinate electrical requirements, plan preparation & plan submittal with project Electrical Engineer.
- Engineering & design will match specific pump station operational and maintenance performance to project requirements.
- Coordinate SCADA communication with public works and FNI.
- **Deliverables:**
    - CAD generated drawing sheets showing pump station equipment, pump station controls, suction piping, air relief and filtering requirements, building dimensions and notes, and technical specifications in CSI format.
    - AACE Class 2 OPCC estimates will be updated.
    - This proposal assumes a total of three (3) drawing submittals: (50% CD, 95% CD, 100% CD and IFC drawings)

Task 6 - Bidding Support

- Attend one (1) Pre-Bid Meeting on-site.
    - Attend pre-bid review meetings to discuss design approach, contract documents, and site conditions.
- Review questions from bidding contractors and respond as an Addendum to clarify design documents, details & specifications.
- Review bids and assist in evaluation of bids.
- **Deliverables:** Memoranda, drawings &/or specifications

Task 7 - Construction Support Services

- Pre-Construction Services
    - Attend one (1) pre-construction meeting on-site with the owner and contractor to coordinate construction, schedule, and answer contractor questions prior to installation.
- Coordination during construction - We have provided an allowance for hourly time for coordination, field questions and respond as needed.
- On-Site Observations
    - Track construction submittals in FNI Manager Construction Management Software.
    - Review change orders and payment requests submitted by the contractor; provide recommendations to owner.
    - Attend six (6) staking visits assuming 3x holes will be staked per trip.
        - Staking will including GPS locating of head locations, quick couplers.
        - While on site during staking activities, observation of installed components will be conducted to review conformance of installation to irrigation details, specifications, and manufacturer recommendations. A field report with pictures will be developed after each visit.

    - Perform up to two (2) floating site observation visits during construction. A field report with pictures will be developed after each visit.
    - Schedule and participate in two (2) visits at “Substantial Completion” with Contractor for review of irrigation construction and system operation. Prepare “punch list” of all items requiring adjustment or correction to be performed by Contractor prior to Final Inspection.
    - Schedule and participate in two (2) visits to conduct final walk-through with Contractor to observe completeness of installation and compliance with “punch list” items.
    - Total quantity of on-site observation visits is twelve (12). Project phasing may increase the quantity of visits outlined above. Hines will stay in communication with owner regarding progress of this task and is glad to provide additional visits if requested; a proposal will be provided upon request for additional scope/visits.
    - **Observation Deliverables:** Inspection reports in 8.5"x11" format in PlanGrid with pictures.
- As-Built Drawing Development
    - Review and provide comments on contractor’s ‘As-Built’ mark-ups (based on field changes)
    - Preparation of as-built drawings in AutoCAD format utilizing information gathered from the Contractor's red-lined field drawing set and GPS data collected information. As-built shall contain items indicated in as-built submittal section of irrigation specifications and shall reflect GPS data collected by contractor.

OPTIONAL SCOPE-OF-WORK

Task 8 - GPS Mapping by Hines Versus the Contractor

- Conduct GPS data collection of the irrigation system by Hines versus the contractor (~3 holes per day). It is assumed this will be performed as part of two (2) extended visits over the course of 3-4days per data collection visit. All components are to be flagged/marked by the contractor prior to the site visit by the contractor.
- Hines will develop a GPS map inclusive of all irrigation infrastructure displayed will include Power Drop locations, Controller locations, Sprinkler heads, System valves, Mainlines, Laterals, Wiring & controller communication cable routing and all related irrigation components.

Task 9 - Central Control Programming Assistance

- Assist in mapping and hydraulic tree setup of central control software in coordination with superintendent and product distributor. (Remote)

Task 10 - Design Second Pump Station

- Task activities same as pump station design task above.

