CITY OF CHARLES TOWN
INFRASTRUCTURE COMMITTEE
AGENDA • AUGUST 28, 2023

City Council Committee Meeting **CITY HALL** **4:30 PM**

101 E Washington Street, Charles Town, WV 25414

1. CALL TO ORDER

2. NEW BUSINESS

: **2023-757**: Congress & Lawrence Street Intersection Damage
2023-08-01 Lawrence and Congress 90% plans.pdf
Congress and Lawrence Intersection Improvements 90% Plans.pdf

: **2023-758**: Augustine Avenue Trail
230807 Estimate.pdf
8-4-23 Augustine Ave_.pdf
Copy of 230825 Permanent Drainage Easements.xlsx

: **2023-759**: Liberty Street Storm Water Project
Liberty Street ROW Const Est5-24-2021.pdf
Liberty Street Parking Lot Const Est5-24-2021.pdf
7037-LS-Summary Report-Compiled (December 2020).pdf

: **2023-760**: City Signage - Audit and Designs

: **2023-761**: Staff/City Manager Suggested Item(s) from Attached List
Infrastructure Projects running list_.pdf

: **2023-762**: Accessible Parking Request - Referral from City Council
Email from JCSO and WVDOH.pdf

3. ADJOURNMENT

4. NOTICE: The Public May View the Meeting Live by Clicking on the Event Link at: https://www.charlestownwv.us/government/agendas-and-minutes/

Infrastructure Committee
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

AGENDA ITEM (ID #)

Meeting: 08/28/23
Department: Infrastructure Committee
Category: Information Only
Initiator:

2023-757: Congress & Lawrence Street Intersection Damage

Congress & Lawrence Street Intersection Damage

ATTACHMENTS:

- 2023-08-01 Lawrence and Congress 90% plans.pdf
- Congress and Lawrence Intersection Improvements 90% Plans.pdf

PROJECT MANAGER _ JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP (703) 727-5828
DESIGN BY MARK PHILLIPS, P.E. (703) 870-3631 (KIMLEY-HORN)

PROJECT #: 110845003

AUGUST 7, 2023

90% PRELIMINARY PLANS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

STATE	CITY	PROJECT	SHEET NO.
WV	CITY OF CHARLES TOWN	110845003	1

FUNCTIONAL CLASSIFICATION AND TRAFFIC DATA

	S LAWRENCE ST	W CONGRESS ST
ROADWAY FUNCTIONAL CLASSIFICATION	MINOR URBAN COLLECTOR	MINOR URBAN COLLECTOR
AADT (2022)	~2500	~2500
GS STANDARD	GS-7	GS-7
V (MPH)	25	25

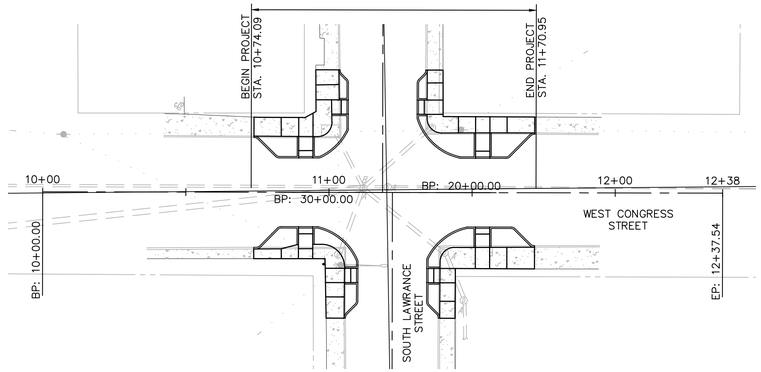
CHARLES TOWN, WEST VIRGINIA
WEST CONGRESS STREET AND SOUTH LAWRENCE STREET INTERSECTION IMPROVEMENT DESIGN
90% PRELIMINARY PLANS

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
1A	CONSTRUCTION ALIGNMENT AND SURVEY CONTROL DATA
1B(1)–1B(2)	TEMPORARY TRAFFIC CONTROL PLAN
2	GENERAL NOTES AND TYPICAL SECTIONS
2A	EXISTING CONDITIONS AND DEMOLITION PLAN
3	ROADWAY PLAN
3A(1)–3A(2)	GRADING DETAIL SHEET
3B(1)	EROSION & SEDIMENT CONTROL PHASE I
3B(2)	EROSION & SEDIMENT CONTROL PHASE II
3C(1)	DRAINAGE DESCRIPTIONS
3C(2)–3C(3)	STANDARD DETAILS
3C(4)–3C(5)	DRAINAGE CALCULATIONS
3D	DRAINAGE PROFILES
3E	SIGNING & MARKING PLAN

PLAN REVISIONS

DATE	COMMENT



NORTH

GRAPHIC SCALE IN FEET
0 12.5 25 50

PROJECT OWNER & CONSULTANT

CLIENT / OWNER

CITY OF CHARLES TOWN
JIM WYSONG
CHARLES TOWN MAINTENANCE SUPERVISOR
101 E WASHINGTON STREET
CHARLES TOWN, WV 25414

ENGINEER

Kimley»Horn

© 2023 KIMLEY-HORN AND ASSOCIATES, INC.
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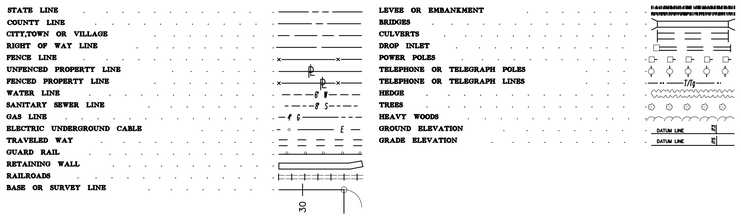
RESTON, VA 20191
PHONE: 703-674-1300
FAX: 703-674-1350

SURVEYOR

GRS GROUP
6703 DELAND COURT
WEST SPRINGFIELD, VA 22152
PHONE: (703) 727-5828
FAX: (703) 763-2320

CONVENTIONAL SIGNS



ADDITIONAL EASEMENTS FOR UTILITY RELOCATIONS MAY BE REQUIRED BEYOND THE PROPOSED RIGHT OF WAY SHOWN ON THE PLANS.

THESE PLANS ARE UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY.

THE COMPLETE ELECTRONIC .PDF VERSION OF THE PLAN ASSEMBLY AS AWARDED, INCLUDING ALL SUBSEQUENT REVISIONS, WILL BE THE OFFICIAL CONSTRUCTION PLANS. FOR INFORMATION RELATIVE TO ELECTRONIC FILES AND LAYERED PLANS, SEE GENERAL NOTES.

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT.

CHARLES TOWN – COMPLETE LIST OF WAIVERS/VARIANCES

ORDINANCE	SECION OF ORDINANCE	DESCRIPTION OF WAIVER OR VARIANCE	DATE GRANTED

LOCATION MAP



NORTH

GRAPHIC SCALE IN FEET
0 200 400 800

EINGINEER/SURVEYOR'S CERTIFICATION

"THE PLAT REPRESENTS A SURVEY MADE BY HIM/HER; ALL MONUMENTS AND IMPROVEMENTS INDICATED THEREON ACTUALLY EXIST, AND THAT THEIR LOCATION, SIZE AND MATERIAL ARE CORRECTLY SHOWN; HE/SHE IS FAMILIAR WITH ALL REQUIREMENTS OF THIS ORDINANCE; AND, TO HIS/HER BEST KNOWLEDGE AND BELIEF, ALL REQUIREMENTS OF THIS ORDINANCE HAVE BEEN FULLY COMPLIED THEREWITH."

MARK R. PHILLIPS
KIMLEY-HORN & ASSOCIATES, INC.

DATE

APPROVALS

PRELIMINARY PLAT APPROVAL — DATE

PLANNING COMMISSION — DATE

ZONING ADMINISTRATOR — DATE

THESE PLANS ARE IN CONFORMANCE WITH CITY OF CHARLES TOWN STANDARDS AND ORDINANCES, ANY DEVIATION OR CHANGE IN THESE PLANS SHALL BE APPROVED BY THE ZONING ADMINISTRATOR PRIOR TO CONSTRUCTION.

CALL "MISS UTILITY"

MISS UTILITY OF WEST VIRGINIA (MUWV) AT 811 OR 1-800-245-4848, 48 HOURS PRIOR TO THE START OF WORK. EXCAVATORS MUST NOTIFY ALL PUBLIC UTILITY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION. THE EXCAVATOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL COUNTY REQUIREMENTS, WEST VIRGINIA CODE AND REGULATIONS.

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

PROJECT	SHEET NO.
110845003	1

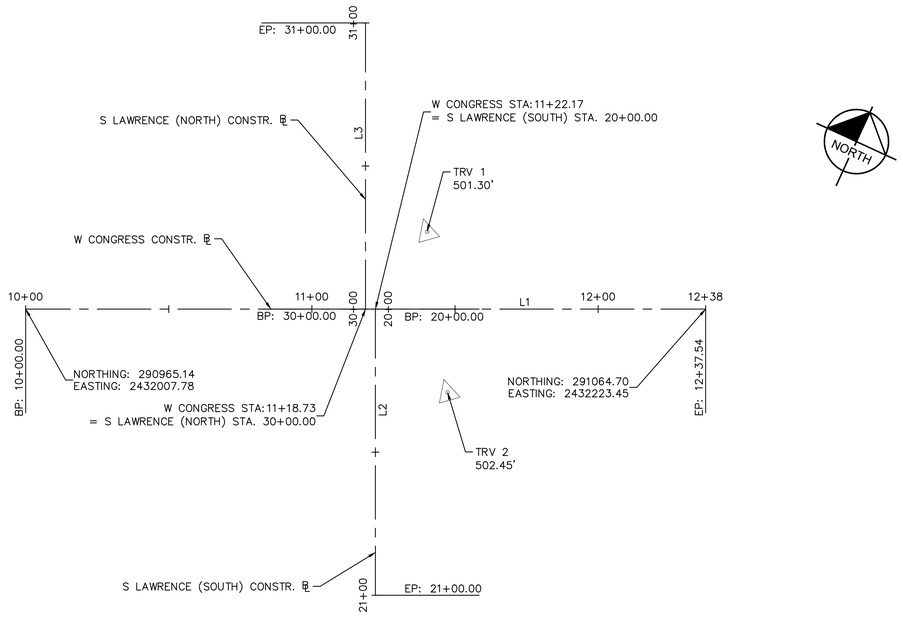
PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	1A

CONSTRUCTION ALIGNMENT AND SURVEY CONTROL DATA



CONSTRUCTION ALIGNMENT DATA – W CONGRESS											
NO.	DELTA OR BRG	RADIUS	PC	PT	LENGTH	PI NORTHING	PI EASTING	TANGENT START NORTHING	TANGENT START EASTING	TANGENT END NORTHING	TANGENT END EASTING
L1	N 65°13'16" E		10+00.00	12+37.54	237.54'			290965.14	2432007.78	291064.70	2432223.45

CONSTRUCTION ALIGNMENT DATA – S LAWRENCE (SOUTH)											
NO.	DELTA OR BRG	RADIUS	PC	PT	LENGTH	PI NORTHING	PI EASTING	TANGENT START NORTHING	TANGENT START EASTING	TANGENT END NORTHING	TANGENT END EASTING
L2	S 24°46'44" E		20+00.00	21+00.00	100.00'			291016.35	2432118.71	290925.55	2432160.62

CONSTRUCTION ALIGNMENT DATA – S LAWRENCE (NORTH)											
NO.	DELTA OR BRG	RADIUS	PC	PT	LENGTH	PI NORTHING	PI EASTING	TANGENT START NORTHING	TANGENT START EASTING	TANGENT END NORTHING	TANGENT END EASTING
L3	N 24°46'44" W		30+00.00	31+00.00	100.00'			291014.90	2432115.58	291105.70	2432073.67

TRAVERSE POINT LOCATION TABLE			
POINT	NORTHING	EASTING	ELEVATION
TRV1	291048.38	2432123.82	501.30'
TRV2	291000.53	2432153.71	502.45'

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W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

CONSTRUCTION ALIGNMENT AND SURVEY CONTROL DATA

GRAPHIC SCALE IN FEET 0 12.5 25 50

PROJECT	SHEET NO.
110845003	1A

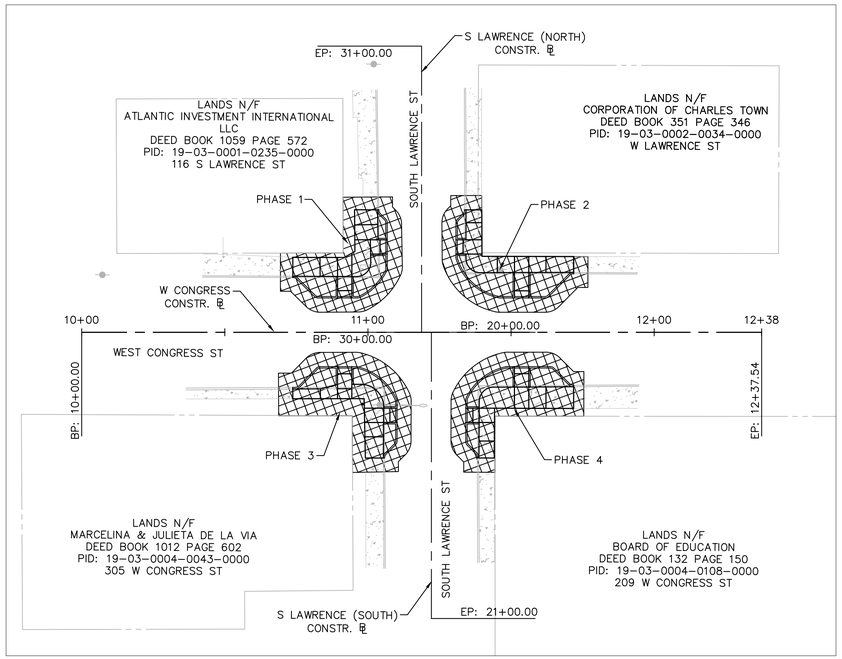
PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	1B(1)

TEMPORARY TRAFFIC CONTROL PLAN



SEQUENCE OF CONSTRUCTION

PHASE 1

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE I AS DEPICTED IN THE PLANS.

INSTALL TEMPORARY TRAFFIC CONTROL SIGNS AND DEVICES IN ACCORDANCE WITH TTC-36.1.

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE II AS DEPICTED IN THE PLANS.

CONSTRUCT STORM IMPROVEMENTS, CURB, AND SIDEWALK IMPROVEMENTS AS DEPICTED IN THE ROADWAY PLANS.

PHASE 2

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE 2 AS DEPICTED IN THE PLANS.

INSTALL TEMPORARY TRAFFIC CONTROL SIGNS AND DEVICES IN ACCORDANCE WITH TTC-36.1.

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE II AS DEPICTED IN THE PLANS.

CONSTRUCT STORM IMPROVEMENTS, CURB, AND SIDEWALK IMPROVEMENTS AS DEPICTED IN THE ROADWAY PLANS.

PHASE 3

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE 3 AS DEPICTED IN THE PLANS.

INSTALL TEMPORARY TRAFFIC CONTROL SIGNS AND DEVICES IN ACCORDANCE WITH TTC-36.1.

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE II AS DEPICTED IN THE PLANS.

CONSTRUCT STORM IMPROVEMENTS, CURB, AND SIDEWALK IMPROVEMENTS AS DEPICTED IN THE ROADWAY PLANS.

PHASE 4

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE 4 AS DEPICTED IN THE PLANS.

INSTALL TEMPORARY TRAFFIC CONTROL SIGNS AND DEVICES IN ACCORDANCE WITH TTC-36.1.

CONTRACTOR SHALL SET UP EROSION AND SEDIMENT CONTROL DEVICES NECESSARY FOR PHASE II AS DEPICTED IN THE PLANS.

CONSTRUCT STORM IMPROVEMENTS, CURB, AND SIDEWALK IMPROVEMENTS AS DEPICTED IN THE ROADWAY PLANS.

PHASE 5

INSTALL TEMPORARY TRAFFIC CONTROL SIGNS AND DEVICES IN ACCORDANCE WITH TTC-67.1.

CONSTRUCT MILL & OVERLAY IMPROVEMENTS AS DEPICTED IN THE ROADWAY PLANS FROM STATION 10+74.11 TO 11+71.09

Typical Traffic Control
Crosswalk Closure and Pedestrian Detour Operation
(Figure TTC-36.1)
NOTES

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**
2. **Curb parking shall be prohibited for at least 50 feet in advance of the midblock crosswalk.**

Guidance:

3. *Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.*
4. *Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.*
5. *Temporary markings should be considered for operations exceeding three days in duration.*

Option:

6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS (W5-1) signs, may be used to control vehicular traffic.
7. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.
8. In order to maintain the systematic use of the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs in a jurisdiction, the fluorescent yellow-green background for pedestrian, bicycle, and school warning signs may be used in TTC zones.

Standard:

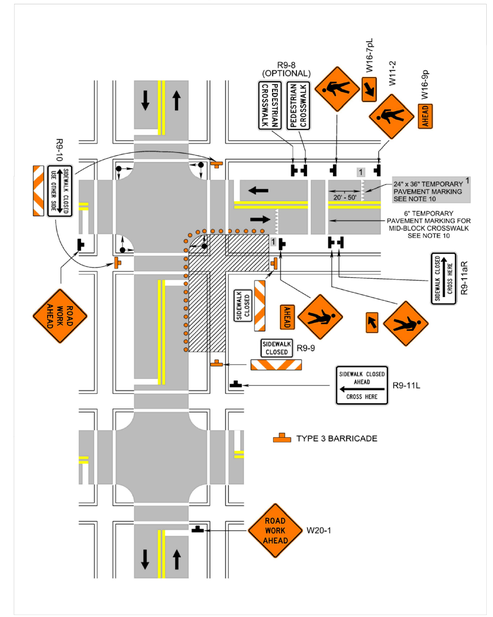
9. **All sidewalk closures shall be closed with Type 3 Barricades.**

Support:

10. Refer to Sections 3B-16 through 3B-18 of the 2009 MUTCD and the Virginia Supplement to the MUTCD for crosswalk lines, yield lines and other related TTC devices that may be used to control vehicular traffic at midblock crosswalks.

1: Revision 1 – 4/1/2015

Crosswalk Closure and Pedestrian Detour Operation
(Figure TTC-36.1)



1: Revision 1 – 4/1/2015

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W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

TEMPORARY TRAFFIC CONTROL PLAN

GRAPHIC SCALE IN FEET 0 12.5 25 50

PROJECT	SHEET NO.
110845003	1B(1)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

TEMPORARY TRAFFIC CONTROL PLAN

Typical Traffic Control
***Lane Closure Operation through an Unsignalized Intersection*[1]**
(Figure TTC-67.0)
NOTES

Guidance:

1. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, 500'-800' where the posted speed limit is greater than 45 mph.*

Standard:

2. **Channelizing device spacing shall be on 20' centers or less 100 feet in advance of the intersection.**

Guidance:

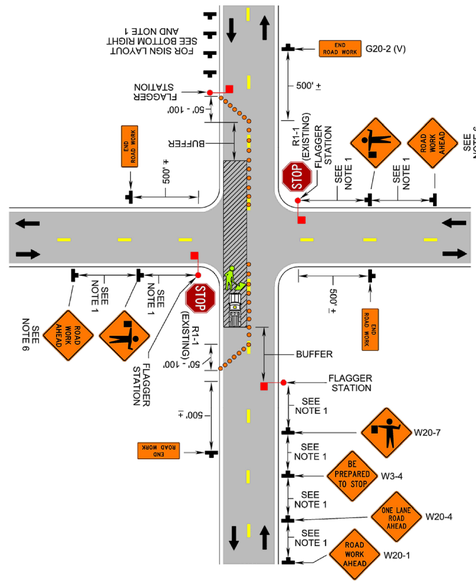
3. *If room permits, a shadow vehicle with at least one rotating amber light or high intensity amber strobe light should be parked 80'-120' in advance of the first work crew.*
4. *If the posted speed limit is 45 mph or greater, the shadow vehicle should have a truck-mounted attenuator.*
5. *If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure TTC-36.*

Option

6. At the stop condition intersecting roadway, additional flagger sign may be used (BE PREPARED TO STOP (W3-4)) between the ROAD WORK AHEAD and the flagger station in the proper sequence, as directed by the Regional Traffic Engineer.

1: Revision 1 – 4/1/2015

Lane Closure Operation through an Unsignalized Intersection[1]
(Figure TTC-67.0)



1: Revision 1 – 4/1/2015

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	1B(2)

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

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W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

TEMPORARY TRAFFIC CONTROL PLAN

	PROJECT	SHEET NO.
	110845003	1B(2)

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SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

GENERAL NOTES AND TYPICAL SECTIONS

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	2

GENERAL NOTES

1. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS HEREIN SHALL CONFORM TO CURRENT JEFFERSON COUNTY CONSTRUCTION STANDARDS AND SPECIFICATIONS AND/OR CURRENT WVDOT STANDARDS AND SPECIFICATIONS.
2. THE ENGINEER SHALL NOT HAVE CONTROL OVER OR CHARGE OF AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES NOR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH WORK SHOWN ON THESE PLANS. THE ENGINEER IS NOT RESPONSIBLE FOR THE CONTRACTOR'S SCHEDULES OR FAILURE TO CARRY OUT THE WORK. THE ENGINEER IS NOT RESPONSIBLE FOR ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTOR, OR THEIR AGENTS OR EMPLOYEES, OR ANY OTHER PERSON PERFORMING PORTIONS OF THE WORK.
3. THE CONTRACTOR, OWNER OR DEVELOPER SHALL BE RESPONSIBLE FOR SECURING ANY THIRD PARTY INSPECTION/TESTING SERVICE TO INSURE CONSTRUCTION COMPLIANCE WITH THESE PLANS AND SPECIFICATIONS. IT IS GREENWAY ENGINEERING'S RECOMMENDATION THAT A THIRD PARTY INSPECTION/TESTING SERVICE BE EMPLOYED TO ENSURE THAT PROJECT IS COMPLETED AND MATERIALS INSTALLED MEET THE DETAILS AND SPECIFICATIONS IN THESE PLANS.
4. THE LOCATION OF EXISTING UTILITIES SHOWN IN THESE PLANS ARE TAKEN FROM EXISTING RECORDS AND AVAILABLE ASBUILT DATA. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES AS NEEDED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DIGGING OF ALL TEST HOLES THAT MAY BE REQUIRED, WHETHER RECOMMENDED OR NOT BY THESE PLANS, TO DETERMINE THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES. IF ANY CONFLICTS ARISING FROM THIS EXISTING UTILITY VERIFICATION OR IF DURING THE COURSE OF CONSTRUCTION, ANY OBJECT OF AN UNUSUAL NATURE IS ENCOUNTERED, THE CONTRACTOR SHALL CEASE WORK IN THAT AREA AND IMMEDIATELY NOTIFY KIMLEY-HORN & ASSOCIATES AND/OR THE PROPER AUTHORITY. KIMLEY-HORN & ASSOCIATES OR ANY ENGINEER ASSOCIATED WITH THESE PLANS SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY CONSTRUCTION COST THAT MAY BE ASSOCIATED WITH THE INSTALLATION OR REINSTALLATION ANY UTILITY OR OTHER IMPROVEMENTS IF NOT NOTIFIED OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE APPROVED PLAN.
5. THE APPROVAL OF THESE PLANS IN NO WAY RELIEVE THE DEVELOPER, THE CONTRACTOR, OR THEIR AGENTS OF ANY LEGAL RESPONSIBILITY WHICH MAY BE REQUIRED BY THE CODE OF WEST VIRGINIA OR ANY OTHER ORDINANCE ENACTED BY THE COUNTY NOR DOES IT GUARANTEE THE ISSUANCE OF ANY REQUIRED PERMIT BY THE COUNTY, WVDOT OR ANY OTHER AGENCY.
6. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES DURING CONSTRUCTION. A REPRESENTATIVE OF THE DEVELOPER MUST BE AVAILABLE AT ALL TIMES.
7. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS OF CLEANING MUD FROM TRUCKS AND/OR OTHER EQUIPMENT PRIOR TO ENTERING PUBLIC STREETS, AND IT IS THE CONTRACTORS RESPONSIBILITY TO CLEAN STREETS, ALLAY DUST, AND TO TAKE WHATEVER MEASURES ARE NECESSARY TO INSURE THAT PUBLIC STREETS ARE MAINTAINED IN A CLEAN, MUD AND DUST FREE CONDITION AT ALL TIMES.
8. THE DEVELOPER WILL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING STREETS AND UTILITIES WHICH OCCURS AS A RESULT OF HIS CONSTRUCTION PROJECT WITHIN OR CONTIGUOUS TO THE EXISTING RIGHT-OF-WAY.
9. WARNING SIGNS, MARKERS, BARRICADES OR FLAGMEN SHOULD BE IN ACCORDANCE WITH THE STATE AND FEDERAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
10. ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION LIMITS OF THE SITE PLAN BEFORE PLACING EMBANKMENT.
11. ALL PAVEMENT SECTIONS SHOWN ON THESE APPROVED PLANS ARE FOR PRELIMINARY DESIGN ONLY. FINAL PAVEMENT DESIGN SHALL BE BASED UPON ACTUAL FIELD TESTED CBR VALUES. THE CONTRACTOR OR DEVELOPER SHALL BE RESPONSIBLE FOR FIELD TESTS PER WVDOT STANDARDS TO OBTAIN ACTUAL CBR VALUES FOR FINAL DESIGN. FINAL PAVEMENT DESIGNS WILL BE APPROVED BY WVDOT AND/OR THE OWNER/DEVELOPER, WHICH EVER APPLICABLE, PRIOR TO INSTALLATION.
12. ALL SPRINGS SHALL BE CAPPED AND PIPED TO THE NEAREST STORM SEWER MANHOLES OR CURB INLET. THE PIPE SHALL BE MINIMUM 6" DIAMETER.
13. WHEN GRADING IS PROPOSED WITHIN EASEMENTS OF UTILITIES, LETTERS OF PERMISSION FROM ALL INVOLVED COMPANIES MUST BE PROVIDED TO THE CITY PRIOR TO ISSUANCE OF GRADING AND/OR SITE DEVELOPMENT PERMITS.
14. NOTIFICATION SHALL BE GIVEN TO THE JEFFERSON COUNTY PUBLIC SEWER DISTRICT TWO WEEKS PRIOR TO CONSTRUCTION SO THEY CAN ARRANGE TO HAVE A PROJECT REPRESENTATIVE DURING CONSTRUCTION. THE DISTRICT WOULD LIKE TO BE IN THE PRE-CONSTRUCTION PROJECT MEETINGS WITH THE CONTRACTOR.
15. NOTIFICATION SHALL BE GIVEN TO THE CITY OF CHARLES TOWN UTILITY BOARD PRIOR TO CONSTRUCTION OF WATER LINES. INFORMATION SHOULD ALSO BE OBTAINED FROM THE APPROPRIATE AUTHORITY CONCERNING PERMITS, CUT SHEETS, AND CONNECTIONS TO EXISTING LINES.
16. THE DEVELOPER AND/OR CONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY ALL UTILITY COMPANIES WITH COPIES OF THE APPROVED PLANS AND ADVISE THEM THAT ALL GRADING SHALL CONFORM TO THE APPROVED PLANS, AND FURTHER THAT THE UTILITY COMPANIES SHALL BE RESPONSIBLE FOR HONORING THESE PLANS AND THE FINISHED GRADES IN THE INSTALLATION OF THEIR UTILITY LINES.
17. ALL UTILITIES TO BE LOCATED UNDERGROUND.
18. CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITY LINES IN THE AREA OF PROPOSED EXCAVATING OR BLASTING AT LEAST TWO (2) WORKING DAYS, BUT NOT MORE THAN TEN (10) WORKING DAYS, PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION.
19. THE DEVELOPER WILL BE RESPONSIBLE FOR THE RELOCATION OF ANY UTILITIES WHICH IS REQUIRED AS A RESULT OF HIS PROJECT. THE RELOCATION SHOULD BE DONE PRIOR TO CONSTRUCTION.
20. CONTROLLED FILLS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY METHOD "A" PER STANDARD PROCTOR AASHTO-T99, ASTM-D698, OR VTM-1 AS APPLICABLE. DENSITY SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER AND RESULTS SUBMITTED TO JEFFERSON COUNTY, PRIOR TO PAVEMENT CONSTRUCTION. IF A GEOTECHNICAL REPORT HAS BEEN PREPARED, IT SHOULD SUPERSEDE THE REQUIREMENTS IN THIS NOTE.
21. REFER TO GEOTECHNICAL ENGINEER FOR METHODS, MATERIALS AND DETAILS FOR CONSTRUCTION OF ALL EARTHWORK ACTIVITIES.
22. CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED. NO LESS THAN ONE LITTER RECEPTACLE SHALL BE PROVIDED AT THE CONSTRUCTION SITE.

CITY OF CHARLES TOWN ORDINANCE NOTES:

1. STORM WATER MANAGEMENT SHALL BE PROVIDED BY A COMBINATION OF AN EXISTING STORMWATER MANAGEMENT POND ADJACENT TO OUR SITE AND A PROPOSED UNDERGROUND STORMWATER MANAGEMENT FACILITY, AND BIORETENTION BASIN. THE EXISTING STORMWATER MANAGEMENT POND IS PERMITTED FOR USE PER AGREEMENT IN DEED BOOK 1029, PAGE 165.
2. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF CHARLES TOWN ZONING ORDINANCE AND ARTICLE 1333 OF THE CITY OF CHARLES TOWN SUBDIVISION AND LAND DEVELOPMENT ORDINANCE. CHANGES OR REVISIONS IN CONSTRUCTION PLANS AND SPECIFICATIONS SHALL NOT BE MADE UNLESS FIRST APPROVED BY THE CITY OF CHARLES TOWN AND OTHER APPROPRIATE AGENCIES
3. ALL STREET AND TRAFFIC CONTROL SIGNS SHALL CONFORM TO THE STANDARDS SET FORTH IN SECTION ARTICLE 1333.04 OF THE CITY OF CHARLES TOWN SUBDIVISION AND LAND DEVELOPMENT ORDINANCE. IN ADDITION, ALL SIGNS SHALL BE INSTALLED IN THE PUBLIC RIGHT-OF-WAY AND LOCATED IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, 2009 EDITION AND THE CITY MANAGER.
4. ARCHITECTURALS SHALL BE PROVIDED UNDER SEPARATE COVER.
5. ALL SITE IMPROVEMENTS SHOWN SHALL BE BONDED TO THE SATISFACTION OF THE PLANNING COMMISSION PRIOR TO ISSUANCE OF ANY BUILDING PERMITS.
6. RETAINING WALLS 18 INCHES OR GREATER IN HEIGHT REQUIRE A BUILDING PERMIT THAT MUST BE OBTAINED BY THE OWNER/DEVELOPER. THESES WALLS MUST BE DESIGNED AND CERTIFIED BY A LICENSED WEST VIRGINIA ENGINEER AND SHALL BE SUBMITTED UNDER SEPARATE COVER.
7. ALL ENTRANCE SIGNS, BUILDING SIGNS AND FREESTANDING PYLON SIGN SHALL REQUIRE A SIGN PERMIT TO ENSURE CONFORMANCE WITH THE CITY OF CHARLES TOWN'S SIGN REGULATIONS.
8. ALL FREESTANDING SIGNS SHALL BE ERECTED AT A MAXIMUM HEIGHT OF 30 FEET AND SHALL CONTAIN A MAXIMUM SQUARE FOOTAGE OF 100 SQUARE FEET, EXCLUDING STRUCTURE COMPONENTS FOR THE SIGN. ALL FREESTANDING SIGNS PERMITTED SHALL COMPLY WITH THE CITY OF CHARLES TOWN ZONING ORDINANCE SIGN REQUIREMENTS.
9. ALL BUILDING MOUNTED SIGNS OR BUSINESS SIGNS LOCATED ON INDIVIDUAL LOTS SHALL HAVE A MAXIMUM SQUARE FOOTAGE OF 50 SQUARE FEET, EXCLUDING STRUCTURAL COMPONENTS FOR THE SIGN AND EACH LOT IS TO BE ALLOWED ONE SIGN.
10. AS REQUIRED BY THE ZONING ORDINANCE, STRUCTURES SHALL BE LIMITED TO A MAXIMUM HEIGHT OF 55 FEET WITHIN THE GENERAL COMMERCIAL DISTRICT.

CITY OF CHARLES TOWN ENGINEERING NOTES:

1. EXISTING TREES ARE TO REMAIN IN THEIR NATURAL CONDITION THROUGHOUT THE DEVELOPMENT WHEREVER PRACTICAL.
2. AT THIS TIME, NO OFF-SITE BORROW PITS ARE ANTICIPATED FOR THIS PROJECT.
3. PROPERTY CORNERS ARE TO BE SET WITH 5 8" x 30" REBARS WITH I.D. CAPS UNLESS OTHERWISE NOTED.
4. ALL PROPOSED UTILITIES (E.G. ELECTRIC, CABLE, TELEPHONE) SHALL BE LOCATED UNDERGROUND.
5. CUT AND FILL ACTIVITY/MATERIAL SHALL NOT ENCROACH ON ADJOINING PROPERTIES.
17. SOLID WASTE REMOVAL HAS BEEN PROVIDED BY 1 REFUSE DUMPSTER LOCATION ON SITE. THE PROPERTY MANAGER WILL DETERMINE THE TYPE OF DUMPSTER AND THE FREQUENCY OF COLLECTION.
18. SITE LIGHTING IS NOT PROPOSED FOR THIS SITE. ANY ADDITIONAL LIGHTING SHALL MEET THE CITY OF CHARLES TOWN REQUIREMENTS.

WVDOT NOTES

WV1. ALL WORK, CONSTRUCTION METHODS AND MATERIALS SHALL CONFORM WITH THE WEST VIRGINIA DIVISION OF HIGHWAYS "STANDARD SPECIFICATIONS ROADS AND BRIDGES ADOPTED JANUARY 1, 2000" AND SUPPLEMENTAL SPECIFICATIONS DATED JANUARY 1, 2001. ALL WORK ON THIS PROJECT SHALL ALSO CONFORM WITH THE SOIL CONSERVATION SERVICE EROSION AND SEDIMENT CONTROL REGULATIONS AND ANY OTHER STATE, FEDERAL, OR LOCAL REGULATIONS APPLICABLE. IN THE EVENT OF CONFLICT BETWEEN ANY OF THESE STANDARDS, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT SHALL GOVERN.

WV2. ALL CONSTRUCTION SHALL COMPLY WITH THE LATEST U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION.

WV3. WHEN WORKING ON WVDOT RIGHT-OF-WAY, ALL TRAFFIC CONTROL, WHETHER PERMANENT OR TEMPORARY, SHALL BE IN ACCORDANCE WITH "TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS" DATED NOVEMBER 1994 AS PUBLISHED BY WVDOT.

WV4. DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION, CONTROL AND SAFETY OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY WVDOT.

WV.5 PRIOR TO INITIATION OF WORK, CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL NECESSARY WVDOT LAND USE PERMITS FOR ANY WORK ON WVDOT RIGHT-OF-WAY.

WV.6 IF REQUIRED BY THE LOCAL WVDOT RESIDENCY OFFICE, A PRECONSTRUCTION CONFERENCE MUST BE ARRANGED AND HELD BY THE ENGINEER AND/OR DEVELOPER WITH THE ATTENDANCE OF THE CONTRACTOR, VARIOUS COUNTY AGENCIES, UTILITY COMPANIES AND WVDOT PRIOR TO INITIATION OF WORK.

WV7. CONTRACTOR SHALL NOTIFY THE LOCAL WVDOT RESIDENCY OFFICE WHEN WORK IS TO BEGIN OR CEASE FOR ANY UNDETERMINED LENGTH OF TIME. WVDOT WILL ALSO REQUIRE 48 HOURS NOTICE FOR ANY INSPECTION.

WV.8 THE CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING ADEQUATE ACCESS TO THE PROJECT FROM THE ADJACENT PUBLIC ROADWAY THROUGH CONSTRUCTION AND MAINTENANCE OF A CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE SOIL CONSERVATION SERVICE EROSION & SEDIMENT CONTROL HANDBOOK. FURTHERMORE, ACCESS TO OTHER PROPERTIES AFFECTED BY THIS PROJECT SHALL BE MAINTAINED THROUGH CONSTRUCTION.

WV9. CONTRACTOR SHALL ENSURE ADEQUATE DRAINAGE IS ACHIEVED AND MAINTAINED ON THE SITE DURING AND AT THE END OF CONSTRUCTION.

WV10. ALL WATER AND SEWER LINES WITHIN EXISTING OR PROPOSED WVDOT RIGHT-OF-WAY ARE TO HAVE MINIMUM 36" COVER AND, WHEN POSSIBLE, TO BE INSTALLED UNDER ROADWAY DRAINAGE FACILITIES.

WV11. ANY UNUSUAL SUBSURFACE CONDITIONS ENCOUNTERED DURING THE COURSE OF CONSTRUCTION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER AND WVDOT. WORK SHALL CEASE IN THAT VICINITY UNTIL AN ADEQUATE DESIGN CAN BE DETERMINED BY THE ENGINEER AND APPROVED BY WVDOT.

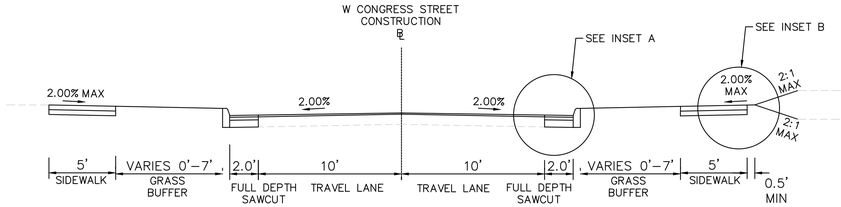
WV12. ALL UNDERCUT AREAS AND BORROW MATERIAL SHALL BE INSPECTED AND APPROVED BY WVDOT INSPECTOR PRIOR TO PLACEMENT OF FILL.

WV13. ALL ROADWAY FILL, BASE, SUBSURFACE MATERIAL AND BACKFILL OF UTILITY/STORM SEWER TRENCHES SHALL BE COMPACTED IN 6" LIFTS TO 98% OF THEORETICAL MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99 METHOD A, WITHIN PLUS OR MINUS 2% OF OPTIMUM MOISTURE FOR THE FULL WIDTH OF ANY DEDICATED STREET RIGHT-OF-WAY. AT THE DIRECTION OF WVDOT INSPECTOR DENSITY TESTS PERFORMED BY A QUALIFIED INDEPENDENT AGENCY SHALL BE CONDUCTED AS REQUIRED IN THE WVDOT ROAD AND BRIDGE SPECIFICATIONS. A COPY OF ALL TESTS SHALL BE SUBMITTED TO WVDOT PRIOR TO FINAL WVDOT APPROVAL.

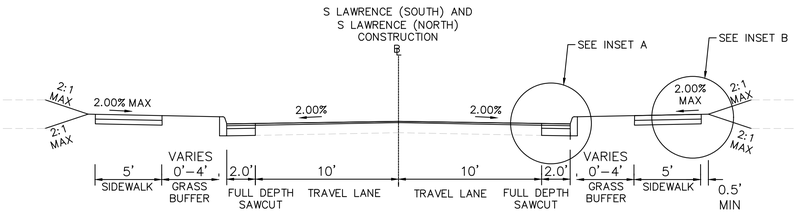
WV16. IF REQUIRED BY THE LOCAL WVDOT RESIDENCY OFFICE, COPIES OF ALL INVOICES FOR MATERIALS WITHIN ANY DEDICATED STREET RIGHT-OF-WAY MUST BE PROVIDED TO THE WVDOT INSPECTOR PRIOR TO ACCEPTANCE OF WORK. UNIT AND TOTAL PRICES MAY BE OBSCURED.

WV17. PRIOR TO ACCEPTANCE BY WVDOT OF ANY STREETS, ANY REQUIRED STREET SIGNAGE AND/OR PAVEMENT MARKINGS MUST BE INSTALLED BY THE DEVELOPER.

TYPICAL SECTIONS

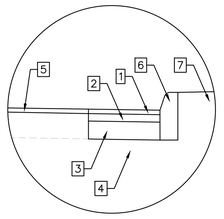


STATION TO STATION
10+73.75 11+71.84

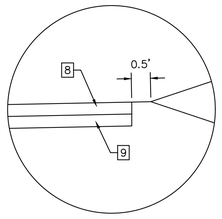


STATION TO STATION AND STATION TO STATION
20+09.98 20+43.80 30+10.04 30+42.77

INSET A



INSET B



LEGEND:

1	1-1/2" BITUMINOUS CONCRETE SURFACE COURSE
2	2-1/2" BITUMINOUS CONCRETE BASE COURSE
3	6" AGGREGATE SUBBASE
4	COMPACTED SUBGRADE
5	VAR. (2"-3") FLEXIBLE PAVEMENT PLANNING AND FIXED DEPTH OVERLAY
6	COMBINATION 6" CURB & GUTTER: STD. CG-2 REQ'D
7	STANDARD GRASS BUFFER
8	4" CLASS B CONCRETE SIDEWALK, MAXIMUM 1/4" PER FOOT
9	4" AGGREGATE BASE MATERIAL TYPE I, NO. 21B

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

GENERAL NOTES AND TYPICAL SECTIONS

GRAPHIC SCALE IN FEET 0 2.5 5 10

PROJECT	SHEET NO.
110845003	2

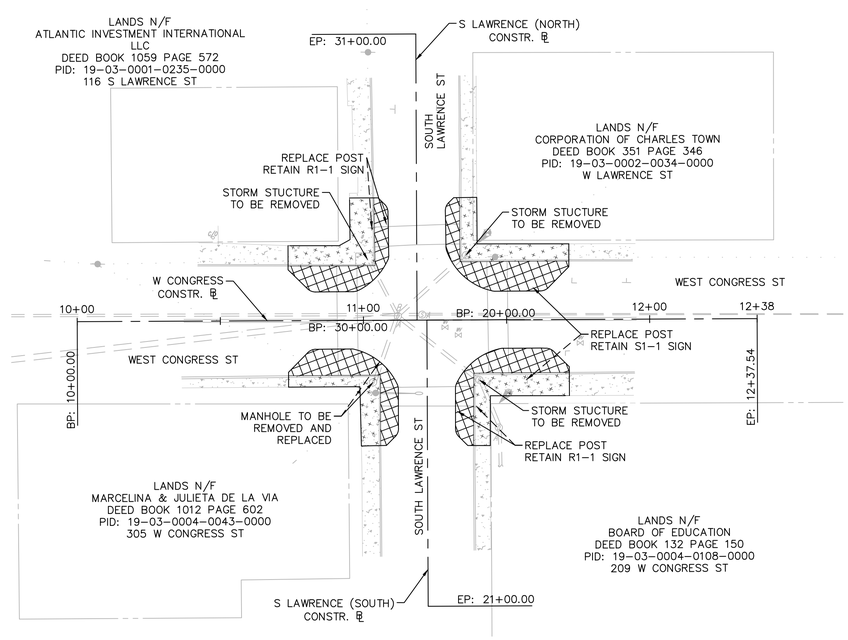
PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

MARK ROSS PHILLIPS
REGISTERED
25167
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	2A

EXISTING CONDITIONS AND DEMOLITION PLAN



DEMOLITION OF PAVEMENT TOTAL AREA: 1,047 SQ. FT

DEMOLITION OF CONCRETE TOTAL AREA: 1,307 SQ. FT

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W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

EXISTING CONDITIONS AND DEMOLITION PLAN

GRAPHIC SCALE IN FEET
0 12.5 25 50

PROJECT 110845003

SHEET NO. 2A

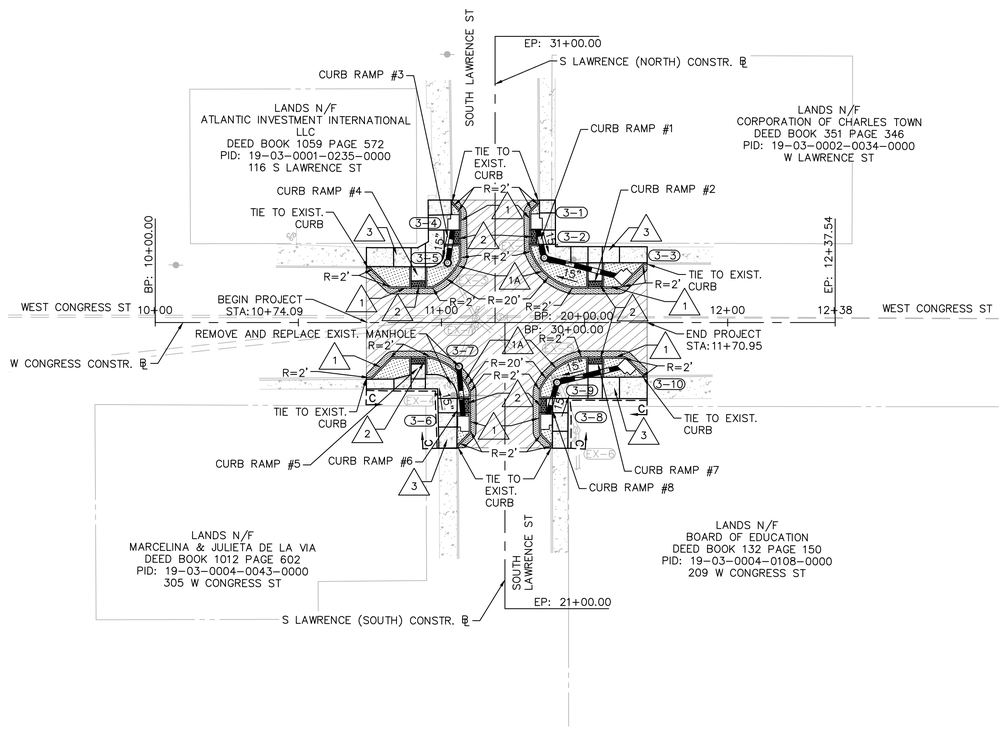
PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3

ROADWAY PLAN



LEGEND:

- PROPOSED FULL DEPTH PAVEMENT
- PROPOSED MILL & OVERLAY
- PROPOSED CONCRETE ITEMS
- PROPOSED GRASS BUFFER

- 1 — 6" CURB, STD. CG-2 REQ'D.
- 1A — 6" CURB, RAD. CG-2 REQ'D.
- 2 — DETECTABLE WARNING SURFACE, STD. CG-12, TYPE C REQ'D.
- 3 — HYDR.CEMENT CONC. SIDEWALK REQ'D. W=5.
- C — DENOTES CONSTRUCTION LIMITS IN CUT
- F — DENOTES CONSTRUCTION LIMITS IN FILL

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

ROADWAY PLAN

NORTH

GRAPHIC SCALE IN FEET 0 12.5 25 50

PROJECT	SHEET NO.
110845003	3

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SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

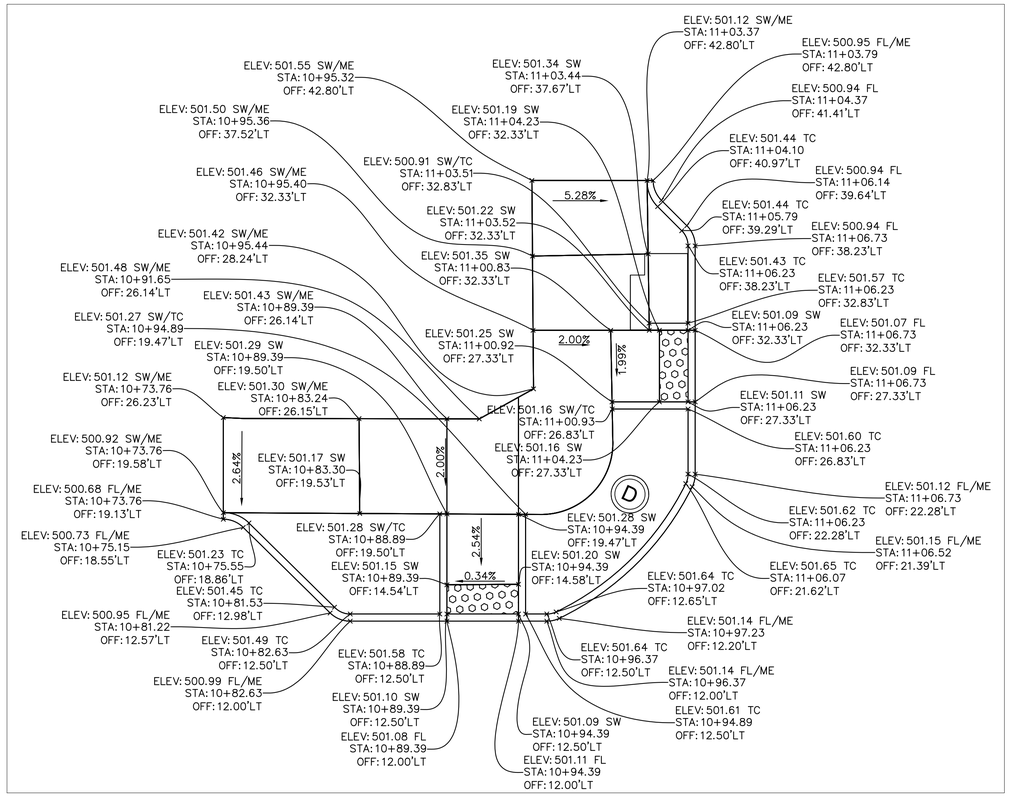
MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

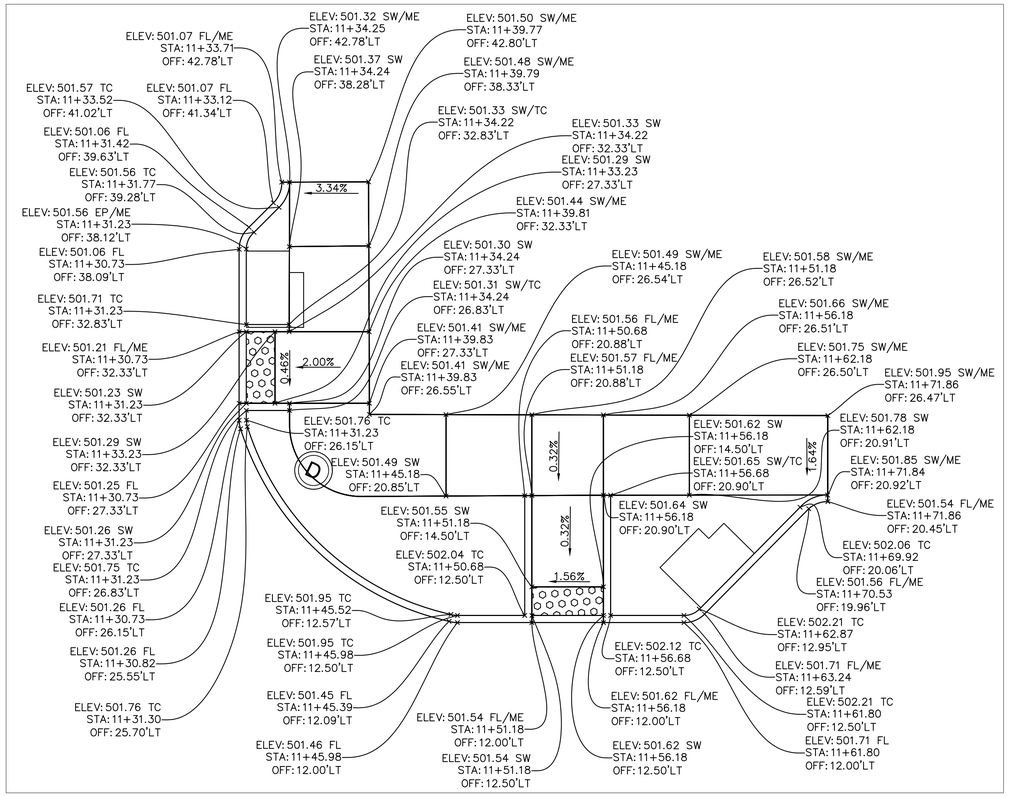
REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3A(1)

GRADING DETAIL SHEET

NORTHWEST CORNER



NORTHEAST CORNER



EP: EDGE OF PAVEMENT
FL: FLOWLINE
ME: MATCH EXISTING
SW: SIDEWALK
TC: TOP OF CURB

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W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

GRADING DETAIL SHEET

NORTH

GRAPHIC SCALE IN FEET 0 2.5 5 10

PROJECT 110845003

SHEET NO. 3A(1)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

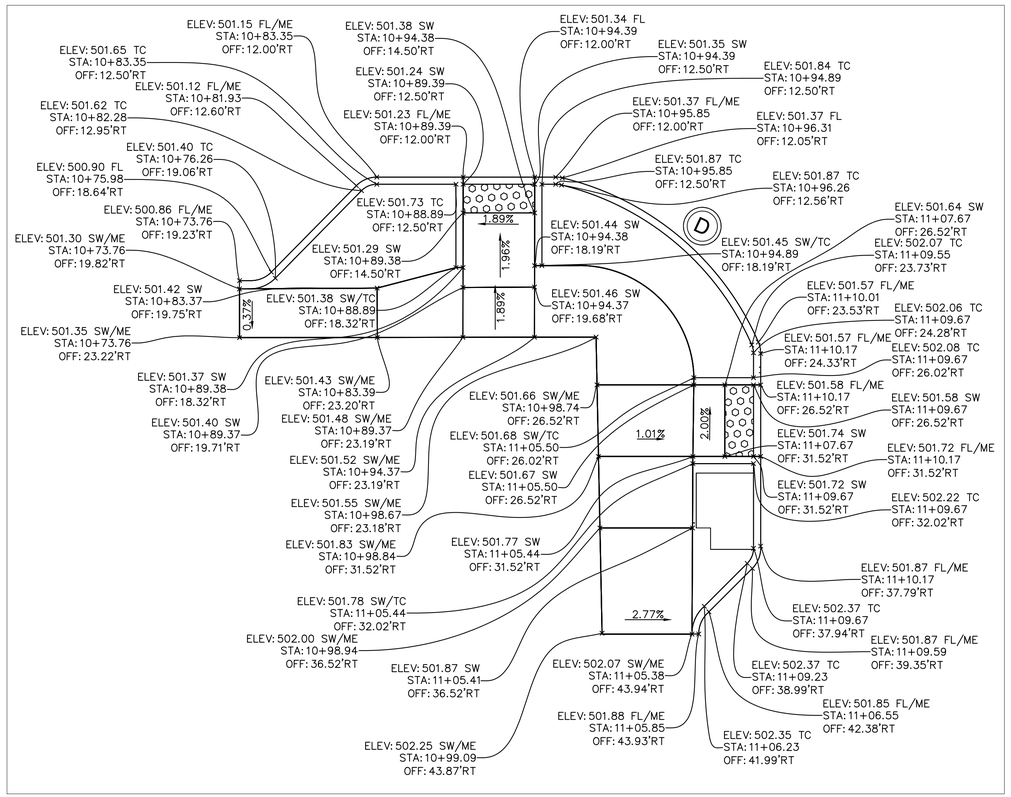
MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