Anticipated Schedule

Project Milestones	Duration
Notice to Proceed, NTP (Amendment No. 2)	
Coverage Plan	3 weeks after NTP (Amendment No. 2)

Project Milestones	Duration
50% Design Submittal	3 Weeks after Final Coverage Plan
City and FNI Review and Comments	2 Weeks after 50% Design Submittal
95% Design Submittal	3 Weeks after Receipt of Comments
City and FNI Review and Comments	2 Weeks after 95% Design Submittal
100% Design Submittal	2 Weeks after Receipt of Comments
Bid Phase	Assumed 6-week duration
IFC Design Documents Submittal	2 Weeks after Contract Award
Construction Phase - System installation	Estimated 6-8 months from time of construction. Lead times for materials may vary
Pump station Delivery and install	4-6 months after ordered To be ordered right away after submittal approval

Assumptions

- The system will be designed to a minimum operating pressure of 60psi for minimum sprinkler operation. 80 Psi is ideal and will be our target PSI if allowed.
- That existing pump stations will supply water to the course during construction and no temporary pumping system will be needed.
- The city will supply the front end specifications, assembly of bid documents will be by FNI or City.
- Topographic information with 2 foot or better contours are to be provided by the client in autocadd format.
- Topographic or SUE surveys are excluded from the scope of work.
- The base cadd file of the course will be provided by the client in cadd format.
- The design assumes that there will be one pump station to be designed for the course out of pond #2 or #14. If two are required, we have listed to upcharge for two stations.
- Construction installation of the irrigation is estimated to be 6-8 months from the time of installation start.
- The pump station skid and enclosure is estimated to be 4-6 months from the time of order to install.
- The City will provide an on-site inspector and a construction manager during the installation of the irrigation system and related components.
- No regulatory review or obtaining permits are assumed. Preliminary contact with Tong Li at TCEQ indicated that they would not require a new permit and this would be grandfathered.

Client-Provided Information

This proposal assumes that the Client will provide the information necessary to complete the scope of work. Examples of client-provided information include but are not limited to: Project base files in the required format (golf course architectual design, existing irrigation as-buits, utility as-builts), key design team contact information, project milestone definition, and coordinated reasonable advanced notice of submittal deadlines.

Additional Services

If additional services are requested beyond what is outlined in the tasks listed above, Hines would be pleased to provide a written proposal that will outline new scope, tasks, fee, & reimbursable expenses associated with the work.

Notes:

- Major base changes made after 95% Construction Document submittal, resulting in major irrigation design revisions, will require additional fees.
- All final construction documentation, including front end specifications, shall be approved by the Owner's Representative prior to issuance for bidding.
- Reimbursable expenses will be billed directly, without markup.
- Construction service tasks & fees proposed are an estimate of required activities at the time of project proposal. Construction service activities will be completed on Client request and invoiced Hourly Not-to-Exceed assuming there is remaining approved fee available. Should scope and fee be exhausted prior to completion of the tasks outlined above, or should the Client request additional items not listed above, Hines will request approval of additional scope and fees.
- Not included in this scope-of-work:
    - Design of electrical service to pump station(s), electrical design inside the pump station room
    - Site survey
    - Bid solicitations or management of contractor
    - Pond design, pond aeration design, raw water turn-out structure design, water rights inventory/evaluation.
    - Transfer lines and pump requirements between ponds 17, 14 and 2.
    - Pump station design enhancement to increase provide transfer pump for transfer line.
    - Data Programming to SKIDATA/Building Automations.
    - Pump house Design.
    - Electrical Design

We request written approval to proceed with this project. Signature indicates agreement with our scope, fee, and General Conditions. Refer to Attachment A for a detailed list of our General Conditions. Please call with any questions or comments; we look forward to working with you on this project!

Kind Regards,
Hines Inc.