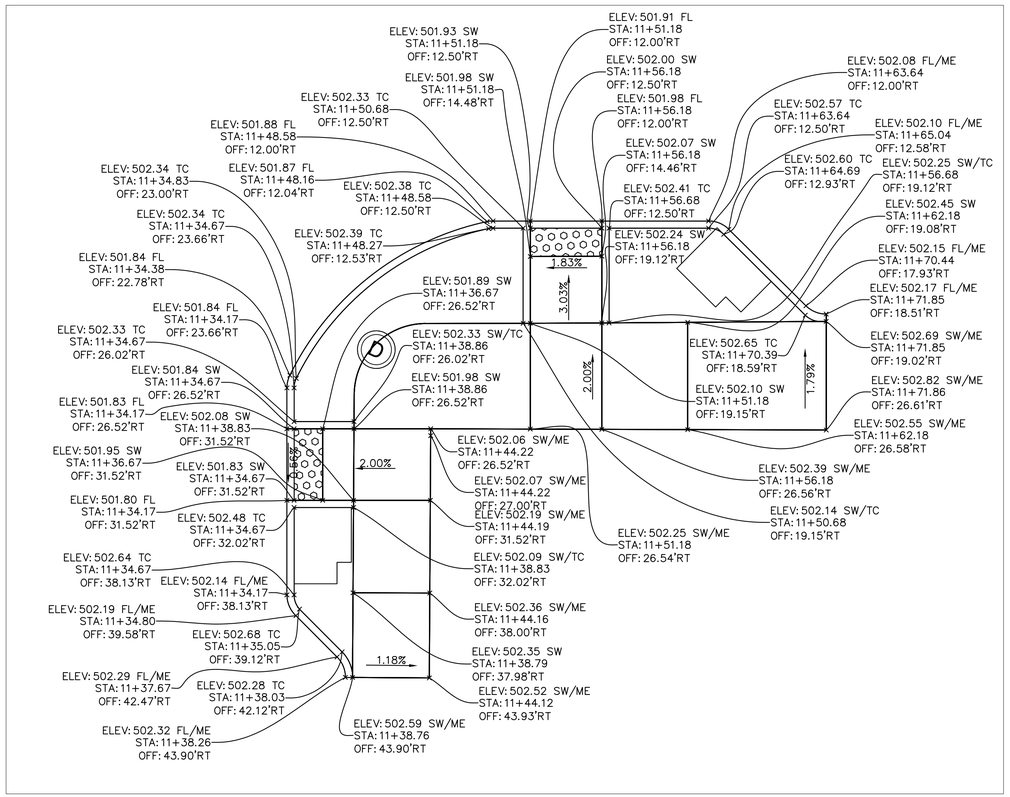
REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3A(2)

GRADING DETAIL SHEET

SOUTHWEST CORNER



SOUTHEAST CORNER



EP: EDGE OF PAVEMENT
FL: FLOWLINE
ME: MATCH EXISTING
SW: SIDEWALK
TC: TOP OF CURB

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W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

GRADING DETAIL SHEET

NORTH

GRAPHIC SCALE IN FEET 0 2.5 5 10

PROJECT 110845003

SHEET NO. 3A(2)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
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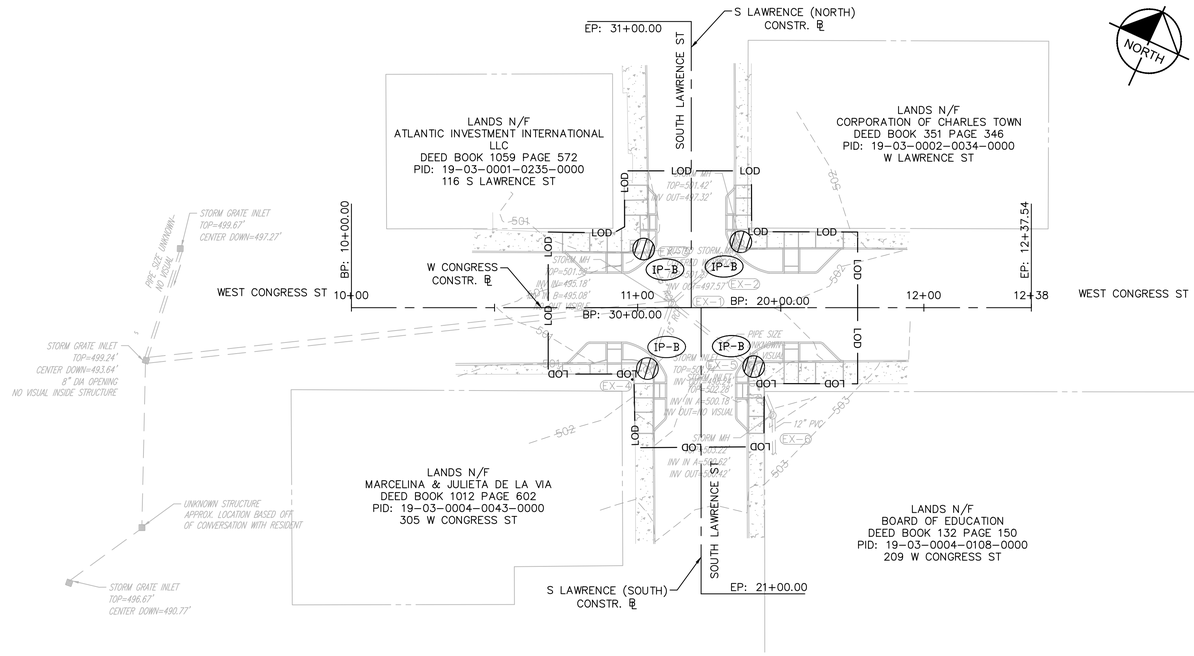
EROSION & SEDIMENT CONTROL PHASE I



LEGEND:

- IP-B — INLET PROTECTION, EC-6, TYPE B
- C___ — DENOTES CONSTRUCTION LIMITS IN CUT
- F___ — DENOTES CONSTRUCTION LIMITS IN FILL
- SF — TEMPORARY SILT FENCE, EC-5, TYPE A
- LOD — LOD — LIMITS OF DISTURBANCE

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3B(1)

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

EROSION & SEDIMENT CONTROL PHASE I

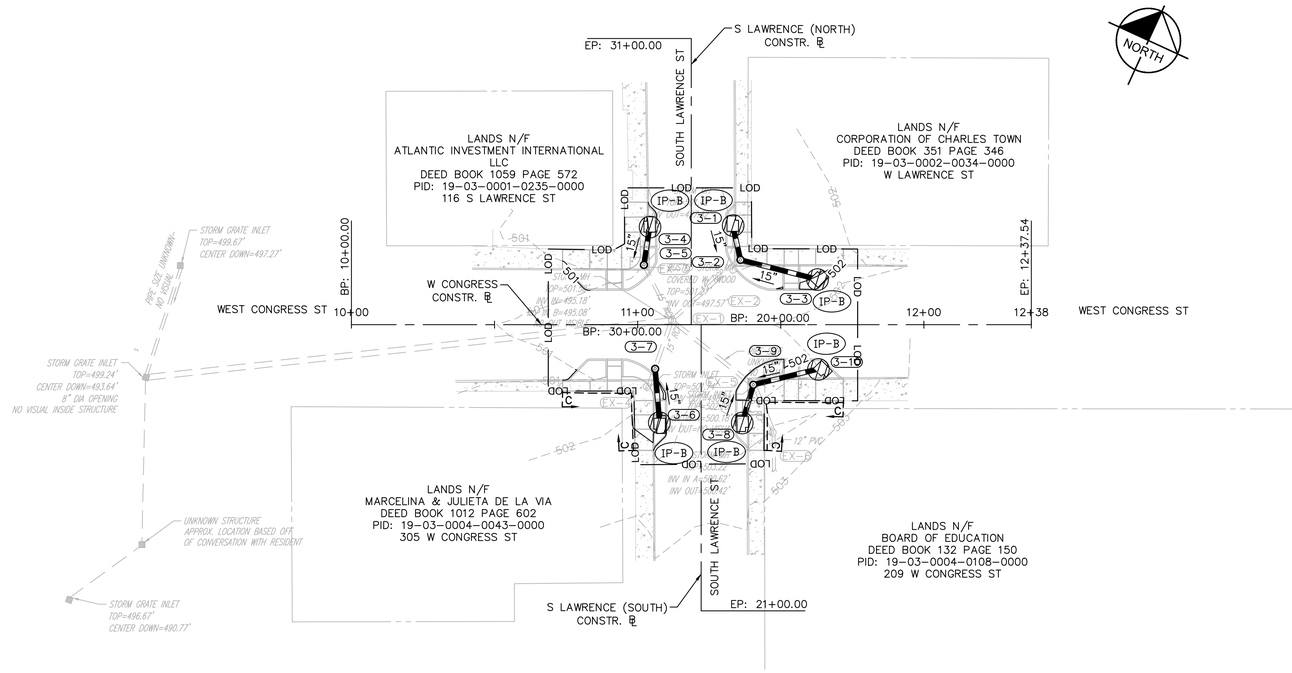
GRAPHIC SCALE IN FEET 0 12.5 25 50

PROJECT 110845003

SHEET NO. 3B(1)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

EROSION & SEDIMENT CONTROL PHASE II



LEGEND:

IP-B	INLET PROTECTION, EC-6, TYPE B
C	DENOTES CONSTRUCTION LIMITS IN CUT
F	DENOTES CONSTRUCTION LIMITS IN FILL
SF	TEMPORARY SILT FENCE, EC-5, TYPE A
LOD	LIMITS OF DISTURBANCE

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3B(2)

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

EROSION & SEDIMENT CONTROL PHASE II

GRAPHIC SCALE IN FEET 0 12.5 25 50	PROJECT 110845003	SHEET NO. 3B(2)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

DRAINAGE DESCRIPTIONS

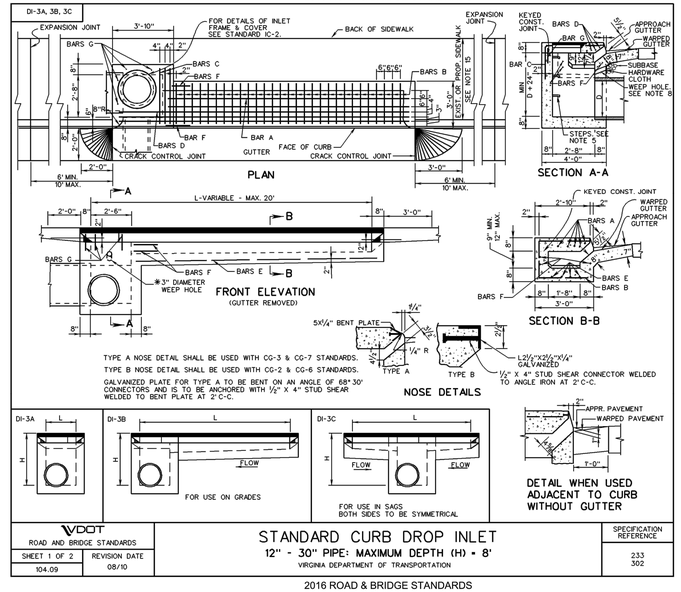
MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3C(1)

3-1	1 Std. DI-3B Req. L=4.83', H=3.95', Inv=497.48' Type B Nose, Std. IS-1 Req.	3-6	1 Std. DI-3B Req. L=4.83', H=4.48', Inv=497.58' Type B Nose, Std. IS-1 Req.	3-9	1 Std. MH-1 Req. H=3.64', Assumed Std. IS-1 Req.
3-1 – 3-2	12' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=497.48, Inv(Out)=497.42	3-6 – 3-7	19' – 15" Conc. Pipe Class IV Req. (Min. 3' Cover) Silt Tight Joint Type Inv(In)=497.58, Inv(Out)=497.49	EX-1	STORM MH TOP=501.58' INV IN=495.18' INV IN B=495.08' NO OUT VISIBLE
3-2	1 Std. MH-1 Req. H=5.13', Inv=496.38' Std. IS-1 Req.	3-7	1 Std. MH-1 Req. H=4.08', Inv=497.39' Std. IS-1 Req.	EX-2	BUSTED STORM MH COVERED W/ WOOD TOP=501.27' INV OUT=497.57'
3-2 – EX-1	32' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=497.32, Inv(Out)=495.18	3-7 – EX-1	18' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=497.39, Inv(Out)=495.18	EX-3	STORM MH TOP=501.42' INV OUT=497.32'
EX-1	1 Std. MH Req. H=6.41', Inv=495.18'	EX-1	1 Std. MH Req. H=6.41', Inv=495.18' Std. IS-1 Req.	EX-4	STORM INLET TOP=501.74' INV OUT=498.24'
3-3	1 Std. DI-3B Req. L=4.83', H=4.51', Inv=497.56' Type B Nose, Std. IS-1 Req.	3-8	1 Std. DI-3B Req. L=4.83', H=3.86', Inv=498.51' Type B Nose, Std. IS-1 Req.	EX-5	STORM INLET TOP=502.28' INV IN A=500.18' INV OUT=NO VISUAL
3-3 – 3-2	28' – 15" Conc. Pipe Class IV Req. (Min. 3' Cover) Silt Tight Joint Type Inv(In)=497.56, Inv(Out)=497.42	3-8 – 3-9	14' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=498.51, Assumed Inv(Out)=498.44	EX-6	STORM MH TOP=503.22' INV IN A=500.62' INV OUT=500.42'
3-2	1 Std. MH-1 Req. H=5.13', Inv=496.38' Std. IS-1 Req.	3-9	1 Std. MH-1 Req. H=3.64', Assumed Inv=498.34' Std. IS-1 Req. Note: Prior to construction and implementation of structure 3-9 the contractor shall verify the existing culvert invert elevation. Should the elevation differ than what is shown on the plans the contractor shall coordinate with the city and city engineer to identify a solution prior to beginning the work.		
3-4	1 Std. DI-3B Req. L=4.83', H=3.49', Inv=497.74' Type B Nose, Std. IS-1 Req.				
3-4 – 3-5	13' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=497.74, Inv(Out)=497.67	3-9 – EX-1	36' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=498.34, Inv(Out)=495.18		
3-5	1 Std. MH-1 Req. H=3.83', Inv=497.57' Std. IS-1 Req.	EX-1	1 Std. MH Req. H=6.41', Inv=495.18' Std. IS-1 Req.		
3-5 – EX-1	22' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=497.57, Inv(Out)=495.18	3-10	1 Std. DI-3B Req. L=4.83', H=3.93', Inv=498.55' Type B Nose, Std. IS-1 Req.		
EX-1	1 Std. MH Req. H=6.41', Inv=495.18' Std. IS-1 Req.	3-10 – 3-9	23' – 15" Conc. Pipe Class IV Req. (Min. 0' Cover) Silt Tight Joint Type Inv(In)=498.55, Assumed Inv(Out)=498.44		

2016 ROAD & BRIDGE STANDARDS



2016 ROAD & BRIDGE STANDARDS

TABLE OF QUANTITIES

DI-3A, 3B, 3C

REINFORCING STEEL

TYPE	L	AREA OF SLOT	Concrete	BARS A		BARS B		BARS C		BARS D		BARS E		BARS F		BARS G		WEIGHT
	Ft.	Sq. Ft.	Cu. Yds.	No.	Lin. Ft. ✱	No.	Lin. Ft. ✱	No.	Lin. Ft. ✱	No.	Lin. Ft.✱	No.	Lin. Ft.✱	No.	Lin. Ft.✱	No.	Lin. Ft.✱	Lbs.
DI-3A	2'-6"	1.15	2.26	-	-	-	-	1	5'-7"	3	3'-2"	-	-	-	-	6	1'-0"	22
DI-3B	4'	1.83	2.59	5	7'-8"	2	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	7'-8"	3	1'-6"	4	1'-0"	64
	6'	2.75	3.02	5	9'-8"	6	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	9'-6"	3	1'-6"	4	1'-0"	111
	8'	3.67	3.46	5	11'-8"	10	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	11'-6"	3	1'-6"	4	1'-0"	158
	10'	4.58	3.90	5	13'-8"	14	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	13'-6"	3	1'-6"	4	1'-0"	204
	12'	5.50	4.34	5	15'-8"	18	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	15'-6"	3	1'-6"	4	1'-0"	251
	14'	6.42	4.78	5	17'-8"	22	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	17'-6"	3	1'-6"	4	1'-0"	298
	16'	7.33	5.22	5	19'-8"	26	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	19'-6"	3	1'-6"	4	1'-0"	345
	18'	8.25	5.66	5	21'-8"	30	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	21'-6"	3	1'-6"	4	1'-0"	391
	20'	9.17	6.09	5	23'-8"	34	6'-7" to 6'-10"	3	5'-7"	3	3'-2"	4	23'-6"	3	1'-6"	4	1'-0"	438
DI-3C	6'	2.75	3.01	10	7'-9"	4	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	7'-9"	6	1'-6"	2	1'-0"	111
	8'	3.67	3.45	10	9'-9"	8	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	9'-9"	6	1'-6"	2	1'-0"	158
	10'	4.58	3.89	10	11'-9"	12	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	11'-9"	6	1'-6"	2	1'-0"	205
	12'	5.50	4.33	10	13'-9"	16	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	13'-9"	6	1'-6"	2	1'-0"	252
	14'	6.42	4.77	10	15'-9"	20	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	15'-9"	6	1'-6"	2	1'-0"	298
	16'	7.33	5.21	10	17'-9"	24	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	17'-9"	6	1'-6"	2	1'-0"	345
	18'	8.25	5.65	10	19'-9"	28	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	19'-9"	6	1'-6"	2	1'-0"	392
	20'	9.17	6.09	10	21'-9"	32	6'-7" to 6'-10"	5	5'-7"	3	3'-2"	8	21'-9"	6	1'-6"	2	1'-0"	439

NOTES

1. DEPTH OF INLET (H) TO BE SHOWN ON PLANS.
2. THE "H" DIMENSION SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS SHALL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. FOR PURPOSES OF ESTIMATING, THIS DIMENSION IS ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS.
3. WHEN SPECIFIED ON THE PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
4. IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE, THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
5. STEPS ARE TO BE PROVIDED WHEN H IS 4'-0" OR GREATER. FOR DETAILS SEE STANDARD ST-1.
6. THIS ITEM MAY BE PRECAST OR CAST-IN-PLACE.
7. ✱4 X 8" SMOOTH DOWELS AT APPROXIMATELY 12" C-C TO BE PLACED IN ALL AREAS ADJACENT TO ABUTTING CONCRETE TO PREVENT SETTLEMENT.
8. 3" DIAMETER WEEP HOLE TO BE LOCATED TO DRAIN SUBBASE MATERIAL. WEEP HOLE WITH 12"X18" PLASTIC HARDWARE CLOTH ½" MESH OR GALVANIZED STEEL WIRE MINIMUM WIRE DIAMETER 0.03", NUMBER 4 MESH HARDWARE CLOTH UNCOVERED FIRMLY TO THE OUTSIDE OF THE STRUCTURE.
9. ALL REINFORCING STEEL SHALL HAVE A MIN. COVER OF 2".
10. ALL REINFORCING STEEL TO BE CUT CLEAR OF ALL OPENINGS BY 2".
11. CAST-IN PLACE CONCRETE IS TO BE CLASS A3 (3000 PSI). PRECAST CONCRETE IS TO BE 4000 PSI.
12. LENGTH OF SLOT (L) WILL, IN EVERY CASE, BE SHOWN ON PLANS.
13. IF INLET IS CONSTRUCTED IN MEDIAN CURB OR WITH INTEGRAL CURB, GUTTER IS TO BE OMITTED (SEE DETAIL).
14. STANDARD INLETS MAY BE CONSTRUCTED WITH CONCRETE BLOCKS IN ACCORDANCE WITH THE DETAILS SHOWN ON STANDARD DRAWING DI-MB.
15. THIS AREA MAY BE EARTHEN, IN WHICH CASE THE EXPANSION JOINTS WILL APPLY ONLY TO CURB AND GUTTER.
16. CONCRETE QUANTITIES SHOWN ARE FOR DEPTH (H) OF 2'-0". WITHOUT PIPES, THE AMOUNT OF CONCRETE SHOWN MUST BE REDUCED TO OBTAIN TRUE QUANTITIES. FOR PIPES OF DIFFERENT SIZES USED OR SUBTRACT 0.32 CUBIC YARDS OF CONCRETE FOR EACH FOOT OF DEPTH.
17. LENGTH OF ANGLE IRON AS SHOWN ON SHEET 1 OF 2 IS TO BE L+9⅝" AT 4.10 LBS./FT..
18. ✱ DENOTES LENGTH OF ONE (1) BAR.
19. ALL REINFORCING BARS TO BE #5.
20. WHEN INLET IS USED IN 4'-0" MEDIAN, BACK OF INLET IS TO BE SHAPED TO CONFORM TO PROPOSED CURB.

SPECIFICATION REFERENCE	STANDARD CURB DROP INLET 12" - 30" PIPE: MAXIMUM DEPTH (H) = 8' VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS REVISION DATE / SHEET 2 OF 2 104.10
233 302		

2016 ROAD & BRIDGE STANDARDS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

DRAINAGE DESCRIPTIONS

PROJECT	SHEET NO.
110845003	3C(1)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

STANDARD DETAILS

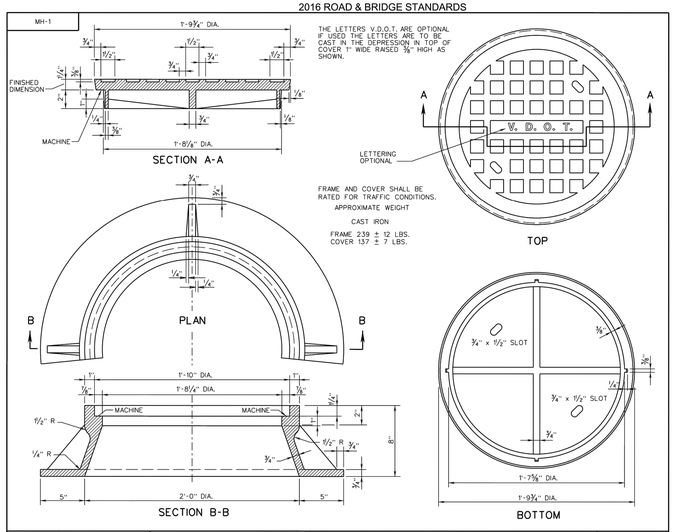
MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3C(2)

2016 ROAD & BRIDGE STANDARDS

MH-1

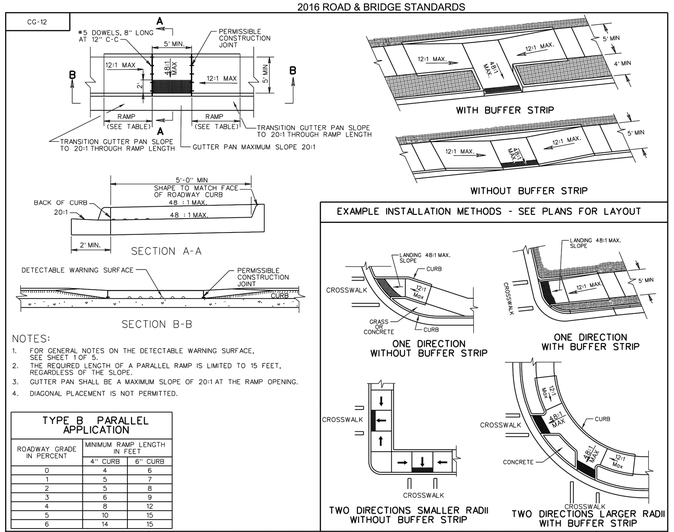


VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	SPECIFICATION REFERENCE
SHEET 2 OF 3	REVISION DATE 04/20	STANDARD MANHOLE FRAME AND COVER VIRGINIA DEPARTMENT OF TRANSPORTATION	224 302
106.02			

2016 ROAD & BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

CG-12



NOTES:
1. FOR GENERAL NOTES ON THE DETECTABLE WARNING SURFACE, SEE SHEET 1 OF 5.
2. THE REQUIRED LENGTH OF A PARALLEL RAMP IS LIMITED TO 15 FEET, REGARDLESS OF THE SLOPE.
3. GUTTER PAN SHALL BE A MAXIMUM SLOPE OF 20:1 AT THE RAMP OPENING.
4. DIAGONAL PLACEMENT IS NOT PERMITTED.

TYPE B PARALLEL APPLICATION		
ROADWAY GRADE IN PERCENT	MINIMUM RAMP LENGTH IN FEET	
	4" CURB	6" CURB
0	4	6
1	5	7
2	5	8
3	6	9
4	8	12
5	10	15
6	14	15

EXAMPLE INSTALLATION METHODS - SEE PLANS FOR LAYOUT

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	SPECIFICATION REFERENCE
SHEET 3 OF 5	REVISION DATE 04/19	CG-12 DETECTABLE WARNING SURFACE TYPE B (PARALLEL) APPLICATION VIRGINIA DEPARTMENT OF TRANSPORTATION	105 502 504
204.03			

2016 ROAD & BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

MH-1

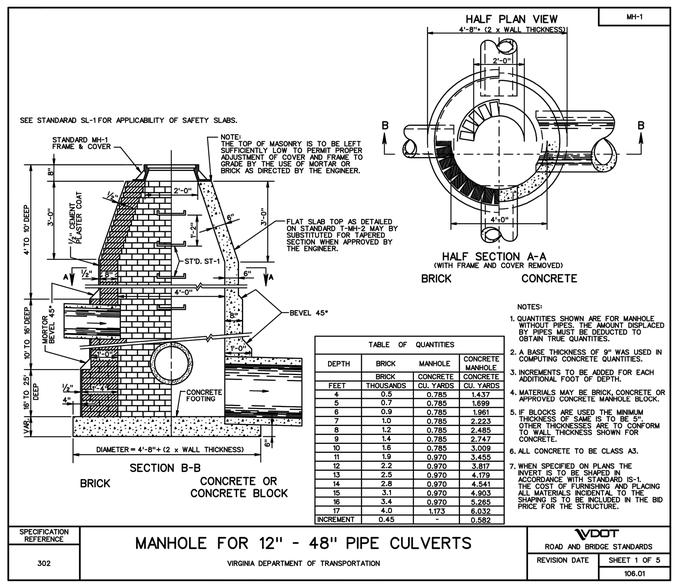


TABLE OF QUANTITIES			
DEPTH	BRICK	MANHOLE	CONCRETE MANHOLE
	BRICK	CONCRETE	CONCRETE
FEET	THOUSANDS	CU. YARDS	CU. YARDS
4	0.5	0.785	1.437
5	0.7	0.785	1.699
6	0.9	0.785	1.961
7	1.0	0.785	2.223
8	1.2	0.785	2.485
9	1.4	0.785	2.747
10	1.6	0.785	3.009
11	1.9	0.970	3.455
12	2.2	0.970	3.817
13	2.5	0.970	4.179
14	2.8	0.970	4.541
15	3.1	0.970	4.903
16	3.4	0.970	5.265
17	4.0	1.173	6.032
INCREMENT	0.45	-	0.582

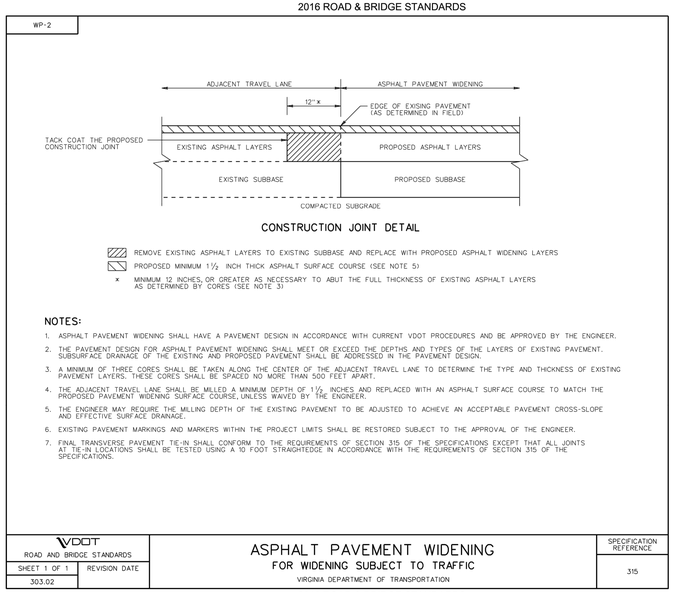
NOTES:
1. QUANTITIES SHOWN ARE FOR MANHOLE WITHOUT PIPES. THE AMOUNT DISPLACED BY PIPES MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES.
2. A BASE THICKNESS OF 9" WAS USED IN COMPUTING CONCRETE QUANTITIES.
3. INCREMENTS TO BE ADDED FOR EACH ADDITIONAL FOOT OF DEPTH.
4. MATERIALS MAY BE BRICK, CONCRETE OR APPROVED CONCRETE MANHOLE BLOCK.
5. IF BLOCKS ARE USED THE MINIMUM THICKNESS OF SAME IS TO BE 5". OTHER THICKNESSES ARE TO CONFORM TO WALL THICKNESS SHOWN FOR CONCRETE.
6. ALL CONCRETE TO BE CLASS A3.
7. WHEN SPECIFIED ON PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.

SPECIFICATION REFERENCE	MANHOLE FOR 12" - 48" PIPE CULVERTS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
302		REVISION DATE SHEET 1 OF 5 106.01

2016 ROAD & BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

WP-2



NOTES:
1. ASPHALT PAVEMENT WIDENING SHALL HAVE A PAVEMENT DESIGN IN ACCORDANCE WITH CURRENT VDOT PROCEDURES AND BE APPROVED BY THE ENGINEER.
2. THE PAVEMENT DESIGN FOR ASPHALT PAVEMENT WIDENING SHALL MEET OR EXCEED THE DEPTHS AND TYPES OF THE LAYERS OF EXISTING PAVEMENT. SUBSURFACE DRAINAGE OF THE EXISTING AND PROPOSED PAVEMENT SHALL BE ADDRESSED IN THE PAVEMENT DESIGN.
3. A MINIMUM OF THREE CORES SHALL BE TAKEN ALONG THE CENTER OF THE ADJACENT TRAVEL LANE TO DETERMINE THE TYPE AND THICKNESS OF EXISTING PAVEMENT LAYERS. THESE CORES SHALL BE SPACED NO MORE THAN 500 FEET APART.
4. THE ADJACENT TRAVEL LANE SHALL BE MILLED A MINIMUM DEPTH OF 1½ INCHES AND REPLACED WITH AN ASPHALT SURFACE COURSE TO MATCH THE PROPOSED PAVEMENT WIDENING SURFACE COURSE, UNLESS WAIVED BY THE ENGINEER.
5. THE ENGINEER MAY REQUIRE THE MILLING DEPTH OF THE EXISTING PAVEMENT TO BE ADJUSTED TO ACHIEVE AN ACCEPTABLE PAVEMENT CROSS-SLOPE AND EFFECTIVE SURFACE DRAINAGE.
6. EXISTING PAVEMENT MARKINGS AND MARKERS WITHIN THE PROJECT LIMITS SHALL BE RESTORED SUBJECT TO THE APPROVAL OF THE ENGINEER.
7. FINAL TRANSVERSE PAVEMENT TIE-IN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 315 OF THE SPECIFICATIONS EXCEPT THAT ALL JOINTS AT TIE-IN LOCATIONS SHALL BE TESTED USING A 10 FOOT STRAIGHTEDGE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 315 OF THE SPECIFICATIONS.

VDOT ROAD AND BRIDGE STANDARDS		ASPHALT PAVEMENT WIDENING FOR WIDENING SUBJECT TO TRAFFIC VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE		315
303.02			

2016 ROAD & BRIDGE STANDARDS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

STANDARD DETAILS

	PROJECT	SHEET NO.
	110845003	3C(2)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

STANDARD DETAILS

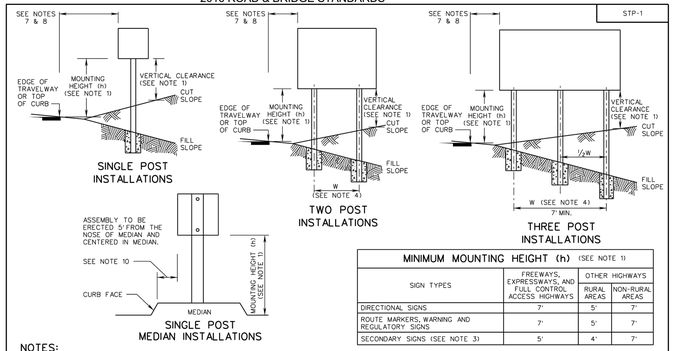
MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3C(3)

2016 ROAD & BRIDGE STANDARDS

STP-1



MINIMUM MOUNTING HEIGHT (h) (SEE NOTE 1)			
SIGN TYPES	FREEWAYS, EXPRESSWAYS, AND FULL CONTROL ACCESS HIGHWAYS	OTHER HIGHWAYS	
		RURAL AREAS	NON-RURAL AREAS
DIRECTIONAL SIGNS	7'	5'	7'
ROUTE MARKERS, WARNING AND REGULATORY SIGNS	7'	5'	7'
SECONDARY SIGNS (SEE NOTE 3)	5'	4'	7'

NOTES:

1. FOR ALL SIGNS EXCEPT STREET NAME SIGNS:
   A. MINIMUM MOUNTING HEIGHT (h) SHALL BE IN ACCORDANCE WITH THE "MINIMUM MOUNTING HEIGHT" TABLE ON THIS SHEET. MOUNTING HEIGHT IS MEASURED FROM THE ROADWAY ELEVATION AT THE EDGE OF THE TRAVEL WAY TO THE BOTTOM OF THE SIGN PANEL.
   B. MAXIMUM MOUNTING HEIGHT (h) FOR THE BOTTOM-MOST SIGN PANEL(S) SHALL BE 8 FEET, EXCEPT WHEN NECESSARY TO ACHIEVE MINIMUM VERTICAL CLEARANCE BENEATH SIGN PANEL AS PER NOTE 1C.
   C. MINIMUM VERTICAL CLEARANCE (DISTANCE BETWEEN BOTTOM OF SIGN PANEL AND FINISHED GRADE BENEATH THE PANEL) SHALL BE 7 FEET FOR ANY PORTION OF THE SIGN WITHIN THE CLEAR ZONE. THIS MINIMUM VERTICAL CLEARANCE MAY BE REDUCED TO 5 FEET FOR EITHER OF THE FOLLOWING CONDITIONS:
      - WHEN SIGNS OR PORTIONS OF SIGNS ARE LOCATED MORE THAN 10 FEET UP A CUT SLOPE GREATER THAN 3:1, OR
      - WHEN THE SIGN IS LOCATED AT LEAST THE MINIMUM DISTANCE BEHIND CURB, BARRIER, OR GUARDRAIL AS PER NOTES 7 AND 8.
2. MOUNTING HEIGHT (h) FOR STREET NAME SIGNS SHALL BE BETWEEN 8'-6" AND 9'-0".
3. A SECONDARY SIGN IS CONSIDERED TO BE A SIGN MOUNTED BELOW ANOTHER SIGN, EXCEPT A ROUTE MARKER WITH AN AUXILIARY PLATE IS CONSIDERED TO BE A SINGLE SIGN. A SECONDARY SIGN SHALL NOT BE MOUNTED LOWER THAN 7 FEET ABOVE A PEDESTRIAN SIDEWALK OR PATHWAY IF IT WILL PROJECT INTO THE PEDESTRIAN FACILITY.
4. W = (0.60) X (SIGN PANEL WIDTH)
5. SQUARE TUBE SIGN POSTS REQUIRING A BREAKAWAY SUPPORT SYSTEM SHALL BE AN FHWA APPROVED BREAKAWAY SUPPORT SYSTEM CONFORMING TO AASHTO'S STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
6. FOR SIGNS LOCATED IN AREAS WHERE PEDESTRIAN MOVEMENTS ARE LIKELY TO OCCUR OR ON-STREET PARKING IS PERMITTED, THE HEIGHT FROM THE LOWEST PORTION OF THE SIGN PANEL TO THE FINISHED SURFACE SHALL HAVE A MINIMUM CLEARANCE OF 7 FEET.
7. THE LATERAL CLEARANCE TO THE SIGN PANEL SHALL BE A MINIMUM OF 2 FEET FROM THE FACE OF CURB OR 4 FEET FROM FACE OF BARRIER, IF PRESENT.
8. UNLESS OTHERWISE APPROVED BY THE ENGINEER, SIGNS PLACED BEHIND GUARDRAIL SHALL BE LOCATED SUCH THAT THE NEAR SIDE EDGE OF THE SIGN PANEL IS OUTSIDE OF THE GUARDRAIL DEFLECTION DISTANCE.
9. FOR SIGNS AT INTERCHANGE EXIT RAMPS, REFER TO STANDARD ISD-1.
10. 2' MINIMUM FOR MEDIANS OVER 10'-IN WIDTH. 12" MINIMUM FOR MEDIANS 10'-OR LESS IN WIDTH UNLESS SHOWN OTHERWISE IN THE CONTRACT DOCUMENTS.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SQUARE TUBE SIGN POST VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
700		REVISION DATE 08/17 · SHEET 1 OF 12 · 1321.10

2016 ROAD & BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

STP-1

TABLE 1
FOR HAMPTON ROADS DISTRICT (SEE NOTE 5)

SIZE OF POST	CENTROID (FT.)	MAXIMUM AREA (TOTAL OF SIGN PANELS) (FT2) SINGLE-POST	TWO-POST	THREE-POST	COMMENTS
2 INCH 14 GA.	8	5.8			TYPE A, TYPE D, OR TYPE F FOUNDATION AS SPECIFIED IN THE CONTRACT DOCUMENTS.
	9	5.1			
	10	4.6			
	11	4.2			
	12	3.8			
	13	3.5			
	14	3.3			
2½ INCH 12 GA.	8	11.8	23.6		SINGLE POST: TYPE A OR TYPE E FOUNDATION. MULTI-POST: TYPE B OR TYPE C FOUNDATION, AS SPECIFIED IN THE CONTRACT DOCUMENTS.
	9	10.5	21.0		
	10	9.4	18.8		
	11	8.6	17.2		
	12	7.8	15.6		
	13	7.2	14.5		
	14	6.7	13.5		
2½ INCH 10 GA.	8	13.6	27.2	40.8	TYPE B OR TYPE C FOUNDATION AS SPECIFIED IN THE CONTRACT DOCUMENTS.
	9	12.1	24.2	36.3	
	10	10.9	21.8	32.7	
	11	9.9	19.8	29.7	
	12	9.1	18.2	27.3	
	13	8.4	16.8	25.2	
	14	7.8	15.6	23.4	
2½ INCH 10 GA. WITH 2⅜ INCH 10 GA. INNER POST (SEE NOTE 1)	8	23.9	47.8	71.7	TYPE B OR TYPE C FOUNDATION AS SPECIFIED IN THE CONTRACT DOCUMENTS.
	9	21.2	42.4	63.6	
	10	19.1	38.2	57.3	
	11	17.4	34.8	52.2	
	12	15.9	31.8	47.7	
	13	14.7	29.4	44.1	
	14	13.6	27.2	40.8	

NOTES:

1. THE INNER POST SHALL BE 6 FEET IN LENGTH.
2. CENTROID SHALL BE DETERMINED IN ACCORDANCE WITH PCS-1.
3. MINIMUM COLD FORMED YIELD STRENGTH SHALL BE:
   14 GA. AND 12 GA. - 60 KSI
   10 GA. - 55 KSI
4. FOLLOW SIGN BRACING DETAILS (SEE SHEET 11 OF 12) FOR MAXIMUM SIGN PANEL WIDTHS AND SIGN BRACING SPACING.
5. TABLE 1 SHALL BE USED FOR THE HAMPTON ROADS DISTRICT, EXCEPT THE CITY OF EMPORIA AND COUNTIES OF GREENSVILLE, SUSSEX, AND SOUTHAMPTON SHALL USE TABLE 2.

VDOT ROAD AND BRIDGE STANDARDS	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SQUARE TUBE SIGN POST VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 2 OF 12 · REVISION DATE 01/15 · 1321.11		700

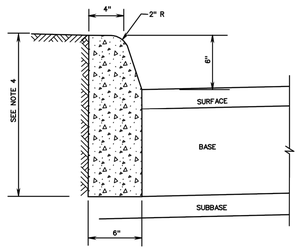
2016 ROAD & BRIDGE STANDARDS

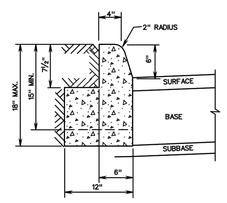
2016 ROAD & BRIDGE STANDARDS

CG-2

NOTES:

1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.
3. CURB HAVING A RADIUS OF 300 FEET OR LESS (ALONG FACE OF CURB) WILL BE PAID FOR AS RADIAL CURB.
4. THE DEPTH OF CURB MAY BE REDUCED AS MUCH AS 3" (15" DEPTH) OR INCREASED AS MUCH AS 3" (21" DEPTH) IN ORDER THAT THE BOTTOM OF CURB WILL COINCIDE WITH THE TOP OF A COURSE OF THE PAVEMENT SUBSTRUCTURE. OTHERWISE, THE DEPTH IS TO BE 18" AS SHOWN. NO ADJUSTMENT IN THE PRICE BID IS TO BE MADE FOR A DECREASE OR AN INCREASE IN DEPTH.
5. CG-2 IS TO BE USED ON ROADWAYS MEETING THE REQUIREMENTS FOR CG-6 AS SHOWN IN APPENDIX A OF THE VDOT ROAD DESIGN MANUAL, IN THE SECTION ON GS URBAN STANDARDS.





ACCEPTABLE ALTERNATIVE IF CURB IS EXTRUDED

SPECIFICATION REFERENCE	STANDARD 6" CURB VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
105 502		REVISION DATE · SHEET 1 OF 1 · 201.01

2016 ROAD & BRIDGE STANDARDS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

STANDARD DETAILS

	PROJECT	SHEET NO.
	110845003	3C(3)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

DRAINAGE CALCULATIONS

Site Information

final results

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 0.07

Maximum reduction required:	*10%*
The site's net increase in impervious cover (acres) is:	*0*
Post-Development TP Load Reduction for Site (lb/yr):	*-0.02*

Check:
BMP Design Specifications List: 2013 Draft Stds & Specs
Linear project? No
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

TP LOAD REDUCTION NOT REQUIRED

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be					0.00
Impervious Cover (acres)				0.07	0.07
					0.07

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested				0.02	0.02 *
Managed Turf (acres) -- disturbed, graded for yards or other turf to be					0.00
Impervious Cover (acres)				0.05	0.05
Area Check	OK.	OK.	OK.	OK.	0.07

** Forest/Open Space areas must be protected in accordance with the Virginia Runoff Reduction Method*

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre		
Pre-ReDevelopment	**Listed**	**Adjusted[1]**
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv(forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	0.00	0.00
Weighted Rv(turf)	0.00	0.00
% Managed Turf	0%	0%
Impervious Cover (acres)	0.07	0.07
Rv(impervious)	0.95	0.95
% Impervious	100%	100%
Total Site Area (acres)	**0.07**	**0.07**
Site Rv	**0.95**	**0.95**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)	
Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.02
Weighted Rv(forest)	0.05
% Forest	27%
Managed Turf Cover (acres)	0.00
Weighted Rv (turf)	0.00
% Managed Turf	0%
Impervious Cover (acres)	0.05
Rv(impervious)	0.95
% Impervious	73%
Final Site Area (acres)	**0.07**
Final Post Dev Site Rv	**0.71**

Land Cover Summary-Post	
Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.02
Weighted Rv(forest)	0.05
% Forest	27%
Managed Turf Cover (acres)	0.00
Weighted Rv (turf)	0.00
% Managed Turf	0%
ReDev. Impervious Cover (acres)	0.05
Rv(impervious)	0.95
% Impervious	73%
Total ReDev. Site Area (acres)	**0.07**
ReDev Site Rv	**0.71**

Land Cover Summary-Post	
Post-Development New Impervious	
New Impervious Cover (acres)	0.00
Rv(impervious)	--

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0053	0.0053	
Pre-ReDevelopment Treatment Volume (cubic feet)	231	231	
Pre-ReDevelopment TP Load (lb/yr)	**0.15**	**0.15**	
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	2.17	2.17	
Baseline TP Load (lb/yr) (**0.41 lbs/acre/yr** applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		*0.03*	

Final Post-Development Treatment Volume (acre-ft)	0.0039	**Post-ReDevelopment Treatment Volume (acre-ft)**	0.0039	**Post-Development Treatment Volume (acre-ft)**	--	
Final Post-Development Treatment Volume (cubic feet)	172	**Post-ReDevelopment Treatment Volume (cubic feet)**	172	**Post-Development Treatment Volume (cubic feet)**	--	
Final Post-Development TP Load (lb/yr)	**0.11**	**Post-ReDevelopment Load (TP) (lb/yr)***	**0.11**	**Post-Development TP Load (lb/yr)**	--	
Final Post-Development TP Load per acre **(lb/acre/yr)**	1.61	Post-ReDevelopment TP Load per acre **(lb/acre/yr)**	1.61			
		Max. Reduction Required (Below Pre-ReDevelopment Load)	**10%**			
		TP Load Reduction Required for Redeveloped Area (lb/yr)	**-0.02**	**TP Load Reduction Required for New Impervious Area (lb/yr)**	**0**	

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**-0.02**	**	*TP LOAD REDUCTION NOT REQUIRED*

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	1.04	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	0.77

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3C(4)

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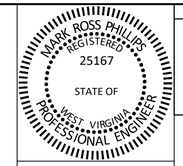
W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

DRAINAGE CALCULATIONS

	PROJECT	SHEET NO.
	110845003	3C(4)

PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631



Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3C(5)

DRAINAGE CALCULATIONS

LD-204 Stormwater Inlet Computations

LD-204 SHEET 1
Rev. 6-85 PPMS# 110845003 PROJ Congress and South Lawrence Street Intersection Improv DATE August 7, 2023 OF 1

INLET																										Sag Inlets Only			
NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	sum CA	I (IN/HR)	Q INCR (CFS)	Q_b, CARRYOVER (CFS)	Q_T, GUTTER FLOW (CFS)	S, GUTTER SLOPE (FT/FT)	S_X, CROSS SLOPE (FT/FT)	T, SPREAD (FT)	W (FT)	W/T	S_W, (FT/FT)	S_W/S_X	E_0	a = 12W(S_W - S_X)+Local Depression	S'_W = a/(12w)	$S_e = S_X + S'_W(E_0)$, (FT/FT)	COMPUTED LENGTH, L_T, (FT)	L, SPECIFIED LENGTH (FT)	L/L_T	E	Q_i, INTERCEPTED (CFS)	Q_b, CARRYOVER (CFS)	d (FT)	h (FT)	d/h	T, SPREAD @ SAG (FT)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)
INLETS - ON GRADE																																
3-1	Proposed	4	-	0.10	0.90	0.088	0.088	4.0	0.352	0.000	0.352	0.0141	0.0300	3.45	1	0.29	0.0300	1.00	0.60	1.00	0.083	0.080	7	4	0.57	0.78	0.28	0.077	0.1035			
3-3	Proposed	4	-	0.24	0.90	0.215	0.215	4.0	0.862	0.000	0.862	0.0292	0.0325	4.01	1	0.25	0.0325	1.00	0.53	1.00	0.083	0.077	12	4	0.33	0.52	0.45	0.415	0.1302			
3-4	Proposed	4	-	0.07	0.90	0.062	0.062	4.0	0.249	0.000	0.249	0.0164	0.0433	2.34	1	0.43	0.0433	1.00	0.77	1.00	0.083	0.108	5	4	0.80	0.94	0.24	0.014	0.1015			
3-6	Proposed	4	-	0.27	0.90	0.240	0.240	4.0	0.959	0.000	0.959	0.0205	0.0235	5.46	1	0.18	0.0235	1.00	0.42	1.00	0.083	0.058	13	4	0.31	0.48	0.46	0.495	0.1282			
3-8	Proposed	4	-	0.30	0.90	0.268	0.268	4.0	1.070	0.000	1.070	0.0276	0.0086	10.08	1	0.10	0.0086	1.00	0.24	1.00	0.083	0.029	22	4	0.18	0.30	0.32	0.746	0.0867			
3-10	Proposed	4	-	2.89	0.90	2.599	2.599	4.0	1.885	0.000	1.885	0.0204	0.0205	7.67	1	0.13	0.0205	1.00	0.31	1.00	0.083	0.046	20	4	0.20	0.33	0.62	1.261	0.1571			

Existing Storm Drain Design Calculations
VDOT LD-229

Project: West Congress Street and South Lawrence Street Intersection Improvements
Locality: City of Charles Town
Date: 7/28/2023
Project No.: 110845003
Designed By/Checked: Miguel Tyshing, E.I.T /Mark Phillips, P.E.

FROM POINT	TO POINT	DRAINAGE AREA	RUNOFF COEFFICIENT	CA		INLET TIME	RAINFALL	RUNOFF	INVERT ELEVATIONS		LENGTH	SLOPE	SIZE	PIPE CAPACITY	Q / Q_f	VELOCITY	FLOW TIME	
				inlet	accum				upper end	lower end							incr	accum
		acres	C			min	in/hr	cfs	ft	ft	ft	%	in	cfs	%	fps	min	
3-6	3-7	0.27	0.90	0.24	0.24	5.00	0.54	0.13	497.59	497.49	19	0.50%	15	4.57	3%	1.64	0.19	5.00
3-7	EX-1	(N/A)	(N/A)	0.00	0.24	0.00	0.56	0.13	497.39	495.18	18	12.30%	15	22.61	1%	5.03	0.06	5.19
3-3	3-2	0.24	0.90	0.22	0.22	5.00	0.54	0.12	497.56	497.42	28	0.50%	15	4.57	3%	1.59	0.29	5.00
3-1	3-2	0.10	0.90	0.09	0.09	5.00	0.54	0.05	497.48	497.42	12	0.50%	15	4.57	1%	1.22	0.17	5.00
3-2	EX-1	(N/A)	(N/A)	0.00	0.30	0.00	0.56	0.17	497.32	495.18	32	6.70%	15	16.70	1%	4.42	0.12	5.29
3-10	3-9	2.89	0.90	2.60	2.60	8.00	0.73	1.90	498.55	498.44	23	0.50%	15	4.57	42%	3.55	0.11	8.00
3-8	3-9	0.30	0.90	0.27	0.27	5.00	0.54	0.15	498.51	498.44	14	0.50%	15	4.57	3%	1.70	0.14	5.00
3-9	EX-1	(N/A)	(N/A)	0.00	2.87	0.00	0.73	2.11	498.34	495.18	36	8.70%	15	19.05	11%	10.23	0.06	8.11
3-5	EX-1	(N/A)	(N/A)	0.00	0.06	0.00	0.56	0.03	497.57	495.18	22	10.90%	15	21.33	0%	3.22	0.11	5.20
3-4	3-5	0.07	0.90	0.06	0.06	5.00	0.54	0.03	497.74	497.67	13	0.50%	15	4.57	1%	1.10	0.20	5.00
EX-1	O-2	(N/A)	(N/A)	0.00	3.47	0.00	0.74	2.57	495.18	493.64	0	5.00%	24	50.36	5%	8.41	0.06	8.17

Existing Hydraulic Grade Line Calculations
VDOT LD-347

Project: West Congress Street and South Lawrence Street Intersection Improvements
Locality: City of Charles Town
Date: 7/31/2023
Project #: 110845003
Designed By/Checked: Miguel Tyshing, E.I.T /Mark Phillips, P.E.

INLET	0.8D + INV (OUT)	ACTUAL OUTLET WSE	DESIGN OUTLET WSE	D_o	Q_o	L_o	S_{fo}	H_f	JUNCTION LOSS												FINAL H	INLET WSE	RIM ELEV	AVAILABLE FREEBOARD
									V_o	H_o	Q_i	V_i	Q_iV_i	$\frac{V_i^2}{2g}$	H_i	Angle	H_s	H_t	1.3 H_t	0.5 H_t				
(1)			(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)		(21)	(22)
EX-1	495.24	495.24	495.24	24	2.57	0	0.0220	0.00	8.41	0.27	2.11	2.94	6.20	0.13	0.05	36.1	0.05	0.38	0.38	0.38	0.38	495.62	501.59	5.97
3-5	496.18	495.62	496.18	15	0.03	22	0.0880	1.93	3.22	0.04	0.03	2.43	0.07	0.09	0.03	36.06	0.04	0.11	0.11	0.11	2.04	498.22	501.40	3.18
3-4	498.67	498.22	498.67	15	0.03	13	0.0050	0.07	1.10	0.01	0.00	0.00	0.00	0.00	0.00	0	0.00	0.01	0.01	0.01	0.07	498.74	501.23	2.49
3-2	496.18	495.62	496.18	15	0.17	32	0.0560	1.79	4.42	0.08	0.12	1.91	0.23	0.06	0.02	55.9	0.03	0.13	0.13	0.13	1.92	498.10	502.69	4.59
3-1	498.42	498.10	498.42	15	0.05	12	0.0030	0.04	1.22	0.01	0.00	0.00	0.00	0.00	0.00	0	0.00	0.01	0.01	0.01	0.05	498.47	501.43	2.96
3-3	498.42	498.10	498.42	15	0.12	28	0.0050	0.14	1.59	0.01	0.00	0.00	0.00	0.00	0.00	0	0.00	0.01	0.02	0.02	0.15	498.57	502.07	3.50
3-7	496.18	495.62	496.18	15	0.13	18	0.1020	1.84	5.03	0.10	0.13	2.43	0.32	0.09	0.03	23.84	0.03	0.16	0.16	0.16	1.99	498.17	502.76	4.60
3-6	498.49	498.17	498.49	15	0.13	19	0.0050	0.09	1.64	0.01	0.00	0.00	0.00	0.00	0.00	0	0.00	0.01	0.02	0.02	0.11	498.60	502.06	3.46
3-9	496.18	495.62	496.18	15	2.11	36	0.0570	2.07	10.23	0.41	1.90	2.93	5.57	0.13	0.05	51.6	0.07	0.52	0.52	0.52	2.59	498.77	502.10	3.33
3-8	499.44	498.77	499.44	15	0.15	14	0.0000	0.00	1.70	0.01	0.00	0.00	0.00	0.00	0.00	0	0.00	0.01	0.02	0.02	0.02	499.46	502.37	2.91
3-10	499.44	498.77	499.44	15	1.90	23	0.0040	0.09	3.55	0.06	0.00	0.00	0.00	0.00	0.00	0	0.00	0.06	0.08	0.08	0.17	499.61	502.48	2.87

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W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

DRAINAGE CALCULATIONS

	PROJECT	SHEET NO.
	110845003	3C(5)

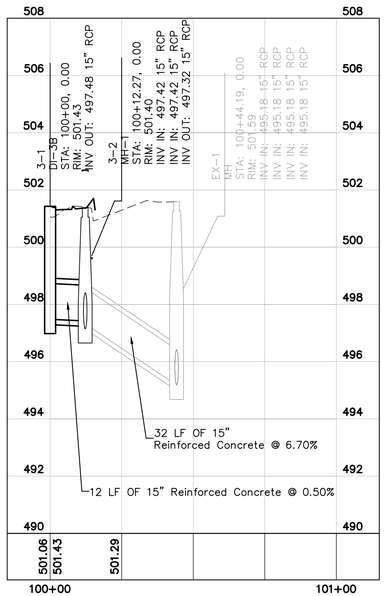
PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

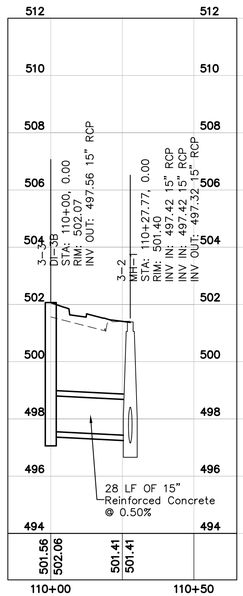
Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3D

DRAINAGE PROFILES



3-1 TO EX-1
SCALE: 1" = 25' H
1" = 2' V



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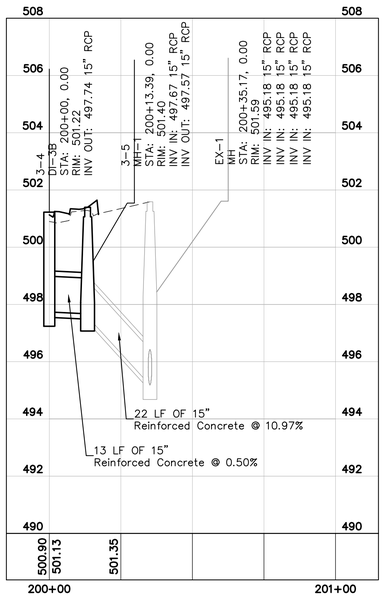
1" = 2' V



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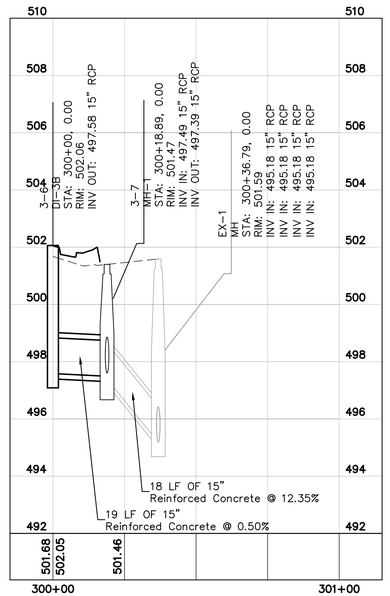
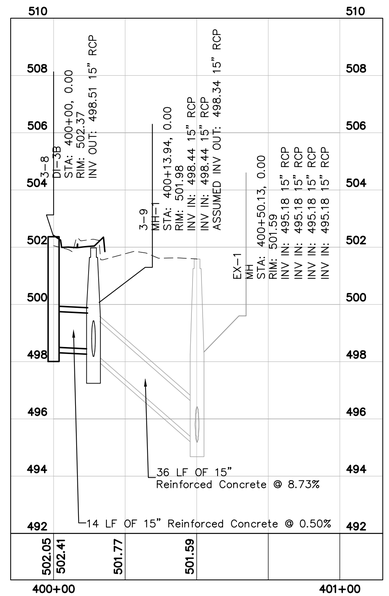
SCALE: 1" = 25' H
1" = 2' V



3-6 TO EX-1
SCALE: 1" = 25' H
1" = 2' V



3-8 TO EX-1
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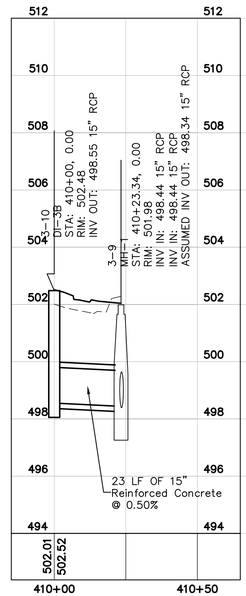
1" = 2' V



3-10 TO 3-9
SCALE: 1" = 25' H
1" = 2' V

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GRAPHIC SCALE IN FEET
0 12.5 25 50
HORIZONTAL
VERTICAL
5
2.5
1.25
0

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

DRAINAGE PROFILES

PROJECT	SHEET NO.
110845003	3D

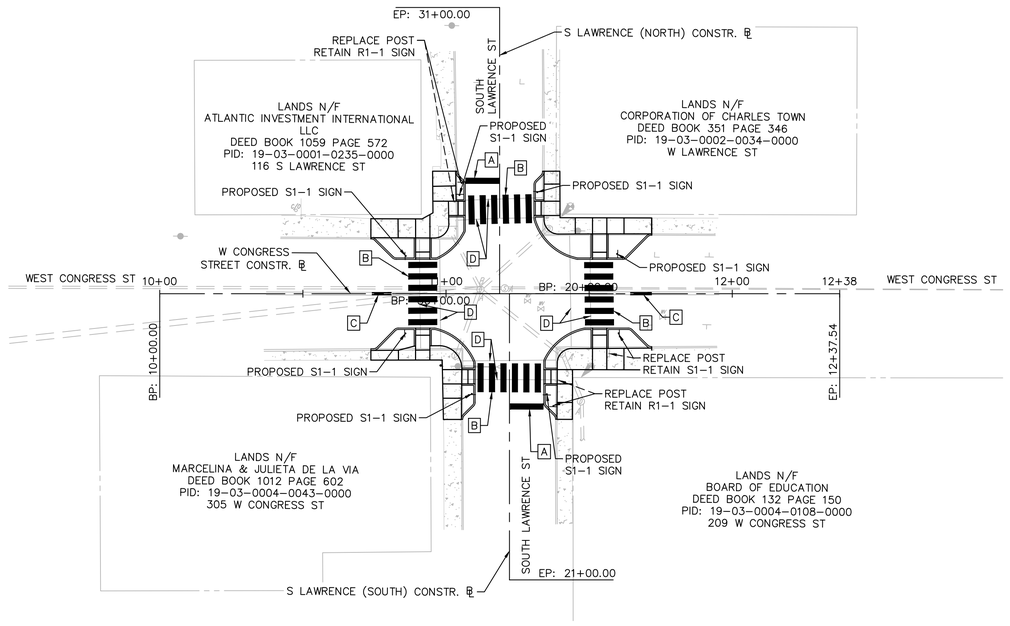
PROJECT MANAGER JIM WYSONG, CITY OF CHARLES TOWN
SURVEYED BY, DATE GRS GROUP, FEBRUARY 28, 2022
DESIGN BY MARK PHILLIPS, P.E. (KIMLEY-HORN) (703) 870-3631

MARK ROSS PHILLIPS REGISTERED 25167 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Kimley-Horn
Reston, Virginia
Roadway Engineer

REVISED	STATE	PROJECT	SHEET NO.
	WV	110845003	3E

SIGNING & MARKING PLAN



#	SIGN	MUTCD #	SIZE	PANEL (SF)	POST TYPE
1	STOP	R1-1	30" X 30"	6	STP-1 2 1/2 " 12 GA TYPE A FOUNDATION
2		S1-1	36" X 36"	11	STP-1 2 1/2 " 12 GA TYPE A FOUNDATION

PAVEMENT MARKING LEGEND:

- A TYPE B, CLASS I, WHITE, 24" WIDTH
- B TYPE B, CLASS I, WHITE, 24" WIDTH, 24" SPACING
- C TYPE B, CLASS 1, YELLOW DOUBLE PAVEMENT LINE MARKING 4" WIDTH, WITH 4" SPACING
- D ERADICATE EXISTING PAVEMENT MARKING

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

W. CONGRESS STREET AND S. LAWRENCE STREET INTERSECTION IMPROVEMENTS
CHARLES TOWN, WEST VIRGINIA

SIGNING & MARKING PLAN

NORTH

GRAPHIC SCALE IN FEET 0 12.5 25 50

PROJECT	SHEET NO.
110845003	3E

Congress and Lawrence Intersection Improvements - 90% Design Plans
Full Intersection Summary
Opinion of Probable Cost

VDOT ITEM #	ITEM DESCRIPTION	UNITS	QUANTITY	SELECTED UNIT PRICE	TOTAL PRICE
	Full Intersection Improvements				
	GENERAL CONSTRUCTION & EARTHWORK				
303SD20-0001	Regular Excavation	CY	20	$80.00	$ 1,600.00
303SD20-0007	Borrow Excavation	CY	20	$120.00	$ 2,400.00
				SUBTOTAL	**$ 4,000.00**
	DRAINAGE AND STORMWATER MANAGEMENT ITEMS				
302SD20-0025	15" Conc. Pipe	LF	110	$160.00	$ 17,600.00
302SD20-0311	Drop Inlet DI-3B, L=4'	EA	6	$7,500.00	$ 45,000.00
302SD20-0660	Manhole MH-1	LF	0	$1,500.00	$ -
302SD20-0663	Frame & Cover MH-1	EA	4	$1,000.00	$ 4,000.00
				SUBTOTAL	**$ 66,600.00**
	PAVEMENT ITEMS				
308SD20-0012	Aggr. Base Matl. Ty. I, No. 21B	TON	53	$50.00	$ 2,650.00
515SD20-0004	Flexible Pave. Planing 0"-2"	SY	413	$10.00	$ 4,130.00
315SD20-0007	Asphalt Conc. Ty. SM-9.5A	TON	105	$180.00	$ 18,900.00
315SD20-0004	Asphalt Conc. Ty. IM-19.0A	TON	13	$200.00	$ 2,600.00
315SD20-0010	Asphalt Conc. Ty. BM-25.0A	TON	22	$210.00	$ 4,620.00
				SUBTOTAL	**$ 32,900.00**
	INCIDENTAL ITEMS				
502SD20-0011	Std. Curb CG-2	LF	257	$50.00	$ 12,850.00
520SD20-0012	Radial Curb CG-2	LF	102	$55.00	$ 5,610.00
504SD20-0002	CG-12 Detectable Warning Surface	SY	9	$550.00	$ 4,950.00
504SD20-0003	Hydr. Cement Conc. Sidewalk 4"	SY	149	$80.00	$ 11,920.00
510SX20-0002	Remove Curb	LF	231	$20.00	$ 4,620.00
508SD20-0004	Demo. Of Pavement (Flexible)	SY	312	$15.00	$ 4,680.00
412SD20-0044	Saw Cutting	LF	292	$15.00	$ 4,380.00
				SUBTOTAL	**$ 49,010.00**
	MAINTENANCE OF TRAFFIC				
NS	Maintenance of Traffic	LS	1	$10,562.10	$ 10,562.10
				SUBTOTAL	**$ 10,562.10**
	ROADSIDE DEVELOPMENT				
602SD20-0003	Topsoil, Class B 2"	ACRE	0.04	$40,000.00	$ 1,600.00
603SD20-0002	Temporary Seed	LB	8	$24.00	$ 192.00
603SD20-0003	Regular Seed	LB	10	$18.00	$ 180.00
603SD20-0004	Overseeding	LB	8	$18.00	$ 144.00
603SD20-0005	Legume Seed	LB	3	$35.00	$ 105.00
603SD20-0006	Legume Overseeding	LB	2	$33.00	$ 66.00
603SD20-0014	Fertilizer (Nitrogen - N)	LB	4	$20.00	$ 80.00
603SD20-0015	Fertilizer (Phosphorous - P)	LB	6	$20.00	$ 120.00
603SD20-0016	Fertilizer (Potassium - K)	LB	3	$20.00	$ 60.00
603SD20-0017	Lime	TON	0.2	$1,090.00	$ 218.00
NS	Tree Removal	EA	0	$500.00	$ -
				SUBTOTAL	**$ 2,765.00**
	EROSION AND SEDIMENT CONTROL				
303SD20-0031	Inlet Protection, Type B	EA	10	$500.00	$ 5,000.00
303SD20-0033	Temporary Silt Fence, Type B	LF	0	$10.00	$ -
				SUBTOTAL	**$ 5,000.00**
	SIGNING AND PAVEMENT MARKING				
701SD20-0001	Sign Panel	SF	100	$40.00	$ 4,000.00
700SD20-0037	Sign Post STP-1,2 1/2", 12 Gauge	LF	135	$28.00	$ 3,780.00
700SD20-0038	Concrete Foundation STP-1, Type A	EA	9	$550.00	$ 4,950.00
704SD20-0006	Type B Class I Pavement Line Marking 4"	LF	30	$1.60	$ 48.00
704SD20-0010	Type B Class I Pavement Line Marking 24"	LF	264	$12.00	$ 3,168.00
				SUBTOTAL	**$ 15,946.00**
				CONSTRUCTION ITEMS SUBTOTAL	**$ 186,783.10**
	CONSTRUCTION INCIDENTALS				
513SD20-0001	Mobilization	LS	1	$21,000.00	$ 21,000.00
517SD20-0001	Construction Surveying (Constr.)	LS	1	$2,000.00	$ 2,000.00
	CONTINGENCY AND CEI				
				CONSTRUCTION, RIGHT OF WAY, UTILITY SUBTOTAL	**$ 209,783.10**
				CONTINGENCY (15%)	$ 32,000.00
				CONSTRUCTION ENGINEERING & INSPECTION (15%)	$ 32,000.00
				TOTAL COST	**$ 273,783.10**

The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

VDOT ITEM #	ITEM DESCRIPTION	UNITS	QUANTITY	SELECTED UNIT PRICE	TOTAL PRICE
	Southwest Corner Improvements				
	GENERAL CONSTRUCTION & EARTHWORK				
303SD20-0001	Regular Excavation	CY	5.00	$80.00	$ 400.00
303SD20-0007	Borrow Excavation	CY	5.00	$120.00	$ 600.00
				SUBTOTAL	**$ 1,000.00**
	DRAINAGE AND STORMWATER MANAGEMENT ITEMS				
501SD20-0004	Underdrain, UD-4	LF	0	$25.00	$ -
302SD20-0025	15" Conc. Pipe	LF	19	$160.00	$ 3,040.00
302SD20-0311	Drop Inlet DI-3B, L=4'	EA	1	$7,500.00	$ 7,500.00
302SD20-0660	Manhole MH-1	LF	0	$1,500.00	$ -
302SD20-0663	Frame & Cover MH-1	EA	1	$1,000.00	$ 1,000.00
				SUBTOTAL	**$ 11,540.00**
	PAVEMENT ITEMS				
308SD20-0012	Aggr. Base Matl. Ty. I, No. 21B	TON	14	$50.00	$ 700.00
515SD20-0004	Flexible Pave. Planing 0"-2"	SY	220	$10.00	$ 2,200.00
315SD20-0007	Asphalt Conc. Ty. SM-9.5A	TON	26	$180.00	$ 4,680.00
315SD20-0004	Asphalt Conc. Ty. IM-19.0A	TON	4	$200.00	$ 800.00
315SD20-0010	Asphalt Conc. Ty. BM-25.0A	TON	6	$210.00	$ 1,260.00
				SUBTOTAL	**$ 9,640.00**
	INCIDENTAL ITEMS				
502SD20-0011	Std. Curb CG-2	LF	62	$50.00	$ 3,100.00
520SD20-0012	Radial Curb CG-2	LF	27	$55.00	$ 1,485.00
502SD20-0022	Std. Comb. Curb & Gutter CG-6	LF	0	$55.00	$ -
502SD20-0023	Rad. Comb. Curb & Gutter CG-6	LF	0	$60.00	$ -
502SD20-0029	Entrance Gutter CG-9D	SY	0	$150.00	$ -
504SD20-0002	CG-12 Detectable Warning Surface	SY	3	$550.00	$ 1,650.00
504SD20-0003	Hydr. Cement Conc. Sidewalk 4"	SY	33	$80.00	$ 2,640.00
510SX20-0002	Remove Curb	LF	57	$20.00	$ 1,140.00
508SD20-0004	Demo. Of Pavement (Flexible)	SY	72	$15.00	$ 1,080.00
412SD20-0044	Saw Cutting	LF	73	$15.00	$ 1,095.00
507SD20-0028	NS Fence	LF	0	$100.00	$ -
				SUBTOTAL	**$ 12,190.00**
	MAINTENANCE OF TRAFFIC				
NS	Maintenance of Traffic	LS	1	$2,836.54	$ 2,836.54
				SUBTOTAL	**$ 2,836.54**
	ROADSIDE DEVELOPMENT				
602SD20-0003	Topsoil, Class B 2"	ACRE	0.01	$40,000.00	$ 400.00
603SD20-0002	Temporary Seed	LB	2	$24.00	$ 48.00
603SD20-0003	Regular Seed	LB	2.5	$18.00	$ 45.00
603SD20-0004	Overseeding	LB	2	$18.00	$ 36.00
603SD20-0005	Legume Seed	LB	0.75	$35.00	$ 27.00
603SD20-0006	Legume Overseeding	LB	0.5	$33.00	$ 17.00
603SD20-0014	Fertilizer (Nitrogen - N)	LB	1	$20.00	$ 20.00
603SD20-0015	Fertilizer (Phosphorous - P)	LB	1.5	$20.00	$ 30.00
603SD20-0016	Fertilizer (Potassium - K)	LB	0.75	$20.00	$ 15.00
603SD20-0017	Lime	TON	0.05	$1,090.00	$ 55.00
NS	Tree Removal	EA	0	$500.00	$ -
				SUBTOTAL	**$ 693.00**
	EROSION AND SEDIMENT CONTROL				
303SD20-0031	Inlet Protection, Type B	EA	3	$500.00	$ 1,500.00
303SD20-0033	Temporary Silt Fence, Type B	LF	0	$10.00	$ -
NS	Tree Protection / 4' Safety Fence	LF	0	$10.00	$ -
NS	NS (Construction Entrance)	EA	0	$3,500.00	$ -
				SUBTOTAL	**$ 1,500.00**
	SIGNING AND PAVEMENT MARKING				
701SD20-0001	Sign Panel	SF	22	$40.00	$ 880.00
700SD20-0035	Sign Post STP-1,2 3/16", 10 Gauge	LF	0	$30.00	$ -
700SD20-0036	Sign Post STP-1,2 1/2", 10 Gauge	LF	0	$30.00	$ -
700SD20-0037	Sign Post STP-1,2 1/2", 12 Gauge	LF	27	$28.00	$ 756.00
700SD20-0038	Concrete Foundation STP-1, Type A	EA	2	$550.00	$ 1,100.00
700SD20-0039	Concrete Foundation STP-1, Type B	EA	0	$675.00	$ -
704SD20-0006	Type B Class I Pavement Line Marking 4"	LF	14	$1.60	$ 22.40
704SD20-0007	Type B Class I Pavement Line Marking 6"	LF	0	$1.50	$ -
704SD20-0010	Type B Class I Pavement Line Marking 24"	LF	132	$12.00	$ 1,584.00
704SD20-0047	Pvmt Symb Mrkg Sgl Turn Arrow Ty B, CL I	EA	0	$300.00	$ -
				SUBTOTAL	**$ 4,342.40**
				CONSTRUCTION ITEMS SUBTOTAL	**$ 43,741.94**
	CONSTRUCTION INCIDENTALS				
513SD20-0001	Mobilization	LS	1	$5,000.00	$ 5,000.00
517SD20-0001	Construction Surveying (Constr.)	LS	1	$1,000.00	$ 1,000.00
	RIGHT OF WAY AQUISITION				
NS	Plats, Title Reports, and Appraisals	EA	-	$ 2,500	$ -
NS	Fee Simple Right-of-Way	SF	-	$ 5.00	$ -
NS	Permanent Easements	SF	-	$ 4.00	$ -
NS	Temporary Easements	SF	-	$ 2.00	$ -
				RIGHT OF WAY SUBTOTAL	**$ -**
	CONTINGENCY AND CEI				
				CONSTRUCTION, RIGHT OF WAY, UTILITY SUBTOTAL	**$ 49,741.94**
				CONTINGENCY (15%)	$ 8,000.00
				CONSTRUCTION ENGINEERING & INSPECTION (15%)	$ 8,000.00
				TOTAL COST	**$ 65,741.94**

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VDOT ITEM #	ITEM DESCRIPTION	UNITS	QUANTITY	SELECTED UNIT PRICE	TOTAL PRICE
	Northwest Corner Improvements				
	GENERAL CONSTRUCTION & EARTHWORK				
303SD20-0001	Regular Excavation	CY	5.00	$80.00	$ 400.00
303SD20-0007	Borrow Excavation	CY	5.00	$120.00	$ 600.00
				SUBTOTAL	**$ 1,000.00**
	DRAINAGE AND STORMWATER MANAGEMENT ITEMS				
501SD20-0004	Underdrain, UD-4	LF	0	$25.00	$ -
302SD20-0025	15" Conc. Pipe	LF	14	$160.00	$ 2,240.00
302SD20-0311	Drop Inlet DI-3B, L=4'	EA	1	$7,500.00	$ 7,500.00
302SD20-0660	Manhole MH-1	LF	0	$1,500.00	$ -
302SD20-0663	Frame & Cover MH-1	EA	1	$1,000.00	$ 1,000.00
				SUBTOTAL	**$ 10,740.00**
	PAVEMENT ITEMS				
308SD20-0012	Aggr. Base Matl. Ty. I, No. 21B	TON	13	$50.00	$ 650.00
515SD20-0004	Flexible Pave. Planing 0"-2"	SY	216	$10.00	$ 2,160.00
315SD20-0007	Asphalt Conc. Ty. SM-9.5A	TON	26	$180.00	$ 4,680.00
315SD20-0004	Asphalt Conc. Ty. IM-19.0A	TON	3	$200.00	$ 600.00
315SD20-0010	Asphalt Conc. Ty. BM-25.0A	TON	5	$210.00	$ 1,050.00
				SUBTOTAL	**$ 9,140.00**
	INCIDENTAL ITEMS				
502SD20-0011	Std. Curb CG-2	LF	65	$50.00	$ 3,250.00
520SD20-0012	Radial Curb CG-2	LF	22	$55.00	$ 1,210.00
502SD20-0022	Std. Comb. Curb & Gutter CG-6	LF	0	$55.00	$ -
502SD20-0023	Rad. Comb. Curb & Gutter CG-6	LF	0	$60.00	$ -
502SD20-0029	Entrance Gutter CG-9D	SY	0	$150.00	$ -
504SD20-0002	CG-12 Detectable Warning Surface	SY	3	$550.00	$ 1,650.00
504SD20-0003	Hydr. Cement Conc. Sidewalk 4"	SY	40	$80.00	$ 3,200.00
510SX20-0002	Remove Comb. Curb and Gutter	LF	55	$20.00	$ 1,100.00
508SD20-0004	Demo. Of Pavement (Flexible)	SY	76	$15.00	$ 1,140.00
412SD20-0044	Saw Cutting	LF	69	$15.00	$ 1,035.00
507SD20-0028	NS Fence	LF	0	$100.00	$ -
				SUBTOTAL	**$ 12,585.00**
	MAINTENANCE OF TRAFFIC				
NS	Maintenance of Traffic	LS	1	$2,952.44	$ 2,952.44
				SUBTOTAL	**$ 2,952.44**
	ROADSIDE DEVELOPMENT				
602SD20-0003	Topsoil, Class B 2"	ACRE	0.01	$40,000.00	$ 400.00
603SD20-0002	Temporary Seed	LB	2	$24.00	$ 48.00
603SD20-0003	Regular Seed	LB	2.5	$18.00	$ 45.00
603SD20-0004	Overseeding	LB	2	$18.00	$ 36.00
603SD20-0005	Legume Seed	LB	0.75	$35.00	$ 27.00
603SD20-0006	Legume Overseeding	LB	0.5	$33.00	$ 17.00
603SD20-0014	Fertilizer (Nitrogen - N)	LB	1	$20.00	$ 20.00
603SD20-0015	Fertilizer (Phosphorous - P)	LB	1.5	$20.00	$ 30.00
603SD20-0016	Fertilizer (Potassium - K)	LB	0.75	$20.00	$ 15.00
603SD20-0017	Lime	TON	0.05	$1,090.00	$ 55.00
NS	Tree Removal	EA	1	$500.00	$ 500.00
				SUBTOTAL	**$ 1,193.00**
	EROSION AND SEDIMENT CONTROL				
303SD20-0031	Inlet Protection, Type B	EA	2	$500.00	$ 1,000.00
303SD20-0033	Temporary Silt Fence, Type B	LF	0	$10.00	$ -
NS	Tree Protection / 4' Safety Fence	LF	0	$10.00	$ -
NS	NS (Construction Entrance)	EA	0	$3,500.00	$ -
				SUBTOTAL	**$ 1,000.00**
	SIGNING AND PAVEMENT MARKING				
701SD20-0001	Sign Panel	SF	28	$40.00	$ 1,120.00
700SD20-0035	Sign Post STP-1,2 3/16", 10 Gauge	LF	0	$30.00	$ -
700SD20-0036	Sign Post STP-1,2 1/2", 10 Gauge	LF	41	$30.00	$ 1,230.00
700SD20-0037	Sign Post STP-1,2 1/2", 12 Gauge	LF	0	$28.00	$ -
700SD20-0038	Concrete Foundation STP-1, Type A	EA	3	$550.00	$ 1,650.00
700SD20-0039	Concrete Foundation STP-1, Type B	EA	0	$675.00	$ -
704SD20-0006	Type B Class I Pavement Line Marking 4"	LF	14	$1.60	$ 22.40
704SD20-0007	Type B Class I Pavement Line Marking 6"	LF	0	$1.50	$ -
704SD20-0010	Type B Class I Pavement Line Marking 24"	LF	132	$12.00	$ 1,584.00
704SD20-0047	Pvmt Symb Mrkg Sgl Turn Arrow Ty B, CL I	EA	0	$300.00	$ -
				SUBTOTAL	**$ 5,606.40**
				CONSTRUCTION ITEMS SUBTOTAL	**$ 44,216.84**
	CONSTRUCTION INCIDENTALS				
513SD20-0001	Mobilization	LS	1	$6,000.00	$ 6,000.00
517SD20-0001	Construction Surveying (Constr.)	LS	1	$1,000.00	$ 1,000.00
	RIGHT OF WAY AQUISITION				
NS	Plats, Title Reports, and Appraisals	EA	-	$ 2,500	$ -
NS	Fee Simple Right-of-Way	SF	-	$ 5.00	$ -
NS	Permanent Easements	SF	-	$ 4.00	$ -
NS	Temporary Easements	SF	-	$ 2.00	$ -
				RIGHT OF WAY SUBTOTAL	**$ -**
	CONTINGENCY AND CEI				
				CONSTRUCTION, RIGHT OF WAY, UTILITY SUBTOTAL	**$ 51,216.84**
				CONTINGENCY (15%)	$ 8,000.00
				CONSTRUCTION ENGINEERING & INSPECTION (15%)	$ 8,000.00
				TOTAL COST	**$ 67,216.84**

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VDOT ITEM #	ITEM DESCRIPTION	UNITS	QUANTITY	SELECTED UNIT PRICE	TOTAL PRICE
	Northeast Corner Improvements				
	GENERAL CONSTRUCTION & EARTHWORK				
303SD20-0001	Regular Excavation	CY	5.00	$80.00	$ 400.00
303SD20-0007	Borrow Excavation	CY	5.00	$120.00	$ 600.00
				SUBTOTAL	**$ 1,000.00**
	DRAINAGE AND STORMWATER MANAGEMENT ITEMS				
501SD20-0004	Underdrain, UD-4	LF	0	$25.00	$ -
302SD20-0025	15" Conc. Pipe	LF	41	$160.00	$ 6,560.00
302SD20-0311	Drop Inlet DI-3B, L=4'	EA	2	$7,500.00	$ 15,000.00
302SD20-0660	Manhole MH-1	LF	0	$1,500.00	$ -
302SD20-0663	Frame & Cover MH-1	EA	1	$1,000.00	$ 1,000.00
				SUBTOTAL	**$ 22,560.00**
	PAVEMENT ITEMS				
308SD20-0012	Aggr. Base Matl. Ty. I, No. 21B	TON	14	$50.00	$ 700.00
515SD20-0004	Flexible Pave. Planing 0"-2"	SY	227	$10.00	$ 2,270.00
315SD20-0007	Asphalt Conc. Ty. SM-9.5A	TON	27	$180.00	$ 4,860.00
315SD20-0004	Asphalt Conc. Ty. IM-19.0A	TON	4	$200.00	$ 800.00
315SD20-0010	Asphalt Conc. Ty. BM-25.0A	TON	6	$210.00	$ 1,260.00
				SUBTOTAL	**$ 9,890.00**
	INCIDENTAL ITEMS				
502SD20-0011	Std. Curb CG-2	LF	66	$50.00	$ 3,300.00
520SD20-0012	Radial Curb CG-2	LF	29	$55.00	$ 1,595.00
502SD20-0022	Std. Comb. Curb & Gutter CG-6	LF	0	$55.00	$ -
502SD20-0023	Rad. Comb. Curb & Gutter CG-6	LF	0	$60.00	$ -
502SD20-0029	Entrance Gutter CG-9D	SY	0	$150.00	$ -
504SD20-0002	CG-12 Detectable Warning Surface	SY	3	$550.00	$ 1,650.00
504SD20-0003	Hydr. Cement Conc. Sidewalk 4"	SY	40	$80.00	$ 3,200.00
510SX20-0002	Remove Curb	LF	61	$20.00	$ 1,220.00
508SD20-0004	Demo. Of Pavement (Flexible)	SY	83	$15.00	$ 1,245.00
412SD20-0044	Saw Cutting	LF	76	$15.00	$ 1,140.00
507SD20-0028	NS Fence	LF	0	$100.00	$ -
				SUBTOTAL	**$ 13,350.00**
	MAINTENANCE OF TRAFFIC				
NS	Maintenance of Traffic	LS	1	$3,033.26	$ 3,033.26
				SUBTOTAL	**$ 3,033.26**
	ROADSIDE DEVELOPMENT				
602SD20-0003	Topsoil, Class B 2"	ACRE	0.01	$40,000.00	$ 400.00
603SD20-0002	Temporary Seed	LB	2	$24.00	$ 48.00
603SD20-0003	Regular Seed	LB	2.5	$18.00	$ 45.00
603SD20-0004	Overseeding	LB	2	$18.00	$ 36.00
603SD20-0005	Legume Seed	LB	0.75	$35.00	$ 27.00
603SD20-0006	Legume Overseeding	LB	0.5	$33.00	$ 17.00
603SD20-0014	Fertilizer (Nitrogen - N)	LB	1	$20.00	$ 20.00
603SD20-0015	Fertilizer (Phosphorous - P)	LB	1.5	$20.00	$ 30.00
603SD20-0016	Fertilizer (Potassium - K)	LB	0.75	$20.00	$ 15.00
603SD20-0017	Lime	TON	0.05	$1,090.00	$ 55.00
NS	Tree Removal	EA	1	$500.00	$ 500.00
				SUBTOTAL	**$ 1,193.00**
	EROSION AND SEDIMENT CONTROL				
303SD20-0031	Inlet Protection, Type B	EA	3	$500.00	$ 1,500.00
303SD20-0033	Temporary Silt Fence, Type B	LF	0	$10.00	$ -
NS	Tree Protection / 4' Safety Fence	LF	0	$10.00	$ -
NS	NS (Construction Entrance)	EA	0	$3,500.00	$ -
				SUBTOTAL	**$ 1,500.00**
	SIGNING AND PAVEMENT MARKING				
701SD20-0001	Sign Panel	SF	22	$40.00	$ 880.00
700SD20-0035	Sign Post STP-1,2 3/16", 10 Gauge	LF	0	$30.00	$ -
700SD20-0036	Sign Post STP-1,2 1/2", 10 Gauge	LF	27	$30.00	$ 810.00
700SD20-0037	Sign Post STP-1,2 1/2", 12 Gauge	LF	0	$28.00	$ -
700SD20-0038	Concrete Foundation STP-1, Type A	EA	2	$550.00	$ 1,100.00
700SD20-0039	Concrete Foundation STP-1, Type B	EA	0	$675.00	$ -
704SD20-0006	Type B Class I Pavement Line Marking 4"	LF	16	$1.60	$ 25.60
704SD20-0007	Type B Class I Pavement Line Marking 6"	LF	0	$1.50	$ -
704SD20-0010	Type B Class I Pavement Line Marking 24"	LF	132	$12.00	$ 1,584.00
704SD20-0047	Pvmt Symb Mrkg Sgl Turn Arrow Ty B, CL I	EA	0	$300.00	$ -
				SUBTOTAL	**$ 4,399.60**
				CONSTRUCTION ITEMS SUBTOTAL	**$ 56,925.86**
	CONSTRUCTION INCIDENTALS				
513SD20-0001	Mobilization	LS	1	$7,000.00	$ 7,000.00
517SD20-0001	Construction Surveying (Constr.)	LS	1	$1,000.00	$ 1,000.00
	RIGHT OF WAY AQUISITION				
NS	Plats, Title Reports, and Appraisals	EA	-	$ 2,500	$ -
NS	Fee Simple Right-of-Way	SF	-	$ 5.00	$ -
NS	Permanent Easements	SF	-	$ 4.00	$ -
NS	Temporary Easements	SF	-	$ 2.00	$ -
				RIGHT OF WAY SUBTOTAL	**$ -**
	CONTINGENCY AND CEI				
				CONSTRUCTION, RIGHT OF WAY, UTILITY SUBTOTAL	**$ 64,925.86**
				CONTINGENCY (15%)	$ 10,000.00
				CONSTRUCTION ENGINEERING & INSPECTION (15%)	$ 10,000.00
				TOTAL COST	**$ 84,925.86**

The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

VDOT ITEM #	ITEM DESCRIPTION	UNITS	QUANTITY	SELECTED UNIT PRICE	TOTAL PRICE
	Southeast Corner Improvements				
	GENERAL CONSTRUCTION & EARTHWORK				
303SD20-0001	Regular Excavation	CY	5.00	$80.00	$ 400.00
303SD20-0007	Borrow Excavation	CY	5.00	$120.00	$ 600.00
				SUBTOTAL	**$ 1,000.00**
	DRAINAGE AND STORMWATER MANAGEMENT ITEMS				
501SD20-0004	Underdrain, UD-4	LF	0	$25.00	$ -
302SD20-0025	15" Conc. Pipe	LF	38	$160.00	$ 6,080.00
302SD20-0311	Drop Inlet DI-3B, L=4'	EA	2	$7,500.00	$ 15,000.00
302SD20-0660	Manhole MH-1	LF	0	$1,500.00	$ -
302SD20-0663	Frame & Cover MH-1	EA	1	$1,000.00	$ 1,000.00
				SUBTOTAL	**$ 22,080.00**
	PAVEMENT ITEMS				
308SD20-0012	Aggr. Base Matl. Ty. I, No. 21B	TON	14	$50.00	$ 700.00
515SD20-0004	Flexible Pave. Planing 0"-2"	SY	231	$10.00	$ 2,310.00
315SD20-0007	Asphalt Conc. Ty. SM-9.5A	TON	28	$180.00	$ 5,040.00
315SD20-0004	Asphalt Conc. Ty. IM-19.0A	TON	4	$200.00	$ 800.00
315SD20-0010	Asphalt Conc. Ty. BM-25.0A	TON	6	$210.00	$ 1,260.00
				SUBTOTAL	**$ 10,110.00**
	INCIDENTAL ITEMS				
502SD20-0011	Std. Curb CG-2	LF	65	$50.00	$ 3,250.00
520SD20-0012	Radial Curb CG-2	LF	26	$55.00	$ 1,430.00
502SD20-0022	Std. Comb. Curb & Gutter CG-6	LF	0	$55.00	$ -
502SD20-0023	Rad. Comb. Curb & Gutter CG-6	LF	0	$60.00	$ -
502SD20-0029	Entrance Gutter CG-9D	SY	0	$150.00	$ -
504SD20-0002	CG-12 Detectable Warning Surface	SY	3	$550.00	$ 1,650.00
504SD20-0003	Hydr. Cement Conc. Sidewalk 4"	SY	38	$80.00	$ 3,040.00
510SX20-0002	Remove Curb	LF	59	$20.00	$ 1,180.00
508SD20-0004	Demo. Of Pavement (Flexible)	SY	83	$15.00	$ 1,245.00
412SD20-0044	Saw Cutting	LF	75	$15.00	$ 1,125.00
507SD20-0028	NS Fence	LF	0	$100.00	$ -
				SUBTOTAL	**$ 12,920.00**
	MAINTENANCE OF TRAFFIC				
NS	Maintenance of Traffic	LS	1	$3,028.26	$ 3,028.26
				SUBTOTAL	**$ 3,028.26**
	ROADSIDE DEVELOPMENT				
602SD20-0003	Topsoil, Class B 2"	ACRE	0.01	$40,000.00	$ 400.00
603SD20-0002	Temporary Seed	LB	2	$24.00	$ 48.00
603SD20-0003	Regular Seed	LB	2.5	$18.00	$ 45.00
603SD20-0004	Overseeding	LB	2	$18.00	$ 36.00
603SD20-0005	Legume Seed	LB	0.75	$35.00	$ 27.00
603SD20-0006	Legume Overseeding	LB	0.5	$33.00	$ 17.00
603SD20-0014	Fertilizer (Nitrogen - N)	LB	1	$20.00	$ 20.00
603SD20-0015	Fertilizer (Phosphorous - P)	LB	1.5	$20.00	$ 30.00
603SD20-0016	Fertilizer (Potassium - K)	LB	0.75	$20.00	$ 15.00
603SD20-0017	Lime	TON	0.05	$1,090.00	$ 55.00
NS	Tree Removal	EA	1	$500.00	$ 500.00
				SUBTOTAL	**$ 1,193.00**
	EROSION AND SEDIMENT CONTROL				
303SD20-0031	Inlet Protection, Type B	EA	2	$500.00	$ 1,000.00
303SD20-0033	Temporary Silt Fence, Type B	LF	0	$10.00	$ -
NS	Tree Protection / 4' Safety Fence	LF	0	$10.00	$ -
NS	NS (Construction Entrance)	EA	0	$3,500.00	$ -
				SUBTOTAL	**$ 1,000.00**
	SIGNING AND PAVEMENT MARKING				
701SD20-0001	Sign Panel	SF	28	$40.00	$ 1,120.00
700SD20-0035	Sign Post STP-1,2 3/16", 10 Gauge	LF	0	$30.00	$ -
700SD20-0036	Sign Post STP-1,2 1/2", 10 Gauge	LF	41	$30.00	$ 1,230.00
700SD20-0037	Sign Post STP-1,2 1/2", 12 Gauge	LF	0	$28.00	$ -
700SD20-0038	Concrete Foundation STP-1, Type A	EA	2	$550.00	$ 1,100.00
700SD20-0039	Concrete Foundation STP-1, Type B	EA	0	$675.00	$ -
704SD20-0006	Type B Class I Pavement Line Marking 4"	LF	16	$1.60	$ 25.60
704SD20-0007	Type B Class I Pavement Line Marking 6"	LF	0	$1.50	$ -
704SD20-0010	Type B Class I Pavement Line Marking 24"	LF	132	$12.00	$ 1,584.00
704SD20-0047	Pvmt Symb Mrkg Sgl Turn Arrow Ty B, CL I	EA	0	$300.00	$ -
				SUBTOTAL	**$ 5,059.60**
				CONSTRUCTION ITEMS SUBTOTAL	**$ 56,390.86**
	CONSTRUCTION INCIDENTALS				
513SD20-0001	Mobilization	LS	1	$7,000.00	$ 7,000.00
517SD20-0001	Construction Surveying (Constr.)	LS	1	$1,000.00	$ 1,000.00
	RIGHT OF WAY AQUISITION				
NS	Plats, Title Reports, and Appraisals	EA	-	$ 2,500	$ -
NS	Fee Simple Right-of-Way	SF	-	$ 5.00	$ -
NS	Permanent Easements	SF	-	$ 4.00	$ -
NS	Temporary Easements	SF	-	$ 2.00	$ -
				RIGHT OF WAY SUBTOTAL	**$ -**
	CONTINGENCY AND CEI				
				CONSTRUCTION, RIGHT OF WAY, UTILITY SUBTOTAL	**$ 64,390.86**
				CONTINGENCY (15%)	$ 10,000.00
				CONSTRUCTION ENGINEERING & INSPECTION (15%)	$ 10,000.00
				TOTAL COST	**$ 84,390.86**

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Infrastructure Committee
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

AGENDA ITEM (ID #)

Meeting: 08/28/23
Department: Infrastructure Committee
Category: Information Only
Initiator:

2023-758: Augustine Avenue Trail

Augustine Avenue Trail

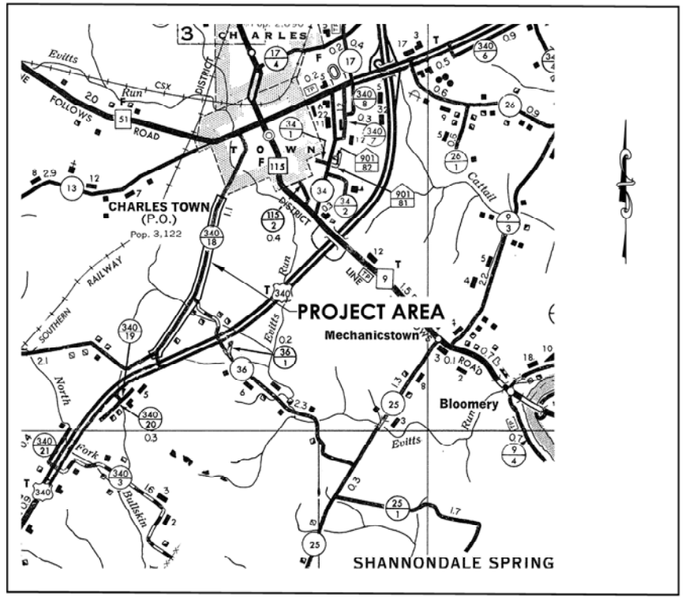
ATTACHMENTS:

- 230807 Estimate.pdf
- 8-4-23 Augustine Ave_.pdf
- Copy of 230825 Permanent Drainage Easements.xlsx

Augustine Avenue
Charles Town, Jefferson County
State Project No.: U319-CHA/RL-2.00 Federal Project No.: TAP-2017(186)DTC
August 7, 2023
PHASE 1 - Page Jackson School Road to Perry Drive
Total Project Construction Cost Estimate

ITEM NO	*ITEM DESCRIPTION*	*QUANTITY*	*UNIT*	*PRICE*	*PER UNIT*	*TOTAL COST*
201001-000	CLEARING AND GRUBBING	1	LS	$21,000.00	/LS	$21,000.00
204001-000	MOBILIZATION	1	LS	$26,250.00	/LS	$26,250.00
207001-001	UNCLASSIFIED EXCAVATION	4,546	CY	$44.75	/CY	$203,433.50
207034-000	FABRIC FOR SEPARATION	6,635	SY	$3.05	/SY	$20,236.75
240001-000	CLEAN CULVERT	307	LF	$20.12	/LF	$6,176.84
307001-000	AGGREGATE BASE COURSE, CLASS 1	1,106	CY	$70.00	/CY	$77,420.00
401001-023	MARSHALL ASPHALT BASE CRSE, SG, TYPE II	1095	TN	$150.00	/TN	$164,250.00
401002-020	MARSHALL ASPHALT WEAR CRSE, SG, TYPE I	526	TN	$160.00	/TN	$84,160.00
508008-001	SAWING EXISTING CONCRETE PAVING	198	LF	$5.00	/LF	$990.00
601002-001	CLASS B CONCRETE	5	CY	$1,315.83	/CY	$6,579.15
604037-016	18 INCH REINFORCED CONCRETE PIPE, CLASS 1	41	LF	$186.47	/LF	$7,645.27
604037-020	24 INCH REINFORCED CONCRETE PIPE, CLASS 1	5	LF	$177.04	/LF	$885.20
604050-012	15 INCH HIGH DENSITY POLYETHYLENE PIPE, PROFILE WA	26	LF	$106.60	/LF	$2,771.60
605016-001	MODIFIED MANHOLE, TYPE 1	1	EA	$5,040.88	/EA	$5,040.88
609001-001	CONCRETE SIDEWALK	5.4	SY	$150.92	/SY	$814.97
609006-001	DETECTABLE WARNING SURFACE	6	EA	$718.12	/EA	$4,308.72
636001-001	TRAFFIC CONTROL	1	LS	$12,600.00	/LS	$12,600.00
636011-001	TRAFFIC CONTROL DEVICE	15,360	UN	$1.66	/UN	$25,497.60
636022-001	CHANGEABLE MESSAGE SIGN	380	DA	$69.90	/DA	$26,562.00
636025-002	WARNING LIGHTS, TYPE B	720	DA	$3.15	/DA	$2,268.00
639001-001	CONSTRUCTION LAYOUT STAKE	1	LS	$4,200.00	/LS	$4,200.00
640005-001	MINIMAL FIELD OFFICE	6	MO	$1,268.73	/MO	$7,612.38
640003-001	BUILDING EQUIPMENT	1	LS	$4,800.00	/LS	$4,800.00
642012-001	SILT FENCE	11,942	LF	$4.35	/LF	$51,947.70
652001-001	AGRICULTURAL LIMESTONE	3	TN	$38.37	/TN	$115.11
652002-001	FERTILIZER, 10-20-10	0.8	TN	$726.92	/TN	$581.54

652003-001	SEED MIXTURES, B, C-1, OR C-2	200	LB	$28.60	/LB	$5,720.00
652003-002	SEED MIXTURE, D	134	LB	$37.15	/LB	$4,978.10
652004-001	STRAW OR HAY MULCH	4	TN	$305.43	/TN	$1,221.72
657008-001	2.00 LB CHANNEL POST	564	LF	$12.38	/LF	$6,982.32
660007-002	RECTANGULAR RAPID FLASHING BEACON ASSEMBLY	2	EA	$21,803.00	/EA	$43,606.00
661001-001	0.080 IN FLAT SHEET SIGN	158.5	SF	$24.46	/SF	$3,876.91
663001-026	EDGE LINE, TYPE II - 4 IN., WHITE	1400	LF	$0.78	/LF	$1,092.00
663005-010	STOPE LINE, TYPE V - 12 IN.	20	LF	$18.40	/LF	$368.00
663006-010	CROSSWALK LINE, TYPE V - 12IN X 6FT	105	LF	$18.50	/LF	$1,942.50
		CONSTRUCTION SUB-TOTAL =				$837,934.75
					13% E & C=	$108,931.52
		TOTAL =				$946,866.27
401001-024	MARSHALL ASPHALT BASE CRSE, S, TYPE II	1045	TN	$145.00	/TN	$151,525.00
401002-021	MARSHALL ASPHALT WEAR CRSE, S, TYPE I	502	TN	$153.43	/TN	$77,021.86



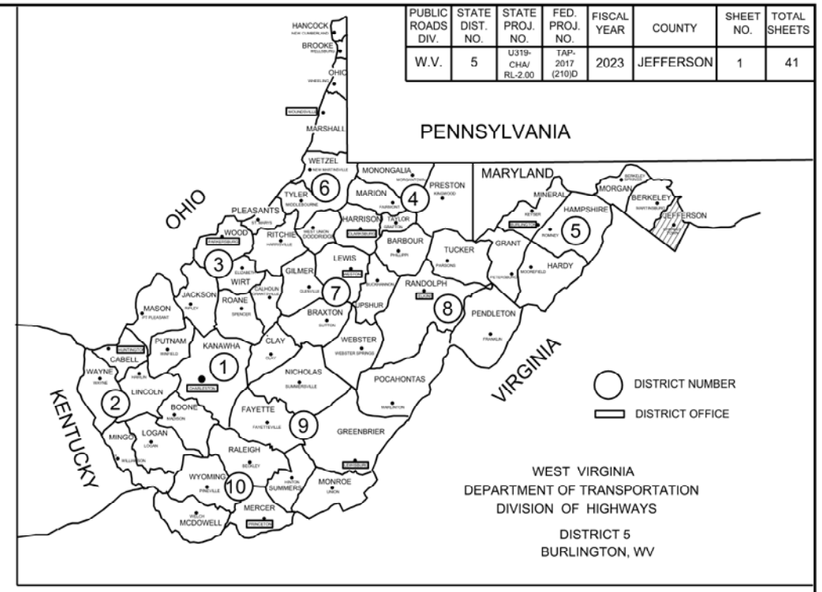
WEST VIRGINIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR CONSTRUCTION

OF

STATE HIGHWAY
FEDERAL PROJECT NO. TAP-2017(210)D
STATE PROJECT NO. U319-CHA/RL-2.00
WV COUNTY ROUTE 340/18
CHARLES TOWN, WV
JEFFERSON COUNTY

CHARLES TOWN AUGUSTINE AVE.

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	1	41



TYPE OF CONSTRUCTION

MULTI-USE PATH - PHASE 1

	STATION		STATION		LF		MILE(S)
MULTI-USE PATH	45+16.39	to	104+87.39	=	5,971	=	1.13

UTILITIES ENCOUNTERED

WATER / SEWER

CHARLES TOWN UTILITY BOARD
661 S. GEORGE STREET
SUITE 101
CHARLES TOWN, WV 25414

POWER

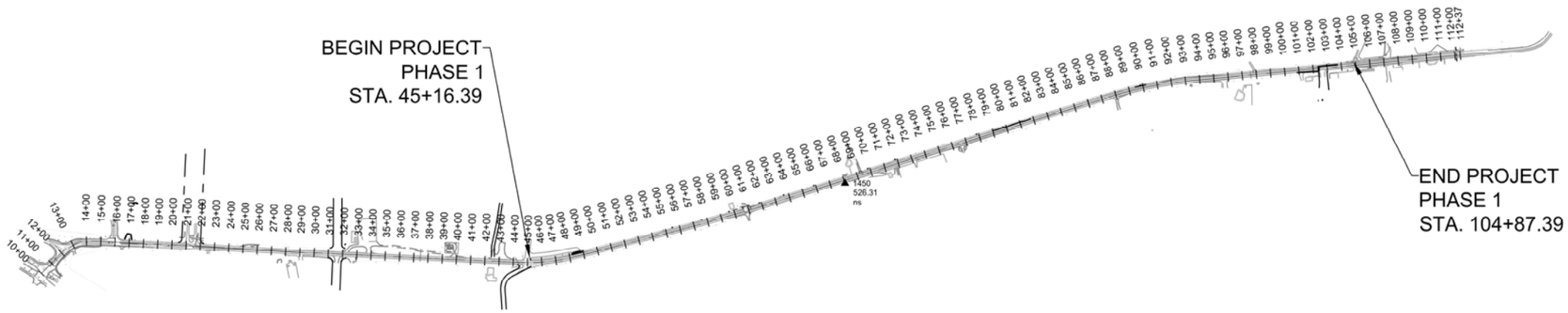
POTOMAC EDISON
901 WILSON STREET
MARTINSBURG, WV 25401
1-(304) 267-3248

CABLE

COMCAST
208 MILDRED STREET
RANSON, WV 25438

TELEPHONE

FRONTIER COMMUNICATIONS
1-(304) 271-8645



SCALE: 0 500'

CONVENTIONAL SIGNS

- STATE LINE
- COUNTY LINE
- CORPORATION LINE
- PROPOSED R/W & EASEMENT LINE
- EXISTING R/W LINE
- PROPERTY LINE
- EXISTING FENCE
- PROPOSED FENCE
- EDGE OF STREAM
- PROPOSED GUARD RAIL
- EXISTING GUARD RAIL
- RAILROAD
- SANITARY LINE (SAN)
- WATER LINE (W)
- TELEPHONE LINE (T)
- ELECTRIC LINE (OHW)
- TELEPHONE POLE
- POWER POLE
- COMBINE POWER AND TELEPHONE POLE
- TREE
- SHRUB
- RIGHT OF WAY MARKER

SCALES

PLAN HOR. 0 20 ft.
10 ft.
VERT.
PROFILE HOR. 0 10 ft.

INDEX TO SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTIONS
3	SUMMARY OF QUANTITIES
4-5	QUANTITIY TABLES
6	GENERAL NOTES
7	REFERENCE POINTS - SURVEY
8-9	MAINTENANCE OF TRAFFIC
10-15	PLAN VIEWS
16	DETAILS
17-21	SIGNING & PAVEMENT SHEETS
22-41	CROSS SECTIONS

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT U319-CHA/RL-2.00& TAP-2017(210)D.

EXECUTIVE SECRETARY

20___

PREPARED BY:
ALPHA ASSOCIATES, INC.

REG. PROF. ENG.