Matt Hall

AGREED TO BY:
Freese and Nichols Representative

Authorized Signature Date

ATTACHMENT A: GENERAL CONDITIONS

1. Contract Payment Terms – Freese and Nichols [hereafter referred to as The Client] accepts the following terms of payment to Hines Inc. [hereafter referred to as Hines Inc]:
    - Hines Payment Terms are due in full after 60 days past invoice date.
    - The Client agrees to pay simple interest on each invoice balance at a rate of 1.5% per month.
    - If an attorney is retained to collect an overdue debt, Hines Inc will be reimbursed for all attorney fees and costs.
2. JOB SITE SAFETY – Hines Inc or its representatives are not responsible for job site safety, or for construction means, methods, techniques, or appropriateness of installation procedures undertaken by any Contractor.
3. SUBSTITUTIONS - Substitution of equipment or specified products is permitted only by written approval of the Irrigation Designer.
4. HAZARDOUS WASTE – Hines Inc is not responsible for identifying, locating, discovering, removal or remediation of any hazardous waste, known or unknown at the site; or for the consequences of any hazardous waste materials at the site, including but not limited to asbestos and PCB's, as well as materials not yet known as hazardous.
5. UTILITY LOCATES – Hines Inc is not responsible for determining and marking the location of any underground pipes, wires, conduits, cables, or structures such as gas lines, fiber optics, irrigation or septic systems or any other items which may exist below the surface of the ground.
6. AS-BUILT DRAWINGS - As-built drawings are required to be submitted to the Owner’s Representative by the Irrigation Contractor upon completion of the installation.
7. OWNERSHIP OF INSTRUMENTS OF SERVICE - The Client acknowledges the Consultant’s construction documents, including electronic files, as instruments of professional service. All reports, drawings, specifications, computer files, field data, notes and other documents and instruments prepared by the Consultant as instruments of service shall remain the property of the Consultant. The Consultant shall retain all common law, statutory and other reserved rights, including, without limitation, the copyrights thereto.
8. CORPORATE PROTECTION - It is intended by The Parties to this Agreement that the Consultant's services in connection with the Project shall not subject the Consultant's individual employees, officers or directors to any personal legal exposure for the risks associated with this Project. Therefore, and notwithstanding anything to the contrary contained herein, the Client agrees that as the Client's sole and exclusive remedy, any claim, demand or suit shall be directed and/or asserted only against the Consultant, a Wyoming corporation, and not against any of the Consultant's individual employees, officers or directors.
9. CONSEQUENTIAL DAMAGES - Notwithstanding any other provision of this Agreement, and to the fullest extent permitted by law, neither the Client nor the Consultant, their respective officers, directors, partners, employees, contractors or sub-consultants shall be liable to the other or shall make any claim for any incidental, indirect or consequential damages arising out of or connected in any way to the Project or to this Agreement. This mutual waiver of consequential damages shall include, but is not limited to, loss of use, loss of profit, loss of business, loss of income, loss of reputation and any other consequential damages that either party may have incurred from any cause of action including negligence, strict liability, breach of contract and breach of strict or implied warranty.

10. INDEMNIFICATION - The Consultant agrees, to the fullest extent permitted by law, to indemnify and hold harmless the Client, its officers, directors and employees (collectively, Client) against all damages, liabilities or costs to the extent caused by the Consultant's negligent performance of professional services under this Agreement and that of its sub-consultants or anyone for whom the Consultant is legally liable. The Client agrees, to the fullest extent permitted by law, to indemnify and hold harmless the Consultant, its officers, directors, employees and sub-consultants (collectively, Consultant) against all damages, liabilities or costs to the extent caused by the Client's negligent acts in connection with the Project and the acts of its contractors, subcontractors or consultants or anyone for whom the Client is legally liable. Neither the Client nor the Consultant shall be obligated to indemnify the other party in any manner whatsoever for the other party's own negligence or for the negligence of others.
11. LIMITATION OF LIABILITY - In recognition of the relative risks and benefits of the Project to both the Client and the Consultant, the risks have been allocated such that the Client agrees, to the fullest extent permitted by law, to limit the liability of the Consultant and Consultants officers, directors, partners, employees, shareholders, owners and sub-consultants for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, including attorneys' fees and costs and expert-witness fees and costs, so that the total aggregate liability of the Consultant and Consultants officers, directors, partners, employees, shareholders, owners and sub-consultants shall not exceed $50,000, or the Consultant's total fee for services rendered on this Project, whichever is greater. It is intended that this limitation apply to any and all liability or cause of action however alleged or arising, unless otherwise prohibited by law.
12. DESIGN SCHEDULES – Hines Inc is not responsible for changes in design schedules (time extensions) due to circumstances beyond our direct control, such as flood, tornado, earthquake, or other events of nature, or due to untimely receipt of approvals, submittals, shop drawings, or critical information from others such as base drawings, soil analysis reports, and similar documents.
13. DESIGN REVISIONS - If any contractor, governmental authority, building department, or any other third-party requests or requires that changes be made to the Construction Documents prepared by Hines Inc, then Client shall notify Hines Inc of the same before any such changes are made. In the event Client, Client's contractors or subcontractors, or anyone for whom the Client is legally liable makes or permits to be made any changes to any documents prepared by Hines Inc or its consultants without obtaining Hines Inc's written consent, or in the event of termination of this Agreement consistent with the terms herein, Client shall assume full responsibility for the results of and any damages caused by such changes. Therefore, Client agrees to waive any claim against Hines Inc and to release Hines Inc from any liability arising directly or indirectly from such changes not consented to by Hines Inc. In addition, Client agrees, to the fullest extent permitted by law, to indemnify and hold harmless Hines Inc, including Hines Inc's consultants, from any damages, liabilities or costs, including reasonable attorneys' fees and costs of defense, arising from such changes. Unless required solely as a result of Hines Inc's failure to follow the applicable laws in place at the time when the 100% Design Development Documents and 100% Bid Documents/Permit Sets were originally prepared, any changes to the design requested or required to be made after Hines Inc's completion of the set of 100% Design Development Documents and 100% Bid Documents/Permit Sets shall be an Additional Service and shall be performed on a time and materials basis. In the event Client uses Hines Inc's work product without retaining Hines Inc to either finalize the Construction Documents or to perform construction observation services, Client releases Hines Inc from all claims and causes of action arising from such uses. Client, to the fullest extent permitted by law, further agrees to indemnify and hold harmless Hines Inc and its consultants from all costs and expenses, including the cost of defense and attorneys' fees, related to claims and causes of action asserted by any third person or entity to the extent such costs and expenses arise from such use of the documents by Client.