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
MORGANTOWN, WV 26501
PHONE/FAX: 304-296-8216
TOLL FREE: 800-640-8216
www.thinkALPHAfirst.com
PROJECT NUMBER: 2205061.00

RECOMMENDED _____ PROJECT MANAGER

RECOMMENDED FOR APPROVAL _____ STATE HIGHWAY ENGINEER

APPROVED _____ COMMISSIONER OF HIGHWAYS

SUBMITTED: AUGUST 4, 2023

PROJECT NO. U319-CHA/RL-2.00, TAP-2017(210)D

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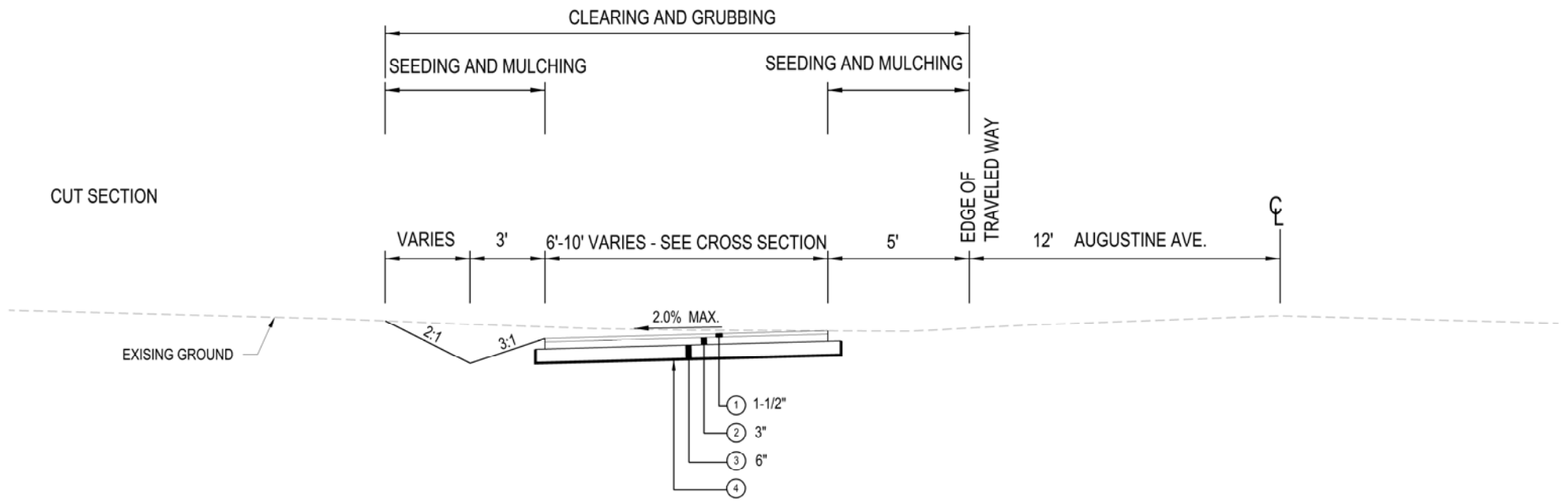
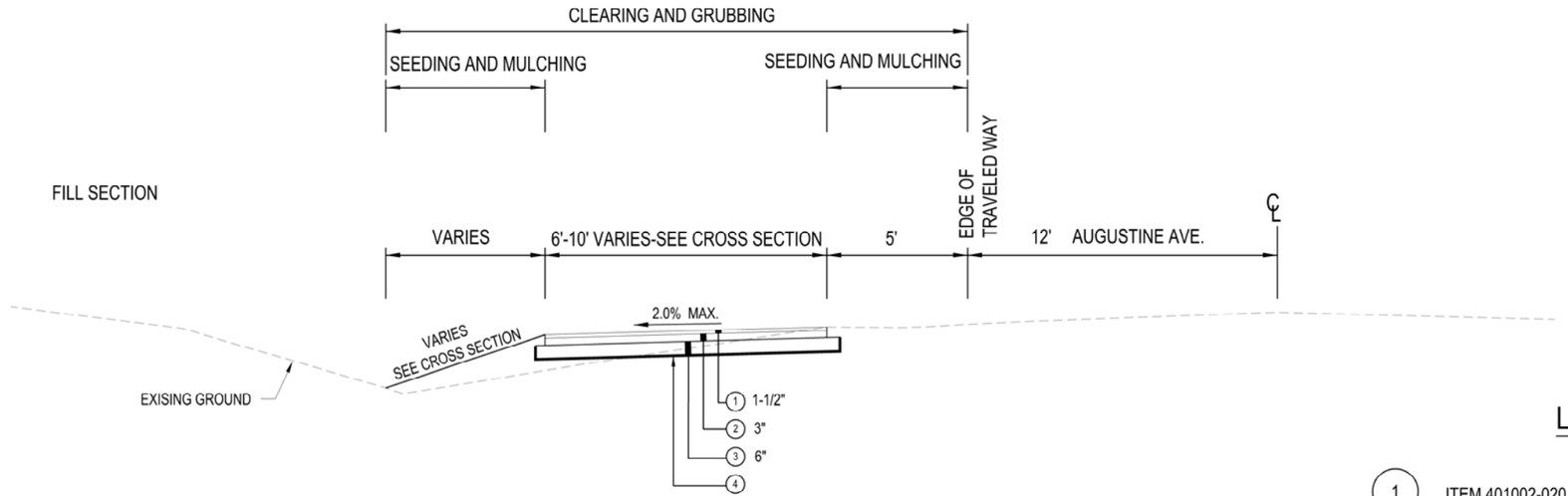
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	2	41





TYPICAL MULTI-USE PATH SECTIONS

NOT TO SCALE

LEGEND

1. ITEM 401002-020 MARSHALL ASPHALT WEARING CRSE, SG, TYPE I, TON
   ITEM 401002-021 MARSHALL ASPHALT WEARING CRSE, S, TYPE I, TON
2. ITEM 401001-023 MARSHALL ASPHALT BASE CRSE, SG, TYPE II, TON
   ITEM 401001-024 MARSHALL ASPHALT BASE CRSE, S, TYPE II, TON
3. ITEM 307001-000 AGGREGATE BASE COURSE, CLASS I, CY
4. ITEM 207034-000 FABRIC FOR SEPARATION

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
MORGANTOWN, WV 26501
PHONE/FAX: 304-296-8216
TOLL FREE: 800-640-8216
www.thinkALPHAfirst.com

ALPHA PROJECT: 2205061

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
TYPICAL SECTIONS

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	3	41

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	ALTERNATE	ITEM DESCRIPTION	UNIT	QUANTITY
		ROADWAY ITEMS		
201001-000		CLEARING AND GRUBBING	LS	1
204001-000		MOBILIZATION	LS	1
207001-001		UNCLASSIFIED EXCAVATION	CY	4546
207034-000		FABRIC FOR SEPARATION	SY	6635
240001-000		CLEAN CULVERT	LF	307
307001-000		AGGREGATE BASE COURSE, CLASS 1	CY	1106
508001-001		SAWING EXISTING CONCRETE PAVING	LF	198
601002-001		CLASS B CONCRETE	CY	5
604037-016		18 INCH REINFORCED CONCRETE PIPE, CLASS 1	LF	41
604037-020		24 INCH REINFORCED CONCRETE PIPE, CLASS 1	LF	5
604050-012		15 INCH HIGH DENSITY POLYETHYLENE PIPE	LF	26
605016-001		MODIFIED MANHOLE, TYPE 1	EA	1
609001-001		CONCRETE SIDEWALK	SY	5.42
609006-001		DETECTABLE WARNING SURFACE	EA	6
636001-001		TRAFFIC CONTROL	LS	1
636011-001		TRAFFIC CONTROL DEVICE	UNIT	15,360
636014-001		FLAGGER	HR	120
636022-001		CHANGEABLE MESSAGE SIGN	DA	380
636025-002		WARNING LIGHTS, TYPE B	DA	720

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	ALTERNATE	ITEM DESCRIPTION	UNIT	QUANTITY
639001-001		CONSTRUCTION LAYOUT STAKE	LS	1
640005-001		MINIMAL FIELD OFFICE	MO	6
640003-001		BUILDING EQUIPMENT	LS	1
642012-001		SILT FENCE	LF	11,942
652001-001		AGRICULTURAL LIMESTONE	TN	3
652002-001		FERTILIZER, 10-20-10	TN	0.8
652003-001		SEED MIXTURES, B, C-1, OR C-2	LB	200
652003-002		SEED MIXTURE, D	LB	134
652004-001		STRAW OR HAY MULCH	TN	4
657008-001		2.00 LB CHANNEL POST	LF	564
660007-002		RECTANGULAR RAPID FLASHING BEACON ASSEMBLY	EA	2
661001-001		0.080 IN FLAT SHEET SIGN	SF	158.5
663001-026		EDGE LINE, TYPE II - 4 IN., WHITE	LF	1400
663005-010		STOP LINE, TYPE V - 12 IN.	LF	20
663006-010		CROSSWALK LINE, TYPE V - 12 IN. x 6 FT.	LF	105
401002-020	AA1	MARSHALL ASPHALT WEARING CRSE, SG, TYPE I	TN	526
401002-021	AA2	MARSHALL ASPHALT WEARING CRSE, S, TYPE I	TN	502
401001-023	BB1	MARSHALL ASPHALT BASE CRSE, SG, TYPE II	TN	1095
401001-024	BB2	MARSHALL ASPHALT BASE CRSE, S, TYPE II	TN	1045

SUBMITTED: AUGUST 4, 2023

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TOLL FREE: 800-640-8216
www.thinkALPHAfirst.com

ALPHA PROJECT: 2205061

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
SUMMARY OF QUANTITIES

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	4	41

GRADING SUMMARY*

LOCATION		(1) TOTAL UNCLASSIFIED EXCAVATION ITEM 207001-001	(2) UNSUITABLE EXCAVATION	(3) USABLE EXCAVATION	(4) SHRINK OR SWELL FACTOR	(5) ADJUSTED EXCAVATION	(6) UNCLASSIFIED EMBANKMENT	(7) SELECT EMBANKMENT	(8) TOTAL EMBANKMENT	(9) EXCESS (+) OR BORROW (-)
STATION	STATION	CY	CY	CY		CY	CY	CY	CY	CY
45+16.39	46+00.00	19.01	0	19.01	0.85	16.16	4.52	0	4.52	11.64
46+00.00	47+00.00	14.70	0	14.70	0.85	12.50	7.35	0	7.35	5.15
47+00.00	48+00.00	18.30	0	18.30	0.85	15.56	3.43	0	3.43	12.13
48+00.00	48+51.59	16.24	0	16.24	0.85	13.80	0.95	0	0.95	12.85
48+51.59	49+00.00	17.03	0	17.03	0.85	14.48	0.64	0	0.64	13.84
49+00.00	50+00.00	20.63	0	20.63	0.85	17.54	17.70	0	17.70	-0.16
50+00.00	51+00.00	12.28	0	12.28	0.85	10.44	44.67	0	44.67	-34.23
51+00.00	52+00.00	10.13	0	10.13	0.85	8.61	43.44	0	43.44	-34.83
52+00.00	53+00.00	12.17	0	12.17	0.85	10.34	17.63	0	17.63	-7.29
53+00.00	54+00.00	27.07	0	27.07	0.85	23.01	2.46	0	2.46	20.55
54+00.00	55+00.00	48.44	0	48.44	0.85	41.17	0.00	0	0.00	41.17
55+00.00	56+00.00	72.22	0	72.22	0.85	61.39	0.00	0	0.00	61.39
56+00.00	57+00.00	73.35	0	73.35	0.85	62.35	0.00	0	0.00	62.35
57+00.00	58+00.00	36.76	0	36.76	0.85	31.25	17.54	0	17.54	13.71
58+00.00	59+00.00	11.87	0	11.87	0.85	10.09	61.11	0	61.11	-51.02
59+00.00	60+00.00	128.26	0	128.26	0.85	109.02	43.57	0	43.57	65.45
60+00.00	61+00.00	146.35	0	146.35	0.85	124.40	0.00	0	0.00	124.40
61+00.00	62+00.00	27.26	0	27.26	0.85	23.17	7.94	0	7.94	15.23
62+00.00	62+08.80	1.32	0	1.32	0.85	1.12	1.82	0	1.82	-0.70
62+08.80	63+00.00	19.62	0	19.62	0.85	16.68	13.38	0	13.38	3.30
63+00.00	64+00.00	37.67	0	37.67	0.85	32.02	1.89	0	1.89	30.13
64+00.00	65+00.00	73.44	0	73.44	0.85	62.42	0.00	0	0.00	62.42
65+00.00	66+00.00	110.30	0	110.30	0.85	93.76	0.00	0	0.00	93.76
66+00.00	67+00.00	106.06	0	106.06	0.85	90.15	0.00	0	0.00	90.15
67+00.00	68+00.00	57.98	0	57.98	0.85	49.28	0.00	0	0.00	49.28
68+00.00	68+33.14	34.50	0	34.50	0.85	29.33	5.32	0	5.32	24.01
68+33.14	69+00.00	96.90	0	96.90	0.85	82.37	10.73	0	10.73	71.64
69+00.00	69+29.08	23.75	0	23.75	0.85	20.19	0.00	0	0.00	20.19
69+29.08	70+00.00	52.91	0	52.91	0.85	44.97	0.00	0	0.00	44.97
70+00.00	71+00.00	81.15	0	81.15	0.85	68.98	0.00	0	0.00	68.98
71+00.00	72+00.00	49.04	0	49.04	0.85	41.68	0.11	0	0.11	41.57
72+00.00	73+00.00	32.61	0	32.61	0.85	27.72	0.44	0	0.44	27.28
73+00.00	74+00.00	28.44	0	28.44	0.85	24.17	1.94	0	1.94	22.23
74+00.00	75+00.00	18.43	0	18.43	0.85	15.67	11.28	0	11.28	4.39
75+00.00	75+08.98	3.94	0	3.94	0.85	3.35	3.29	0	3.29	0.06
75+08.98	76+00.00	47.11	0	47.11	0.85	40.04	24.95	0	24.95	15.09
76+00.00	77+00.00	41.69	0	41.69	0.85	35.44	0.46	0	0.46	34.98
77+00.00	77+36.21	19.34	0	19.34	0.85	16.44	0.00	0	0.00	16.44
77+36.21	78+00.00	46.70	0	46.70	0.85	39.70	0.00	0	0.00	39.70
78+00.00	79+00.00	162.13	0	162.13	0.85	137.81	0.00	0	0.00	137.81
79+00.00	79+37.01	48.66	0	48.66	0.85	41.36	5.03	0	5.03	36.33
79+37.01	80+00.00	121.47	0	121.47	0.85	103.25	8.56	0	8.56	94.69
80+00.00	81+00.00	309.94	0	309.94	0.85	263.45	0.00	0	0.00	263.45
81+00.00	81+40.36	64.16	0	64.16	0.85	54.54	0.43	0	0.43	54.11
81+40.36	82+00.00	80.38	0	80.38	0.85	68.32	0.64	0	0.64	67.68
82+00.00	83+00.00	147.61	0	147.61	0.85	125.47	0.00	0	0.00	125.47
83+00.00	83+36.14	22.36	0	22.36	0.85	19.01	0.00	0	0.00	19.01
83+36.14	84+00.00	24.07	0	24.07	0.85	20.46	2.05	0	2.05	18.41
84+00.00	85+00.00	10.65	0	10.65	0.85	9.05	18.22	0	18.22	-9.17
85+00.00	86+00.00	7.00	0	7.00	0.85	5.95	39.02	0	39.02	-33.07
86+00.00	86+05.20	5.05	0	5.05	0.85	4.29	3.22	0	3.22	1.07

GRADING SUMMARY*

LOCATION		(1) TOTAL UNCLASSIFIED EXCAVATION ITEM 207001-001	(2) UNSUITABLE EXCAVATION	(3) USABLE EXCAVATION	(4) SHRINK OR SWELL FACTOR	(5) ADJUSTED EXCAVATION	(6) UNCLASSIFIED EMBANKMENT	(7) SELECT EMBANKMENT	(8) TOTAL EMBANKMENT	(9) EXCESS (+) OR BORROW (-)
STATION	STATION	CY	CY	CY		CY	CY	CY	CY	CY
86+05.20	87+00.00	137.78	0	137.78	0.85	117.11	35.87	0	35.87	81.24
87+00.00	87+36.24	29.29	0	29.29	0.85	24.90	0.00	0	0.00	24.90
87+36.24	88+00.00	48.04	0	48.04	0.85	40.83	0.00	0	0.00	40.83
88+00.00	89+00.00	129.46	0	129.46	0.85	110.04	0.00	0	0.00	110.04
89+00.00	89+81.87	81.46	0	81.46	0.85	69.24	2.46	0	2.46	66.78
89+81.87	90+00.00	19.92	0	19.92	0.85	16.93	0.69	0	0.69	16.24
90+00.00	91+00.00	151.46	0	151.46	0.85	128.74	0.80	0	0.80	127.94
91+00.00	92+00.00	95.98	0	95.98	0.85	81.58	0.00	0	0.00	81.58
92+00.00	93+00.00	61.57	0	61.57	0.85	52.33	0.00	0	0.00	52.33
93+00.00	94+00.00	39.80	0	39.80	0.85	33.83	0.09	0	0.09	33.74
94+00.00	95+00.00	34.44	0	34.44	0.85	29.27	0.17	0	0.17	29.10
95+00.00	96+00.00	22.11	0	22.11	0.85	18.79	13.09	0	13.09	5.70
96+00.00	97+00.00	11.98	0	11.98	0.85	10.18	15.46	0	15.46	-5.28
97+00.00	97+59.83	85.50	0	85.50	0.85	72.68	20.16	0	20.16	52.52
97+59.83	97+90.76	46.70	0	46.70	0.85	39.70	9.67	0	9.67	30.03
97+90.76	98+00.00	5.18	0	5.18	0.85	4.40	0.00	0	0.00	4.40
98+00.00	98+83.85	52.76	0	52.76	0.85	44.85	0.00	0	0.00	44.85
98+83.85	99+00.00	23.32	0	23.32	0.85	19.82	0.00	0	0.00	19.82
99+00.00	100+00.00	212.13	0	212.13	0.85	180.31	0.00	0	0.00	180.31
100+00.00	101+00.00	196.31	0	196.31	0.85	166.86	0.00	0	0.00	166.86
101+00.00	102+00.00	121.83	0	121.83	0.85	103.56	0.00	0	0.00	103.56
102+00.00	103+00.00	96.69	0	96.69	0.85	82.19	0.00	0	0.00	82.19
103+00.00	104+00.00	73.20	0	73.20	0.85	62.22	1.00	0	1.00	61.22
104+00.00	104+30.17	25.82	0	25.82	0.85	21.95	0.30	0	0.30	21.65
104+30.17	104+71.16	38.71	0	38.71	0.85	32.90	0.00	0	0.00	32.90
104+71.16	104+87.39	5.88	0	5.88	0.85	5.00	0.00	0	0.00	5.00
	TOTALS	4545.76		4545.76		3863.90	525.49		525.49	3338.41

SUMMARY OF PAVING QUANTITIES

LOCATION		ITEM 207034-000 FABRIC FOR SEPARATION	ITEM 307001-000 AGGREGATE BASE COURSE, CLASS 1	ITEM 401001-023 MARSHALL ASPHALT BASE COURSE, STONE OR GRAVEL, TYPE II	ITEM 401002-020 MARSHALL ASPHALT WEARING COURSE, STONE OR GRAVEL, TYPE I	REMARKS
STATION	STATION	SY	CY	TN	TN	
45+16.39	104+87.39	6635	1,105.73	1,094.69	525.44	
TOTALS		6635	1,105.73	1,094.69	525.44	

SUBMITTED: AUGUST 4, 2023

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ALPHA PROJECT: 2205061

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
QUANTITY TABLES 1

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	5	41

CLEARING AND GRUBBING AND SEEDING AND MULCHING

LOCATION		CLEARING AND GRUBBING	SEEDING AND MULCHING	REMARKS
STATION	STATION	AC	AC	
45+16.39	46+00.00	0.02	0.01	
46+00.00	47+00.00	0.04	0.02	
47+00.00	48+00.00	0.04	0.02	
48+00.00	48+51.59	0.01	0.02	
48+51.59	49+00.00	0.00	0.02	
49+00.00	50+00.00	0.05	0.03	
50+00.00	51+00.00	0.06	0.04	
51+00.00	52+00.00	0.06	0.04	
52+00.00	53+00.00	0.05	0.03	
53+00.00	54+00.00	0.04	0.02	
54+00.00	55+00.00	0.05	0.02	
55+00.00	56+00.00	0.05	0.03	
56+00.00	57+00.00	0.05	0.03	
57+00.00	58+00.00	0.05	0.03	
58+00.00	59+00.00	0.06	0.04	
59+00.00	60+00.00	0.07	0.04	
60+00.00	61+00.00	0.05	0.02	
61+00.00	62+00.00	0.04	0.01	
62+00.00	62+08.80	0.004	0.002	
62+08.80	63+00.00	0.04	0.02	
63+00.00	64+00.00	0.04	0.02	
64+00.00	65+00.00	0.05	0.03	
65+00.00	66+00.00	0.06	0.03	
66+00.00	67+00.00	0.06	0.03	
67+00.00	68+00.00	0.05	0.03	
68+00.00	68+33.14	0.02	0.01	
68+33.14	69+00.00	0.04	0.03	
69+00.00	69+29.08	0.01	0.01	
69+29.08	70+00.00	0.01	0.03	
70+00.00	71+00.00	0.05	0.03	
71+00.00	72+00.00	0.05	0.02	
72+00.00	73+00.00	0.04	0.02	
73+00.00	74+00.00	0.04	0.02	
74+00.00	75+00.00	0.04	0.02	
75+00.00	75+08.98	0.005	0.003	
75+08.98	76+00.00	0.05	0.03	
76+00.00	77+00.00	0.04	0.02	
77+00.00	77+36.21	0.02	0.01	
77+36.21	78+00.00	0.03	0.02	
78+00.00	79+00.00	0.06	0.04	
79+00.00	79+37.01	0.02	0.01	
79+37.01	80+00.00	0.03	0.02	
80+00.00	81+00.00	0.07	0.05	
81+00.00	81+40.36	0.02	0.01	
81+40.36	82+00.00	0.03	0.02	
82+00.00	83+00.00	0.05	0.03	
83+00.00	83+36.14	0.01	0.01	
83+36.14	84+00.00	0.03	0.01	
84+00.00	85+00.00	0.05	0.02	
85+00.00	86+00.00	0.05	0.03	
86+00.00	86+05.20	0.00	0.00	
86+05.20	87+00.00	0.04	0.06	

CLEARING AND GRUBBING AND SEEDING AND MULCHING

LOCATION		CLEARING AND GRUBBING	SEEDING AND MULCHING	REMARKS
STATION	STATION	AC	AC	
87+00.00	87+36.24	0.02	0.01	
87+36.24	88+00.00	0.03	0.02	
88+00.00	89+00.00	0.06	0.04	
89+00.00	89+81.87	0.05	0.03	
89+81.87	90+00.00	0.01	0.006	
90+00.00	91+00.00	0.07	0.05	
91+00.00	92+00.00	0.06	0.04	
92+00.00	93+00.00	0.05	0.03	
93+00.00	94+00.00	0.05	0.02	
94+00.00	95+00.00	0.04	0.02	
95+00.00	96+00.00	0.05	0.02	
96+00.00	97+00.00	0.05	0.02	
97+00.00	97+59.83	0.04	0.03	
97+59.83	97+90.76	0.01	0.02	
97+90.76	98+00.00	0.002	0.004	
98+00.00	98+83.85	0.04	0.02	
98+83.85	99+00.00	0.01	0.01	
99+00.00	100+00.00	0.07	0.05	
100+00.00	101+00.00	0.07	0.05	
101+00.00	102+00.00	0.06	0.04	
102+00.00	103+00.00	0.06	0.04	
103+00.00	104+00.00	0.05	0.03	
104+00.00	104+30.17	0.02	0.01	
104+30.17	104+71.16	0.02	0.01	
104+71.16	104+87.39	0.003	0.001	
	TOTALS	2.99	1.84	

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
QUANTITY TABLES 2

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	6	41

GOVERNING SPECIFICATIONS

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS ROADS AND BRIDGES, JANUARY 1, 2023 , THE CONTRACT DOCUMENTS, AND THE CONTRACT PLANS ARE THE GOVERNING PROVISIONS APPLICABLE TO THIS PROJECT.

THE FOREST SERVICE TRAIL ACCESSIBILITY GUIDELINES (FASTAG), THE FOREST SERVICE OUTDOOR RECREATION ACCESSIBILITY GUIDELINES (FSORAG), THE US FOREST SERVICE TRAIL FUNDAMENTALS AND TRAIL MANAGEMENT OBJECTIVES,THE ABA ACCESSIBILITY GUIDELINES (EFFECTIVE NOVEMBER 2013) ARE APPLICABLE TO THIS PROJECT.

THE ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY (PROWAG) SHALL BE APPLICABLE TO THIS PROJECT.

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS (WVDOH) STANDARD DETAILS BOOK, VOLUME 1, DATED MAY 2016 WITH REVISIONS THROUGH DECEMBER 2021, IS HEREBY INCORPORATED INTO THESE PLANS EXCEPT AS OTHERWISE NOTED.

NOTICE TO CONTRACTORS

IT IS TO BE ANTICIPATED THAT OTHER CONTRACTORS MAY BE WORKING IN THIS AREA, AND IT IS IMPERATIVE THAT A STRICT PLAN OF COORDINATION BETWEEN CONTRACTORS BE AGREED ON IN REFERENCE TO WORKING PLANS AND STORAGE AREAS. THIS PLAN OF COORDINATION WILL BE PRESENTED TO THE PROJECT ENGINEER IN WRITING FOR REVIEW. THE CONTRACTOR SHALL COORDINATE WITH AND ALLOW ACCESS TO ALL OTHER CONTRACTORS.

EXISTING UTILITIES

THE LOCATION AND/OR ELEVATIONS OF ALL KNOWN UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON THE BEST AVAILABLE INFORMATION FROM EXISTING PLANS AND FROM FIELD INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE STATUS AND LOCATION OF EACH UTILITY PRIOR TO BEGINNING WORK AND TO TAKE THE NECESSARY PRECAUTIONS TO AVOID DAMAGE TO THESE UTILITIES. IN THE EVENT OF DAMAGE OR DISRUPTION OF THESE UTILITIES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY AN OFFICIAL OF THE AFFECTED UTILITY AND LEND ALL POSSIBLE ASSISTANCE IN RESTORING SERVICE. THE CONTRACTOR SHALL ASSUME ALL COSTS ASSOCIATED WITH THE REPAIR AND INTERRUPTION OF SUCH SERVICES.

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-245-4848 AT LEAST 72 HOURS BEFORE COMMENCING WORK ON THIS PROJECT.

HMA PAVEMENT MIX

ALL HMA PAVEMENT FOR THIS PROJECT SHALL BE A MEDIUM MIX DESIGN.

BENCH MARKS

THE CONTRACTOR SHALL HOLD BENCH MARK LOCATIONS THROUGHOUT THE LIFE OF THE PROJECT. IN THE EVENT THAT A BENCH MARK IS DISTURBED, THE CONTRACTOR, AS DIRECTED BY THE PROJECT ENGINEER, WILL RELOCATE OR REESTABLISH THE BENCH MARK. NO ADDITIONAL PAYMENT OR COMPENSATION WILL BE MADE FOR THIS WORK.

ELEVATIONS

ALL ELEVATIONS SHOWN REFER TO NAVD 1988 DATUM.

COORDINATES

ALL COORDINATES SHOWN ARE WEST VIRGINIA STATE PLANE NORTH ZONE NAD 83 (2001).

EXISTING MANHOLES

ALL EXISTING MANHOLES TO BE ADJUSTED, AND OTHER UTILITIES WITHIN THE PROJECT AREA SHALL BE INCIDENTAL TO ITEM 201001-000 CLEARING AND GRUBBING.

EROSION AND SEDIMENT CONTROL

THE CONTRACTOR SHALL BE RESPONSIBLE FOR WATER QUALITY THROUGHOUT THE DURATION OF CONSTRUCTION IN ACCORDANCE WITH THE GENERAL WEST VIRGINIA/NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) WATER POLLUTION CONTROL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES, PERMIT NUMBER WV0115924 ISSUED JANUARY 10, 2019 BY THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP), AND ANY MODIFICATION(S) THERE TO. THE NPDES PERMIT EXPIRES FEBRUARY 9, 2024.

THE CONTRACTOR SHALL DEVELOP A SITE-SPECIFIC STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THIS PROJECT BASED ON THE CONTRACTOR(S) MEANS AND METHODS, AND IN ACCORDANCE WITH THE WVDEP EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL (2006 EDITION, REVISED AUGUST 29, 2016) AND THE NPDES PERMIT. THE CONTRACTOR(S) SWPPP SHALL INCLUDE ALL EROSION AND SEDIMENT CONTROL DETAILS INCLUDED IN THE CONSTRUCTION PLANS AND DETAILS OF ADDITIONAL OR ALTERNATE BEST MANAGEMENT PRACTICES (BMPS)/ENHANCED BMPS PROPOSED BY THE CONTRACTOR.

THE CONTRACTOR SHALL PREPARE A GROUNDWATER PROTECTION PLAN (GPP) AS A SEPARATE, STAND-ALONE DOCUMENT SIGNED BY A COMPANY OFFICER. THE GPP WILL INCLUDE A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN AND, IF THE PROJECT IS LOCATED IN AN AREA KNOWN TO HAVE KARST TOPOGRAPHY, A KARST MITIGATION PLAN (KMP) IS REQUIRED. THE CONTRACTOR MAY USE THE KMP TEMPLATE PROVIDED BY THE WVDOH OR DEVELOP AND SUBMIT AN ALTERNATIVE KMP.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SPECIFIC EROSION AND SEDIMENT CONTROL (ESC) FEATURES BASED ON THE CONTRACTOR(S) MEANS, METHODS, AND PHASING. THE CONTRACTOR(S) SWPPP SHALL PROVIDE THE LOCATION OF THE ESC FEATURES INCLUDING BUT NOT LIMITED TO SEDIMENT TRAPS, ACCESS ROADS, INTERNAL CONTROLS, ETC. THE ESC FEATURES SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE WVDEP EROSION ANS SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL (2006 EDITION, REVISED AUGUST 29, 2016). DETAILS IN THE PLANS, THE CONDITIONS OF THE NPDES PERMIT AND THE MANUFACTURER(S) RECOMMENDATIONS (AS APPLICABLE).

ENHANCED BMPS SHALL BE USED ON THIS PROJECT, INCLUDING BUT NOT LIMITED TO:
* INSPECTION OF ALL ESC BMPS WITHIN THE PROJECT AREA BY A QUALIFIED PERSON AT LEAST ONCE EVERY FOUR (4) CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY PRECIPITATION EVENT OF 0.25 INCHES OR GREATER PER 24 HOUR PERIOD OR THE OCCURRENCE OF RUNOFF FROM SNOWMELT SUFFICIENT TO CAUSE A DISCHARGE.
* REPAIRS OR MAINTENANCE OF ANY DEFECTIVE BMPS IDENTIFIED DURING THE INSPECTION SHALL BE PERFORMED WITH IN 24 HOURS. HOWEVER, PERMITTEES MUST IMPLEMENT ALTERNATE BMPS PRIOR TO STORM EVENTS WHILE AWAITING REPAIR OF THE PRIMARY ENHANCED BMP.
* TEMPORARY SEEDING AND MULCHING OF DISTURBED AREAS WITHIN FOUR (4) DAYS WHEN THOSE AREAS WILL NOT BE RE-DISTURBED FOR MORE THAN 14 DAYS.
* PERMANENT SEEDING AND MULCHING WITHIN FOUR (4) DAYS OF REACHING FINAL GRADE.
* FINAL STABILIZATION WITHIN FOUR (4) DAYS AFTER CONSTRUCTION HAS BEEN COMPLETE.

THE CONTRACTOR SHALL PROVIDE THE WVDOH WITH A COPY OF THE SWPPP, GPP, KMP (IF REQUIRED), AND THE ORIGINAL CO-APPLICANT/PERMITTEE *1 SIGNATURE PAGE SIGNED BY AN OFFICER OF THE COMPANY OR A DESIGNEE. A DESIGNEE MAY HAVE SIGNATURE AUTHORITY IF A CORPORATE OFFICER PROVIDES A LETTER OF DESIGNATED AUTHORITY. THE WVDOH WILL PREPARED AND SUBMIT AN APPLICATION TO MODIFY THE NPDES PERMIT REGISTRATION ADDING THE SWPPP, GPP, KMP (IF REQUIRED), THE WVDOH CO-APPLICANT/PERMITTEE *2 SIGNATURE PAGE, AND THE CONTRACTOR(S) CO-APPLICANT/PERMITTEE *1 SIGNATURE PAGE.

EARTH DISTURBING ACTIVITIES SHALL NOT BE INITIATED UNTIL THE WVDEP HAS APPROVED THE NPDES PERMIT MODIFICATION, SWPPP, GPP, AND KMP (IF REQUIRED). THE WVDOH WILL NOT BE RESPONSIBLE FOR ANY DELAYS IN OBTAINING WVDEP APPROVAL OF THE NPDES PERMIT MODIFICATIONS DUE TO THE TIMELESS OF WVDEP(S) REVIEW OR THE CONTRACTOR(S) FAILURE TO PROVIDE A COMPLETE SWPPP, GPP, KMP (IF REQUIRED) OR SUBMIT CORRECTIONS AND/OR ADDITIONAL INFORMATION REQUIRED BY WVDEP IN A TIMELY MANNER. ANY ADDITIONAL/FUTURE NPDES PERMIT REGISTRATION MODIFICATION APPLICATIONS SHALL BE SUBMITTED BY THE CONTRACTOR THROUGH THE WVDEP ELECTRONIC SUBMISSION SYSTEM (ESS).

THE CONTRACTOR SHALL HAVE THE PRIMARY RESPONSIBILITY FOR COMPLIANCE WITH THE NPDES PERMIT.

IF ANY OF THE COMPONENTS OF THE APPROVED SWPPP PROVE INEFFECTIVE AT MINIMIZING OR PREVENTING SEDIMENT LADEN STORMWATER FROM LEAVING THE PROJECT SITE, THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL BMPS, MODIFY THE SWPPP, AND MODIFY THE NPDES PERMIT REGISTRATION TO PROVIDE A MORE EFFECTIVE MEANS OF CONTROLLING/ELIMINATING EROSION AND SILTATION FROM THE STORMWATER RUNOFF. IF APPROVED BMPS ARE INEFFECTIVE AT PROTECTING RECEIVING WATERS AND THE CONTRACTOR IS UNABLE TO IDENTIFY AND EMPLOY BMPS CAPABLE OF PREVENTING SEDIMENT LADEN RUNOFF FROM LEAVING THE PROJECT SITE, THE CONTRACTOR SHALL IMMEDIATELY CEASE FURTHER LAND DISTURBANCE UNTIL SUCH TIME THAT THE UNAUTHORIZED DISCHARGE CEASES.

IN THE EVENT THAT TEMPORARY EROSION AND POLLUTION CONTROL MEASURES ARE ORDERED BY THE ENGINEER DUE TO THE CONTRACTOR'S NEGLIGENCE, CARELESSNESS, OR FAILURE TO INSTALL PERMANENT CONTROLS AS PART OF THE WORK SCHEDULED, SUCH WORK SHALL BE PERFORMED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FUTURE NPDES PERMIT MODIFICATION APPLICATION FEES, ANNUAL RENEWAL FEES, AND PENALTIES/FINES/CONSENT ORDERS ASSOCIATED WITH THE NPDES PERMIT REGISTRATION UNTIL SUCH TIME THE CONTRACTOR IS RELEASED FROM THE CONSTRUCTION CONTRACT.

THE CONTRACTOR SHALL ESTABLISH ESC PLAN FEATURES AT THE EARLIEST POSSIBLE DATE. THE CONTRACTOR(S) FIRST ORDER OF WORK IS THE INSTALLATION OF SEDIMENT STRUCTURES AND BMPS/ENHANCED BMPS SUCH AS SUPER SILT FENCE, STABILIZED CLEAN STORMWATER DIVERSIONS, ETC. INITIAL CLEARING AND GRUBBING SHALL BE LIMITED TO WHAT IS NECESSARY TO ESTABLISH THE ESC PLAN FEATURES FOR THE PROPOSED DISTURBED AREA.

THE CONTRACTOR SHALL ENSURE THAT ALL ESC FEATURES ON THE PROJECT ARE INSPECTED AS REQUIRED BY THE NPDES PERMIT. THE CONTRACTOR SHALL REPLACE, CLEAN, AND/OR INSTALL ADDITIONAL ESC FEATURES, AS NECESSARY, TO REMAIN IN COMPLIANCE WITH THE NPDES PERMIT.

EROSION AND SEDIMENT CONTROL (CONT.)

IF OFF-SITE WASTE AND/OR BORROW AREAS ARE PROPOSED, THE CONTRACTOR AND/OR PROPERTY OWNER SHALL BE RESPONSIBLE TO APPLY FOR NPDES REGISTRATION OF ANY OFF-SITE WASTE AND/OR BORROW SITES (IF APPLICABLE). A COPY OF THE NPDES REGISTRATION AND ANY MODIFICATION(S) THERETO, AS WELL AS THE APPROVED SWPPP, GPP, ESC PLAN, AND SPILL PREVENTION, CONTROL AND COUNTERMEASURES PLAN, SHALL BE KEPT ON-SITE AND AVAILABLE FOR REVIEW AT ALL TIMES BY THE CONTRACTOR(S) EMPLOYEES, WVDOH. RESOURCE AGENCIES OR OTHER INTERESTED PARTIES UPON DEMAND, WVDOH SHALL NOT BE A CO-APPLICANT/PERMITTEE ON WASTE AND/OR BORROW SITES LOCATED OUTSIDE OF WVDOH RIGHT OF WAY.

FLOCCULANTS, OR OTHER TREATMENT CHEMICALS MAY BE USED ONLY IN ACCORDANCE WITH GOOD ENGINEERING PRACTICES AND THE MANUFACTURER/SUPPLIER SPECIFICATIONS. DOSING RATES SHALL BE SPECIFIED AND MATERIAL SAFETY DATA SHEETS (MSDS) SHALL BE INCLUDED IN THE CONTRACTOR(S) SWPPP AND GPP, MAINTAINED ON SITE, AND AVAILABLE FOR INSPECTION.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR QUARTERLY TRAINING OF ALL ON-SITE PERSONNEL ON SPILL AND LEAK RESPONSE, INTERNAL REPORTING, GOOD HOUSEKEEPING, ROUTINE INSPECTION, AND MAINTENANCE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NPDES PERMIT, SWPPP, AND GPP.

PERIODIC INSPECTIONS OF THE SITE AND ESC BMPS WILL BE CONDUCTED BY REPRESENTATIVES OF THE WVDEP TO ENSURE COMPLIANCE WITH THE CONDITIONS AND REQUIREMENTS OF THE NPDES PERMIT. REPRESENTATIVES OF OTHER RESOURCE AGENCIES MAY ALSO CONDUCT SITE INSPECTIONS THROUGHOUT THE LIFE OF THE CONSTRUCTION CONTRACT.

WATER QUALITY

FOR THE DURATION OF CONSTRUCTION, THE PROJECT ENGINEER WILL WORK CLOSELY WITH THE CONTRACTOR SUPERINTENDENT. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE FOLLOWING:

- IMPLEMENTING AND MAINTAINING THE EROSION CONTROL PLAN.
- DIRECTING THE CONSTRUCTION, OPERATION, AND DISMANTLING OF TEMPORARY EROSION CONTROL FEATURES.
- IMPLEMENTING REMEDIAL ACTION REQUIRED TO REPAIR FAILING EROSION AND SEDIMENTATION CONTROL FEATURES.
- IMPLEMENTING STORM AND WINTER SHUTDOWN PROCEDURES.
- SHAPING EARTHWORK PRIOR TO THE SUSPENSION OF GRADING OPERATIONS EACH DAY IN A MANNER THAT WILL PERMIT STORM RUNOFF WITH A MINIMUM OF EROSION.
- OPERATING AND MAINTAINING EROSION CONTROL FEATURES IN AN ACCEPTABLE MANNER.
- CLEANING AND RESTORING, TO ITS ORIGINAL CONDITION, ANY EROSION OR SEDIMENT CONTROL FEATURE THAT HAS REACHED HALF OF ITS CAPACITY.

THE CONTRACTOR WILL BE REQUIRED TO PREPARE A SPILL PREVENTION, CONTROL AND COUNTERMEASURES (SPCC) PLAN THAT ITEMIZES SPECIFIC MEASURES THAT WILL BE IMPLEMENTED TO PREVENT AND CLEAN UP CHEMICAL AND PETROLEUM PRODUCT SPILLS THAT MAY OCCUR DURING ALL PHASES OF PROJECT CONSTRUCTION. FUEL STORAGE AND REFUELING ACTIVITIES, EQUIPMENT MAINTENANCE ACTIVITIES, AND EQUIPMENT WASHING WILL BE KEPT AT LEAST 500 FEET AWAY FROM ANY PERENNIAL OR INTERMITTENT WATERCOURSE OR WETLAND.

DRAINAGE

THE CONTRACTOR SHALL MAINTAIN WORKING STORM DRAINAGE SYSTEMS THROUGHOUT THE WORK AREAS AT ALL TIMES DURING CONSTRUCTION. THE WORKING SYSTEM MAY CONSIST OF THE EXISTING STORM DRAINAGE SYSTEM, THE PROPOSED STORM DRAINAGE SYSTEM, OR A COMBINATION THEREOF. DRAINAGE PIPES FOR THE PROPOSED SYSTEMS SHALL BE CONSTRUCTED IN SECTION LENGTHS NECESSARY TO MAINTAIN THE LANES OF TRAFFIC INDICATED IN THE MAINTENANCE OF TRAFFIC NOTES OR DESIGNATED BY THE PROJECT SUPERVISOR. NO ADDITIONAL PAYMENT OR COMPENSATION WILL BE MADE FOR THIS WORK.

ALL PIPES TO REMAIN SHALL BE CONNECTED TO THE DRAINAGE SYSTEM OR HAVE A POSITIVE OUTLET.

ALL DRAINAGE OUTLET STRUCTURES SHALL BE FIELD ADJUSTED AS REQUIRED TO MATCH THE EXISTING GROUND AS DIRECTED BY THE ENGINEER.

ALL EXISTING DRAINAGE FACILITIES SHALL BE FIELD VERIFIED BY THE CONTRACTOR.

WHERE THE EXISTING CULVERTS UNDER ROADWAYS WITHIN WORK LIMITS ARE TO REMAIN, THE CULVERTS ARE TO REMAIN OPEN AND ARE TO BE CLEANED. THE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 240001-000, "CLEAN CULVERTS."

ALL DITCHES SHALL BE LINED WITH TYPE A MATTING UNLESS OTHERWISE NOTED.

PAVEMENT UNDERCUT

WHEN MATERIAL IS ENCOUNTERED AT SUBGRADE ELEVATION WHICH CANNOT BE COMPACTED TO THE REQUIRED DENSITY, IT SHALL BE UNDERCUT AND BACKFILLED WITH SELECT EMBANKMENT. THE VOLUME EXCAVATED SHALL BE PAID FOR AS ITEM 207001-001, UNCLASSIFIED EXCAVATION. THE BACKFILL SHALL BE SELECT EMBANKMENT. IF SELECT EMBANKMENT IS NOT AVAILABLE OR NOT ENOUGH QUANTITY IS AVAILABLE, THE ADDITIONAL NEEDED SELECT EMBANKMENT SHALL BE PAID FOR UNDER ITEM 211002-000, ROCK BORROW EXCAVATION. THE TOP 6" OF THE BACKFILL SHALL BE MADE WITH PARTICLES NOT LARGER THAN 3". THE DECISION FOR UNDERCUTTING AND THE DEPTH OF UNDERCUT WILL BE DETERMINED BY THE ENGINEER.

SIGNS -

ALL SIGNS WITHIN THE PROJECT AREA ARE TO BE REMOVED AND RESET INCIDENTAL TO ITEM #201001-000 CLEARING AND GRUBBING.

LEGEND

EXISTING	PROPOSED
INDEX CONTOUR	INDEX CONTOUR
INTERMEDIATE CONTOUR	INTERMEDIATE CONTOUR
WATERLINE	STORM SEWER
SANITARY SEWER LINE	STEAM LINE
OVERHEAD ELECTRIC	PROPERTY LINE
UNDERGROUND ELECTRIC	FENCE
OVERHEAD UTILITIES	GUARD RAIL
GAS LINE	SILT FENCE
STORM SEWER	LIMITS OF DISTURBANCE
STEAM LINE	DEMOLITION LINE
PROPERTY LINE	UTILITY POLE
FENCE	POLE MOUNTED LIGHT
GUARD RAIL	FIRE HYDRANT
	WATER VALVE
UTILITY POLE	SANITARY SEWER MANHOLE
LIGHT POLE	INLET PROTECTION
CONTROL POINTS	CONCRETE/SIDEWALK
FIRE HYDRANT	
SANITARY SEWER MANHOLE	
CONCRETE/SIDEWALK	

ABBREVIATIONS

AC	ACRES
BLDG	BUILDING
CONC	CONCRETE
CMP	CORRUGATED METAL PIPE
CRBF	CAPPED REBAR FOUND
DB	DEED BOOK
ELEV	ELEVATION
EX	EXISTING
FFE	FIRST FLOOR ELEVATION
GM	GAS METER
HDPE	HIGH DENSITY POLYETHYLENE
INV	INVERT
LF	LINEAR FEET
LT	LEFT
N/F	NOW OR FORMERLY
PCL	PARCEL
PG	PAGE
PROP	PROPOSED
RCP	REINFORCED CONCRETE PIPE
R/W	RIGHT-OF-WAY
RR	RAILROAD
RT	RIGHT
SF	SQUARE FEET
STA	STATION
SWM	STORM WATER MANAGEMENT
TBR	TO BE REMOVED
TBRL	TO BE RELOCATED
TM	TAX MAP
TYP	TYPICAL
WM	WATER METER
W/	WITH

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
GENERAL NOTES

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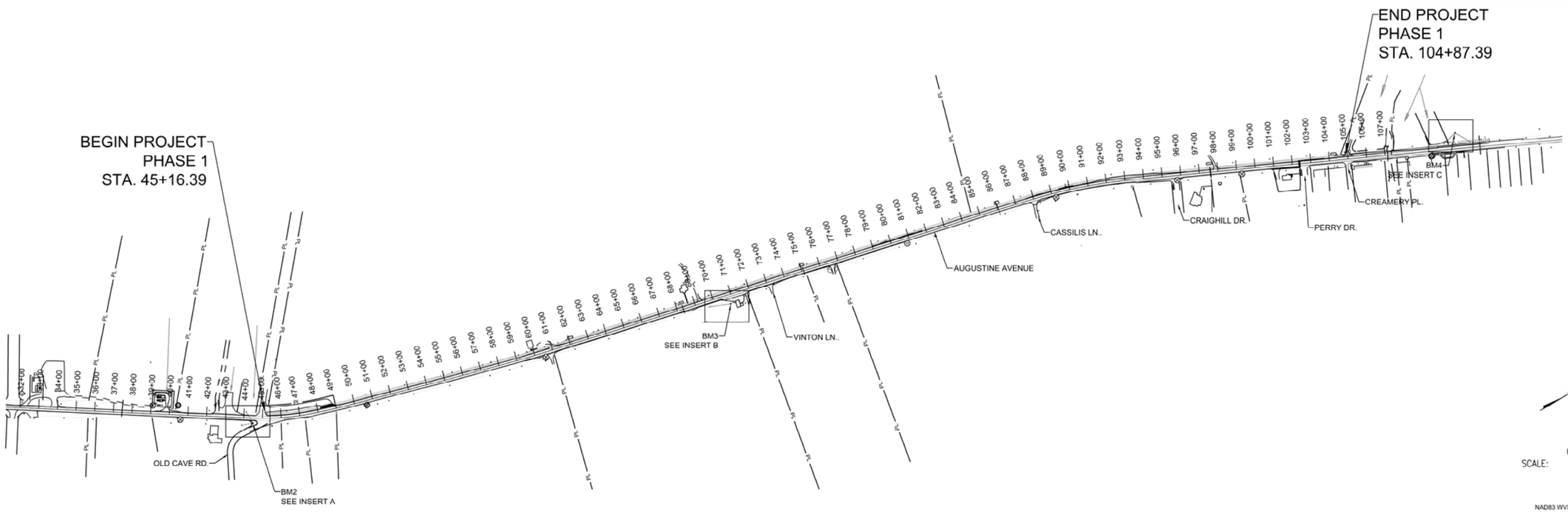
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	7	41



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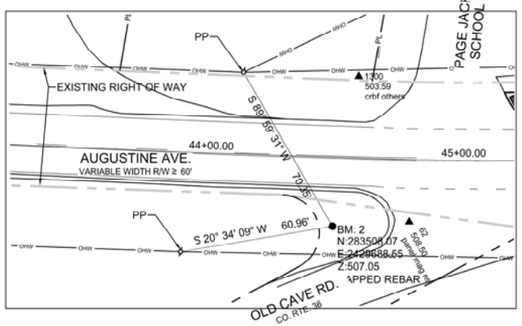

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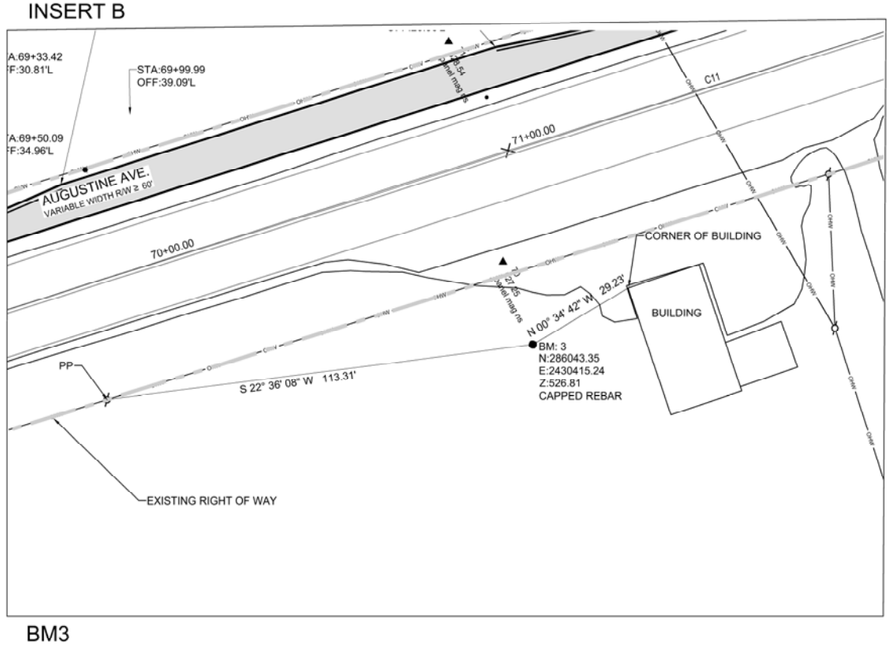

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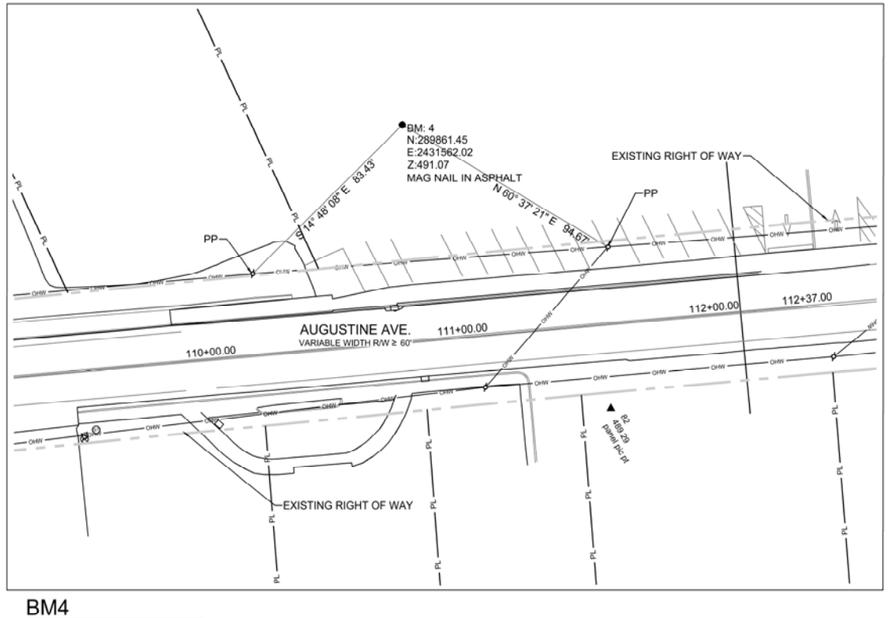

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
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CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
REFERENCE POINTS

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
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TEMPORARY TRAFFIC CONTROL PLAN

TEMPORARY TRAFFIC CONTROL NOTES

1. MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH SECTION 636 OF THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS, ROADS AND BRIDGES, JANUARY 1, 2023, THE CONTRACT DOCUMENTS AND THE CONTRACT PLANS ARE THE GOVERNING PROVISIONS APPLICABLE TO THIS PROJECT, AND THE "MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS" 2006 EDITION, WHICH IS MADE PART OF THIS CONTRACT AND THE TRAFFIC PLAN FOR INDIVIDUAL SEGMENTS AS DESCRIBED BELOW:

2. REFLECTIVE SHEETING ON TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE OF NEW CONDITION AT THE BEGINNING OF THE PROJECT LIFE. THIS TO ENSURE THAT NIGHT VISIBILITY AND LEGIBILITY SHALL BE MAINTAINED.

3. WHEN COVERING EXISTING SIGNS THE CONTRACTOR HAS THE OPTION OF USING:
   - A. HEAVY DUTY BLACK OVERLAY (PLASTIC OR BURLAP TYPE)
   - B. THIN WOOD OVERLAY (E.G. PLYWOOD)
   - C. TAKING SIGNS DOWN AND REINSTALLING WHEN APPROPRIATE.
   - D. ANY DAMAGES CAUSED BY ABOVE-NAMED SHALL BE REPLACED/REPAIRED TO ORIGINAL CONDITION AT CONTRACTORS EXPENSE.
   - E. ALL ABOVE OPERATIONS SHALL BE BID INCIDENTAL TO ITEM 636011-001.

4. ACCESS TO ALL HOUSES AND BUSINESSES SHALL BE MAINTAINED AT ALL TIMES.

5. WORK ZONE SPEED LIMIT SIGNS (R2-1M; 25 MPH) SHALL BE INSTALLED FOR THIS PROJECT. THIS SIGN SHALL BE DUAL INSTALLED 500 FT. IN ADVANCE OF THE "SHOULDER CLOSED 1000 FT." SIGN. ANOTHER SIGN (R2-IM) SHALL BE INSTALLED 500 FT. AFTER THE BEGINNING OF THE FULL SHOULDER CLOSURE AND ONE EVERY 1/2 MILE FOR THE FULL LENGTH OF THE SHOULDER CLOSURE. ALL EXISTING SPEED LIMIT SIGNS WITHIN THIS CLOSURE SHALL BE COVERED. ALL WORK ZONE SPEED LIMIT SIGNS WITHIN THE CLOSURE SHALL BE MOUNTED ON THE RIGHT SIDE OF THE OPEN LANE.

6. EXISTING SIGNS
   ANY SUCH EXISTING FACILITIES MODIFIED, REMOVED OR DAMAGED BY THE CONTRACTOR SHALL BE REPLACED TO ITS ORIGINAL CONDITION BY THE CONTRACTOR AT HIS EXPENSE AND SUCH SHALL BE BID INCIDENTAL TO ITEM 636011-001.

7. NOTICE TO CONTRACTORS
   IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TRAFFIC CONTROL WITH ANY ADJACENT CONSTRUCTION PROJECT. THIS COORDINATION SHALL BE DONE SO THAT ANY CLOSURE SHALL NOT CONFLICT WITH ANY OTHER CLOSURE. THIS PLAN OF COORDINATION SHALL BE PRESENTED TO THE ENGINEER IN WRITING FOR HIS APPROVAL.

8. MOVING FLAGGER SPECIAL PROVISIONS
   ALL FLAGGERS SHALL BE FURNISHED BY THE CONTRACTOR AND ALL FLAGGING SHALL BE HIS RESPONSIBILITY. WHERE A MOVING FLAGGER IS NOTED OR CALLED FOR, TWO FLAGGERS SHALL BE PROVIDED AT EACH END OF THE AREAS WHERE TRAFFIC IS BEING STOPPED. ONE FLAGGER IS TO BE POSITIONED IN ACCORDANCE WITH THE MANUAL, WHILE THE OTHER FLAGGER IS TO CONTINUALLY MOVE WITH STOPPING TRAFFIC. TWO-WAY RADIOS SHALL BE PROVIDED TO THE FLAGGERS WHEN THEY ARE OUT OF SIGHT OF EACH OTHER.

9. CHANGEABLE MESSAGE SIGNS
   THE CHANGEABLE MESSAGE SIGNS USED ON THIS PROJECT SHALL CONFORM TO SUBSECTION 636.19 OF THE CURRENT SPECIFICATIONS, CURRENT SUPPLEMENTAL SPECIFICATIONS, AND THE SPECIAL PROVISIONS WHICH ARE MADE A PART OF THESE PLANS. THESE SIGNS SHALL BE MANUFACTURED BY ADDCO, WINKOMATIC, OR AN APPROVED EQUAL. TWO CHANGEABLE MESSAGE SIGNS HAVE BEEN INCLUDED FOR THIS PROJECT. LOCATIONS AND NEED FOR USE TO BE DETERMINED BY THE CONTRACTOR. THEY WILL HAVE LEAD-INS 10 DAYS PRIOR TO BEGIN OF WORK FOR BOTH DIRECTIONS OR AS DIRECTED BY THE ENGINEER.

10. A ATSSA CERTIFIED OR EQUIVALENT TRAFFIC PERSON SHALL BE PROVIDED AT ALL TIMES WHEN WORKERS ARE PRESENT IN THE WORK ZONE AND AS DIRECTED BY THE ENGINEER.

11. USE CASE A3 OR APPLICABLE FOR TRAIL CONSTRUCTION AND TO INSTALL PERMANENT SIGNING AND PAVEMENT MARKINGS.

12. USE CASE A5 FOR CONSTRUCTION OF RECTANGULAR RAPID FLASHING BEACON AND CROSSWALK.

13. TYPE B LIGHTS SHALL BE INSTALLED ON ALL LEAD-IN SIGNING. ANY ADDITIONAL LIGHTS NEEDED SHALL BE AT THE DISCRETION OF THE PROJECT ENGINEER. THESE LIGHTS SHALL BE BID AS ITEM NUMBER 636025-001, WARNING LIGHTS, TYPE B.

SEQUENCE OF CONSTRUCTION

1. BEGIN GRADING IN AREAS OF PROPOSED WORK. DISPOSE OF WASTE MATERIAL PER SPECIFICATIONS. MILL EDGE OF EXISTING PAVEMENT SURFACE PER TYPICAL SECTION.
2. INSTALL EXTENDED PIPES AND HEADWALLS.
3. INSTALL SEPARATION FABRIC, BEDDING STONE FOR SIDEWALKS AND AGGREGATE BASE FOR DRIVEWAY PADS.
4. CONSTRUCT ASPHALT SIDEWALKS, CURB RAMPS, AND DETECTABLE WARNING SURFACES.
5. REPLACE ASPHALT PAVEMENT IN AREAS THAT WERE MILLED PER TYPICAL SECTION.
6. SEED AND MULCH DISTURBED AREAS.
7. CLEAN UP SITE PRIOR TO DE-MOBILIZATION.

TRAFFIC CONTROL SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	
		UNIT	TOTAL
636011-001	TRAFFIC CONTROL DEVICE	UNIT	15360
636014-001	FLAGGER	HOUR	120
636022-001	CHANGEABLE MESSAGE SIGN	DAY	380
636025-001	WARNING LIGHTS, TYPE A	DAY	0
636025-001	WARNING LIGHTS, TYPE B	DAY	720

TEMPORARY TRAFFIC CONTROL DEVICE QUANTITY TABLE

DEVICE #	DESCRIPTION	VALUE IN UNITS EACH TRAFFIC CONTROL DEVICE	QUANTITIES	TOTAL UNITS
1	SIGNS ON PORTABLE MOUNTS AND BARRICADES (TOTAL SIGN AREA 16 SQ. FT. OR GREATER)	170	0	0
2	SIGNS ON PORTABLE MOUNTS AND BARRICADES (TOTAL SIGN AREA LESS THAN 16 SQ. FT.)	80	0	0
3	SIGNS ON PERMANENT POSTS (TOTAL SIGN AREA 16 SQ. FT. OR GREATER)	180	10	1800
4	SIGNS ON PERMANENT POSTS (TOTAL SIGN AREA LESS THAN 16 SQ. FT.)	90	0	0
5	BARRICADES-TYPE I	35	0	0
6	BARRICADES-TYPE II	60	0	0
7	BARRICADES-TYPE III	90	0	0
8	DRUMS	60	226	13560
9	CONES	5	0	0
10	VERTICAL PANEL OR GROUND MOUNTED DELINEATORS	10	0	0
11	BARRIER OR GUARDRAIL MOUNTED DELINEATORS (BID INCIDENTAL TO BARRIER OR GUARDRAIL)	0	0	0
12	CHANNELIZER CONES	40	0	0
13	OVERSIZE SIGNS	300	0	0
			TOTAL	15360

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
MAINTENANCE OF TRAFFIC - 1

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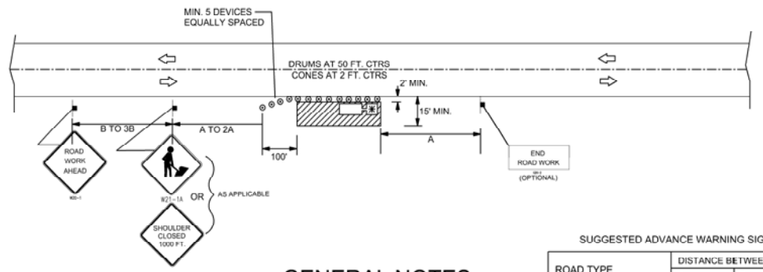


SYMBOLS

- WORK AREA
- SIGN
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- CHANNELIZATION DEVICES (DRUMS OR CONES)

TYPICAL APPLICATIONS

CULVERT EXTENSIONS
SIDE SLOPE CHANGES
GUARDRAIL INSTALLATION AND MAINTENANCE
DELINEATOR INSTALLATION AND MAINTENANCE
LANDSCAPING OPERATIONS
CLEANING DITCHES AND DRAINAGE STRUCTURES
SHOULDER REPAIR
ADJACENT WORK ON SIDE ROADS/BRIDGES
SIGNING OPERATIONS

GENERAL NOTES

1. OVERNIGHT OPERATIONS ILLUSTRATED AND IF SUCH, USE DRUMS. FOR DAYLIGHT OPERATIONS ONLY, USE CONES OR DRUMS AS DIRECTED BY THE ENGINEER.
2. ANY UNATTENDED OBSTACLE OR EXCAVATION IN THE WORK AREA OVERNIGHT SHALL BE PROTECTED BY TYPE I OR TYPE II BARRICADES.
3. IF THE WORK OPERATION REQUIRES THAT FOUR OR MORE WORK VEHICLES ENTER THE THROUGH TRAFFIC LANES IN A ONE HOUR PERIOD A FLAGGER SHALL BE PROVIDED AND THE FLAGGER SIGN SHALL BE USED (AT 500 FT. IN ADVANCE).
4. ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE RESTRICTED AT ALL TIMES TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.
5. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS NEEDED ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

* WORK VEHICLE (IF USED) SHALL HAVE DUAL FLASHERS AND FLASHING AMBER DOME LIGHT OPERATING.

SUGGESTED ADVANCE WARNING SIGN SPACING

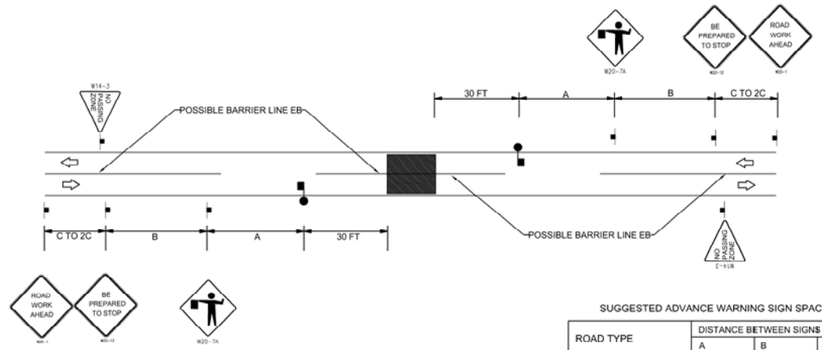
ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,500	2,640

*SPEED CATEGORY TO BE DETERMINED BY WVDOH

CASE A3

TWO-LANE, TWO-WAY TRAFFIC
DAY OR NIGHT OPERATIONS.
(STATIONARY)

WHERE, AT ANY TIME, ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON THE AREA BETWEEN 2 FT. AND 15 FT. FROM THE EDGE OF PAVEMENT.



SYMBOLS

- WORK AREA
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- FLAGGER WITH PADDLE

TYPICAL APPLICATIONS

SHORT TERM CLOSING
SHORT TERM UTILITY CROSSING FOR TWO OR THREE LANE ROADWAYS
HAUL ROADS

GENERAL NOTES

1. CONDITIONS REPRESENTED ARE FOR A PLANNED CLOSURE NOT EXCEEDING 30 MINUTES DURING THE DAYTIME.
2. THE FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
3. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS NEEDED ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS (IN FT)		
	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,500	2,640

*SPEED CATEGORY TO BE DETERMINED BY WVDOH

CASE A5

TWO-LANE, TWO-WAY TRAFFIC
SHORT TERM OPERATIONS.
DAYTIME ONLY.

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
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PHONE/FAX: 304-296-8216
TOLL FREE: 800-640-8216
www.thinkALPHAfirst.com

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
MAINTENANCE OF TRAFFIC - 2

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	10	41

CURVE C1	
PI STA	45+00.85
Δ	3°26'14"
R	1200.00'
T	36.01'
L	71.99'
E	0.54'
S.E.	N/A

CURVE C2	
PI STA	45+92.94
Δ	4°48'32"
R	1000.00'
T	41.99'
L	83.93'
E	0.88'
S.E.	N/A

CURVE C3	
PI STA	47+02.86
Δ	5°12'10"
R	1100.00'
T	49.98'
L	99.89'
E	1.13'
S.E.	N/A

CURVE C4	
PI STA	48+52.54
Δ	2°36'52"
R	4372.14'
T	99.77'
L	199.50'
E	1.14'
S.E.	N/A

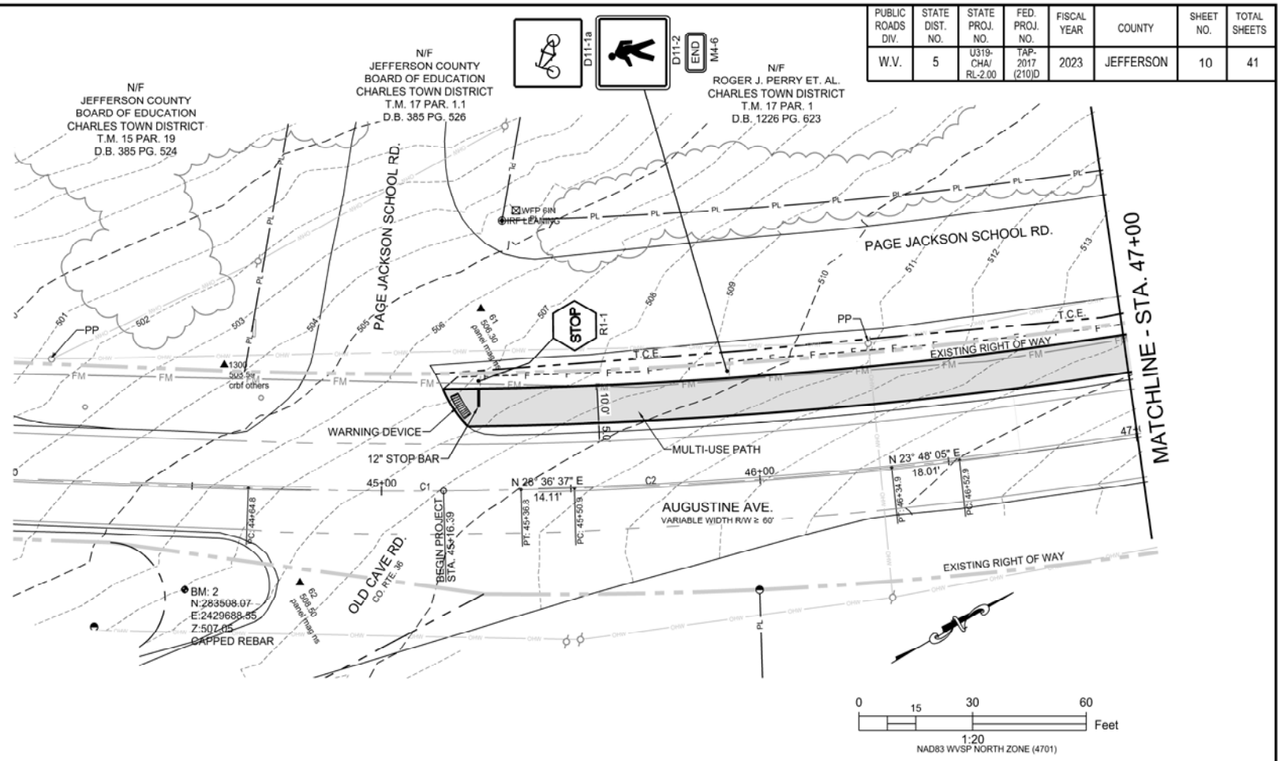
CURVE C5	
PI STA	49+93.87
Δ	0°36'30"
R	5000.00'
T	26.54'
L	53.09'
E	0.07'
S.E.	N/A

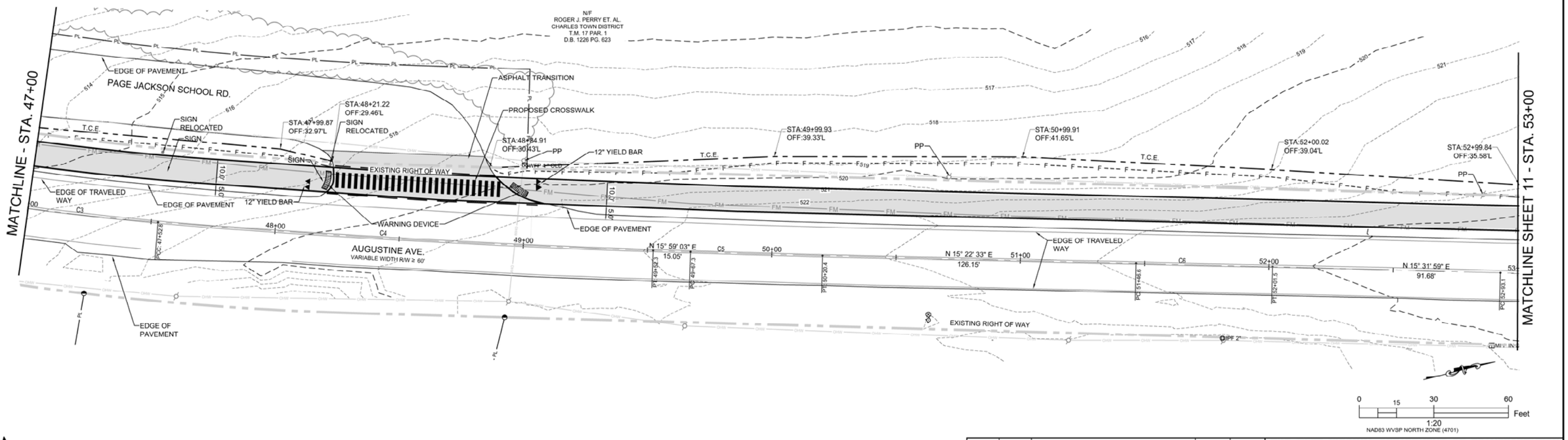
CURVE C6	
PI STA	51+74.01
Δ	0°09'26"
R	20000.00'
T	27.45'
L	54.90'
E	0.02'
S.E.	N/A

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PC: 44+64.85	283535.9550	2429673.7836
PT: 45+36.84	283598.0829	2429710.1301
PC: 45+50.95	283610.4703	2429716.8868
PT:46+34.88	283685.7522	2429753.9394

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PC: 46+52.89	283702.2303	2429761.2076
PCC: 47+52.77	283795.3240	2429797.3161
PT: 49+52.28	283985.7946	2429856.6094
PC: 49+67.32.	284000.2593	2429860.7527

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PT: 50+20.41	284051.3721	2429875.1006
PC: 51+46.56	284173.0094	2429908.5497
PT: 52+01.46	284225.9203	2429923.1778
PC: 52+93.14	284314.2535	2429947.7295





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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
PLAN VIEW 1

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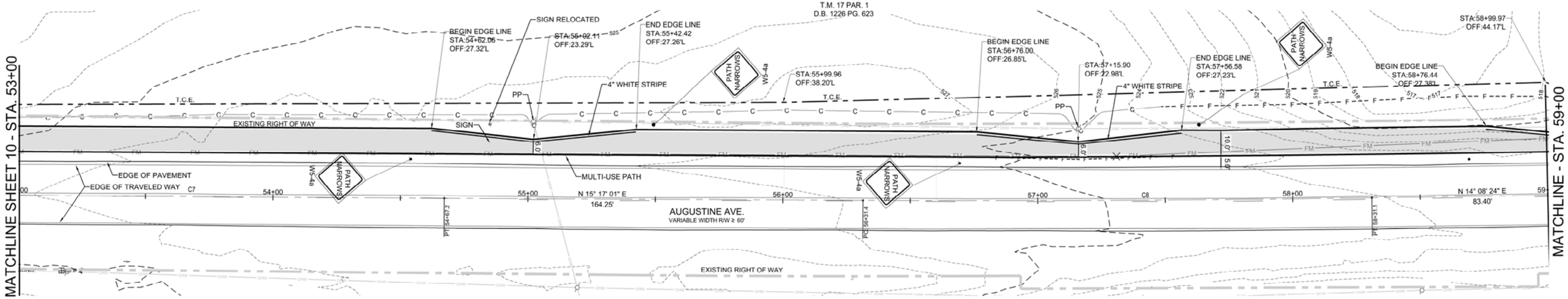
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	11	41

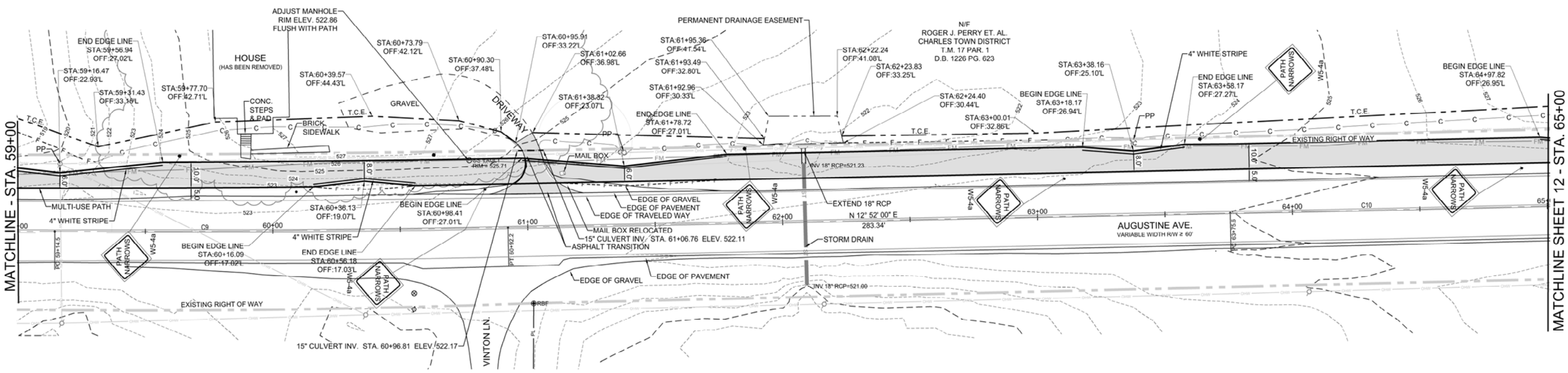


CURVE C7	
PI STA	53+80.17
Δ	0°14'58"
R	40000.00'
T	87.03'
L	174.06'
E	0.09'
S.E.	N/A

CURVE C8	
PI STA	57+31.26
Δ	1°08'37"
R	10000.00'
T	99.81'
L	199.62'
E	0.50'
S.E.	N/A

CURVE C9	
PI STA	60+03.35
Δ	1°16'24"
R	8000.00'
T	88.89'
L	177.78'
E	0.49'
S.E.	N/A

CURVE C10	
PI STA	64+53.39
Δ	0°26'45"
R	20000.00'
T	77.81'
L	155.63'
E	0.15'
S.E.	N/A



AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PT: 54+67.20	284482.0569	2429993.9766
PC: 56+31.45	284640.4933	2430037.2714
PT: 58+31.06	284833.5623	2430087.9647

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PC: 59+14.46	284914.4315	2430108.3376
PT: 60+92.24	285087.2904	2430149.8481
PC: 63+75.58	285363.5187	2430212.9440

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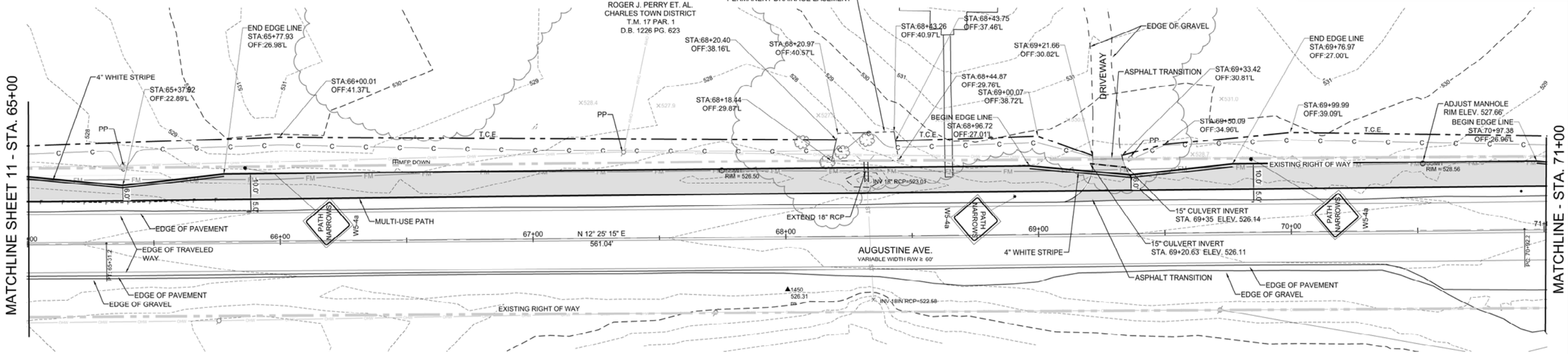
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
PLAN VIEW 2

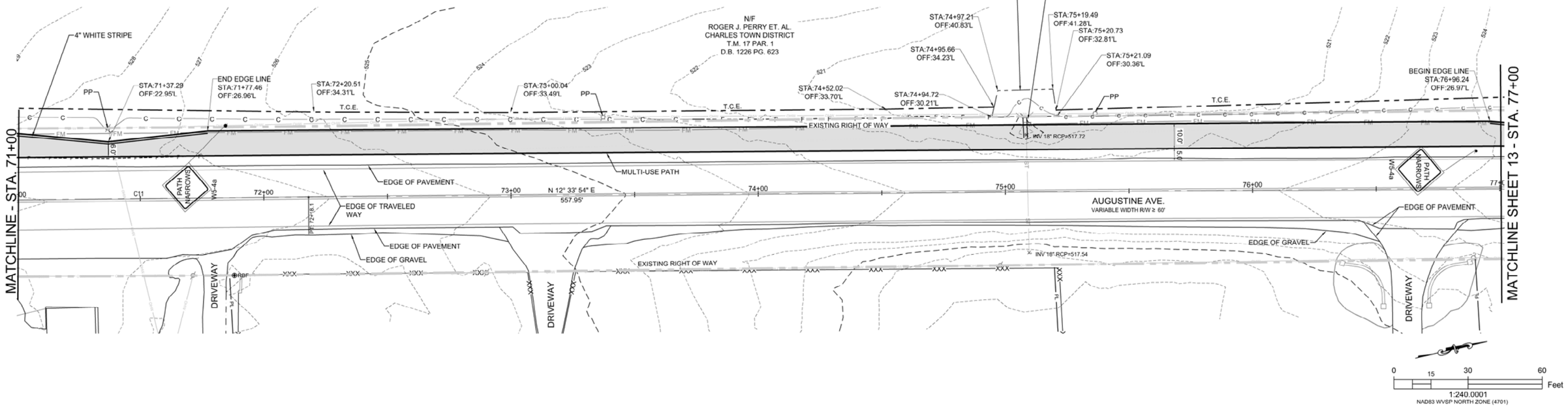
Z:\Projects\2022_Jobs\220506100\Drawings\Civil\Current\Construction\11-PLAN VIEW 2 - PHASE 1.dwg

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	12	41



CURVE C11	
PI STA	71+55.17
Δ	0°08'39"
R	50000.00'
T	62.92'
L	125.85'
E	0.04'
S.E.	N/A

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PT: 65+31.20	285515.3702	2430247.0088
PC: 70+92.25	286063.2813	2430367.6844
PT: 72+18.09	286186.1468	2430394.9073



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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
PLAN VIEW 3

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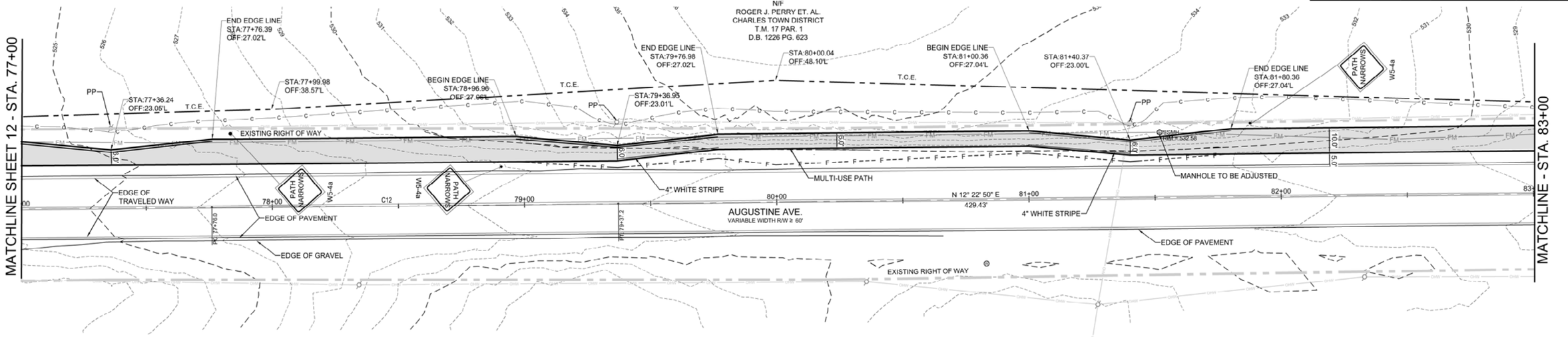
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	13	41

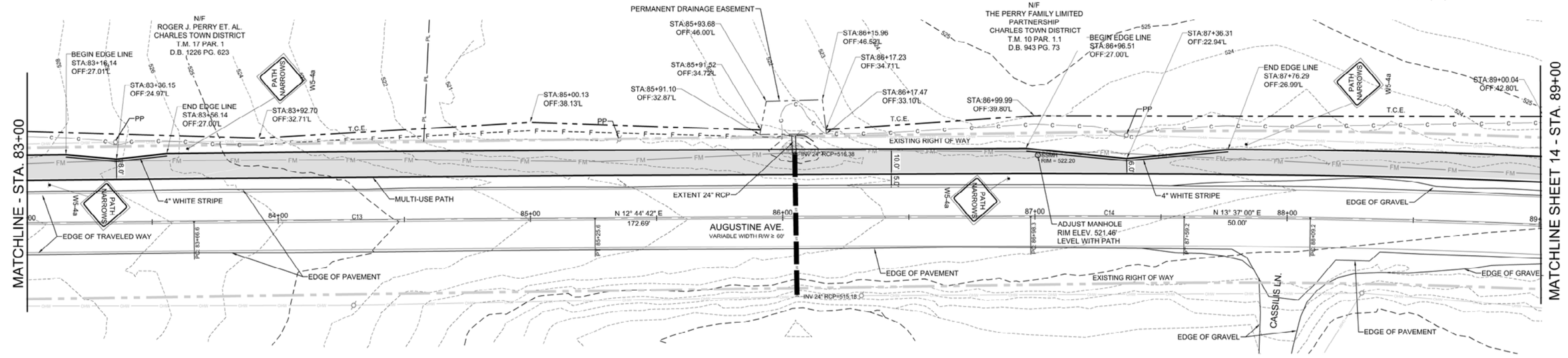


CURVE C12	
PI STA	78+56.61
Δ	0°11'05"
R	50000.00'
T	80.57'
L	161.13'
E	0.06'
S.E.	N/A

CURVE C13	
PI STA	84+46.11
Δ	0°21'52"
R	25000.00'
T	79.50'
L	159.00'
E	0.13'
S.E.	N/A

CURVE C14	
PI STA	87+28.73
Δ	0°52'19"
R	4000.00'
T	30.44'
L	60.87'
E	0.12'
S.E.	N/A

0 15 30 60 Feet
1:240
NAD83 WVSP NORTH ZONE (4701)



AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PC: 77+76.04	286730.7310	2430516.2881
PT: 79+37.17	286888.0584	2430551.0883
PC: 83+66.61	287307.5068	2430643.1601

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PT: 85+25.61	287462.6994	2430677.7436
PC: 86+98.30	287631.1347	2430715.8408
PT: 87+59.17	287690.4009	2430729.7206

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PC: 88+09.17	287738.9970	2430741.4923

0 15 30 60 Feet
1:20
NAD83 WVSP NORTH ZONE (4701)

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
PLAN VIEW 4

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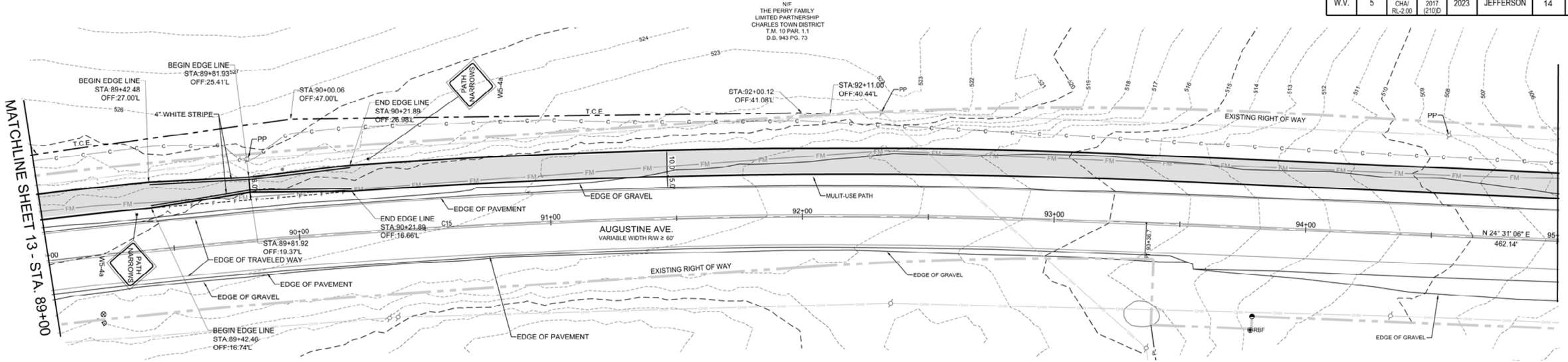
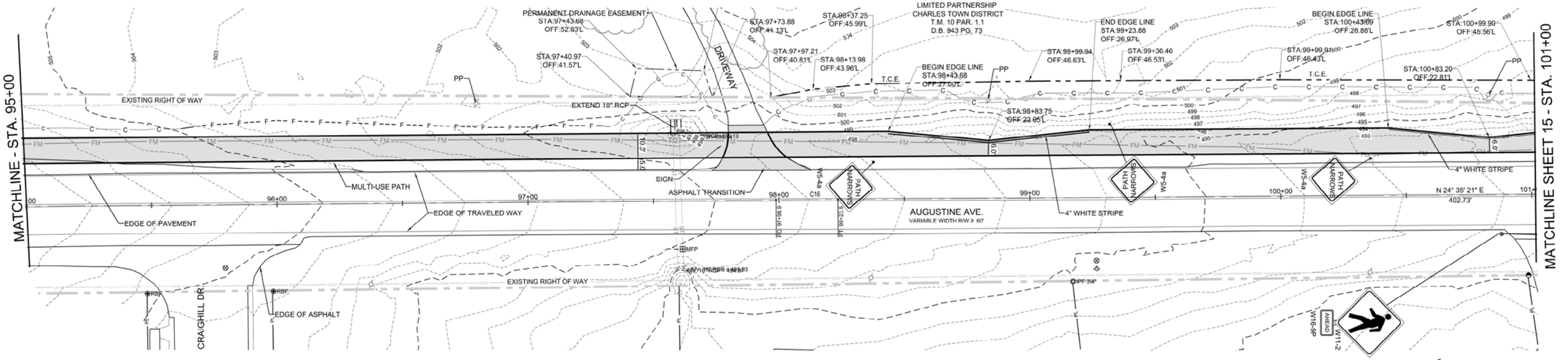
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	14	41



CURVE C15	
PI STA	90+73.74
Δ	10°54'06"
R	2772.59'
T	264.57'
L	527.54'
E	12.59'
S.E.	N/A

CURVE C16	
PI STA	98+11.18
Δ	0°04'14"
R	20000.00'
T	12.33'
L	24.66'
E	0.00'
S.E.	N/A

0 15 30 60 Feet
1:20
NAD83 WVSP NORTH ZONE (4701)



AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PT: 93+36.71	288236.8418	2430913.5712
PC: 97+98.85	288657.3124	2431105.3540
PT: 98+23.51	288679.7384	2431115.5996

0 15 30 60 Feet
1:20
NAD83 WVSP NORTH ZONE (4701)

SUBMITTED: AUGUST 4, 2023

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
PLAN VIEW 5

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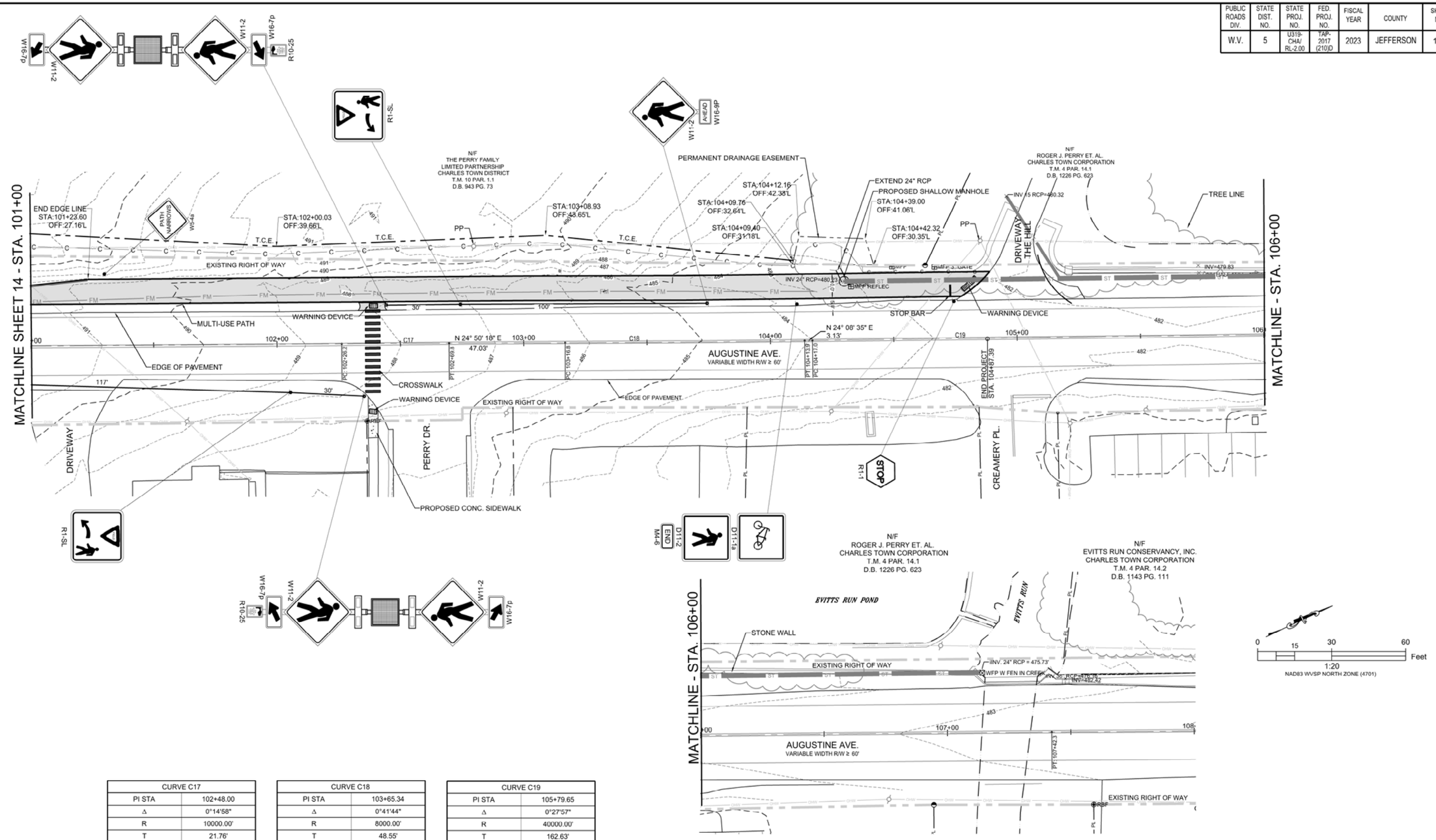
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	15	41



CURVE C17	
PI STA	102+48.00
Δ	0°14'58"
R	10000.00'
T	21.76'
L	43.52'
E	0.02'
S.E.	N/A

CURVE C18	
PI STA	103+65.34
Δ	0°41'44"
R	8000.00'
T	48.55'
L	97.10'
E	0.15'
S.E.	N/A

CURVE C19	
PI STA	105+79.65
Δ	0°27'57"
R	40000.00'
T	162.63'
L	325.26'
E	0.33'
S.E.	N/A

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PC: 102+26.24	289045.9491	2431283.1703
PT: 102+69.76	289085.4868	2431301.3761
PC: 103+16.79	289128.1625	2431321.1298

AUGUSTINE AVE.		
DESCRIPTION	NORTHING	EASTING
PT: 104+13.80	289216.5249	2431361.3816
PC: 104+17.02	289219.3810	2431362.6617
PT: 107+42.28	289515.6461	2431496.9037

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
PLAN VIEW 6

SUBMITTED: AUGUST 4, 2023

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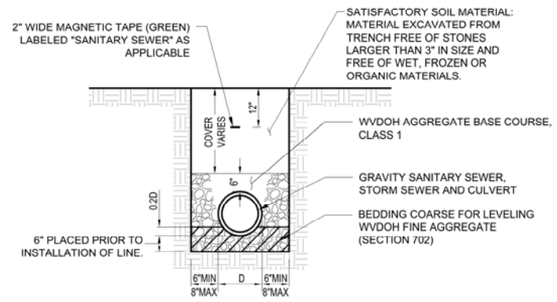
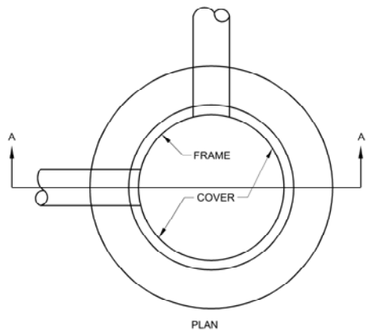
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	16	41



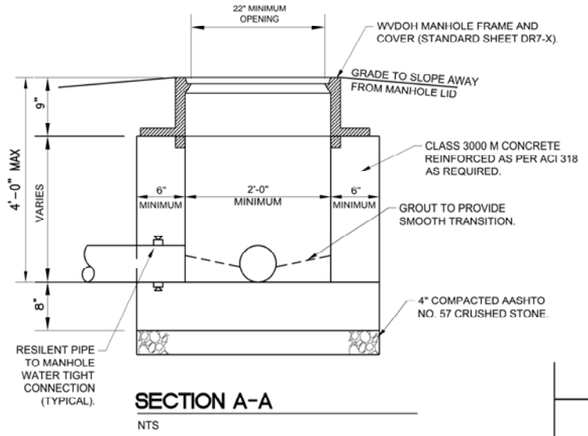
TRENCH DETAIL FOR GRAVITY SANITARY SEWER, STORM SEWER + CULVERT

NOT TO SCALE



SECTION B-B

NTS



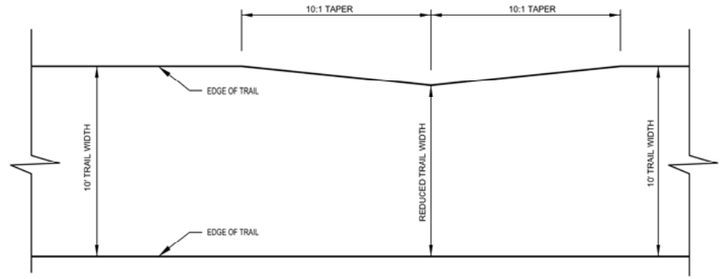
SECTION A-A

NTS

TYPICAL SHALLOW MANHOLE DETAIL

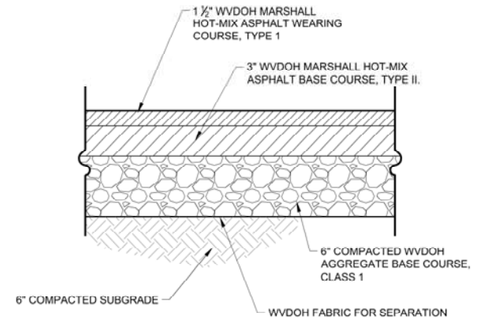
NOT TO SCALE

"SHALLOW MANHOLE" PER EACH SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL EARTHWORK, AASHTO NO. 57 CRUSHED STONE, SHALLOW MANHOLE, WATER TIGHT CONNECTION(S), GROUT, FRAME, AND COVER.



TRAIL TAPER DETAIL

NOT TO SCALE



TRAIL SECTION

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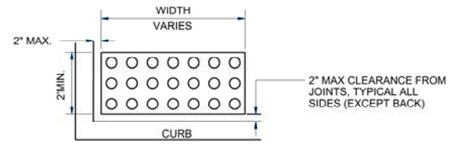


DETECTABLE WARNING SURFACE (DWS)

NOT TO SCALE

NOTES

DETECTABLE WARNING SURFACES (DWS'S) SHALL ONLY BE PURCHASED FROM VENDORS ON THE WEST VIRGINIA DIVISION OF HIGHWAYS APPROVED VENDOR LIST 609.2 - DETECTABLE WARNING SURFACES.

DESIGN AND PLACEMENT OF DETECTABLE WARNING SURFACE (DWS) SHALL BE IN ACCORDANCE WITH SECTION 609 OF THE CURRENT WVDOT, DOH STANDARD SPECIFICATIONS ROADS AND BRIDGES AND SUBSEQUENT DOH SUPPLEMENTAL SPECIFICATIONS AND THE PUBLIC RIGHT OF WAY ACCESSIBILITY GUIDELINES (PROWAG) DATED JULY 26, 2011.

DETECTABLE WARNING SURFACES SHALL EXTEND ACROSS THE FULL WIDTH OF THE CURB RAMP THRESHOLD WHERE THE CURB IS FLUSH WITH THE ROADWAY AND SHALL BE PLACED AT THE BACK OF THE CURB WITH A 0" MINIMUM, 2" MAXIMUM BORDER DIMENSION FROM JOINTS ON EACH SIDE OF THE DWS. WHERE THE BACK OF THE CURB EDGE IS TOOLED TO PROVIDE A RADIUS, THE BORDER DIMENSION SHOULD BE MEASURED FROM THE END OF THE RADIUS.

DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, STREET, OR HIGHWAY. EITHER LIGHT ON DARK OR DARK ON LIGHT.

A WET OR PLASTIC SET-IN-PLACE DETECTABLE WARNING SURFACE (DWS) SHALL BE INSTALLED AT THE TIME OF THE PLACEMENT OF THE CURB RAMP, WHILE THE ASPHALT IS STILL PLASTIC.

MOLD-IN-PLACE CONCRETE DOMES, BRICK PAVERS, OR IRON OR STEEL WARNING SYSTEMS SHALL NOT BE USED.

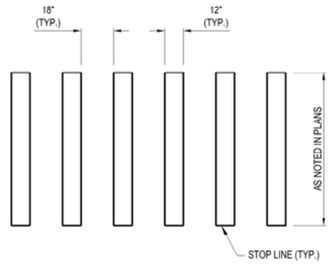
SET-IN-PLACE DWS SHALL BE USED IN NEW CONSTRUCTION. SURFACE MOUNTED DWS ARE NOT PERMITTED.

A SINGLE DWS PANEL SHALL BE USED WITH CURB RAMP WIDTHS OF 5' OR LESS.

ANY CUTTING OF DWS DURING INSTALLATION SHALL BE APPROVED BY PROJECT ENGINEER.

IF DWS IS CUT TO CONFORM TO A SPECIFIC SHAPE OF RAMP AND ANCHORING DEVICES BECOME PART OF THE WASTE, THEN ANCHOR WILL BE REMOVED AND REATTACHED INTO THE DWS AT THE ORIGINAL EDGE OFFSET AS PER MANUFACTURER.

ALL DOWEL BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 709.1 OF THE CURRENT WVDOH STANDARD SPECIFICATIONS ROADS AND BRIDGES.



CROSS WALK DETAIL

NOT TO SCALE

SUBMITTED: AUGUST 4, 2023

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ALPHA PROJECT: 2205061

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
DETAILS

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	17	41

SIGNING AND PAVEMENT MARKING GENERAL NOTES

GOVERNING SPECIFICATIONS

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS ROAD AND BRIDGES, ADOPTED 2017, AS AMENDED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, SUPPLEMENTAL SPECIFICATIONS, ISSUED JANUARY 1, 2023, THE PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG; CURRENT EDITION), THE CONTRACT DOCUMENTS AND THE CONTRACT PLANS ARE THE GOVERNING PROVISIONS APPLICABLE TO THIS PROJECT.

STANDARD DETAILS

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS STANDARD DETAILS BOOK, VOLUME I, DATED MAY 2016 AND VOLUME II, DATED JANUARY 2019 SHALL APPLY TO THIS PROJECT.

STANDARD DETAILS MAY BE FOUND ONLINE AT THE FOLLOWING URL:
HTTP://TRANSPORTATION.WV.GOV/HIGHWAYS/ENGINEERING/PAGES/PUBLICATIONS.ASPX

CORNERS

CORNERS OF ALL ALUMINUM SIGNS SHALL BE ROUNDED; HOWEVER, CORNERS OF ALUMINUM SIGN FACES (EXTRUDED OR OVERLAYS) SHALL NOT BE ROUNDED.
FABRICATED SIGNS WITH DIRECT APPLIED COPY (BLUE, GREEN OR BROWN BACKGROUND) SHALL HAVE A 1 $\frac{1}{2}$ INCH CORNER RADIUS ON THE ALUMINUM BLANK.

SIGN FABRICATION

ALL SIGNS SHALL BE FABRICATED IN ACCORDANCE WITH THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS "SIGN FABRICATION MANUAL", "DESIGN GUIDE FOR SIGNING", "STANDARD SPECIFICATIONS ROADS AND BRIDGES", LATEST EDITIONS.

HARDWARE

THE MOUNTING HARDWARE SHALL BE OF VANDAL-RESISTANT DESIGN MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS ON ALL FLAT SHEET SIGNS. THE FABRICATOR SHALL SUPPLY FIVE (5) PIECES OF MATERIAL TO THE DIVISION OF HIGHWAYS FOR TESTING PRIOR TO THE MANUFACTURE OF SIGNS. THE DIVISION OF HIGHWAYS ALSO RESERVES THE RIGHT TO RANDOM TEST THIS MATERIAL AFTER SHIPMENT TO THE PROJECT.

SURFACE MOUNT BREAKAWAY DEVICE

THE FOLLOWING ASSEMBLIES SHALL BE ON SURFACE MOUNT BREAKAWAY DEVICE BY SIGN SUPPORT SYSTEMS OR APPROVED EQUAL. COST FOR THE BREAKAWAY MOUNTING DEVICE SHALL BE BID AS 657042-001, SURFACE MOUNT BREAKAWAY DEVICE. SEE SECTION 657 OF THE 2022 SUPPLEMENTAL SPECIFICATIONS.
APPLIES TO THE FOLLOWING ASSEMBLIES: 0, 0, 0

SHOP DRAWING SUBMISSION

THE CONTRACTOR SHALL SUBMIT SIGN FABRICATION SHOP DRAWINGS IN EITHER ONE OF TWO WAYS. A SINGLE SUBMISSION OF ALL FLAT SHEET SIGNS AND A SINGLE SUBMISSION OF ALL EXTRUDED PANEL SIGNS, OR A SINGLE COMBINED SUBMISSION OF ALL SIGN FABRICATION DETAILS.

SEGMENTED OR PARTIAL SHOP DRAWING SUBMISSIONS FOR SIGNS OR BREAKAWAYS WILL NOT BE ACCEPTED.

SHOP DRAWINGS FOR STANDARD FLAT SHEET SIGNS ARE NOT REQUIRED TO BE SUBMITTED FOR APPROVAL.

CLEARING BRUSH AND TREE TRIMMING

BRUSH OR OTHER VEGETATION WHICH BLOCKS THE VISIBILITY OF A SIGN INSTALLED IN THIS PROJECT SHALL BE CUT AND REMOVED FROM THE RIGHT OF WAY. THERE IS NO SEPARATE PAYMENT FOR THIS WORK AND ALL COSTS SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 661001-001. THE AMOUNT TO BE REMOVED SHALL BE DETERMINED BY STANDING ON THE RIGHT EDGE OF PAVEMENT AT A MINIMUM DISTANCE OF 500 FT IN ADVANCE OF THE SIGN.

IDENTIFICATION CODE FOR SCREENED SIGNS

AN IDENTIFICATION CODE SHALL BE PLACED ON ALL SIGNS WITH SCREENED MESSAGES THAT ARE MANUFACTURED FOR THE DIVISION OF HIGHWAYS. THE CODE SHALL CONSIST OF THE LETTERS "WVDH" WITH AN ABBREVIATED FORM OF THE MONTH AND YEAR OF FABRICATION DIRECTLY BELOW. IT SHALL ALSO INCLUDE AN ABBREVIATED NAME OF THE SHEETING MANUFACTURER AND THE INK MANUFACTURER

EXAMPLE: WVDH 3M
8/19 A

EACH LINE OF LETTERS OR NUMERALS SHALL BE 1/4 INCH HIGH, NO GREATER THAN ONE INCH IN LENGTH AND OF THE SAME COLOR AS THAT BEING SCREENED. THE CODE SHALL BE PLACED ON THE LOWER RIGHT HAND EDGE OF THE SIGN. IF THE SIGN HAS BOTH BORDER AND MARGIN, THE IDENTIFICATION CODE SHALL BE WITHIN THE BORDER, BUT MAY EXTEND INTO THE MARGIN AND/OR SIGN AREA. IF THE SIGN HAS BORDER ONLY, THE CODE SHALL BE WITHIN THE BORDER, BUT MAY EXTEND INTO THE SIGN AREA.

PAVEMENT MARKING NOTES

1. ALL 4 INCH SOLID WHITE EDGE LINES, LANE LINES, AND CENTERLINES SHALL BE TYPE II PAVEMENT MARKINGS.

2. EDGE LINES SHALL BE CENTERED 4 INCHES FROM EDGES OF TRAIL.

3. ALL MARKINGS SHALL BE CONTINUOUS AND CONSISTENT WITH EXISTING MARKINGS WHERE THEY JOIN.

4. NO MARKINGS SHALL BE PLACED ON EXPANSION JOINTS ON STRUCTURES OR ON LONGITUDINAL CONSTRUCTION JOINTS UNLESS SO DIRECTED BY THE ENGINEER.

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
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www.thinkALPHAfirst.com

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
SIGNING GENERAL NOTES

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	18	41

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
657008-001	2.00 LB CHANNEL POST	LF	564
657018-001	SUPPORT OR BRACKET REMOVAL	EA	0.0
657042-001	SURFACE MOUNT BREAKAWAY DEVICE	EA	0.0
660007-002	RECTANGULAR RAPID FLASHING BEACON ASSEMBLY	EA	2
661001-001	0.080 IN FLAT SHEET SIGN	SF	159
663001-026	EDGE LINE, TYPE II - 4 IN, WHITE	LF	1400
663005-010	STOP LINE, TYPE V - 12 IN	LF	20
663006-010	CROSSWALK LINE, TY V, 12 IN x 6 FT	LF	105

RECTANGULAR RAPID FLASHING BEACON ASSEMBLY

LOCATION	OFFSET			ITEM 660007-002	REMARKS
STATION	LEFT	RIGHT		EA	
102+36		22		1	
102+43	16			1	
			TOTAL	2	

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH

PAVEMENT MARKING QUANTITIES

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	19	41

ASSEMBLY NUMBER	PROPOSED SIGN NUMBER	EXISTING SIGN NUMBER	PROPOSED LOCATION	EXISTING LOCATION	LAYOUT SHEET NUMBER	FABRICATION DETAIL SHT. NO.	SIGN DISPOSITION	SIGNS					SUPPORT & FOUNDATIONS														
													U-CHANNEL				REFLECTIVE INSERTS	SOPPORT OR BRACKET REMOVAL	REUSE STUB/SPT	STEEL BEAM SUPPORT				FOUNDATION		
								WIDTH	HEIGHT	FLAT SHEET 0.080	PANEL	INSTALL REUSED SIGN	2.00	3.00	4.00BB	6.00BB				S4x7.7	W6x12	W8x18	W10x22	DIA.	DEPTH	CONC.
								FT.	FT.	S.F.	S.F.		#/FT.	#/FT.	#/FT.	#/FT.				L.F.	L.F.	L.F.	L.F.	FT.	FT.	C.Y.
CROSSWALK																										
1	WII-2		101+05, RT		15		NEW	3.00	3.00	9.00			14													
	W16-9P						NEW	2.50	1.50	3.75																
2	R1-5L		102+05, RT		15		NEW	1.50	1.50	2.25			12.5													
3	WII-2		102+35, RT		15		NEW	3.00	3.00				15		SEE SOLAR RRFB ASSEMBLY DETAIL ON SHEET ##											
	WI6-7p						NEW	2.00	1.00	2.00																
	WII-2						NEW	3.00	3.00	9.00																
	WI6-7p						NEW	2.00	1.00	2.00																
	R10-25						NEW	0.75	1.00	0.75																
4	WII-2		102+43, LT		15		NEW	3.00	3.00	9.00			15		SEE SOLAR RRFB ASSEMBLY DETAIL ON SHEET ##											
	WI6-7p						NEW	2.00	1.00	2.00																
	WII-2						NEW	3.00	3.00	9.00																
	WI6-7p						NEW	2.00	1.00	2.00																
	R10-25						NEW	0.75	1.00	0.75																
5	R1-5L		102+73, LT		15		NEW	1.50	1.50	2.25			12.5													
6	WII-2		103+73, LT		15		NEW	4.00	4.00	16.00			14													
	WI6-9p																									
MULTI-USE PATH																										
	R1-1		45+26, LT		10		NEW	1.50	1.50	2.25			12.5													
	DII-1a		45+93, LT		10		NEW	1.50	1.50	2.25			15.5													
	DII-2						NEW	1.50	1.50	2.25																
	M4-6						NEW	1.00	0.50	0.50																
	W5-4a		54+54, LT		11		NEW	1.50	1.50	2.25			12.5													
			55+49, LT		11		NEW	1.50	1.50	2.25			12.5													
			56+69, LT		11		NEW	1.50	1.50	2.25			12.5													
			57+63, LT		11		NEW	1.50	1.50	2.25			12.5													
			58+69, LT		11		NEW	1.50	1.50	2.25			12.5													
			59+63, LT		11		NEW	1.50	1.50	2.25			12.5													
			60+09, LT		11		NEW	1.50	1.50	2.25																
			60+63, LT		11		NEW	1.50	1.50	2.25																
			60+84, LT		11		NEW	1.50	1.50	2.25			12.5													
			61+85, LT		11		NEW	1.50	1.50	2.25			12.5													
			63+11, LT		11		NEW	1.50	1.50	2.25			12.5													
			63+64, LT		12		NEW	1.50	1.50	2.25			12.5													
			64+90, LT		12		NEW	1.50	1.50	2.25			12.5													
			65+86, LT		12		NEW	1.50	1.50	2.25			12.5													
			68+91, LT		12		NEW	1.50	1.50	2.25			12.5													
			69+84, LT		12		NEW	1.50	1.50	2.25			12.5													
			70+91, LT		12		NEW	1.50	1.50	2.25			12.5													
			71+85, LT		13		NEW	1.50	1.50	2.25			12.5													
			76+91, LT		13		NEW	1.50	1.50	2.25			12.5													
			77+84, LT		13		NEW	1.50	1.50	2.25			12.5													
			78+91, LT		13		NEW	1.50	1.50	2.25			12.5													
			81+88, LT		13		NEW	1.50	1.50	2.25			12.5													
			83+10, LT		13		NEW	1.50	1.50	2.25			12.5													
			83+64, LT		13		NEW	1.50	1.50	2.25			12.5													
			86+90, LT		13		NEW	1.50	1.50	2.25			12.5													
			87+83, LT		13		NEW	1.50	1.50	2.25			12.5													
			89+37, LT		14		NEW	1.50	1.50	2.25			12.5													
			90+29, LT		14		NEW	1.50	1.50	2.25			12.5													
			98+38, LT		14		NEW	1.50	1.50	2.25			12.5													
			99+32, LT		14		NEW	1.50	1.50	2.25			12.5													
			100+36, LT		14		NEW	1.50	1.50	2.25			12.5													
			101+30, LT		15		NEW	1.50	1.50	2.25			12.5													
	DII-1a		104+11, LT		15		NEW	1.50	1.50	2.25			15.5													
	DII-2						NEW	1.00	0.50	0.50																
	M4-6																									
	R1-1		104+74, LT		15		NEW	1.50	1.50	2.25			12.5													
							PROJECT TOTAL			158.50			564													

	657008-001	661001-001
	2.00 LB CHANNEL POST	0.080 IN FLAT SHEET SIGN
	LF	SF
PROJECT TOTALS	564	159

NOTES:

1. THE WARNING SIGNS AND PLAQUES FOR THE RRFB WILL BE PAID FOR UNDER ITEM 661001-001. ALL EQUIPMENT AND HARDWARE REQUIRED TO MOUNT RRFB AND ASSOCIATED EQUIPMENT TO THE ASSEMBLY SHALL BE INCLUDED IN THE UNIT COAT OF ITEM 660007-002.
2. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL SIGN DIMENSIONS OF ALL STR., R&S, AND R&D ASSEMBLIES. SUPPORT LENGTH SHOWN IN THIS PROJECT INCLUDES STUB LENGTHS. FOR STUB LENGTHS SEE STANDARD DETAIL SHEET ##.

NEW - NEW SIGN ON NEW SUPPORT

R&D - REMOVE AND DISCARD

R&S - REMOVE AND SAVE

STR - SIGN TO REMAIN

IRS - INSTALLATION OF REUSABLE SIGN

SUBMITTED: AUGUST 4, 2023

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
SIGNING QUANTITIES

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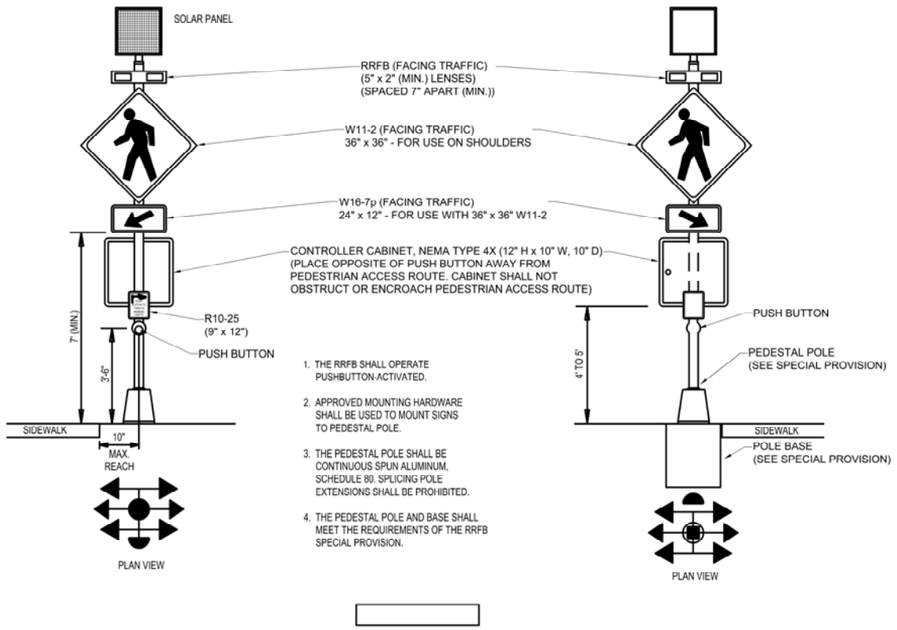
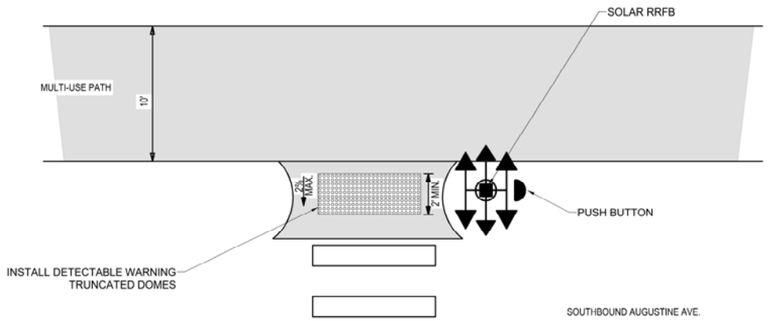
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	20	41

SOLAR RRFB ASSEMBLY DETAIL

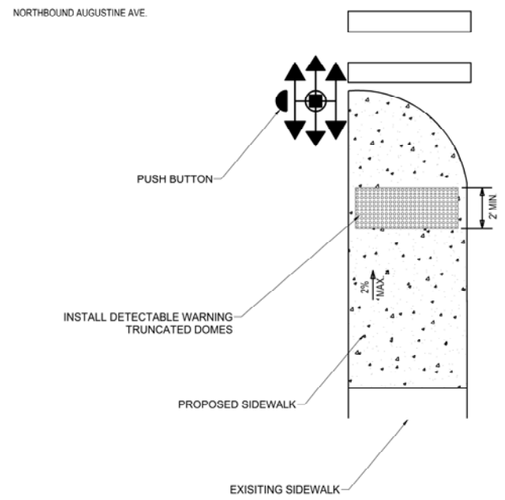


1. THE RRFB SHALL OPERATE PUSHBUTTON ACTIVATED.
2. APPROVED MOUNTING HARDWARE SHALL BE USED TO MOUNT SIGNS TO PEDESTAL POLE.
3. THE PEDESTAL POLE SHALL BE CONTINUOUS SPUN ALUMINUM, SCHEDULE 80. SPLICING POLE EXTENSIONS SHALL BE PROHIBITED.
4. THE PEDESTAL POLE AND BASE SHALL MEET THE REQUIREMENTS OF THE RRFB SPECIAL PROVISION.