14. DISPUTES - This contract shall be interpreted under the laws of the State of Colorado. The initial attempt to address claims, disputes or other matters in question between the Parties to the Agreement arising out of or relating to this Agreement or breach thereof shall be by formal mediation. If the claims or disputes cannot be resolved by this form of contract dispute resolution, relief through the court system shall be sought. The Parties consent to the jurisdiction of the District Court for Larimer County, Colorado.
15. STANDARD OF CARE - In providing services under this Agreement, the Consultant shall perform in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality.
16. SUBMITTAL REVIEW - Review of submittals, shop drawings and other documentation shall be for the purpose of determining general conformance with the design expressed in the construction drawings, and not to determine the accuracy or completeness of details such as dimensions and quantities or for substantiating instructions for installation or performance of equipment, all of which are the responsibility of the Contractor.
17. This proposal is automatically revoked if not accepted in writing within, 60 days of its date.

Lago Vista Effluent Pond Repairs - Amendment No. 2
7/9/2025
DRAFT Detailed Fee Estimate

Project Fee Summary		
Basic Services	$	495,277
Special Services	$	58,469
Total Project	$	553,745

Tasks				Lab
	Basic or Special		Task Description	

Naveen Chillara	Gurkan Ozgurel	Jeremy Goethals	Bryce Todd	Cihan Barnett	Adam Court	Janet Frantz	Rob Harrison	Janis Murphy	Jorge Garces
Senior Advisor	PM	APM	Civil Engineer	Electrical Engineer	Electrical EIT	Electrical CAD Lead	Electrical QC	QA Manager	Construction Manager
$175	$270	$160	$178	$186	$140	$193	$274	$256	$156
1	2	6	4	3	1		2		
1	2	6	4	3	1	1	2		1
2	10	16	16	8	8				
	15	8							
1	6	5						3	
		3					4		
	7	14	7						
			12						
	12	16	8						
								8	
				12	12				
	1		4	34	76	24	14		
1	1		4	40	60	30	14		
1	1		4	22	32	12	20		
6			4	20	10				
6			4	100	128	12	52		
	1	2							
		2							
		1							
	1	1							
	4		4						
				12	8				
	1			8	4				
				8					
1	1			8	4				
				4	4	8			
				4	4				8
				4	4				64
				8	8				8
				8	8				8
									104
	8			12	24				8
									2
				22	40				2
1				2	4				2
	1			2	4				2
2	1			2	1				2
2	1			4	2		2		2
	2			6	8	12	2		
25	**79**	**83**	**75**	**356**	**455**	**99**	**112**	**11**	**213**
$ 4,463	**$ 21,783**	**$ 13,543**	**$ 13,580**	**$ 67,667**	**$ 65,169**	**$ 19,457**	**$ 31,202**	**$ 2,871**	**$ 33,817**

Lago Vista Effluent Pond Repairs - Amendment No. 2
7/9/2025
DRAFT Detailed Fee Estimate