WEST DETAIL



EAST DETAIL



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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
SIGNING DETAIL SHEET

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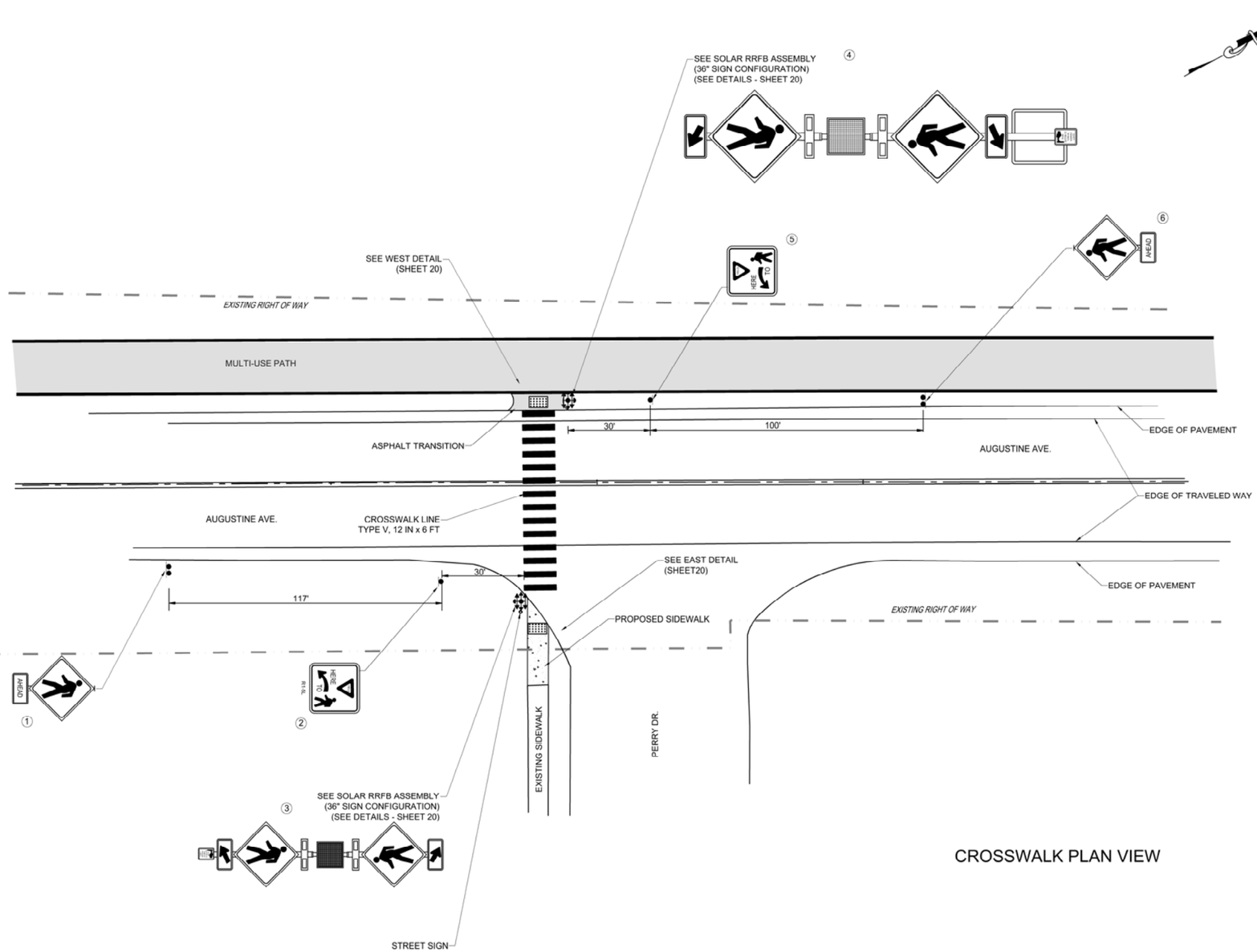
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	21	41



CROSSWALK PLAN VIEW

SUBMITTED: AUGUST 4, 2023

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH

SIGNING + PAVEMENT MARKING PLAN

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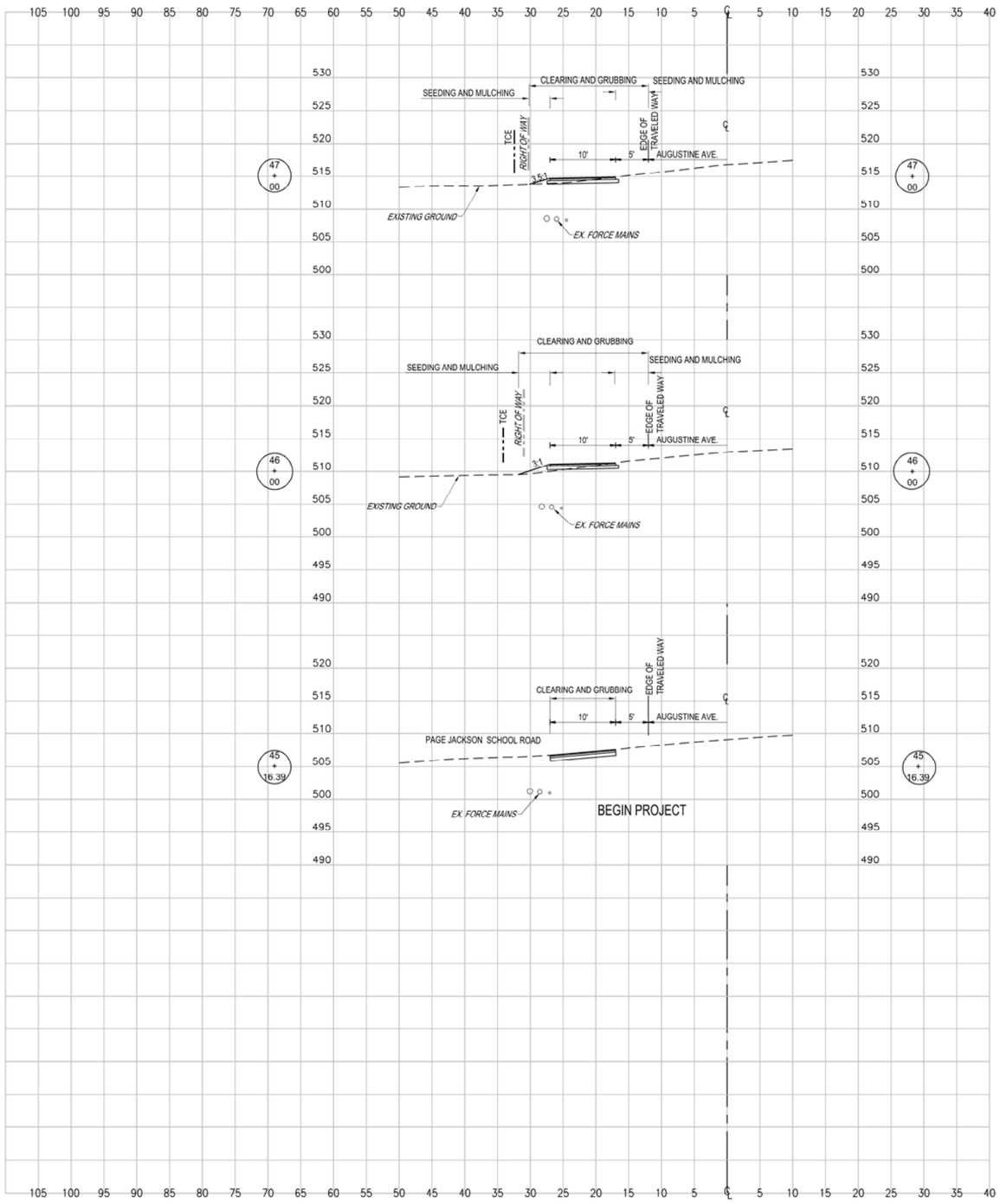
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	22	41



STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
47+00.00		8.17		18.17		4.39		0.00		1.05		0.00	
	100.00		898.00		1897.50		14.70		0.00		7.35		0.00
46+00.00		9.79		19.78		3.55		0.00		2.92		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
46+00.00		9.79		19.78		3.55		0.00		2.92		0.00	
	83.61		409.27		1244.95		19.01		0.00		4.52		0.00
45+16.39		0.00		10.00		8.73		0.00		0.00		0.00	



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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 1

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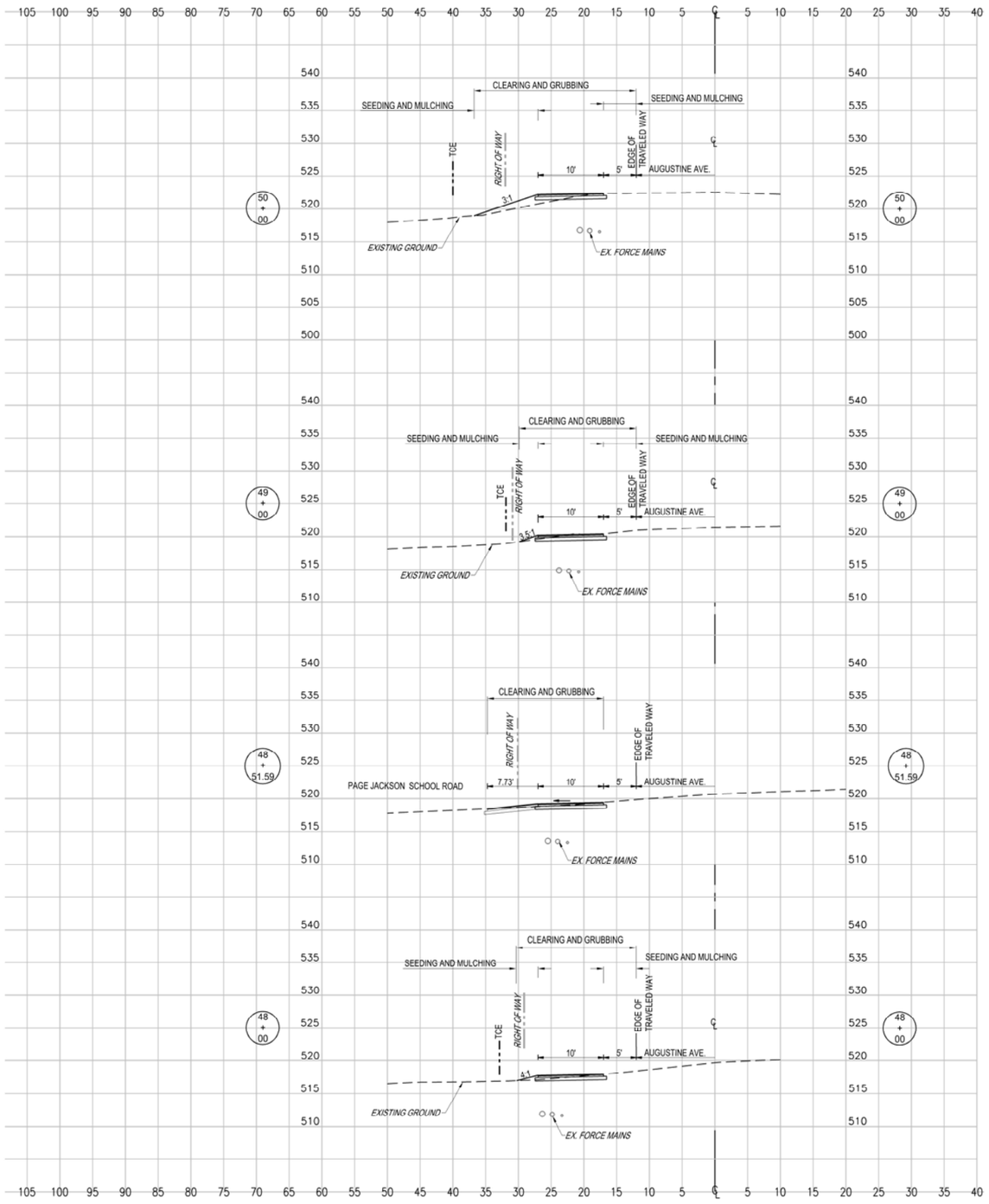
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	23	41

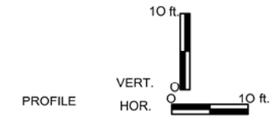


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
50+00.00		14.74		24.72		3.56		0.00		8.85		0.00	
	100.00		1131.00		2132.50		20.63		0.00		17.70		0.00
49+00.00		7.88		17.93		7.58		0.00		0.71		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
49+00.00		7.88		17.93		7.58		0.00		0.71		0.00	
	48.41		190.74		863.15		17.03		0.00		0.64		0.00
48+51.59		0.00		17.73		11.42		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
48+51.59		0.00		17.73		11.42		0.00		0.00		0.00	
	51.59		215.39		930.43		16.16		0.00		0.95		0.00
48+00.00		8.35		18.34		5.49		0.00		0.99		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
48+00.00		8.35		18.34		5.49		0.00		0.99		0.00	
	100.00		826.00		1825.50		18.30		0.00		3.78		0.00
47+00.00		8.17		18.17		4.39		0.00		1.05		0.00	



SUBMITTED: AUGUST 4, 2023

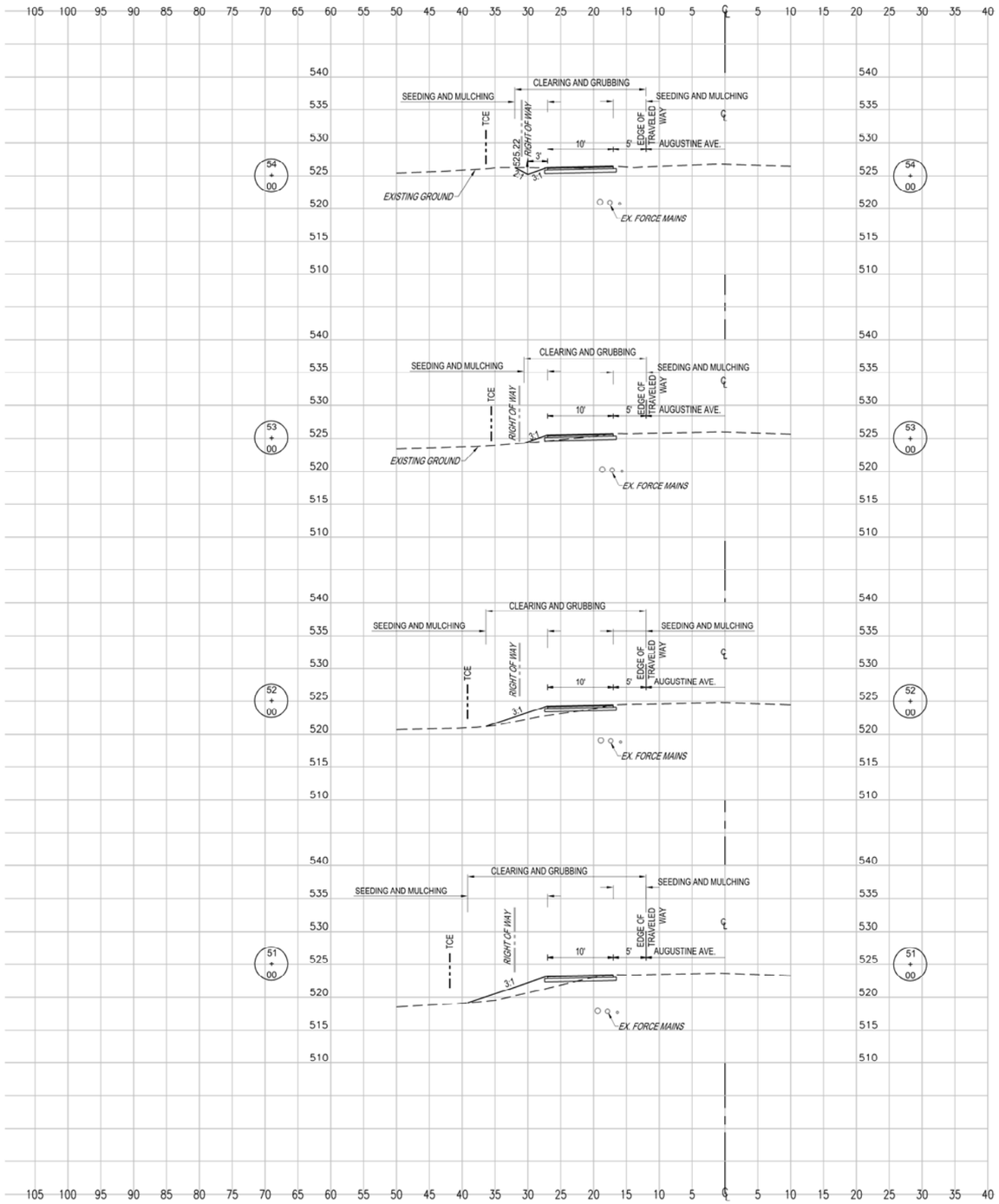
ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
MORGANTOWN, WV 26501
PHONE/FAX: 304-296-8216
TOLL FREE: 800-640-8216
www.thinkALPHAfirst.com

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 2

Z:\Projects\2022_Jobs\220506100\Drawings\Civil\Current\Construction\Cross Section 2 - PHASE 1.dwg

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	24	41

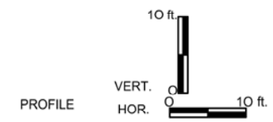


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
54+00.00		9.98		19.94		10.45		0.00		0.00		0.00	
	100.00		929.00		1928.00		27.07		0.00		2.46		0.00
53+00.00		8.60		18.62		4.17		0.00		1.33		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
53+00.00		8.60		18.62		4.17		0.00		1.33		0.00	
	100.00		1149.50		2149.00		12.17		0.00		17.63		0.00
52+00.00		14.39		24.36		2.40		0.00		8.19		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
52+00.00		14.39		24.36		2.40		0.00		8.19		0.00	
	100.00		1578.50		2576.00		10.13		0.00		43.44		0.00
51+00.00		17.18		27.16		3.07		0.00		15.27		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
51+00.00		17.18		27.16		3.07		0.00		15.27		0.00	
	100.00		1596.00		2594.00		12.28		0.00		44.67		0.00
50+00.00		14.74		24.72		3.56		0.00		8.85		0.00	



PROFILE

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
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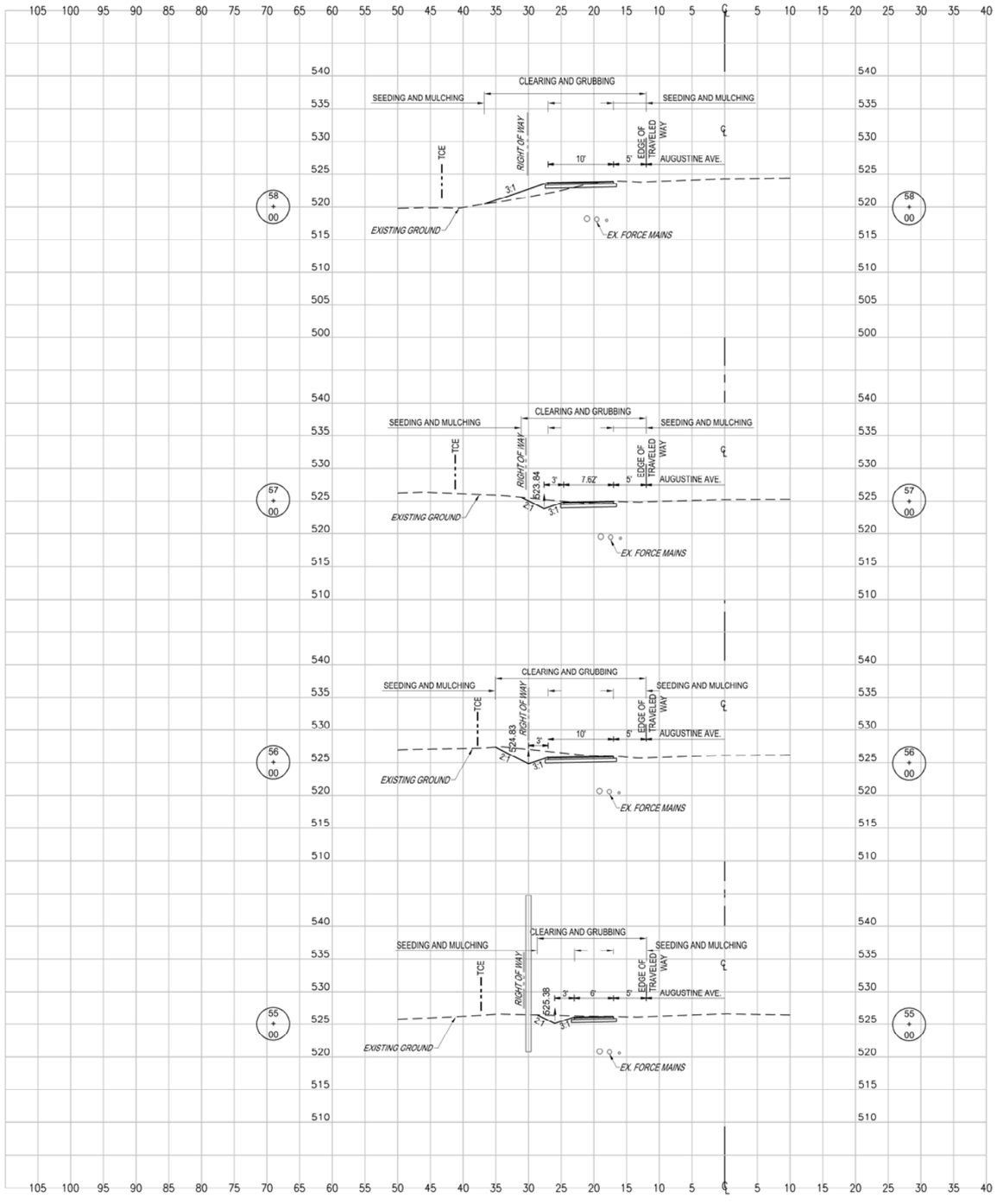
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 3

Z:\Projects\2022_Jobs\220506100\Drawings\Civil\Current\Construction\Cross Section 3 - PHASE 1.dwg

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	25	41

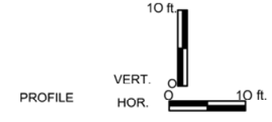


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
58+00.00		14.77		24.75		3.53		0.00		9.47		0.00	
	100.00		1350.00		2347.50		36.76		0.00		17.54		0.00
57+00.00		12.23		22.20		16.32		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
57+00.00		12.23		22.20		16.32		0.00		0.00		0.00	
	100.00		1265.00		2261.50		73.35		0.00		0.00		0.00
56+00.00		13.07		23.03		23.29		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
56+00.00		13.07		23.03		23.29		0.00		0.00		0.00	
	100.00		1204.50		2204.50		72.22		0.00		0.00		0.00
55+00.00		11.02		21.06		15.71		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
55+00.00		11.02		21.06		15.71		0.00		0.00		0.00	
	100.00		1050.00		2050.00		48.44		0.00		0.00		0.00
54+00.00		9.98		19.94		10.45		0.00		0.00		0.00	



SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 4

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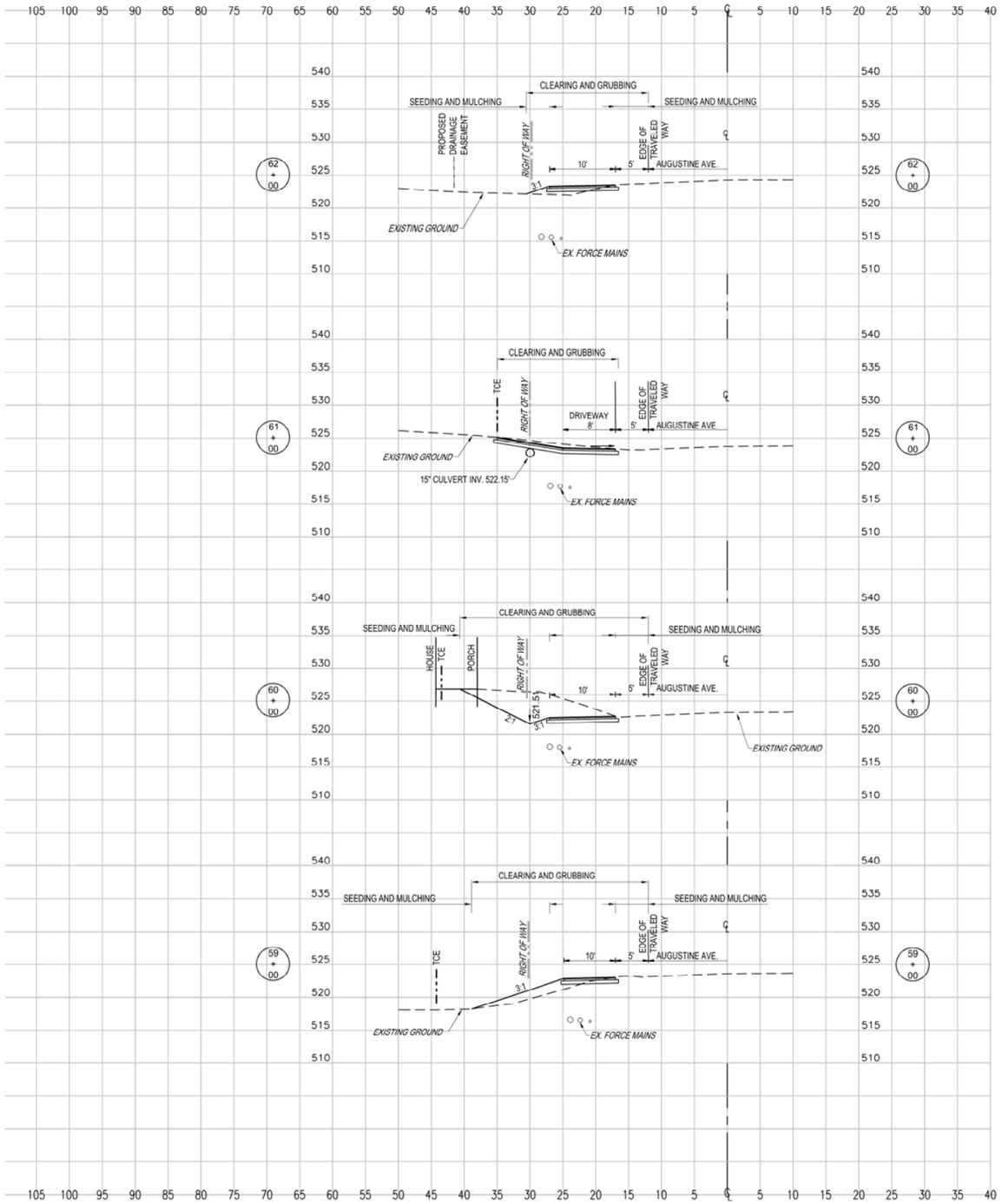
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	26	41

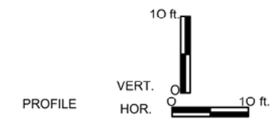


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
62+00.00		8.55		18.52		2.07		0.00		4.29		0.00	
	100.00		427.50		1845.50		27.26		0.00		7.94		0.00
61+00.00		0.00		18.39		12.65		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
61+00.00		0.00		18.39		12.65		0.00		0.00		0.00	
	100.00		932.00		2351.00		146.35		0.00		0.00		0.00
60+00.00		18.64		28.63		66.38		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
60+00.00		18.64		28.63		66.38		0.00		0.00		0.00	
	100.00		1886.50		2885.00		128.26		0.00		43.57		0.00
59+00.00		19.09		29.07		2.88		0.00		23.53		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
59+00.00		19.09		29.07		2.88		0.00		23.53		0.00	
	100.00		1693.00		2691.00		11.87		0.00		61.11		0.00
58+00.00		14.77		24.75		3.53		0.00		9.47		0.00	



SUBMITTED: AUGUST 4, 2023

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TOLL FREE: 800-640-8216
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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 5

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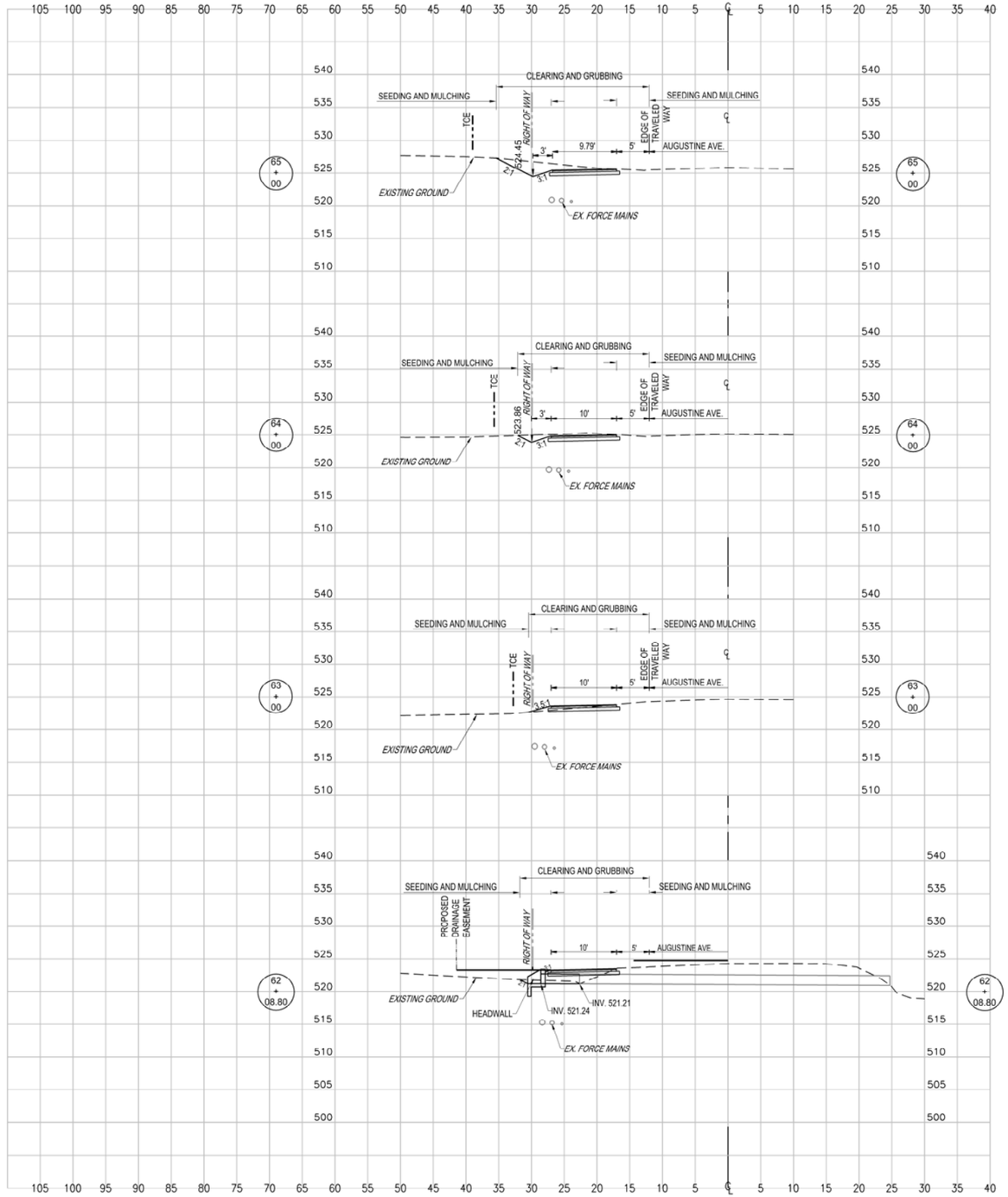
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	27	41

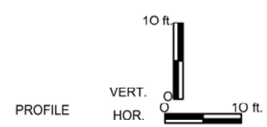


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
65+00.00		13.63		23.61		24.90		0.00		0.00		0.00	
	100.00		1187.00		2185.00		73.44		0.00		0.00		0.00
64+00.00		10.11		20.09		14.76		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
64+00.00		10.11		20.09		14.76		0.00		0.00		0.00	
	100.00		927.50		1925.00		37.67		0.00		1.89		0.00
63+00.00		8.44		18.41		5.58		0.00		1.02		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
63+00.00		8.44		18.41		5.58		0.00		1.02		0.00	
	91.20		829.46		1741.92		19.62		0.00		13.38		0.00
62+08.80		9.75		19.79		6.04		0.00		6.90		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
62+08.80		9.75		19.79		6.04		0.00		6.90		0.00	
	8.80		80.52		168.56		1.32		0.00		1.82		0.00
62+00.00		8.55		18.52		2.07		0.00		4.29		0.00	



SUBMITTED: AUGUST 4, 2023

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 6

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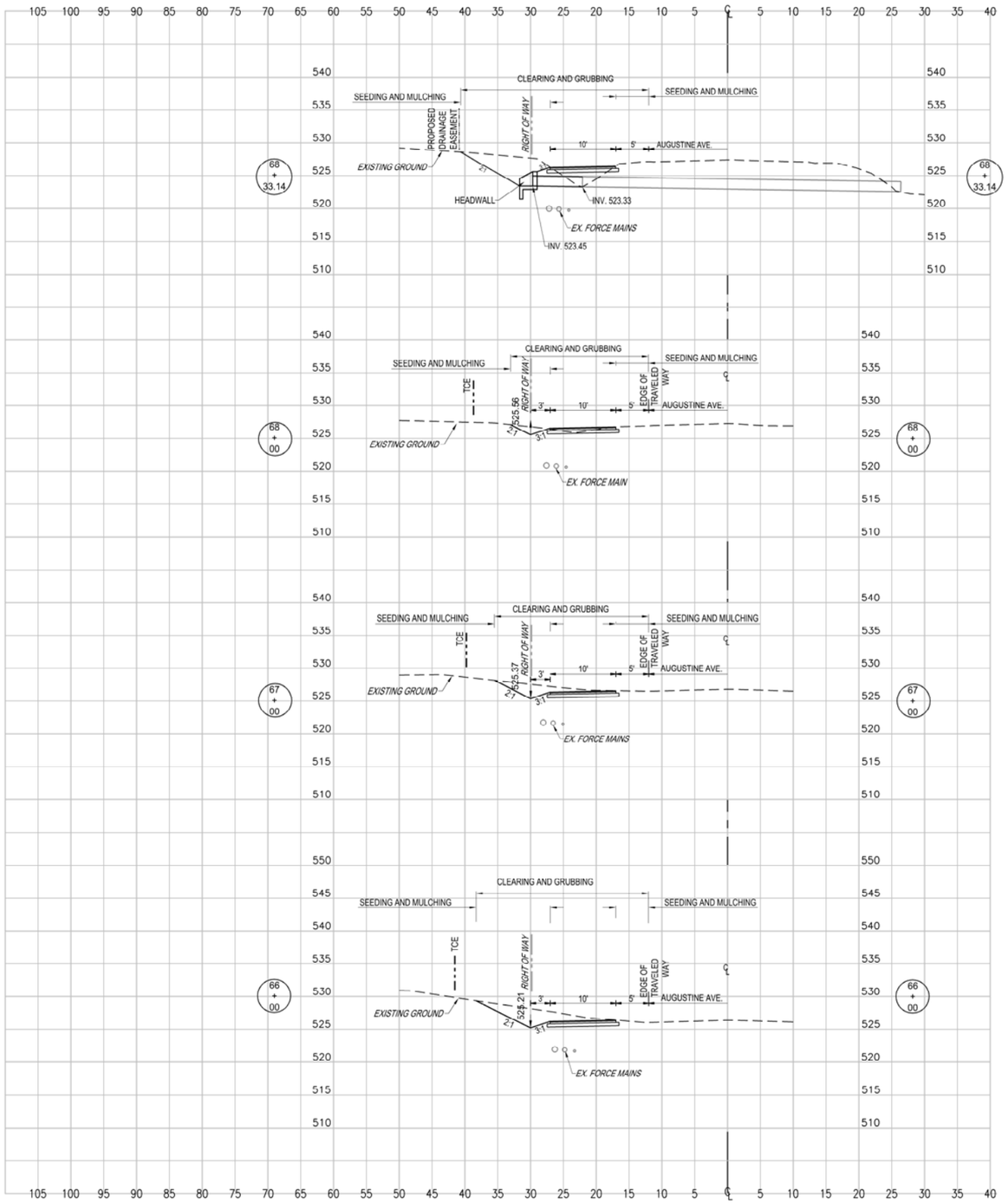
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	28	41

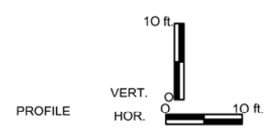


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
68+33.14		18.66		26.65		47.51		0.00		8.67		0.00	
	33.14		492.29		790.06		34.50		0.00		5.32		0.00
68+00.00		11.05		21.03		8.70		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
68+00.00		11.05		21.03		8.70		0.00		0.00		0.00	
	100.00		1227.50		2226.00		57.98		0.00		0.00		0.00
67+00.00		13.50		23.49		22.61		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
67+00.00		13.50		23.49		22.61		0.00		0.00		0.00	
	100.00		1489.00		2487.50		106.06		0.00		0.00		0.00
66+00.00		16.28		26.26		34.66		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
66+00.00		16.28		26.26		34.66		0.00		0.00		0.00	
	100.00		1495.50		2493.50		110.30		0.00		0.00		0.00
65+00.00		13.63		23.61		24.90		0.00		0.00		0.00	



PROFILE

SUBMITTED: AUGUST 4, 2023

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 7

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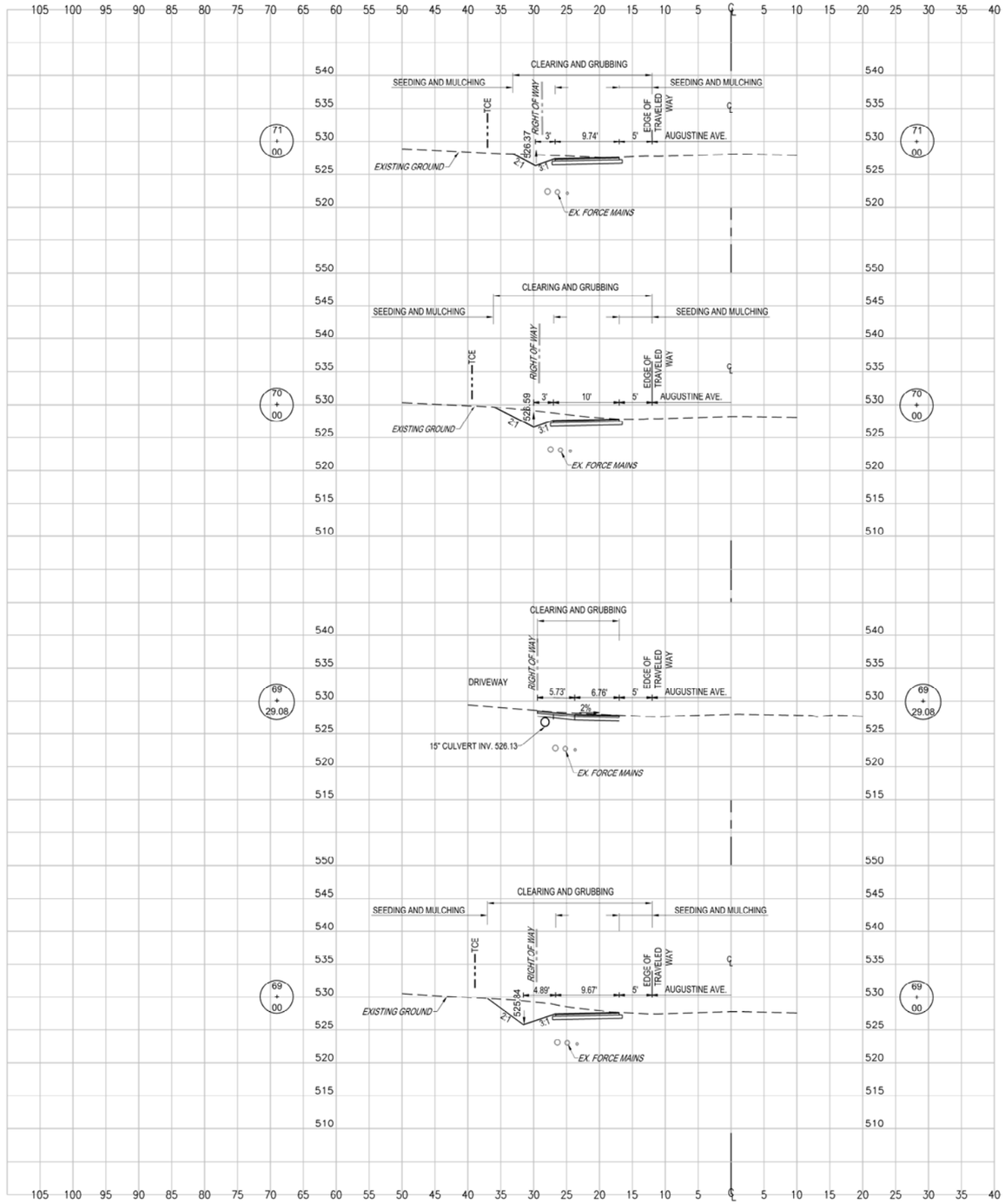
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	29	41

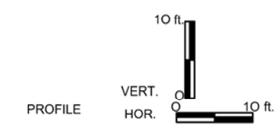


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
71+00.00		11.46		21.43		16.89		0.00		0.00		0.00	
	100.00		1280.00		2277.00		81.15		0.00		0.00		0.00
70+00.00		14.14		24.11		26.93		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
70+00.00		14.14		24.11		26.93		0.00		0.00		0.00	
	70.92		501.40		1295.71		52.91		0.00		0.00		0.00
69+29.08		0.00		12.43		13.36		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
69+29.08		0.00		12.43		13.36		0.00		0.00		0.00	
	29.08		211.41		537.25		23.75		0.00		0.00		0.00
69+00.00		14.54		24.52		30.75		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
69+00.00		14.54		24.52		30.75		0.00		0.00		0.00	
	66.86		1109.88		1710.61		96.90		0.00		10.73		0.00
68+33.14		18.66		26.65		47.51		0.00		8.67		0.00	



SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
MORGANTOWN, WV 26501
PHONE/FAX: 304-296-8216
TOLL FREE: 800-640-8216
www.thinkALPHAfirst.com

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 8

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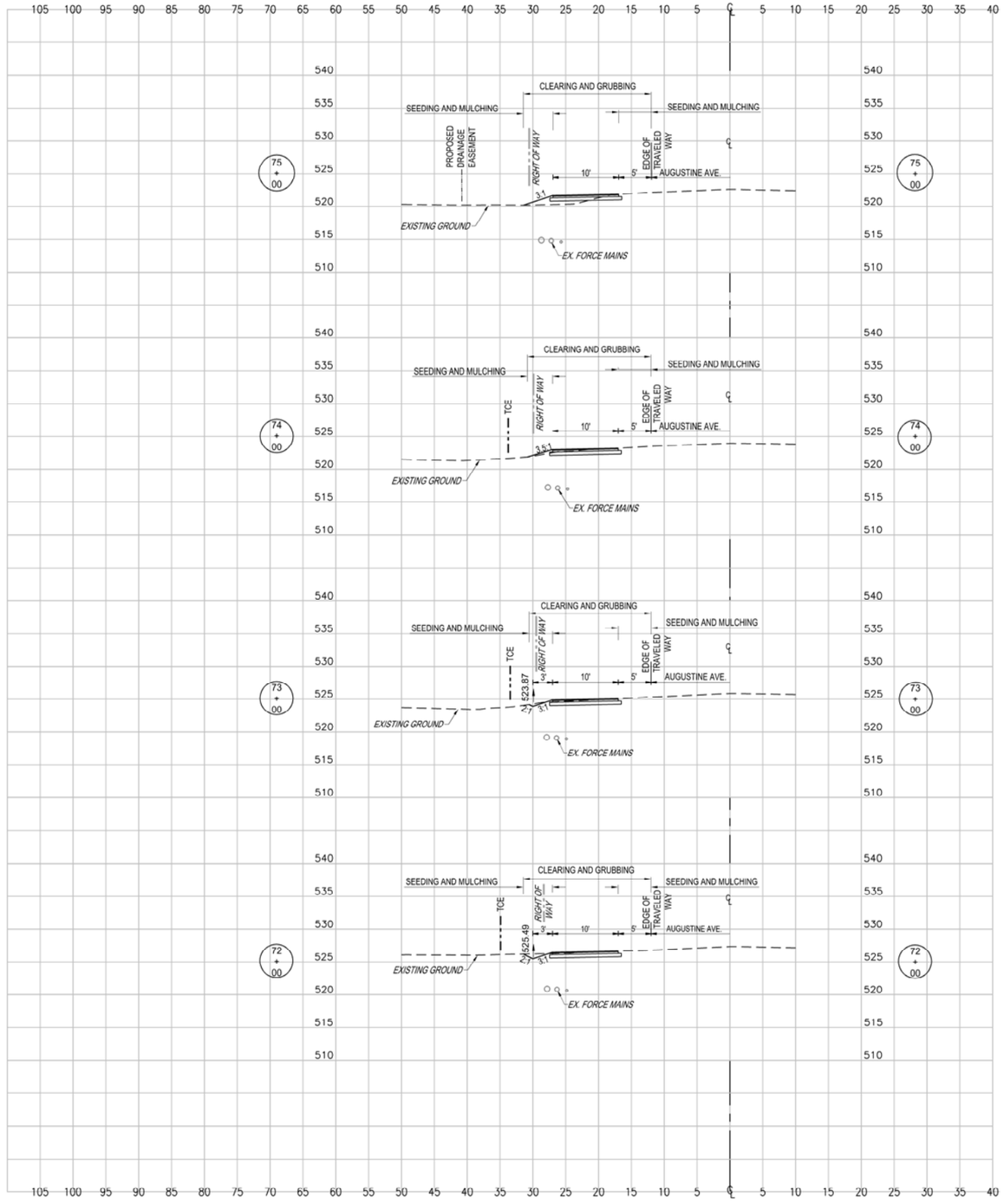
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	30	41

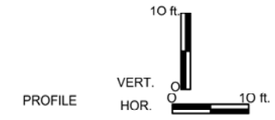


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
75+00.00		9.49		19.47		2.61		0.00		5.22		0.00	
	100.00		916.50		1914.00		18.43		0.00		11.28		0.00
74+00.00		8.84		18.81		7.34		0.00		0.87		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
74+00.00		8.84		18.81		7.34		0.00		0.87		0.00	
	100.00		871.00		1869.50		28.44		0.00		1.94		0.00
73+00.00		8.58		18.58		8.02		0.00		0.18		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
73+00.00		8.58		18.58		8.02		0.00		0.18		0.00	
	100.00		901.50		1900.50		32.61		0.00		0.44		0.00
72+00.00		9.45		19.43		9.59		0.00		0.06		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
72+00.00		9.45		19.43		9.59		0.00		0.06		0.00	
	100.00		1045.50		2043.00		49.04		0.00		0.11		0.00
71+00.00		11.46		21.43		16.89		0.00		0.00		0.00	



SUBMITTED: AUGUST 4, 2023

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 9

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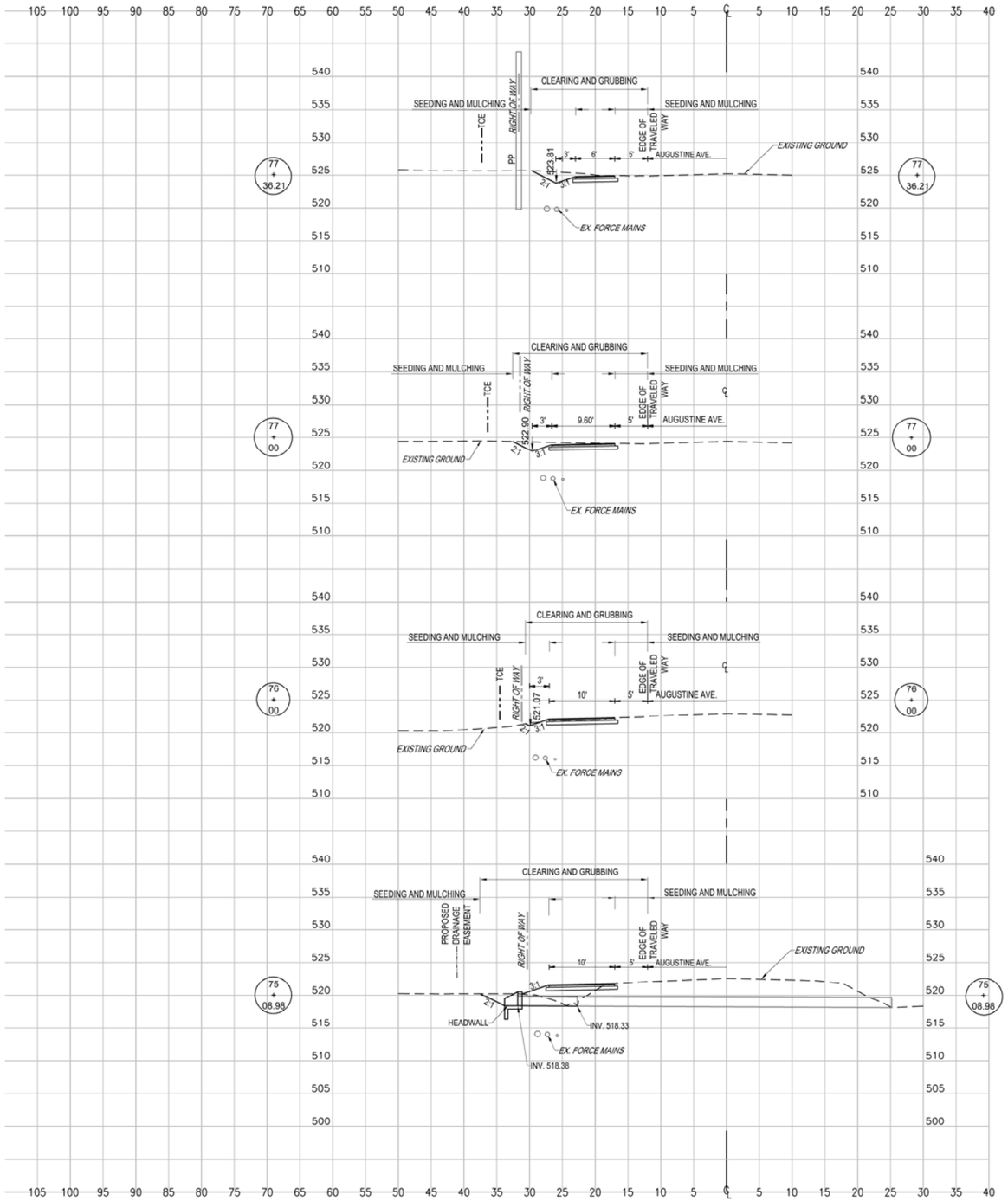
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	31	41

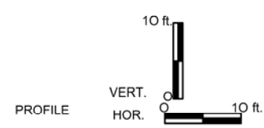


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
77+36.21		11.81		17.81		13.34		0.00		0.00		0.00	
	36.21		412.61		701.75		19.43		0.00		0.00		0.00
77+00.00		10.98		20.95		15.63		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
77+00.00		10.98		20.95		15.63		0.00		0.00		0.00	
	100.00		980.00		1977.50		41.69		0.00		0.46		0.00
76+00.00		8.62		18.60		6.88		0.00		0.25		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
76+00.00		8.62		18.60		6.88		0.00		0.25		0.00	
	91.02		1098.16		2009.27		47.11		0.00		24.95		0.00
75+08.98		15.51		25.55		21.07		0.00		14.55		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
75+08.98		15.51		25.55		21.07		0.00		14.55		0.00	
	8.98		112.25		202.14		3.94		0.00		3.29		0.00
75+00.00		9.49		19.47		2.61		0.00		5.22		0.00	



PROFILE

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 10

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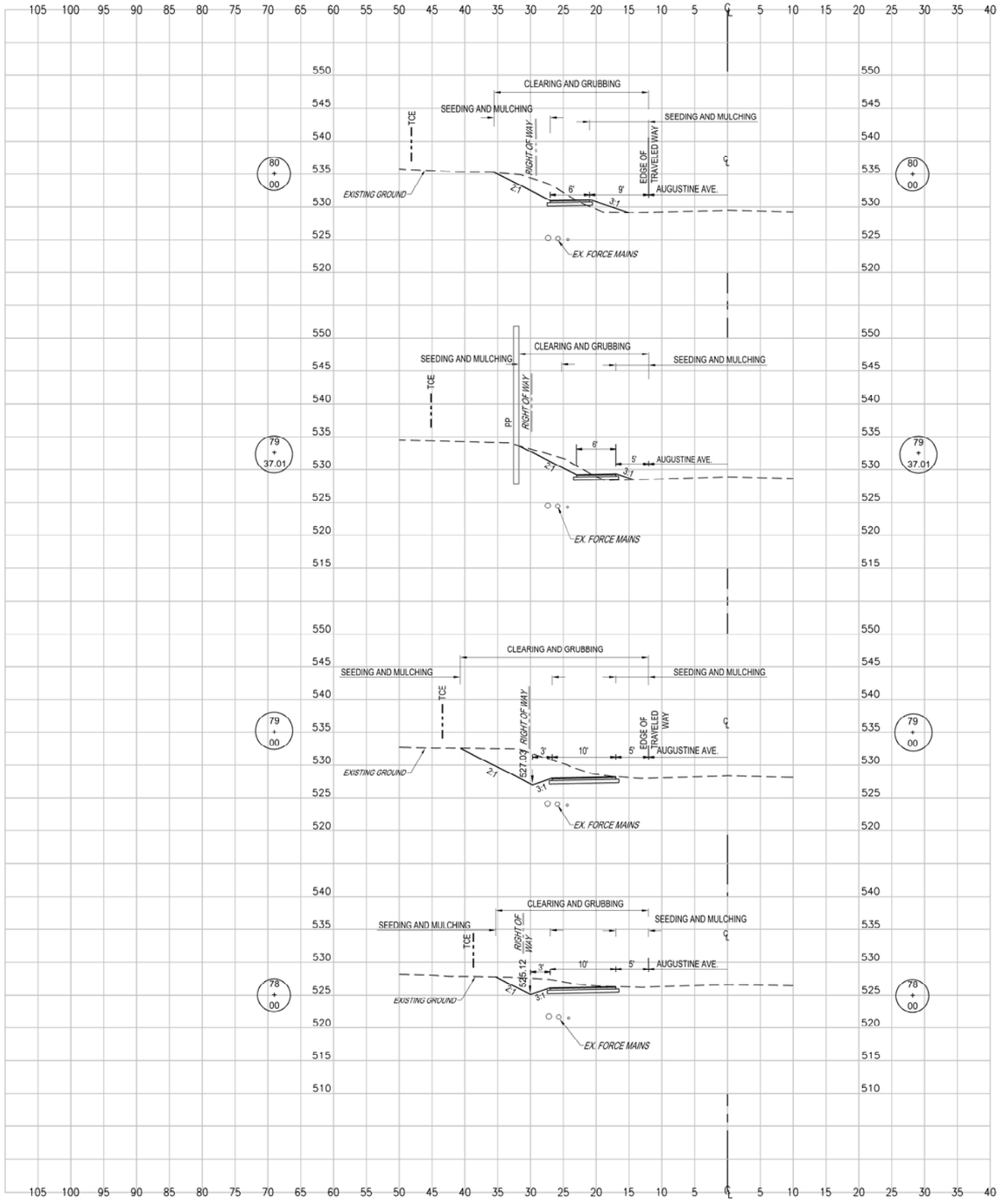
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	32	41



STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
80+00.00		23.14		33.12		94.49		0.00		0.00		0.00	
	62.99		1163.11		1665.77		121.47		0.00		8.56		0.00
79+37.01		13.79		19.77		9.64		0.00		7.34		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
79+37.01		13.79		19.77		9.64		0.00		7.34		0.00	
	37.01		607.33		902.49		48.66		0.00		5.03		0.00
79+00.00		19.03		29.00		61.36		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
79+00.00		19.03		29.00		61.36		0.00		0.00		0.00	
	100.00		1616.00		2613.50		162.13		0.00		0.00		0.00
78+00.00		13.29		23.27		26.19		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
78+00.00		13.29		23.27		26.19		0.00		0.00		0.00	
	63.79		800.56		1310.25		46.70		0.00		0.00		0.00
77+36.21		11.81		17.81		13.34		0.00		0.00		0.00	

PROFILE
1O ft.
VERT.
HOR.
1O ft.

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 11

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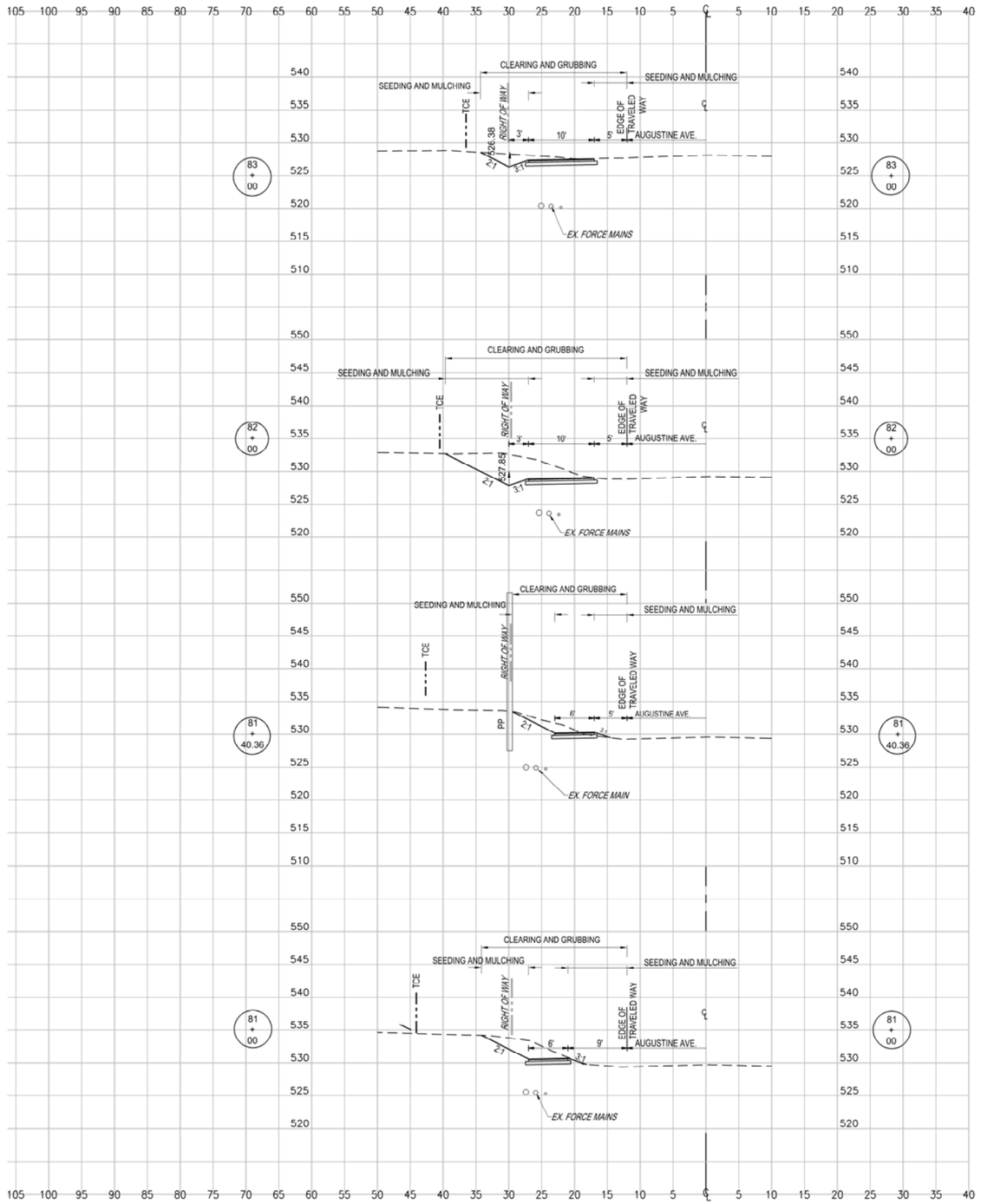
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	33	41

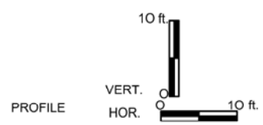


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
83+00.00		12.32		22.30		19.90		0.00		0.00		0.00	
	100.00		1498.50		2505.50		147.61		0.00		0.00		0.00
82+00.00		17.65		27.81		59.81		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
82+00.00		17.65		27.61		59.81		0.00		0.00		0.00	
	59.64		867.46		1343.69		80.38		0.00		0.64		0.00
81+40.36		11.44		17.45		12.97		0.00		0.58		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
81+40.36		11.44		17.45		12.97		0.00		0.58		0.00	
	40.36		630.63		953.71		64.16		0.00		0.43		0.00
81+00.00		19.81		29.81		72.88		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
81+00.00		19.81		29.81		72.88		0.00		0.00		0.00	
	100.00		2147.50		3146.50		309.94		0.00		0.00		0.00
80+00.00		23.14		33.12		94.49		0.00		0.00		0.00	



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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 12

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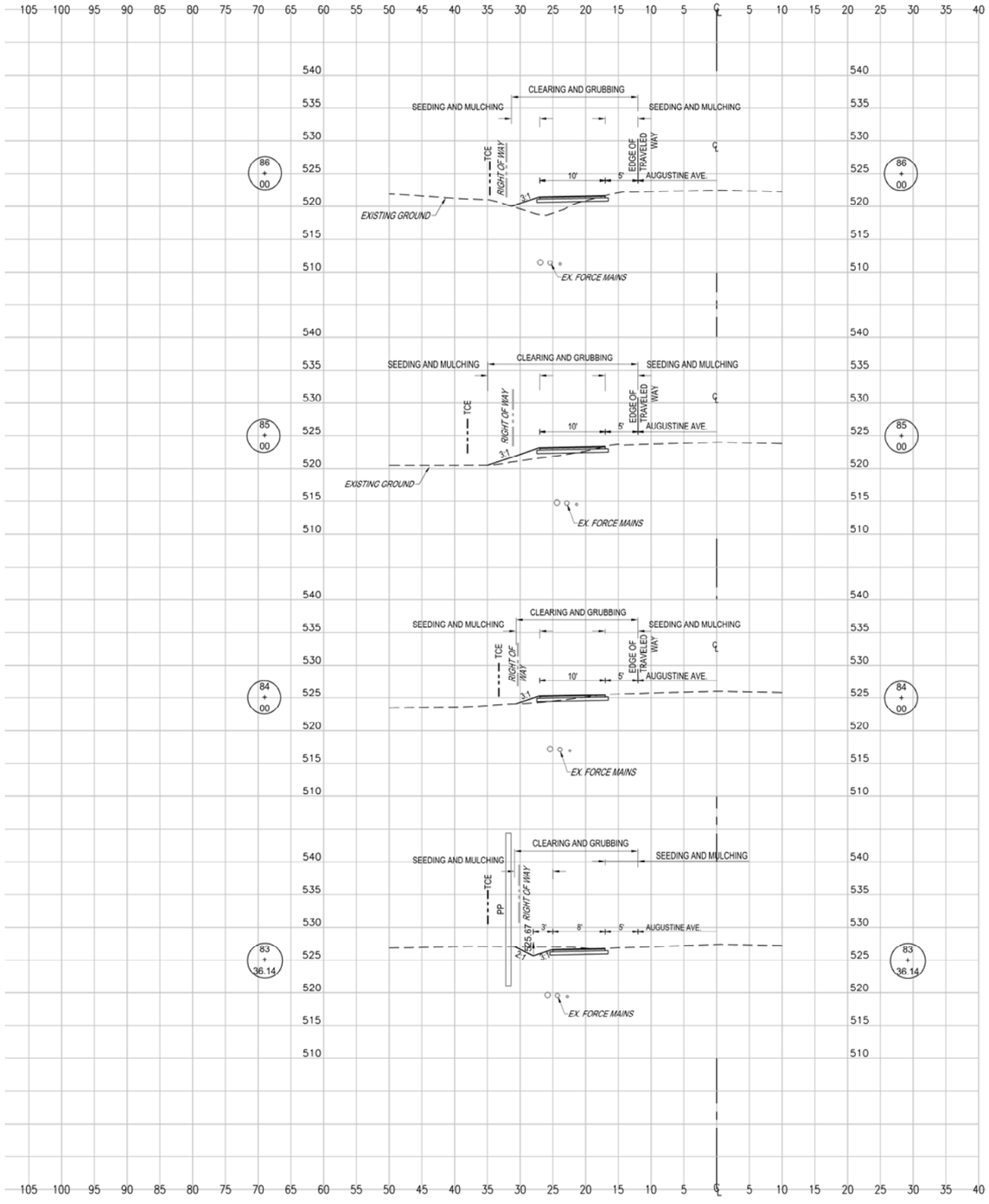
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	34	41

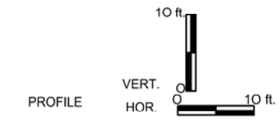


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
86+00.00		9.32		19.29		1.80		0.00		12.96		0.00	
	100.00		1113.00		2113.50		7.00		0.00		39.02		0.00
85+00.00		12.94		22.98		1.98		0.00		8.11		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
85+00.00		12.94		22.98		1.98		0.00		8.11		0.00	
	100.00		1078.00		2079.00		10.65		0.00		18.22		0.00
84+00.00		8.62		18.60		3.77		0.00		1.73		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
84+00.00		8.62		18.60		3.77		0.00		1.73		0.00	
	63.86		621.68		1195.78		20.44		0.00		2.05		0.00
83+36.14		10.85		18.85		13.51		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
83+36.14		10.85		18.85		13.51		0.00		0.00		0.00	
	36.14		418.68		743.58		22.36		0.00		0.00		0.00
83+00.00		12.32		22.30		19.90		0.00		0.00		0.00	



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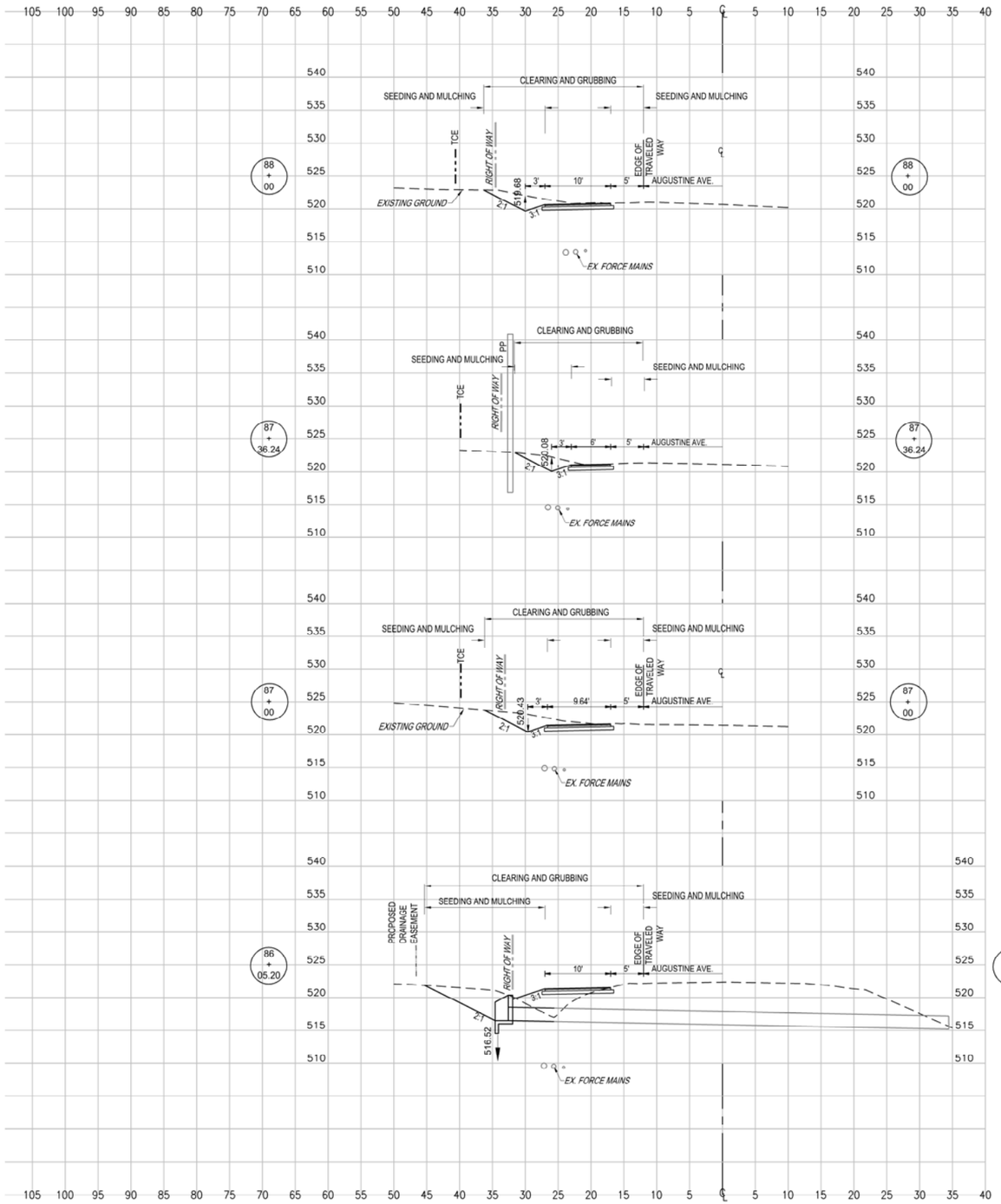
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 13

Z:\Projects\2022_Jobs\220506100\Drawings\Civil\Current\Construction\Cross Section 13 - PHASE 1.dwg

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	35	41

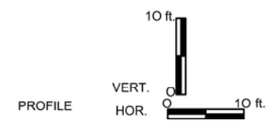


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
88+00.00		14.35		24.32		24.57		0.00		0.00		0.00	
	63.76		890.09		1399.21		48.04		0.00		0.00		0.00
87+36.24		13.57		19.57		16.12		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
87+36.24		13.57		19.57		16.12		0.00		0.00		0.00	
	36.24		510.80		800.36		29.50		0.00		0.00		0.00
87+00.00		14.62		24.60		27.83		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
87+00.00		14.62		24.60		27.83		0.00		0.00		0.00	
	94.80		1799.30		2744.93		137.78		0.00		35.87		0.00
86+05.20		23.34		33.31		50.65		0.00		20.43		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
86+05.20		23.34		33.31		50.65		0.00		20.43		0.00	
	5.20		84.92		136.76		5.05		0.00		3.22		0.00
86+00.00		9.32		19.29		1.80		0.00		12.96		0.00	



SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
MORGANTOWN, WV 26501
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TOLL FREE: 800-640-8216
www.thinkALPHAfirst.com

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 14

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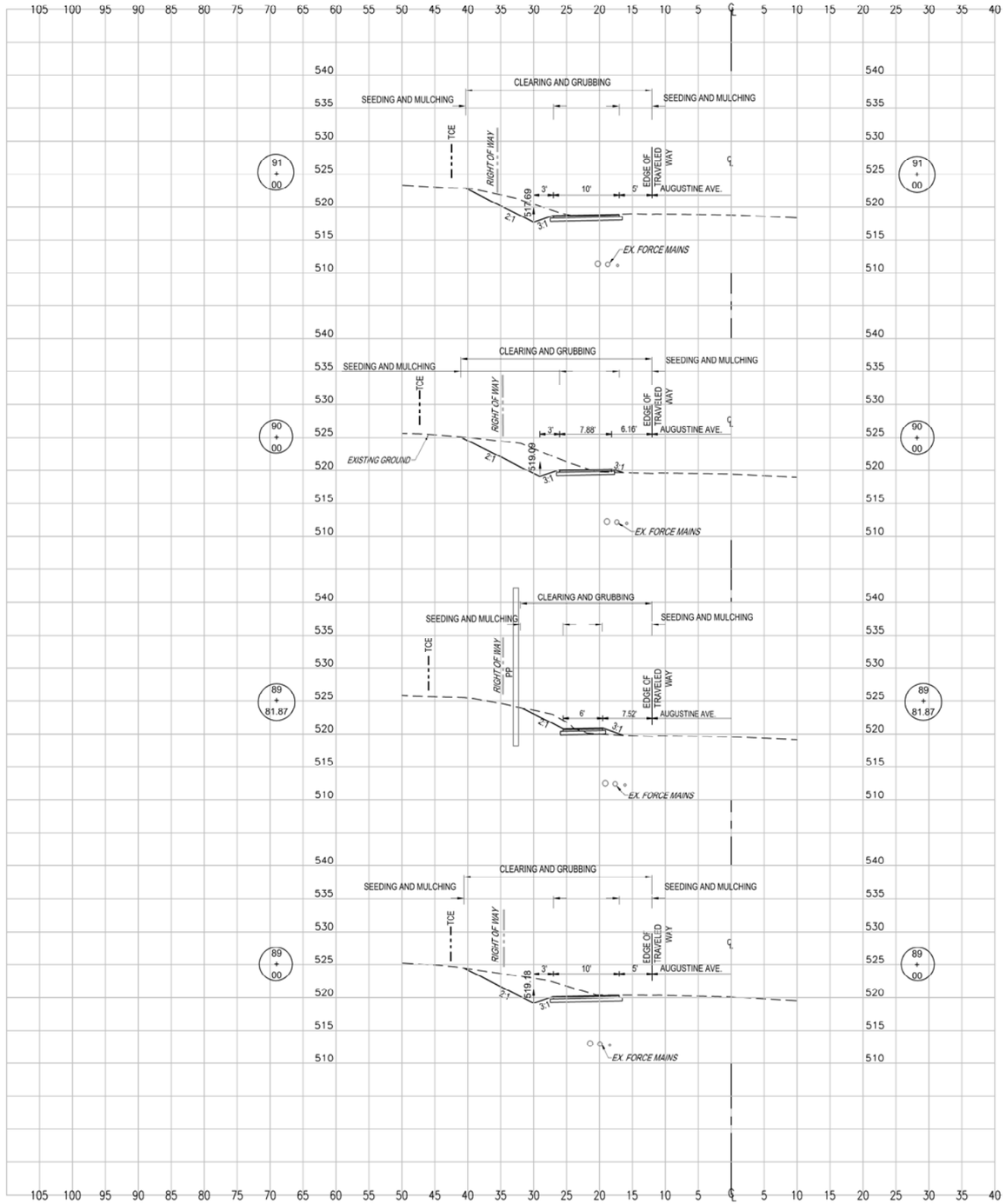
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	36	41



STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
91+00.00		18.32		28.30		30.86		0.00		0.00		0.00	
	100.00		1928.50		2919.00		151.46		0.00		0.80		0.00
90+00.00		20.25		30.08		50.93		0.00		0.43		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
90+00.00		20.25		30.08		50.93		0.00		0.43		0.00	
	18.13		307.03		450.53		19.92		0.00		0.69		0.00
89+81.87		13.62		19.62		8.39		0.00		1.62		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
89+81.87		13.62		19.62		9.39		0.00		1.62		0.00	
	81.87		1317.29		1971.43		82.98		0.00		2.46		0.00
89+00.00		18.56		28.54		45.34		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
89+00.00		18.56		28.54		45.34		0.00		0.00		0.00	
	100.00		1645.50		2643.00		129.46		0.00		0.00		0.00
88+00.00		14.35		24.32		24.57		0.00		0.00		0.00	

PROFILE
VERT. 10 ft.
HOR. 10 ft.

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 15

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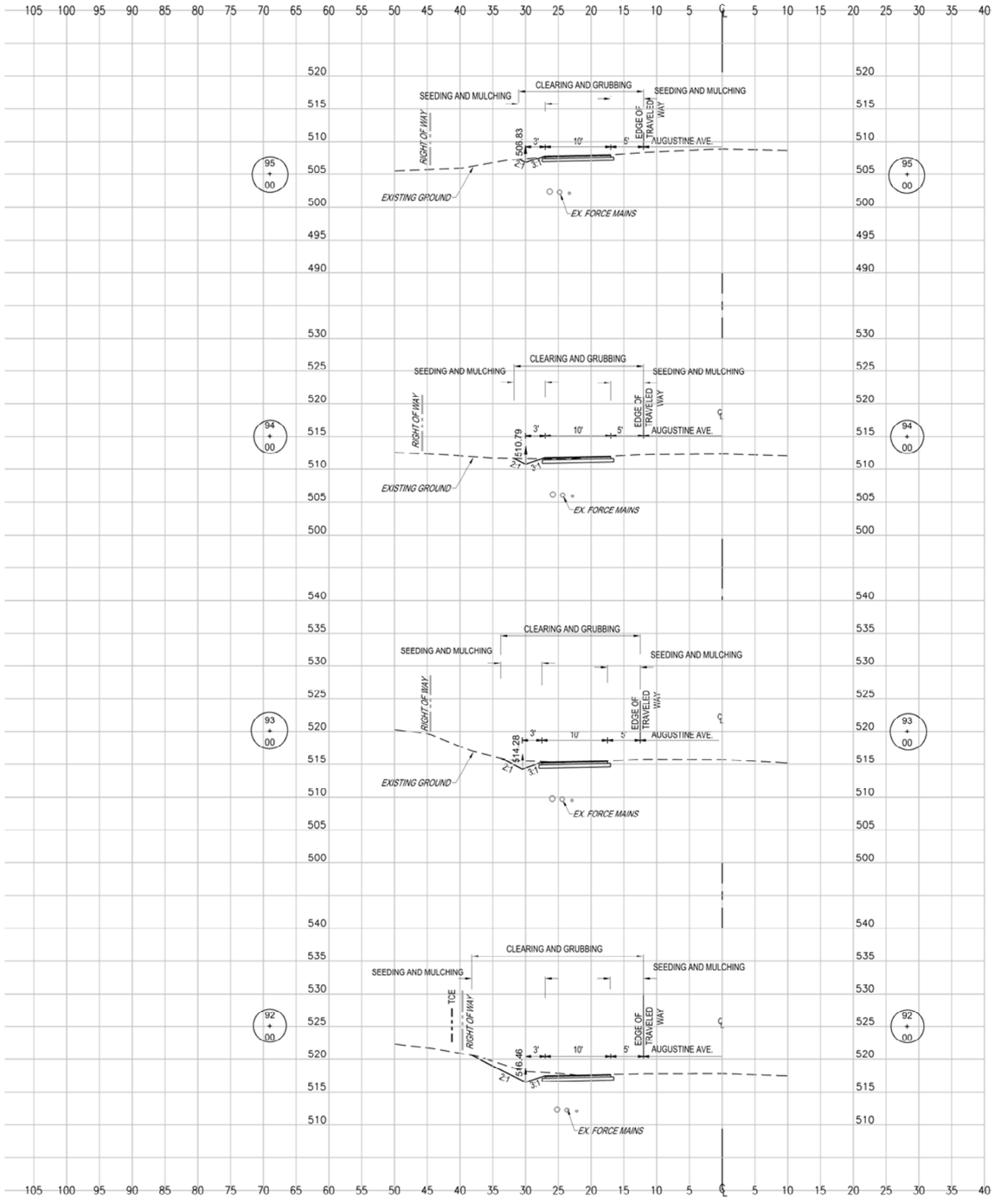
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	37	41

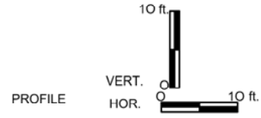


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
95+00.00		9.05		19.07		9.39		0.00		0.04		0.00	
	100.00		940.00		1941.00		34.44		0.00		0.17		0.00
94+00.00		9.75		19.75		9.21		0.00		0.05		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
94+00.00		9.75		19.75		9.21		0.00		0.05		0.00	
	100.00		1052.50		2052.00		39.80		0.00		0.09		0.00
93+00.00		11.30		21.29		12.28		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
93+00.00		11.30		21.29		12.28		0.00		0.00		0.00	
	100.00		1375.00		2373.50		61.57		0.00		0.00		0.00
92+00.00		16.20		26.18		20.97		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
92+00.00		16.20		26.18		20.97		0.00		0.00		0.00	
	100.00		1726.00		2724.00		95.98		0.00		0.00		0.00
91+00.00		18.32		28.30		30.86		0.00		0.00		0.00	



SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 16

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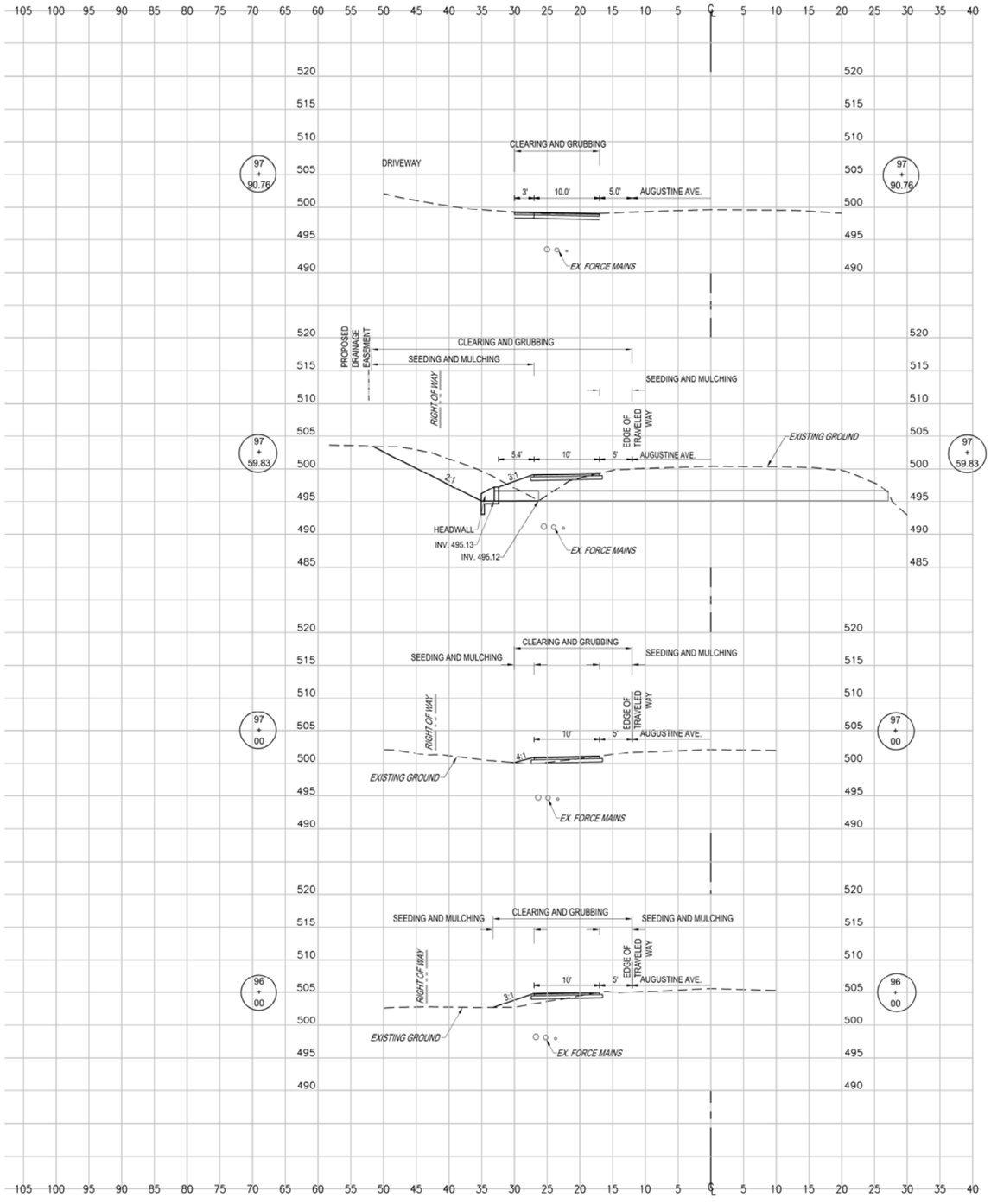
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	38	41

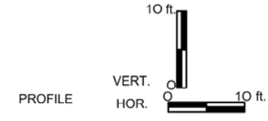


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
97+90.76		0.00		13.01		9.83		0.00		0.00		0.00	
	30.93		460.55		816.71		47.59		0.00		9.67		0.00
97+59.83		29.78		39.80		73.25		0.00		16.88		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
97+59.83		29.78		39.80		73.25		0.00		16.88		0.00	
	59.83		1131.68		1729.98		85.50		0.00		20.16		0.00
97+00.00		8.05		18.03		3.92		0.00		1.32		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
97+00.00		8.05		18.03		3.92		0.00		1.32		0.00	
	100.00		966.00		1963.50		11.98		0.00		15.46		0.00
96+00.00		11.27		21.24		2.55		0.00		7.03		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
96+00.00		11.27		21.24		2.55		0.00		7.03		0.00	
	100.00		1016.00		2015.50		22.11		0.00		13.09		0.00
95+00.00		9.05		19.07		9.39		0.00		0.04		0.00	



PROFILE

SUBMITTED: AUGUST 4, 2023

ALPHA ASSOCIATES, INC.
209 PRAIRIE AVENUE
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www.thinkALPHAfirst.com

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 17

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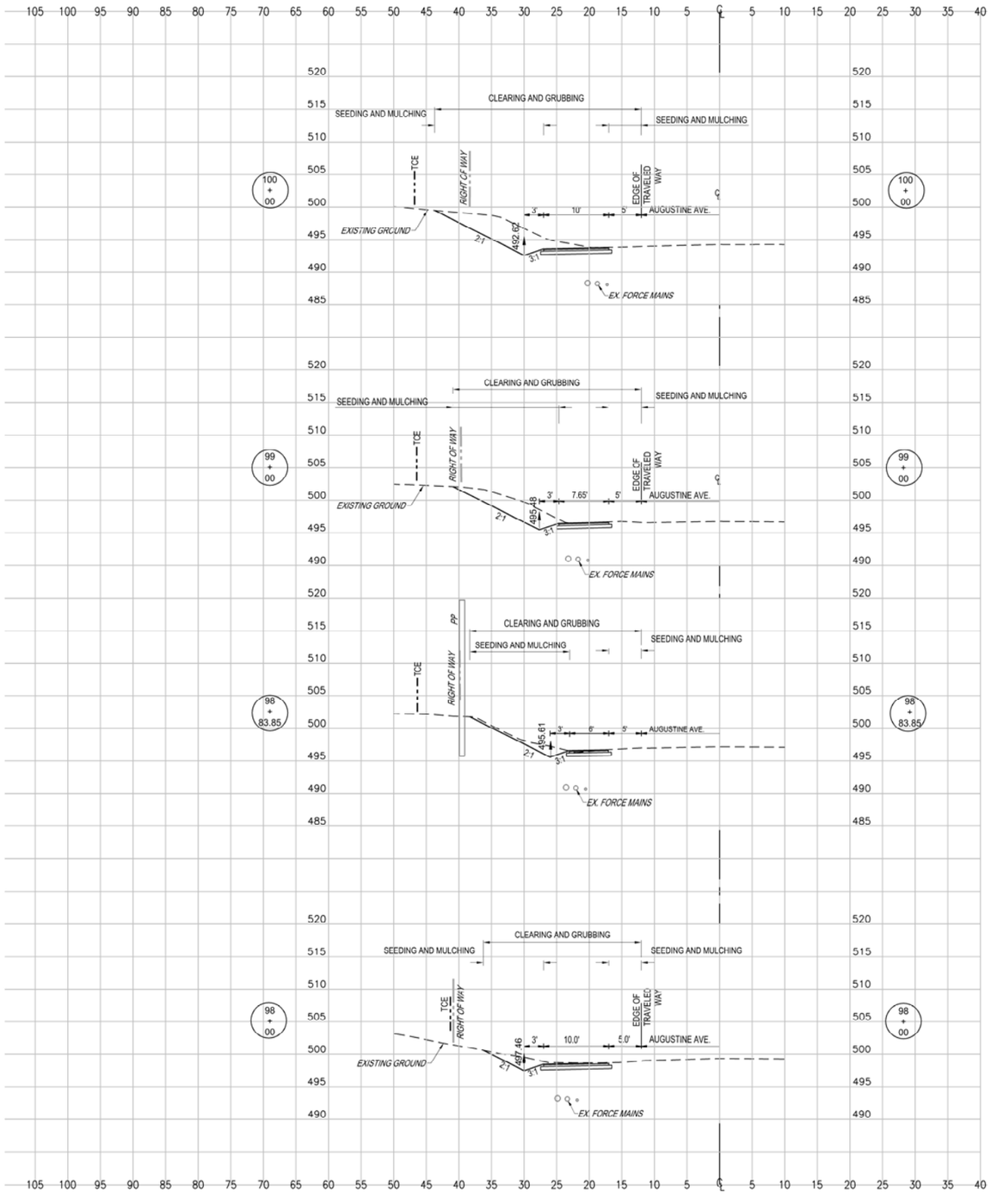
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	39	41

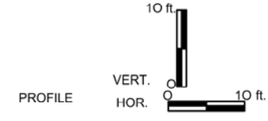


STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
100+00.00		21.70		31.67		58.99		0.00		0.00		0.00	
	100.00		2158.50		3157.00		212.13		0.00		0.00		0.00
99+00.00		21.47		31.47		55.56		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
99+00.00		21.47		31.47		55.56		0.00		0.00		0.00	
	16.15		337.54		466.57		20.80		0.00		0.00		0.00
98+83.85		20.33		26.31		13.98		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
98+83.85		20.33		26.31		13.98		0.00		0.00		0.00	
	83.85		1449.77		2118.89		52.76		0.00		0.00		0.00
98+00.00		14.25		24.23		20.00		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
98+00.00		14.25		24.23		20.00		0.00		0.00		0.00	
	9.24		65.84		172.05		5.10		0.00		0.00		0.00
97+90.76		0.00		13.01		9.83		0.00		0.00		0.00	



PROFILE

SUBMITTED: AUGUST 4, 2023

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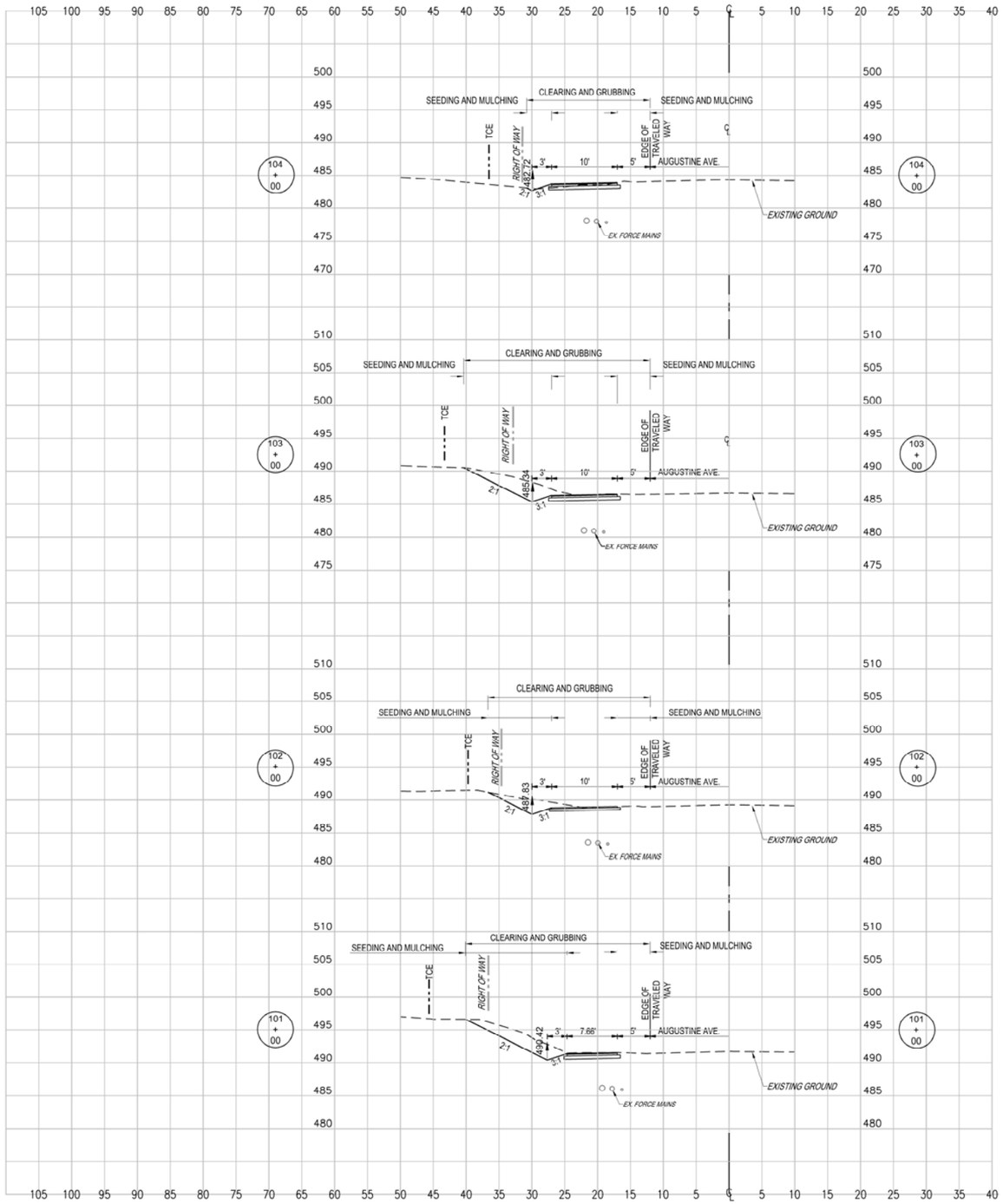
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTIONS 18

Z:\Projects\2022_Jobs\220506100\Drawings\Civil\Current\Construction\Cross Section 18 - PHASE 1.dwg

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	40	41



STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
104+00.00		8.81		18.78		6.09		0.00		0.54		0.00	
	100.00		1359.50		2357.00		73.20		0.00		1.00		0.00
103+00.00		18.38		28.36		33.44		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
103+00.00		18.38		28.36		33.44		0.00		0.00		0.00	
	100.00		1654.00		2653.00		96.69		0.00		0.00		0.00
102+00.00		14.70		24.70		18.77		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
102+00.00		14.70		24.70		18.77		0.00		0.00		0.00	
	100.00		1763.50		2762.50		121.83		0.00		0.00		0.00
101+00.00		20.57		30.55		47.02		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
101+00.00		20.57		30.55		47.02		0.00		0.00		0.00	
	100.00		2113.50		3111.00		196.31		0.00		0.00		0.00
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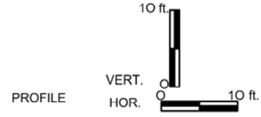

SUBMITTED: AUGUST 4, 2023

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REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHARLES TOWN AUGUSTINE AVE.
MULTI-USE PATH
CROSS SECTION 19

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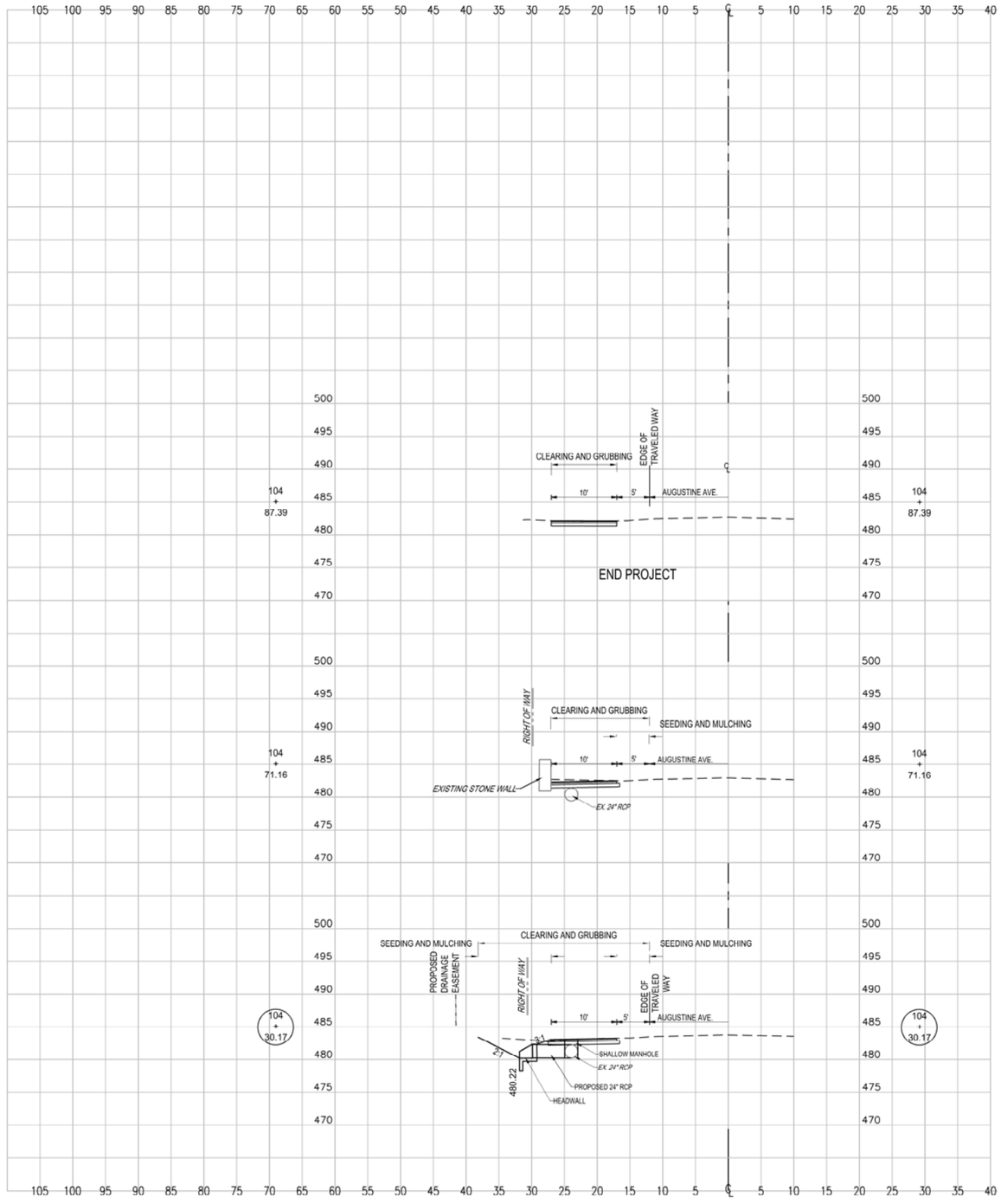
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FED. PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	5	U319-CHA/ RL-2.00	TAP-2017 (210)D	2023	JEFFERSON	41	41



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		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
104+87.39		0.00		10.00		8.70		0.00		0.00		0.00	
	16.23		40.58		203.52		5.88		0.00		0.00		0.00
104+71.16		5.00		15.08		10.86		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
104+71.16		5.00		15.06		10.86		0.00		0.00		0.00	
	40.99		434.29		844.80		38.71		0.00		0.00		0.00
104+30.17		16.19		26.16		40.13		0.00		0.00		0.00	

STATION	LENGTH FT.	SEEDING & MULCHING		CLEARING & GRUBBING		EXCAVATION				EMBANKMENT			
		WIDTH	AREA	WIDTH	AREA	UNCLASSIFIED		UNSUITABLE		UNCLASSIFIED		SELECT	
		FT.	SF.	FT.	SF.	SF.	CY.	SF.	CY.	SF.	CY.	SF.	CY.
104+30.17		16.19		26.16		40.13		0.00		0.00		0.00	
	30.17		377.13		677.92		25.82		0.00		0.30		0.00
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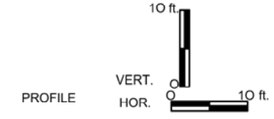

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CROSS SECTION 20

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Infrastructure Committee
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

AGENDA ITEM (ID #)

Meeting: 08/28/23
Department: Infrastructure Committee
Category: Information Only
Initiator:

2023-759: Liberty Street Storm Water Project

Liberty Street Storm Water Project

ATTACHMENTS:

- Liberty Street ROW Const Est5-24-2021.pdf
- Liberty Street Parking Lot Const Est5-24-2021.pdf
- 7037-LS-Summary Report-Compiled (December 2020).pdf

Engineer's Opinion of Potential Costs

Note: The costs presented are approximate in nature and based on information available as of the date on this document. The engineer provides no guarantee for the completeness or accuracy of the costs reflected in this document.

Project Name: **Liberty Street Improvements**
Public ROW Improvements

Prepared By: ZJ **Date:** 5/24/2021

	Item	Quantity	Unit	Unit Price	Cost	Percent
A.	**Erosion and Sediment**					
1.	Inlet Protection	26	Each	$ 165.00	$4,290	
2.	Compost Filter Sock	66	L.F.	$ 10.00	$660	
				Sub-Total for E & S	**$4,950**	1%
B.	**Demolition**					
1.	Asphalt Milling (1")	1,889	S.Y.	$ 10.00	$18,889	
2.	Asphalt Demo	381	S.Y.	$ 20.00	$7,629	
3.	Curb Ramp Demo	9	Each	$ 700.00	$6,300	
4.	Sidewalk Demo	183	S.Y.	$ 13.60	$2,495	
5.	Curb Demo	818	L.F.	$ 2.50	$2,045	
6.	Parking Meter Relocation	10	Each	$ 300.00	$3,000	
7.	30" RCP Storm Pipe	370	L.F.	$ 54.00	$19,980	
8.	Corrugated Storm Pipe	573	L.F.	$ 40.00	$22,920	
9.	PVC Storm Pipe	15	L.F.	$ 30.00	$450	
8.	Inlets	15	Each	$ 350.00	$5,250	
				Sub-Total for Demolition	**$88,958**	16%
C.	**Paving and concrete**					
1.	Pavement Overlay (1")	1,889	S.Y.	$ 8.00	$15,111	
2.	Pavement Full Replacement (6" + Stone)	172	S.Y.	$ 50.00	$8,583	
3.	6" Header Curb	317	L.F.	$ 20.00	$6,340	
5.	6" Ribbon Curb W/ Footer	1,022	L.F.	$ 40.00	$40,880	
6.	6" Header Curb W/Footer	524	L.F.	$ 42.50	$22,270	
7.	Sidewalk Surface Replacement	198	S.Y.	$ 75.00	$14,850	
8.	Sidewalk (New Construction)	183	S.Y.	$ 61.00	$11,163	
9.	Curb Ramps	9	Each	$ 3,000.00	$27,000	
				Sub-Total for Paving and Concrete	**$146,197**	26%

D.	**Storm Sewer**					
1.	Box Culverts (RCP)					
	33"x47"	134	L.F.	$ 422.00	$56,548	
	24"x38"	196	L.F.	$ 400.00	$78,400	
2.	Elliptical RCP					
	22"x34"	38	L.F.	$ 200.00	$7,600	
3.	RCP					
	24"	73	L.F.	$ 85.00	$6,205	
4.	HDPE					
	18"	82	L.F.	$ 65.00	$5,330	
	15"	10	L.F.	$ 60.00	$600	
	4" Underdrain	485	L.F.	$ 20.00	$9,700	
5.	Inlets/Structures					
	48"x48" Box	5	Each	$ 7,100.00	$35,500	
	60"x60" Box	1	Each	$ 7,900.00	$7,900	
	30" Nyloplast	4	Each	$ 2,500.00	$10,000	
			Sub-Total for Storm Sewer		**$217,783**	38%
E.	**BMP's (exclusive of curbing, pipe, and inlets)**					
1.	Bioretention	81	C.Y.	$ 500.00	$40,617	
2.	Permeable Pavers	219	S.Y.	$ 134.00	$29,331	
			Sub-Total for BMP's		**$69,948**	12%
F.	**Landscaping**					
1.	Grass/Perrenial Plantings	228	Each	$ 20.00	$4,560	
			Sub-Total for Landscaping		**$4,560**	1%
G.	**Miscellaneous**					
1.	Crosswalk Stripping	35	L.F.	$ 27.00	$945	
2.	Stop Bars	38	L.F.	$ 15.00	$570	
3.	Street Signs	3	Each	$ 300.00	$900	
4.	Maintenance of Traffic (budget)	1	L.S.	$ 30,000.00	$30,000	
5.	Utility Pole Shoring (budget)	5	L.S.	$ 500.00	$2,500	
			Sub-Total for Miscellaneous		**$34,915**	6%

H. Total Cost

Sub-Totals:

Erosion and Sediment	$4,950
Demolition	$88,958
Paving and concrete	$146,197
Storm Sewer	$217,783
BMP's (exclusive of curbing, pipe, and inlets)	$69,948
Landscaping	$4,560
Miscellaneous	$34,915
Grand Sub-Total	**$567,311**
20% Overhead & Contingency	**$113,462**
TOTAL COST	**$680,774**

Notes:

*Maintenance of traffic budget based on 6 months of construction w/ $5,000 alotted for each month

Engineer's Opinion of Potential Costs

Note: The costs presented are approximate in nature and based on information available as of the date on this document. The engineer provides no guarantee for the completeness or accuracy of the costs reflected in this document.

Project Name: **Liberty Street Improvements**
County Parking Lot

Prepared By: ZJ **Date:** 5/24/2021

	Item	Quantity	Unit	Unit Price	Cost	Percent
A.	**Erosion and Sediment**					
1.	Inlet Protection	26	Each	$ 165.00	$4,290	
2.	Compost Filter Sock	66	L.F.	$ 10.00	$660	
				Sub-Total for E & S	**$4,950**	1%
B.	**Demolition**					
1.	Asphalt Milling (1")	3,167	S.Y.	$ 10.00	$31,667	
2.	Asphalt Demo	1,430	S.Y.	$ 20.00	$28,591	
3.	Curb Ramp Demo	1	Each	$ 700.00	$700	
4.	Curb Demo	134	L.F.	$ 2.50	$335	
5.	Building Demo (1000 sq ft * 2 floors)	2,000	S.F.	$ 14.00	$28,000	
				Sub-Total for Demolition	**$89,293**	15%
C.	**Paving and concrete**					
1.	Pavement Overlay (1")	3,167	S.Y.	$ 8.00	$25,333	
2.	6" Header Curb	185	L.F.	$ 20.00	$3,700	
3.	6" Ribbon Curb W/ Footer	535	L.F.	$ 40.00	$21,400	
5.	6" Header Curb W/Footer	295	L.F.	$ 42.50	$12,538	
6.	6" Sawtooth Curb W/Footer	295	L.F.	$ 45.00	$13,275	
7.	Sidewalk	183	S.Y.	$ 61.00	$11,163	
8.	Curb Ramps	1	Each	$ 3,000.00	$3,000	
9.	Retaining Walls (Under 6', x2)	238	L.F.	$ 536.00	$127,568	
				Sub-Total for Paving and Concrete	**$217,977**	37%
D.	**Storm Sewer**					
1.	ADS					
	12"	66	L.F.	$ 55.00	$3,630	
	15"	339	L.F.	$ 60.00	$20,340	
	18"	18	L.F.	$ 65.00	$1,170	
	UD	522	L.F.	$ 20.00	$10,440	
2.	Inlets					
	24" Nyloplast	6	Each	$ 2,250.00	$13,500	
	30" Nyloplast	3	Each	$ 2,500.00	$7,500	
				Sub-Total for Storm Sewer	**$56,580**	10%

E.	**BMP's (exclusive of curbing and pipe)**						
1.	Bioretention	162	C.Y.	$	500.00	$80,932	
2.	Permeable Pavers	786	S.Y.	$	134.00	$105,309	
				Sub-Total for BMP's		**$186,241**	31%
F.	**Landscaping**						
1.	Grass/Perrenial Plantings	305	Each	$	20.00	$6,100	
2.	Shrubs	89	Each	$	60.00	$5,340	
3.	Trees	13	Each	$	400.00	$5,200	
4.	Sod	441	S.Y.	$	7.00	$3,084	
				Sub-Total for Landscaping		**$19,724**	3%
G.	**Miscellaneous**						
1.	Parking Space Stripping	1926	L.F.	$	3.00	$5,778	
2.	Stop Bars	84	L.F.	$	15.00	$1,260	
3.	ADA & Ped Access Stripping	203	L.F.	$	10.00	$2,030	
4.	Street Signs	2	Each	$	300.00	$600	
5.	Directional Arrows	15	L.S.	$	150.00	$2,250	
6.	Parking Lot Painted Lettering	18	Each	$	30.00	$540	
7.	Wheel Stops	43	Each	$	60.00	$2,580	
8.	Picnic Table	2	Each	$	800.00	$1,600	
9.	Utility Pole Shoring (budget)	2	L.S.	$	500.00	$1,000	
				Sub-Total for Miscellaneous		**$17,638**	3%

H. Total Cost

Sub-Totals:	
Erosion and Sediment	$4,950
Demolition	$89,293
Paving and concrete	$217,977
Storm Sewer	$56,580
BMP's (exclusive of curbing and pipe)	$186,241
Landscaping	$19,724
Miscellaneous	$17,638
Grand Sub-Total	**$592,403**
20% Overhead & Contingency	**$118,481**
TOTAL COST	**$710,883**

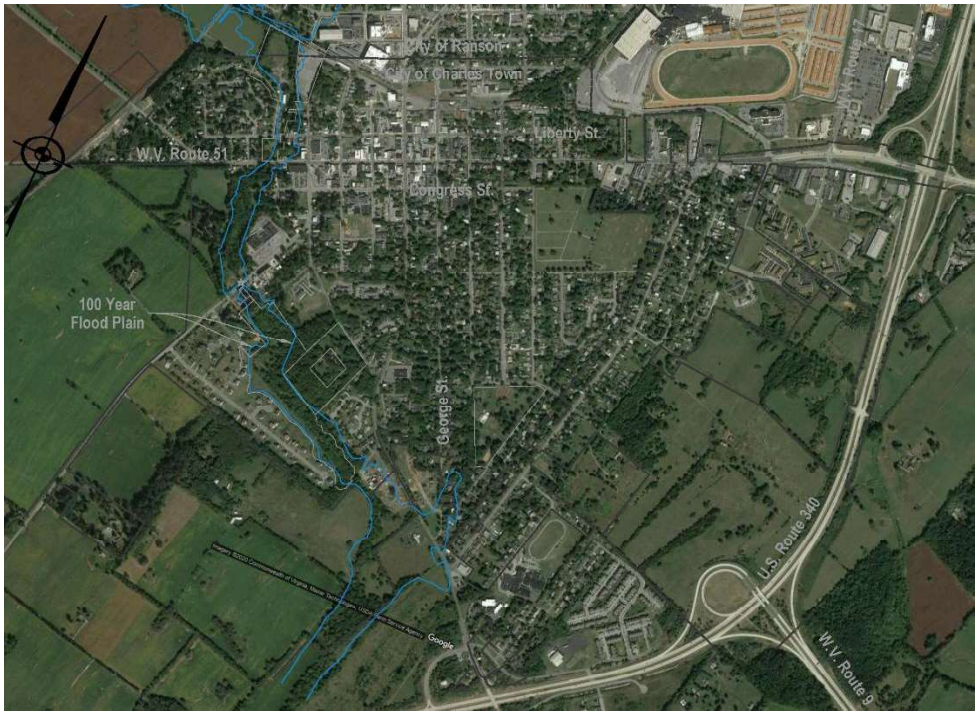
Stormwater Runoff Evaluation

Task #1 – Liberty Street Flooding and Storm Sewer Trunk Line Capacity Evaluation

City of Charles Town, West Virginia
December 2020

Prepared for: City of Charles Town, West Virginia
Contact: Daryl Hennessy, City Manager, City of Charles Town

Prepared By: Greenway Engineering, Inc.
Contact: Randy L. Kepler, P.E. Director of Engineering



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Executive Summary

Prepared at the request of the City of Charles Town, West Virginia, Greenway Engineering offers this report, establishing a foundational starting point for continuing Stormwater Management Analysis and Planning of Drainage Improvements within the City of Charles Town.