Tasks				or									
	Basic or Special		Task Description	Joel Kokernor Construction Manager, QC $259	Anne Hoskins Client Representative $325	Billy Metzger Project Admin $194	Cameron Alden Pipeline Engineer $232	Cristian Ortuno Reintsch Pipeline EIT $140	Erin Rippy Pipeline EIT $121	Daniel Stoutenburg Pipeline QC $284	Cooper Bisset GIS Analyst $125	Total Hours	Total Labor Effort
			TASK 1. PROJECT MANAGEMENT										$ -
			Client Kickoff Meeting (virtual)		1							20	$ 4,038
			Internal Kickoff Meeting		1		1					23	$ 4,630
			Monthly Progress Meetings (8 virtual)		2		8					70	$ 13,848
			Invoicing and Monthly Progress Reports			8						31	$ 7,021
			Quality Management Plan and Assurance		5					4		24	$ 6,247
			Constructability Reviews	8			2					17	$ 4,193
													$ -
			TASK 2. IRRIGATION DESIGN										$ -
			Coordination and Meetings (7 virtual)									28	$ 5,482
			Site Visits (2 visits)									12	$ 2,173
			Review Meetings and Tracking (4 virtual meetings assumed)									36	$ 7,368
			QC Reviews of Deliverables							4		12	$ 3,246
													$ -
			TASK 3. ELECTRICAL AND SCADA SYSTEM DESIGN										$ -
			Site Visits (2 visits)									24	$ 4,000
			50% Design Submittal (Drawings, OPCC)									153	$ 26,982
			95% Design Submittal (Drawings, OPCC, Specs)									150	$ 27,189
			100% Issued-for-Bid (IFB) Design Submittal (Drawings, Specs)									92	$ 17,899
			SCADA System Integration Coordination Meetings (3 virtual)									40	$ 7,029
	Special		Additional Services									302	$ 55,906
													$ -
			TASK 4. PIPELINE FEASIBILITY / ROUTE STUDY										$ -
			Review/develop possible pipeline routes between Pond #2 and Pond #14				4	16	16			39	$ 5,812
			Review existing pump capabilities and related facilities				12	40	8			62	$ 9,880
			Develop draft technical memorandum				2	4	12		8	28	$ 3,871
			Develop draft OPCC				2	2	4			9	$ 1,417
			Review meeting with City of Lago Vista				2	2	2			8	$ 1,446
			Develop final technical memorandum and OPCC				1	4	8		2	17	$ 2,489
			Site Visit					6	6			12	$ 1,598
													$ -
			TASK 5. BID PHASE SERVICES										$ -
			Coordination with Hines Inc. During Irrigation System Package Bidding									8	$ 1,827
			Bid Phase Support for Electrical and SCADA Bid Package										$ -
			Prepare Pre-bid Conference Materials, and attend Pre-bid Conference and Site Tour									20	$ 3,427
			Review Contractor Questions and Prepare Addenda		2							15	$ 3,032
			Review Tabulated Bid Results, Contractor Qualifications, and Financials									8	$ 1,521
			Prepare Recommendation of Award Memorandum									14	$ 2,548
			Prepare Issued for Construction (IFC) Submittal (Conformed Documents)									16	$ 2,905
													$ -
			TASK 6. CONSTRUCTION PHASE SERVICES										$ -
			Pre-Construction Conference (on-site)									16	$ 2,603
			Progress Meetings and Site Visits										$ -
			Monthly Progress Meetings and Site Visits (8 on-site visits during Electrical/SCADA)									72	$ 11,494
			Performance of Substantial Completion Walkthrough		4							28	$ 5,262
			Performance of Final Completion Walkthrough									24	$ 3,937
			Contractor Proposals, Claims and Submittals										$ -
			Establish and Maintain Construction Documentation System (for 13 months)	2								106	$ 17,039
			Requests for Information (RFI's)	2								54	$ 9,722
			Notify City of Non-Conforming Work	1								3	$ 581
			Record Data / Certified Test Reports / Shop Drawings									64	$ 10,228
			Contractor Claims / Change Requests (1)	1								10	$ 1,713
			Proposed Contract Modifications (1)	1								10	$ 1,810
			Work Change Directives (1)	1								9	$ 1,737
			Change Orders (1)	1								14	$ 2,820
			Record Drawings	1								31	$ 6,020
			Total Hours / Quantity	**18**	**15**	**8**	**34**	**74**	**56**	**8**	**10**	**1,731**	
			Total Effort	**$ 4,747**	**$ 4,972**	**$ 1,580**	**$ 8,059**	**$ 10,586**	**$ 6,906**	**$ 2,315**	**$ 1,273**		**$ 313,989**

Lago Vista Effluent Pond Repairs - Amendment No. 2 7/9/2025 DRAFT Detailed Fee Estimate	8.5 Basic Services Special Services Total Project	Pro

Tasks				Expenses		
	Basic or Special		Task Description	Tech Charge	Miles	Total Expense Effort
			TASK 1. PROJECT MANAGEMENT			$ -
			Client Kickoff Meeting (virtual)	20		$ 170
			Internal Kickoff Meeting	23		$ 196
			Monthly Progress Meetings (8 virtual)	70		$ 595
			Invoicing and Monthly Progress Reports	31		$ 264
			Quality Management Plan and Assurance	24		$ 204
			Constructability Reviews	17		$ 145
						$ -
			TASK 2. IRRIGATION DESIGN			$ -
			Coordination and Meetings (7 virtual)	28		$ 238
			Site Visits (2 visits)	12	140	$ 200
			Review Meetings and Tracking (4 virtual meetings assumed)	36		$ 306
			QC Reviews of Deliverables	12		$ 102
						$ -
			TASK 3. ELECTRICAL AND SCADA SYSTEM DESIGN			$ -
			Site Visits (2 visits)	24	280	$ 400
			50% Design Submittal (Drawings, OPCC)	153		$ 1,301
			95% Design Submittal (Drawings, OPCC, Specs)	150		$ 1,275
			100% Issued-for-Bid (IFB) Design Submittal (Drawings, Specs)	92		$ 782
			SCADA System Integration Coordination Meetings (3 virtual)	40		$ 340
	Special		Additional Services	302		$ 2,563
						$ -
			TASK 4. PIPELINE FEASIBILITY / ROUTE STUDY			$ -
			Review/develop possible pipeline routes between Pond #2 and Pond #14	39		$ 332
			Review existing pump capabilities and related facilities	62		$ 527
			Develop draft technical memorandum	28		$ 238
			Develop draft OPCC	9		$ 77
			Review meeting with City of Lago Vista	8		$ 68
			Develop final technical memorandum and OPCC	17		$ 145
			Site Visit	12	140	$ 200
						$ -
			TASK 5. BID PHASE SERVICES			$ -
			Coordination with Hines Inc. During Irrigation System Package Bidding	8		$ 68
			Bid Phase Support for Electrical and SCADA Bid Package			$ -
			Prepare Pre-bid Conference Materials, and attend Pre-bid Conference and Site Tour	20		$ 170
			Review Contractor Questions and Prepare Addenda	15		$ 128
			Review Tabulated Bid Results, Contractor Qualifications, and Financials	8		$ 68
			Prepare Recommendation of Award Memorandum	14		$ 119
			Prepare Issued for Construction (IFC) Submittal (Conformed Documents)	16		$ 136
						$ -
			TASK 6. CONSTRUCTION PHASE SERVICES			$ -
			Pre-Construction Conference (on-site)	16	210	$ 283
			Progress Meetings and Site Visits			$ -
			Monthly Progress Meetings and Site Visits (8 on-site visits during Electrical/SCADA)	72	700	$ 1,102
			Performance of Substantial Completion Walkthrough	28	280	$ 434
			Performance of Final Completion Walkthrough	24	210	$ 351
			Contractor Proposals, Claims and Submittals			$ -
			Establish and Maintain Construction Documentation System (for 13 months)	106		$ 901
			Requests for Information (RFI's)	54		$ 459
			Notify City of Non-Conforming Work	3		$ 26
			Record Data / Certified Test Reports / Shop Drawings	64		$ 544
			Contractor Claims / Change Requests (1)	10		$ 85
			Proposed Contract Modifications (1)	10		$ 85
			Work Change Directives (1)	9		$ 77
			Change Orders (1)	14		$ 119
			Record Drawings	31		$ 264
			Total Hours / Quantity	**1,731**	**1,960**	
			Total Effort	**$ 14,709**	**$ 1,372**	**$ 16,081**

Lago Vista Effluent Pond Repairs - Amendment No. 2
7/9/2025
DRAFT Detailed Fee Estimate

ject Fee Summary
Basic Services
Special Service
Total Project

Tasks				Subconsultants		Total
	Basic or Special		Task Description	Hines, Inc. (Irrigation Designer)	Total Sub Effort	Total Effort
			TASK 1. PROJECT MANAGEMENT		$ -	$ -
			Client Kickoff Meeting (virtual)		$ -	$ 4,208
			Internal Kickoff Meeting		$ -	$ 4,826
			Monthly Progress Meetings (8 virtual)		$ -	$ 14,443
			Invoicing and Monthly Progress Reports		$ -	$ 7,285
			Quality Management Plan and Assurance		$ -	$ 6,451
			Constructability Reviews		$ -	$ 4,337
					$ -	$ -
			TASK 2. IRRIGATION DESIGN	194,500	$ 223,675	$ 223,675
			Coordination and Meetings (7 virtual)		$ -	$ 5,720
			Site Visits (2 visits)		$ -	$ 2,373
			Review Meetings and Tracking (4 virtual meetings assumed)		$ -	$ 7,674
			QC Reviews of Deliverables		$ -	$ 3,348
					$ -	$ -
			TASK 3. ELECTRICAL AND SCADA SYSTEM DESIGN		$ -	$ -
			Site Visits (2 visits)		$ -	$ 4,400
			50% Design Submittal (Drawings, OPCC)		$ -	$ 28,283
			95% Design Submittal (Drawings, OPCC, Specs)		$ -	$ 28,464
			100% Issued-for-Bid (IFB) Design Submittal (Drawings, Specs)		$ -	$ 18,681
			SCADA System Integration Coordination Meetings (3 virtual)		$ -	$ 7,369
	Special		Additional Services		$ -	$ 58,469
					$ -	$ -
			TASK 4. PIPELINE FEASIBILITY / ROUTE STUDY		$ -	$ -
			Review/develop possible pipeline routes between Pond #2 and Pond #14		$ -	$ 6,144
			Review existing pump capabilities and related facilities		$ -	$ 10,407
			Develop draft technical memorandum		$ -	$ 4,109
			Develop draft OPCC		$ -	$ 1,493
			Review meeting with City of Lago Vista		$ -	$ 1,514
			Develop final technical memorandum and OPCC		$ -	$ 2,634
			Site Visit		$ -	$ 1,798
					$ -	$ -
			TASK 5. BID PHASE SERVICES		$ -	$ -
			Coordination with Hines Inc. During Irrigation System Package Bidding		$ -	$ 1,895
			Bid Phase Support for Electrical and SCADA Bid Package		$ -	$ -
			Prepare Pre-bid Conference Materials, and attend Pre-bid Conference and Site Tour		$ -	$ 3,597
			Review Contractor Questions and Prepare Addenda		$ -	$ 3,160
			Review Tabulated Bid Results, Contractor Qualifications, and Financials		$ -	$ 1,589
			Prepare Recommendation of Award Memorandum		$ -	$ 2,667
			Prepare Issued for Construction (IFC) Submittal (Conformed Documents)		$ -	$ 3,041
					$ -	$ -
			TASK 6. CONSTRUCTION PHASE SERVICES		$ -	$ -
			Pre-Construction Conference (on-site)		$ -	$ 2,886
			Progress Meetings and Site Visits		$ -	$ -
			Monthly Progress Meetings and Site Visits (8 on-site visits during Electrical/SCADA)		$ -	$ 12,596
			Performance of Substantial Completion Walkthrough		$ -	$ 5,696
			Performance of Final Completion Walkthrough		$ -	$ 4,288
			Contractor Proposals, Claims and Submittals		$ -	$ -
			Establish and Maintain Construction Documentation System (for 13 months)		$ -	$ 17,940
			Requests for Information (RFI's)		$ -	$ 10,181
			Notify City of Non-Conforming Work		$ -	$ 607
			Record Data / Certified Test Reports / Shop Drawings		$ -	$ 10,772
			Contractor Claims / Change Requests (1)		$ -	$ 1,798
			Proposed Contract Modifications (1)		$ -	$ 1,895
			Work Change Directives (1)		$ -	$ 1,814
			Change Orders (1)		$ -	$ 2,939
			Record Drawings		$ -	$ 6,283
			Total Hours / Quantity	**$ 194,500**		
			Total Effort	**$ 223,675**	**$ 223,675**	**$ 553,745**