An Existing Storm Sewer System in Downtown Charles Town is known to function inadequately for conveyance of runoff to the System, causing surface flooding. Hydrologic and Hydraulic Analysis of the "modeled" system has been conducted and is presented in following sections of this report.

Analysis of Preliminary Data Results provides the Engineer a Fundamental Understanding of the systems performance and a basis for improvement recommendations. If implemented, some recommendations potentially improve surface drainage conditions immediately. Furthermore, options for future improvements of the storm sewer collection infra-structure and potential surface drainage improvements are presented.

Project Development

Introduction

Several Building Structures in the City's Downtown area have been inundated with water on various occasions over recent years. A focus of this evaluation is the flood-prone portion of Liberty Street between George Street and Samuel Street.

This Drainage Evaluation is considered the first step in evaluating the system. A detailed study is provided, though the scope is limited to a small study area, as not to incur unnecessary expense by excluding areas that are not currently experiencing flooding issues, from the scope of this evaluation.

Intent

This report, along with the Exhibit Sheets and Data Summaries provided in the attached Appendices are meant to provide an understanding of…

1. existing surface drainage runoff patterns and
2. existing storm sewer system capacity. Such that,
3. reasonable options for proceeding can be presented to the City for consideration, who have been
4. provided an appropriate understanding of various options, to make informed decisions.

Document Structure

This report narrative is prepared in conjunction with attached Appendices A - F. References to Appendix Documents and information they contain, are made throughout this Narrative. For ease of use, a short summary of the information to be found in the Appendices is provided.

Appendix A *includes five 24"vx 36" Plan View Sheets*

Overall Drainage Area Exhibit Sheet #1 *a Plan View sheet showing the Entire Study Area. Each -Drainage Area is numbered and hatched. Surface Runoff Summaries for each of the Sub-Drainage Areas are provided in table form. A "Vicinity Map and Sheet Index" is Inset at the top left corner. The "Trunk Line" and two "Tributary Lines" are identified and highlighted.*

Drainage Area Exhibit Sheet(s) #2 - #5 *provide smaller scale views of the various drainage areas. Each Storm Sewer Structure is numbered. The Sub-Drainage Areas are quantified with the routing defined.*

Appendix B *includes two 24"vx 36" Profile Sheets*

Storm Sewer Trunk Line Profile Sheet #6 and Storm Sewer Trunk Line & Tributary Line Profiles Sheet #7 *provide Vertical representation for portions of the Existing Storm Sewer System. Elevation Data is included. The Hydraulic Grade Lines (HGL) are plotted. Additionally, Photos are included on the profile showing various Inlets and Storm Sewer Conduits.*

Appendix C, Appendix D & Appendix E *provide Summary Data of Results for Analysis. Results are from Storm Sewer System Model constructed and evaluated by the Engineer.*

Appendix F *is a copy of the "Existing Storm Sewer Asbuilt Survey Sheets" prepared as a basis for construction of the digital models*.

Bird's Eye Drainage Discussion

When considering the City's drainage in broader terms, note the setting.

Impervious ground cover dominates considerable portions of the drainage area being evaluated.

Impervious ground cover correlates with increased surface runoff volumes.

Topography in portions of the downtown area is near flat. Flat slopes limit the velocity at which the stormwater can be conveyed to and passed through the storm sewer system, which limits the volume of stormwater (capacity) that can be conveyed through the system.

Asbuilt Survey Data Collection

Greenway Engineering conducted an asbuilt survey of the Storm Sewer Collection System during the summer of 2020. The survey began at the outfall to Evitts Run, adjacent to St. Augustine Ave. (Study Point "A"), then through the City, to its upstream terminus at the intersection Liberty Street and Samuel Street. Survey data collection included structure and inlet locations, types and elevations along with storm pipe materials, diameters and inverts. (See **Appendix F**)

The survey team also deployed a remote pipe camera to record video along sections of the storm sewer system that were otherwise inaccessible. This effort made it possible to identify the alignment of many conduits as well make general assessments of condition.

Existing Storm Sewer Infrastructure General Findings

The Existing Storm Sewer Infrastructure is a hodgepodge of drainage structures and conduits constructed and reconstructed over approximately one centuries time.

The remote camera revealed various portions of the system to be in generally poor condition. Significant accumulation of sediment, leaves and debris were observed at inlet structures and within the conduit.

Structural Degradation is occurring, based on the observance of bricks, chunks of concrete and asphalt pieces at drainage structures and within the conduit.

A majority of the "Trunk Line" is an old Brick-Lined Box Culvert. Other conduit materials included Concrete, Metal and Terracotta. Nearly all drainage structures at inlets and junction boxes were found to be brick-lined.

Numerous "Lateral Connections" were observed within the system, such that one pipe penetrates the wall of another pipe, directly discharging inside that pipe.

Few Manholes are constructed, limiting access to the storm sewer infrastructure. This is particularly undesirable at Junction Boxes that exist within many road intersections.

Storm Sewer Model Development

Asbuilt data consists of structure top elevations, pipe inverts, diameters, lengths, and materials. Surface runoff data, including drainage areas, imperviousness "C Factors", and Time of Concentration (Tc) Values are provided with the Summary Data Tables. (See **Appendices C, D & E**)

The computer model is generally based on asbuilt data described in the previous section. However; due to field restraints, not all data necessary to build the storm sewer model could be surveyed. Where data could not be obtained from the survey, it became necessary to make assumptions to construct a complete computer model of the existing storm sewer system, capable of yielding results for Analysis.

Storm Sewer Model Development Assumptions

Following is a summary list of assumptions to construct a complete computer model of the existing storm sewer system.

Unknown Invert Elevation Assumption

- Missing invert elevations at various locations within the storm sewer system.
  - Occurrences at "Junction Box" structures with no access at the intersections.
  - Occurrences at Tributary Lines that "Tie-In" and discharge directly to the "Trunk Line"
- The "Primary" assumption is made along the "Trunk Line". Slopes were set between all known invert elevations, then used as necessary to interpolate any missing inverts between known elevations.
- Consider that this methodology also dictates any unknown Invert Elevations for those Tributary Lines that "Tie-In" to the "Trunk Line".

Unknown Pipe Material or Size

- There were miscellaneous segments Unknown Pipe Material or Size.
- Typical assumption would be to match the properties of a known segment along the same line.
  - First match a known upstream segment. If that's unavailable then,
  - Second match a known downstream segment.

Upland Drainage Assumption

Approximately 42 Acres of upland Drainage Area flows to the Railroad Right of Way traversing the northern extent of the city. The Tracks are on fill and would generally be 1' – 3' higher than the adjacent grades, creating a large sump area on the north side of the tracks, which could function as an impoundment. No Cross Culverts were observed to convey flows across the Tracks. Accordingly, this drainage area was not routed to the storm sewer system for inclusion in the computations and results.

Karst Terrain Assumption

The City of Charles Town is underlain by Limestone and Dolostone Bedrock. The geology is known to be susceptible to solutional weathering and the formation of karst landforms such as caves, sinkholes, pinnacled bedrock, and sinking streams (swallets).

The engineer is aware of a substantial void known to exist within the drainage shed to Study Point "A". A Geotechnical Investigation would better understand sub-surface conditions affecting surface conditions.

All Hydraulic Modeling associated with this report has been evaluated with no attribution to Karst Loss, or 0% Karst Loss.

Storm Sewer System Analysis

Parameters of the Hydraulic Analysis

- The "Rational Method" was used to perform hydraulic calculations.
- The "FHWA Method" was used to calculate Hydraulic Grade Lines.
- The storm sewer system analysis calculated flow volumes using Charles Town, WV Rainfall Intensity values taken from the NOAA website.
- Storm Inlet structures were not evaluated for spread, capacity, etc., as a part of this exercise. This evaluation does not confirm required vertical or horizontal clearances, bury depth, or any structural aspect of the storm sewer system.
- The storm sewer system model was constructed and analyzed using Carlson Hydrology 2019 with AutoCAD 2019 software

Drainage Areas

Generally, drainage areas were defined by the contributing drainage area to each intersection with inlets to the system. Defining drainage areas to each inlet location is unnecessary to determine the capacity of the storm sewer system "Trunk Line". However, this methodology does not allow for capacity evaluation of the "Tributary Lines", as the drainage to each intersection is routed through a single inlet structure. Total drainage would be divided among multiple inlets at the intersection with portions of the total draining to each inlet.

Drainage Areas were determined for each inlet structure along the flood-prone portion of Liberty Street between George Street and Samuel Street, as well as those inlets along George Street south of Liberty Street. These are identified as Storm Structure # 281 upstream to Storm Structure # 121.

All surface runoff generated from Drainage Area #1 through Drainage Area #18 is included with the Hydraulic Routing Computations. In total, these areas account for 63.71 Acres of land.

Drainage Area #7 and Drainage Area #12 both define sump areas that were included with the Hydraulic Routing Computations.

Drainage Area "X1" may flow to a sump area at the Intersection of Liberty Street and Charles Street. The Drainage Area is not accounted for with the Hydraulic Routing Computations. The Overland Relief could not be determined.

Drainage Area "X1" may drain to a Karst Feature or to an undetermined Overland Relief (overflows)

1. South through DA #8 to the Intersection of Washington Street and Charles Street and/or,
2. East through/to DA #11 at the intersection of Liberty Street and George Street, then further on to DA #10 and/or DA #12. In the Vicinity of the Court House.

Similarly, Drainage Area "X2" drains to a low area in the vicinity of the North Street and Samuel Street Intersection. Surface Runoff may drain to a Karst Feature or to an undetermined Overland Relief Point. It is not accounted for with the Hydraulic Routing Computations.

The topography shown on the "Drainage Area Exhibit Sheets" is taken from publicly available digital data. The elevation data was obtained with L.I.D.A.R. technology and is presented as two-foot contour increments. Minor modifications ("Clean-Up") were made when processing the digital elevation data. The topography has limited accuracy and is not appropriate for use with design documents. Except for the inability to confidently determine points of Overland Relief, as discussed above regarding DA "X1", the topography is generally sufficient to define general drainage patterns. (See **Appendix A**)

Time of Concentration

Time of Concentration for each of the Drainage Areas could not be determined to a reasonable degree of accuracy or confidence with use of the L.I.D.A.R. topography in this urban landscape. In order to complete the runoff volume computations a Time of Concentration Value must be input. For this study it was found reasonable to make conservative Tc estimates, based on the size of the drainage area. The values assumed are based on previous experience completing stormwater evaluations.

Time of Concentration Values

Drainage Area	Tc Value Assigned
(Acres)	(Minutes)
0.01 - 1.00	5 mins.
1.01 - 4.99	10 mins.
5.00 – 9.99	15 mins.
10.00 & Greater	20 mins.

"C" Factor

To complete runoff volume computations a "C" Factor for each of the Drainage Areas must be assigned. Published Technical Data to is used to assign appropriate values based on the Ground Cover. Values range from 0.10 (Very Pervious) to 0.90 (Completely Impervious). Downtown Business Districts are assigned a "C" Factor = 0.85, which is the default value used for this study.

Using Aerial Photography some smaller Drainage Areas could are identified as completely Impervious ground cover and were accordingly assigned a "C" Factor = 0.90.

Using Aerial Photography, a selection of Drainage Areas could be identified as having less Impervious ground cover than is appropriate for the default "C" Factor = 0.85. These drainage areas were further evaluated for determination of more accurate, weighted "C_w" Factor Values.

Results of the Storm Sewer Model

Results of the Storm Sewer Hydraulic Modeling are discussed in following sections and Summary Data is provided in the attached Appendices. (See **Appendices C, D & E**)

Storm Sewer System Evaluation Findings and Recommendations

Piping

Exhibit Sheets #6 & #7 provide profiles of the Storm Sewer Trunk Line and two Tributary Lines. Hydraulic Grade Lines (HGL) are shown for the 1 Year, 2 Year and 10 Year Storm Events. (See **Appendix B**)

It is common engineering practice to "size" a closed storm sewer system, such that Pipes have Capacity to Convey the volume of runoff resulting from a 10 Year Storm Event, based on Rainfall Intensity or the volume resulting from a 25 Year Storm Event based on Rainfall Depths over a 24-Hour Period.

Evaluation of Hydraulic Grade Lines and Hydraulic Summary Data yield general findings to note.

The Trunk Line…

1) …generally has capacity to convey the 1 Year and 2 Year Storm Events, except for the uppermost portions along Liberty Street, between George Street and Samuel Street.

2) …lacks capacity to convey the 10 Year Storm Event from Structure #108, along W. Avis Street, all the way to its uppermost Inlet Structure #121.

3) …has reverse sloped segments along Liberty Street between Structure #115 and Structure #120.

The Tributary Line #1…

1) …lacks capacity to convey even the 1 Year Storm Event.

2) ...piping is critically undersized to convey even small volumes of runoff that would be expected from many rainfall events.

3) The uppermost reach of piping receives a large 10+ Acre drainage area at the intersection of Congress Street and Samuel Street.

The Tributary Line #2…

1) …has capacity to convey the 1 Year, 2 Year and 10 Year Storm Events.

An Existing Storm Sewer Hydraulic Data Summary is attached to this report. (See **Appendix C**)

Inlets and Structures

It is common engineering practice to "size" a closed storm sewer system, such that Inlets have Capacity to function in a 2 Year Storm Event.

An Existing Storm Sewer Inlet Data Summary is attached to this report. (See **Appendix D)**

An Existing Storm Sewer Structure Data Summary is attached to this report. (See **Appendix E)**

The Hydraulic modeling performed does not determine the adequacy of any single Inlet. The Inlets were modeled to a degree of accuracy, necessary to provide a reasonable estimation of the storm sewer's volume capacity and hydraulic analysis of various storm events.

The asbuilt data collected to prepare the model, along with photography from surveyors' field work provide information to make the following general observations.

1) Many Drainage Structures for Inlets have shallow depths, often less than 3 vertical feet. It is common engineering practice to have a minimum structure depth of 4+ vertical feet.

2) Many Inlets have no Drainage Structure at all. Rather they drain directly through a riser from the top of the receiving Pipe or Box Culvert.

3) Many pipes are found to make "lateral" Connections to Downstream Piping. All Pipe Junctions should be made at a Drainage Structure with Access through an Inlet or Manhole Cover.

4) Several other pipe connections were found to be made in Brick-Lined Vaults in and near road intersections. These Vaults lack direct access for maintenance.

5) Many Drainage Structures at Inlets were observed to be significantly silted in and or containing debris.

Liberty Street Flooding Focus

Findings relative to Liberty Street Flooding

Issues contributing to Flooding in this area are have been identified and are discussed below.

Surface slopes are near flat and various low spots exist creating ponded areas and limiting drainage to the Storm Sewer Inlets.

Curb Heights in this area are very shallow and lack gutters to better convey surface drainage. These shallow curbs are easily overtopped by runoff along the road, causing structure damage beyond the sidewalks.

The storm sewer conduits in this area were observed with "inside fills" of approximately 50%. The "inside fills" that have built up over time consist of stone and other debris.

Inlets in this area are generally small and in poor condition. Some inlets are crushed and others badly deformed.

There is a lack of Inlets along the north side of Liberty Street, where ponding is known to occur.

Recommendations to Improve Liberty Street Flooding

It is recommended that possible Infra-Structure Improvement Opportunities in the vicinity of the Courthouse and surrounding streets be pursued. Various Conceptual Layout options should be developed for consideration. The Conceptual Layouts should be developed to a degree of accuracy such that reasonable cost estimates can be assessed. Additionally, the proposed improvements "degree of impact on surface flooding" should be presented relative to the other options.

The City has applied for a grant that is to assist Chesapeake Bay water quality funding for design and construction of Low Impact Development (L.I.D.) and Green Infrastructure Improvements. Implementing such design approaches and constructing facilities accordingly would reduce runoff volumes draining to flood prone areas and generally improve flooding events that are currently be experienced along and adjacent to Liberty Street.

Design objectives to be considered for implementation with the Conceptual Layouts described above are not limited to; but may include….

1. Additional inlets along the north side of Liberty Street where surface slopes are minimal, flat or create a sump.
2. Repair and replacement of inlets at the Liberty Street and Samuel Street Intersection, reducing debris intrusion to the system and improving stormwater inflow.
3. Construction of Access Manholes to Junction Boxes within the Liberty Street & Samuel Street Intersection and within the Liberty Street & George Street Intersection.
4. Re-construction or otherwise improving pipe sections with reverse slopes along Liberty Street to the connection point at George Street.
5. Removing built up sediment and debris within the storm conduits along Liberty Street and repairing damaged pipes.
6. Surface improvements to provide positive drainage, ensuring surface runoff flows efficiently to inlets, while not impacting access points for local businesses.

Conclusions and the Path Moving Forward…

The existing storm sewer system does not function adequately to prevent surface flooding in localized areas. This Initial study has identified likely sources of causation and identified potential improvements accordingly.

Tributary Line #1 is undersized, lacking capacity to convey the surface runoff flowing from Drainage Area #15, #16 and #17. Bypassed Runoff from these drainage areas have impacts down gradient.

Apparent Sump Areas have been identified within and adjacent to the drainage areas that are defined and routed to the storm sewer system. The Engineer should encourage further efforts to determine the actual routing of the sump areas Identified. Additional field visits by the engineer, along with supplemental survey work, would be necessary to make those determinations.

Immediate Program Needs & Long-Term Recommendations

It is the Engineer's belief that development and implementation of Storm Sewer Maintenance Program could quickly provide impactful performance improvements with limited investment.

Removal of trapped debris and silt from the storm sewer system is encouraged as a priority action for and Immediate Program Need.

A full and complete cleaning of the storm sewer infrastructure by way of vacuum cleaning, jetting and hand clearing to remove the debris. Those inlets found to be damaged should be repaired to ensure structural stability, as well as a proper and open flow path.

Following this major initial debris removal and pipe clearing a regular maintenance program of visual inspection and vacuuming as well as street sweeping is recommended.

Street Sweeping is strongly encouraged. Many of the Storm Sewer Inlets are Grate Inlets, which are prone to clogging.

To aid long term maintenance, it is recommended the City develop a "Structure Repair and Access Program". Access Manholes should be constructed at inaccessible Junction Boxes and to as many additional beneficial points as dictated by the City's determination of acceptable cost and disturbances. Current design standards require access points at changes in pipe alignment and at all pipe junctions.

Greenway also recommends a study of the drainage areas along the railroad track be conducted. A Long-Term solution to apparent standing water and drainage issues in this area may be achievable.

Evaluate detailed drainage patterns along Liberty Street east of the Samuel Street Intersection and identify any existing storm sewer facilities that may exist within that drainage area. A better understanding of that surface runoff may reveal impacts to the flooding issues occurring at and west of

Samuel Street. Should impacts be understood, there may be opportunity to make improvements that benefit the flood prone areas along Liberty Street.

Its intended that the information presented within this report, be to the benefit of the City of Charles Town, WV to proceed with a plan of action, towards a goal of improving drainage systems in the municipality. Greenway Engineering is available to the City and prepared to assist in way possible.

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DRAINAGE AREA EXHIBIT SHEET #2

DRAINAGE AREA EXHIBIT SHEET #3

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DRAINAGE AREA EXHIBIT SHEET #5

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STORM SEWER TRUNK LINE PROFILE SHEET #6

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APPENDIX C

EXISTING STORM SEWER HYDRAULIC SUMMARY DATA

APPENDIX D

EXISTING STORM SEWER INLET SUMMARY DATA

APPENDIX E

EXISTING STORM SEWER STRUCTURE SUMMARY DATA

APPENDIX F

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APPENDIX A

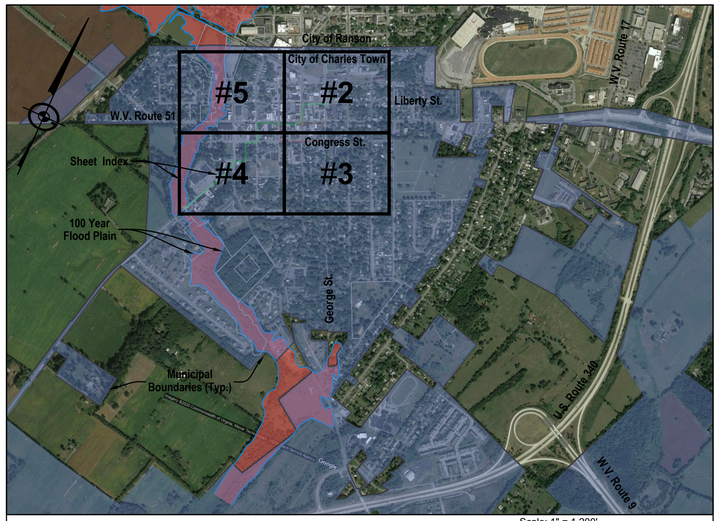
OVERALL DRAINAGE AREA EXHIBIT SHEET #1

DRAINAGE AREA EXHIBIT SHEET #2

DRAINAGE AREA EXHIBIT SHEET #3

DRAINAGE AREA EXHIBIT SHEET #4

DRAINAGE AREA EXHIBIT SHEET #5



Vicinity Map & Sheet Index

Scale: 1" = 1,200'

Imagery 2020 Commonwealth of VA (Obtained from Google)

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Overall Drainage Area Exhibit Sheet #1

City of Charles Town Drainage Evaluation

Liberty Street Study Area

City of Charles Town - Jefferson County, West Virginia

Upland DA
Area = 42 Acres
This Drainage Area flows to the Railroad Right of Way, which seems to function as an impoundment. No Cross Culverts were observed to convey flows across the Tracks.

Trunk Line is High Lighted in Green

Tributary Line #2 is High Lighted in Orange

Tributary Line #1 is High Lighted in Red

Drainage Area Designation (Typ.)

100 Year Flood Plain (Per GIS Data)

Study Point "A"
Lat: 39° 16' 59.96"
Lon: 77° 51' 51.46"

SCALE: 1" = 150'

Drainage Area #1 Surface Runoff Summary			
Along Augustine Ave. South of Avis St. Intersection			*Notes*
Total Drainage Area =	3.77	Acres	Routed To Structures #102 & #201
Time of Concentration (Tc) =	10	Mins	
C Factor =	0.85		

Drainage Area #2 Surface Runoff Summary			
Along West St. South of Avis St. Intersection			*Notes*
Total Drainage Area =	1.56	Acres	Routed To Structure #202
Time of Concentration (Tc) =	10	Mins	
C Factor =	0.80		

Drainage Area #3 Surface Runoff Summary			
Along West St. to Avis St. Intersection			*Notes*
Total Drainage Area =	2.00	Acres	Routed To Structure #204
Time of Concentration (Tc) =	10	Mins	
C(w) Factor =	0.62		

Drainage Area #4 Surface Runoff Summary			
To a Sag Along Avis St.			*Notes*
Total Drainage Area =	3.35	Acres	Routed To Structures #108
Time of Concentration (Tc) =	10	Mins	
C(w) Factor =	0.45		

Drainage Area #5 Surface Runoff Summary			
To a Sag Along Congress St.			*Notes*
Total Drainage Area =	2.09	Acres	Routed To Structure #205
Time of Concentration (Tc) =	10	Mins	
C Factor =	0.85		

Drainage Area #6 Surface Runoff Summary			
To Congress St. & Lawrence St. Intersection			*Notes*
Total Drainage Area =	7.22	Acres	Routed To Structure #214
Time of Concentration (Tc) =	15	Mins	
C(w) Factor =	0.66		

Drainage Area #6A Surface Runoff Summary			
Sump Drain at Wright Denny Elementary			*Notes*
Total Drainage Area =	0.21	Acres	Routed To Structure #217
Time of Concentration (Tc) =	5	Mins	
C Factor =	0.90		

Drainage Area #7 Surface Runoff Summary			
To Washington St. & Lawrence St. Intersection			*Notes*
Total Drainage Area =	4.42	Acres	Routed To Structures #223 & #225. Includes 154 Acres draining to a sump but not tied O.L.R. at this Intersection.
Time of Concentration (Tc) =	10	Mins	
C Factor =	0.85		

Drainage Area #8 Surface Runoff Summary			
To Washington St. & Charles St. Intersection			*Notes*
Total Drainage Area =	4.48	Acres	Routed To Structure #254
Time of Concentration (Tc) =	10	Mins	
C Factor =	0.85		

Drainage Area #9 Surface Runoff Summary			
To Washington St. & George St. Intersection			*Notes*
Total Drainage Area =	3.51	Acres	Routed To Structure #263
Time of Concentration (Tc) =	10	Mins	
C Factor =	0.85		

Drainage Area #10 Surface Runoff Summary			
Along George St. Between Liberty St. & Washington			*Notes*
Total Drainage Area =	0.35	Acres	Routed To Structures #281 & #114
Time of Concentration (Tc) =	5	Mins	
C Factor =	0.90		

Drainage Area #11 Surface Runoff Summary			
To Liberty St. & George St. Intersection			*Notes*
Total Drainage Area =	2.11	Acres	Routed To Structures #115 & #291 - #294
Time of Concentration (Tc) =	See Comps	Mins	
C(w) Factor =	See Comps		

Drainage Area #12 Surface Runoff Summary			
Along Liberty St. Between George St. & Samuel St.			*Notes*
Total Drainage Area =	2.21	Acres	Routed To Structures #115 - #120 & #295. This area is required to flood properties.
Time of Concentration (Tc) =	See Comps	Mins	
C(w) Factor =	See Comps		

Drainage Area #13 Surface Runoff Summary			
To Liberty St. & Samuel St. Intersection			*Notes*
Total Drainage Area =	6.68	Acres	Routed To Structures #115 & #305 & #306. This area is required to flood properties.
Time of Concentration (Tc) =	See Comps	Mins	
C(w) Factor =	See Comps		

Drainage Area #14 Surface Runoff Summary			
At Charles Town Presbyterian Church			*Notes*
Total Drainage Area =	1.31	Acres	Routed To Structures #116 & #312. This area is required to flood properties.
Time of Concentration (Tc) =	5	Mins	
C(w) Factor =	See Comps		

Drainage Area #15 Surface Runoff Summary			
To Congress St. & Charles St. Intersection			*Notes*
Total Drainage Area =	2.59	Acres	Routed To Structures #232
Time of Concentration (Tc) =	10	Mins	
C Factor =	0.85		

Drainage Area #16 Surface Runoff Summary			
To Congress St. & George St. Intersection			*Notes*
Total Drainage Area =	2.92	Acres	Routed To Structures #234
Time of Concentration (Tc) =	10	Mins	
C(w) Factor =	0.62		

Drainage Area #17 Surface Runoff Summary			
To Congress St. & Samuel St. Intersection			*Notes*
Total Drainage Area =	10.27	Acres	Routed To Structures #237
Time of Concentration (Tc) =	20	Mins	
C(w) Factor =	0.55		

Drainage Area #18 Surface Runoff Summary			
To Washington St. & Samuel St. Intersection			*Notes*
Total Drainage Area =	6.24	Acres	Routed To Structures #264
Time of Concentration (Tc) =	15	Mins	
C(w) Factor =	0.52		

Drainage Area #X1 Surface Runoff Summary			
Generally Bound by Liberty St., North St., Lawrence St.			*Notes*
Total Drainage Area =	4.87	Acres	Area is Generally Bound by Liberty, North, Lawrence & George Streets. O.L.R. is very uncertain.
Time of Concentration (Tc) =	N/A	Mins	
C(w) Factor =	N/A		

Drainage Area #X2 Surface Runoff Summary			
Generally East and South of Liberty St. & Samuel St.			*Notes*
Total Drainage Area =	27.59	Acres	Area is Generally East and South of the Liberty St. & Samuel St. O.L.R. is very uncertain.
Time of Concentration (Tc) =	N/A	Mins	
C(w) Factor =	N/A		

Date: November, 2020

Scale: 1" = 150'

Designed By: EJG

File No. 7037

Sheet 1 Of 7

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Drainage Area Exhibit Sheet #2

City of Charles Town Drainage Evaluation

Liberty Street Study Area

City of Charles Town - Jefferson County, West Virginia

Upland DA
Area ≈ 42 Acres
This Drainage Area flows to the RR R/W with No Apparent Cross Culverts to convey discharges across the Tracks, which function as an impoundment

Potential Sump Area
(Not Routed - OLR is Unkown)
DA = 27.59 Acres

Sump Area
(Not Routed - OLR is Unkown)
DA = 4.87 Acres

To Str.# 291
(36" x 18" Combo Grate)
Area = 0.20 Ac.

191 lf - 33"(H) x 47"(W) Concrete Box Culvert

To Str.# 115
(24" x 24" Grate)
Area = 0.09 Ac.

To Str.# 114
(36" x 18" Combo Grate)
Area = 0.16 Ac.

To Str.# 281
(36" x 18" Combo Grate)
Area = 0.19 Ac.

To Str.# 294
(48" x 18" Grate)
Area = 0.47 Ac.

To Str.# 293
(48" x 18" Grate)
Area = 0.70 Ac.

To Str.# 292
(24" x 18" Grate)
Area = 0.25 Ac.

To Str.# 295
(36" x 24" Grate)
Area = 0.44 Ac.

To Str.# 302
(24" x 18" Grate)
Area = 0.52 Ac.

To Str.# 301
(58" x 28" Grate)
Area = 1.16 Ac.

To Str.# 306
(Triple Culvert Inlet)
Area = 1.28 Ac.

To Str.# 305
(28" x 28" Grate)
Area = 0.76 Ac.

To Str.# 116
(28" x 28" Grate)
Area = 0.11 Ac.

To Str.# 120
(28" x 28" Grate)
Area = 0.26 Ac.

To Str.# 119
(36" x 18" Grate)
Area = 0.27 Ac.

To Str.# 118
(33" x 33" Grate)
Area = 0.35 Ac.

To Str.# 117
(33" x 33" Grate)
Area = 0.35 Ac.

To Str.# 121
(28" x 28" Grate)
Area = 2.28 Ac.

To Str.# 304
(24" x 12" Grate)
Area = 0.42 Ac.

To Str.# 303
(24" x 18" Grate)
Area = 0.26 Ac.

To Curb Inlet
(In Church Parking Lot)
Area = 0.69 Ac.

To Culvert Inlet
Area = 0.62 ac.

Sump Area
(Routed to Str.#116)
DA = 0.45 Acres

To Washington St. & Charles St. Intx.
(Routed to Str.#254)
DA = 4.48 Acres

172 lf - 37"(H) x 54"(W) Brick Box Culvert

End 1,485 lf - 48" x 48" Brick Lined Box Culvert

To Washington St. & George St. Intx.
(Routed to Str.#263)
DA = 3.51 Acres

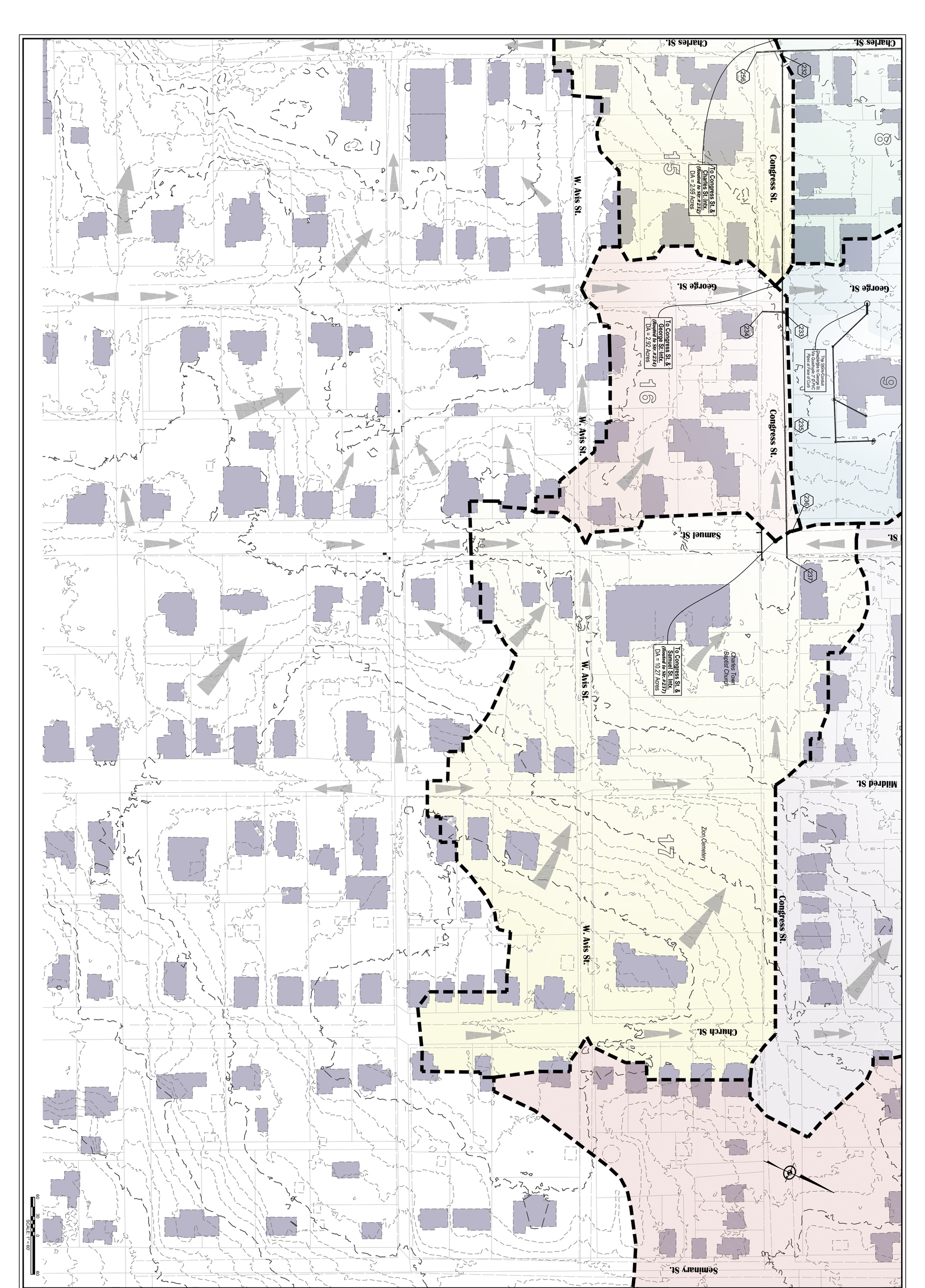
To Washington St. & Samuel St. Intx.
(Routed to Str.#264)
DA = 6.24 Acres

Old Opera House
VFW
Court House
United Bank
U.S. Post Office
Bank of Charles Town
Library
Charles Town Presbyterian Church

Valley Pl.
Bell Pl.
Preston St.
North St.
Liberty St.
Washington St.
Charles St.
George St.
Samuel St.
Mildred St.
Church St.
Seminary St.

60 30 0 60
SCALE: 1" = 60'

Date:	November, 2020
Scale:	1" = 60'
Designed By:	EJG
File No.	7037
Sheet	2 Of 7



Drainage Area Exhibit Sheet #3

City of Charles Town Drainage Evaluation

Liberty Street Study Area

City of Charles Town - Jefferson County, West Virginia

Date:	November, 2020
Scale:	1" = 60'
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File No.	7037
Sheet	3 Of 7

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Evitts Run

To Congress St. Sag
DA = 2.09 Acres
(Routed to Str.#205)

To Congress St. & Lawrence St. Intx.
(Routed to Str.#214)
DA = 7.22 Acres

To W. Avis St. Sag
DA = 3.35 Acres
(Routed to Str.#108)

End 224 lf 48" Round Concrete Culvert & Begin 1,548 lf - 48" x 48" Brick Lined Box Culvert

To W. Avis St. & S. West St. Intx.
DA = 2.00 Acres
(Routed to Str.#204)

End 780 lf - 51" x 51" Brick Lined Box Culvert & Begin 224 lf 48" Round Concrete Culvert

To Drop Inlet
(Sump Area)
DA = 0.21 Acres

To W. Avis St. & Augustine St. Intx.
DA = 1.56 Acres
(Routed to Str.#202)

Along Augustine Ave.
DA = 3.77 Acres
(Routed to Str.#102)

Total Drainage Routed to Study Point "A" = 67.31 Ac.

Study Point "A"
Lat: 39° 16' 59.96"
Lon: 77° 51' 51.46"

Begin 780 lf - 51" x 51" Brick Lined Box Culvert

Wright Denny Elementary

S. West St.
West St.
Lawrence St.
Charles St.
Congress St.
W. Avis St.
W. Academy St.
Augustine Ave.
Weirricks ROW
Mordington Ave.
Ann St.

60 30 0 60
SCALE: 1" = 60'

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Drainage Area Exhibit Sheet #4

City of Charles Town Drainage Evaluation

Liberty Street Study Area

City of Charles Town - Jefferson County, West Virginia

Date:	November, 2020
Scale:	1" = 60'
Designed By:	EJG
File No.	7037
Sheet	4 Of 7

100 Year Flood Plain
(Per GIS Data)

North St.

Lawrence St.

Charles St.

Liberty St.

Washington St.

Evitts Run

X1

Sump Area
(Not Routed - OLR is Unknown)
DA = 4.87 Acres

Sump Area
(Routed to Str.#225 @ Washington St. & Lawrence St. Intx.)
DA = 1.54 Acres

To Washington St. & Lawrence St. Intx.
(Routed to Str.#223)
DA = 2.88 Acres

To Washington St. & Charles St. Intx.
(Routed to Str.#254)
DA = 4.48 Acres

To Congress St. & Lawrence St. Intx.
(Routed to Str.#214)

191 lf - 33"(H) x
Concrete Box C

172 lf - 37"(H)
Brick Box C

End 1,485 lf - 48" x 48"
Brick Lined Box Culvert

5 6 7 8

221 222 223 224 225 226 231 251 252 253 254 255

60 30 0 60
SCALE: 1" = 60'

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Drainage Area Exhibit Sheet #5

City of Charles Town Drainage Evaluation

Liberty Street Study Area

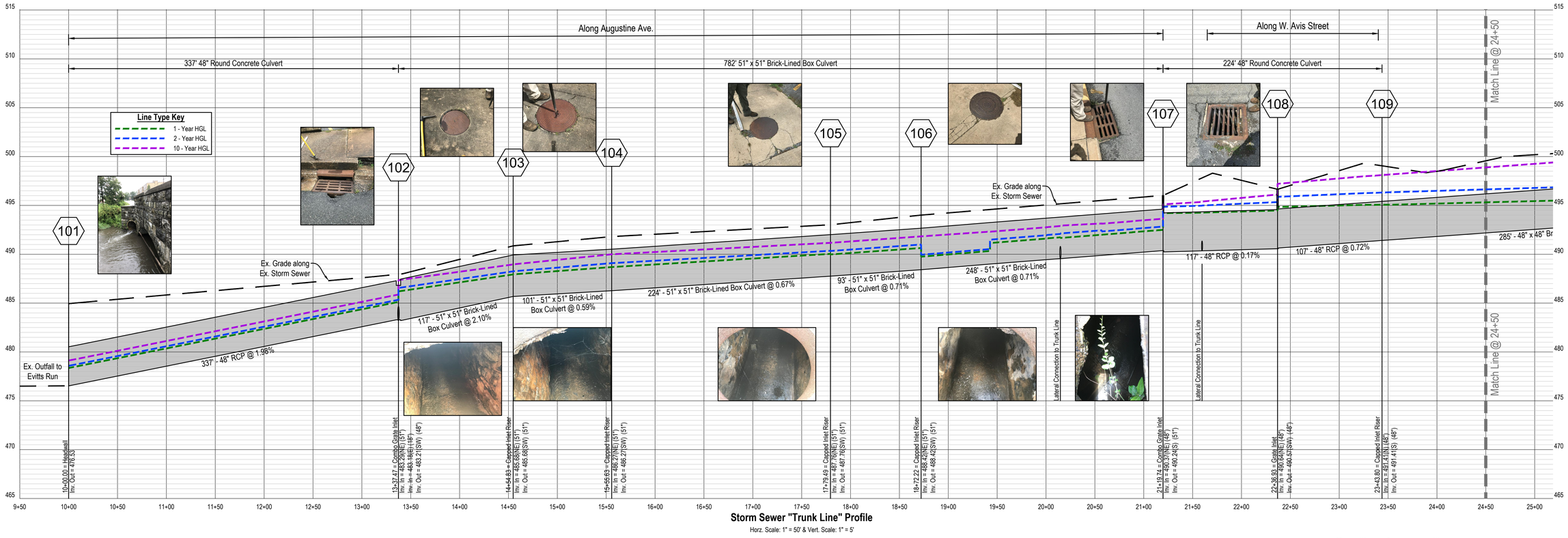
City of Charles Town - Jefferson County, West Virginia

Date:	November, 2020
Scale:	1" = 60'
Designed By:	EJG
File No.	7037
Sheet	5 Of 7

APPENDIX B

STORM SEWER TRUNK LINE PROFILE SHEET #6

STORM SEWER TRUNK LINE & TRIBUTARY LINE PROFILES SHEET #7



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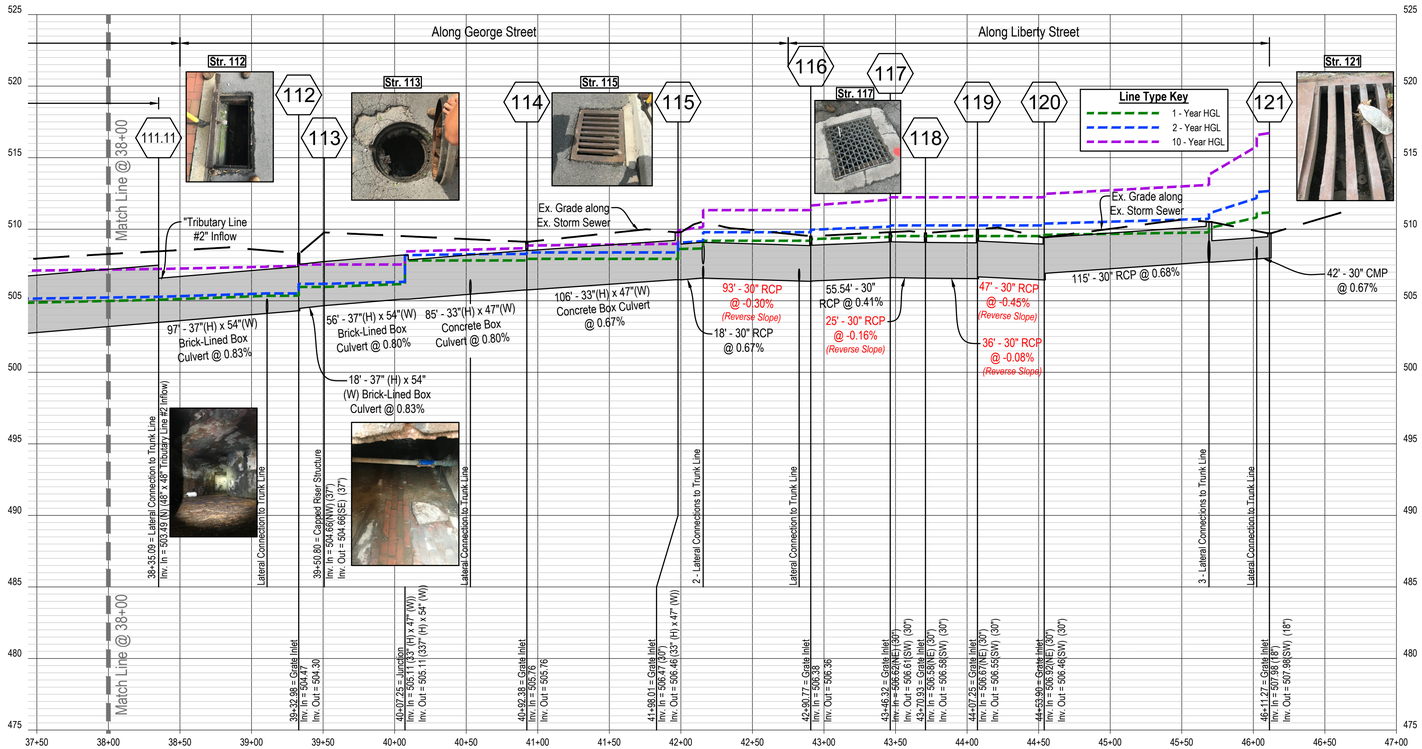
Storm Sewer Trunk Line Profile

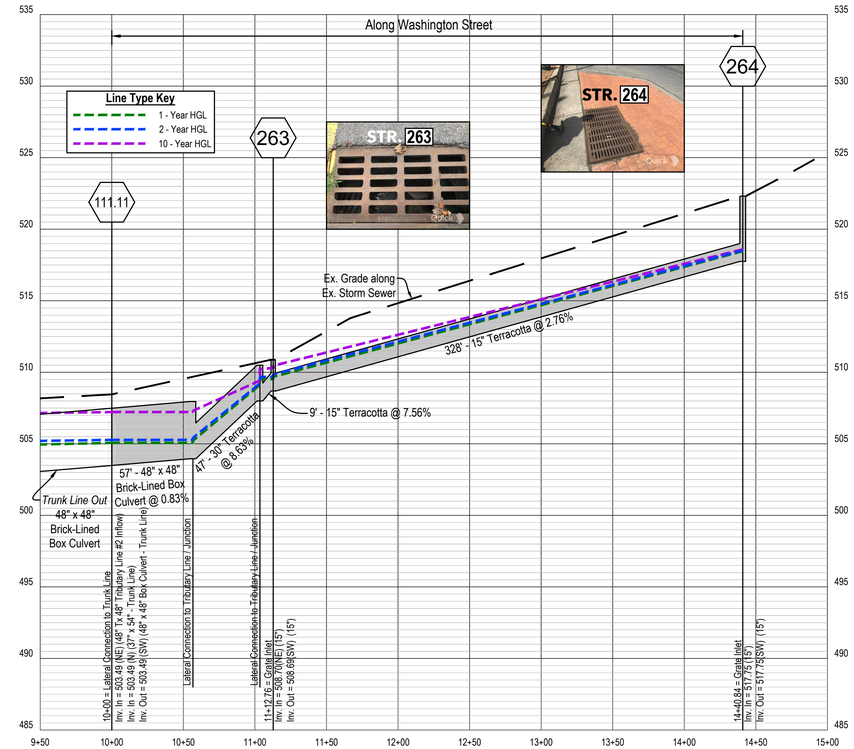
City of Charles Town Drainage Evaluation

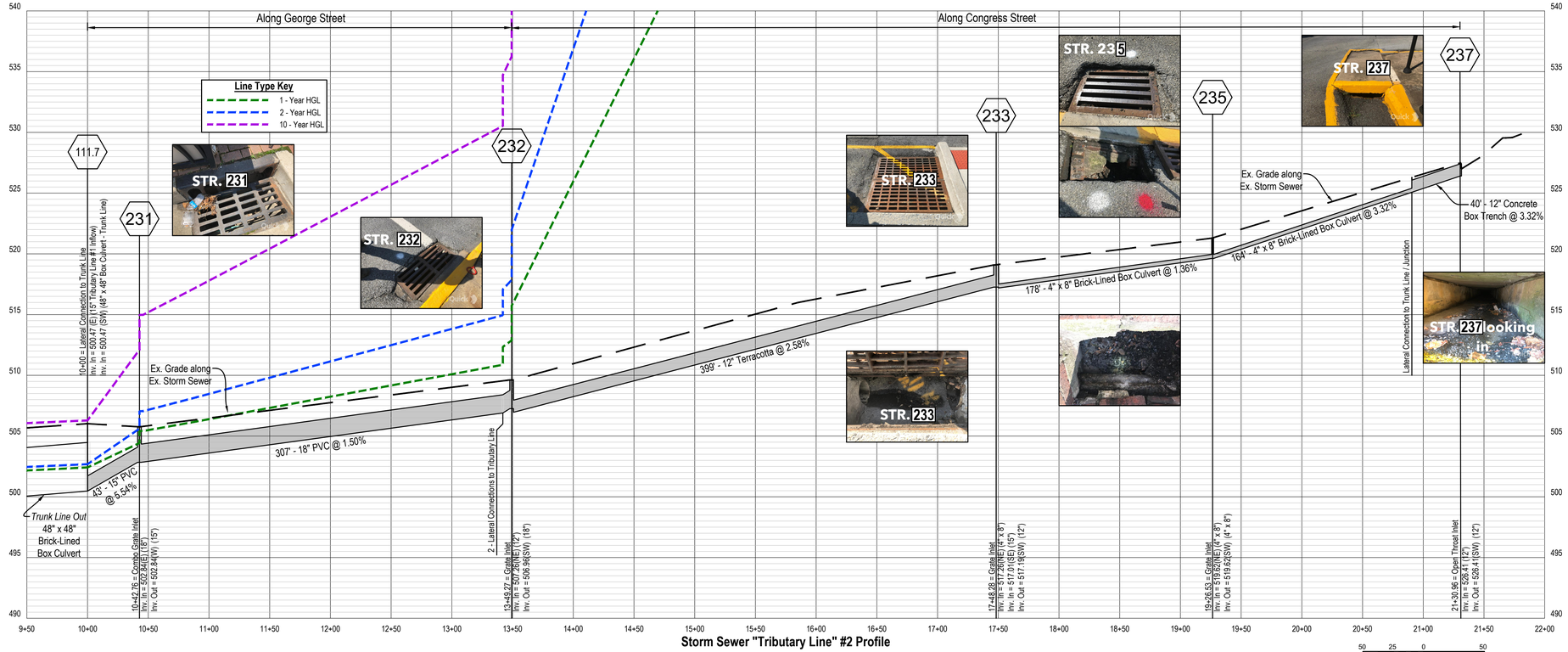
Liberty Street Study Area

City of Charles Town - Jefferson County, West Virginia

Date:	November, 2020
Scale:	Horz.: 1" = 50' & Vert.: 1" = 5'
Designed By:	EJG
File No.	7037
Sheet	6 Of 7











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Storm Sewer Trunk Line & Tributary Line Profiles
City of Charles Town Drainage Evaluation
Liberty Street Study Area
City of Charles Town - Jefferson County, West Virginia

Date:	November, 2020
Scale:	Horz.: 1" = 50' & Vert.: 1" = 5'
Designed By:	EJG
File No.	7037
Sheet	7 Of 7

APPENDIX C

EXISTING STORM SEWER HYDRAULIC SUMMARY DATA

Existing Storm Sewer Pipe Summary Data - 1 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																	1 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
311	312	65	10			CMP	0.024	1.94	1.65	1.78	512.19	509.50	2.69	512.26	510.76	1.50	527.12	10.00	2.71	528.13	10.00	2.71	1.48
304	311	117	10			CMP	0.024	0.88	1.11	1.20	510.01	508.47	1.54	512.19	509.50	2.69	514.53	10.00	7.09	526.91	10.00	7.09	3.87
120.2	304	12	10			CMP	0.024	4.76	2.59	2.79	510.89	507.92	2.97	510.01	508.47	1.54	511.11	10.00	9.50	513.30	10.00	9.50	5.18
120.2	121	9	18			CMP	0.024	0.67	4.65	5.00	510.89	507.92	2.97	509.72	507.98	1.74	511.11	18.00	2.42	511.16	18.00	2.42	4.27
120.1	120.2	33	18			CMP	0.024	0.67	4.67	5.02	510.50	507.70	2.80	510.89	507.92	2.97	510.08	18.00	4.80	510.82	18.00	4.80	8.48
120.3	302	10	8			CMP	0.024	5.02	1.47	1.58	510.00	507.36	2.64	508.88	507.86	1.02	509.94	8.00	5.34	510.74	8.00	5.34	1.86
120.3	301	11	18			CMP	0.024	-0.87	5.30	5.70	510.00	507.36	2.64	509.21	507.27	1.94	509.94	18.00	0.00	509.94	18.00	0.00	3.69
120.1	120.3	39	18			CMP	0.024	-0.86	5.26	5.66	510.50	507.70	2.80	510.00	507.36	2.64	509.94	18.00	0.00	509.94	18.00	0.00	5.56
120.1	303	13	10			CMP	0.024	8.61	3.48	3.75	510.50	507.70	2.80	509.94	508.85	1.09	509.96	10.00	1.71	510.04	10.00	1.71	0.93
120.4	305	14	10			CMP	0.024	1.20	1.30	1.40	510.00	508.90	1.10	510.14	509.07	1.07	510.11	10.00	4.71	510.77	10.00	4.71	2.57
120.5	306	8		12	24	Brick	0.015	2.46	14.95	19.57	510.45	509.15	1.30	510.01	509.34	0.67	510.12	11.64	1.65	510.12	9.36	2.09	3.19
120.4	120.5	9		12	24	Brick	0.015	2.91	16.25	21.27	510.00	508.90	1.10	510.45	509.15	1.30	510.11	12.00	1.60	510.12	11.64	1.65	3.19
120.1	120.4	46		12	24	Brick	0.015	2.62	15.42	20.18	510.50	507.70	2.80	510.00	508.90	1.10	509.98	12.00	2.59	510.11	12.00	2.59	5.19
120	120.1	115	30			RCP	0.013	0.68	33.76	36.32	509.42	506.92	2.50	510.50	507.70	2.80	509.61	30.00	3.76	509.78	24.96	4.22	18.44
119	120	47	30			RCP	0.013	-0.45	27.52	29.60	510.00	506.67	3.33	509.42	506.46	2.96	509.52	30.00	0.00	509.52	30.00	0.00	18.74
118	119	36	30			RCP	0.013	-0.08	11.79	12.68	509.74	506.58	3.16	510.00	506.55	3.45	509.52	30.00	0.00	509.52	30.00	0.00	19.47
117	118	25	30			RCP	0.013	-0.16	16.54	17.79	509.79	506.62	3.17	509.74	506.58	3.16	509.52	30.00	0.00	509.52	30.00	0.00	20.41
116	117	56	30			RCP	0.013	0.41	26.39	28.39	509.52	506.38	3.14	509.79	506.61	3.18	509.31	30.00	4.35	509.46	30.00	4.35	21.36
115.2	116	8	30			RCP	0.013	-0.25	20.35	21.89	509.55	506.38	3.17	509.52	506.36	3.16	509.20	30.00	0.00	509.20	30.00	0.00	22.65
115.2	295	41	10			Terracotta	0.013	5.31	5.05	5.43	509.55	506.38	3.17	510.08	508.54	1.54	509.20	10.00	2.89	509.40	10.00	2.89	1.58
115.1	115.2	67	30			RCP	0.013	-0.30	22.29	23.98	510.54	506.58	3.97	509.55	506.38	3.17	509.20	30.00	0.00	509.20	30.00	0.00	23.83
115.1	294	52	10			PVC	0.012	5.39	5.51	5.93	510.54	506.58	3.97	511.22	509.37	1.85	509.25	10.00	3.09	509.95	6.99	4.14	1.68
115.12	291	9	12			CMP	0.024	2.66	3.15	3.39	510.85	508.93	1.92	510.99	509.17	1.82	509.67	8.94	1.14	509.67	6.02	1.82	0.72
115.11	115.12	6	12			PVC	0.012	2.66	6.29	6.77	510.75	508.76	1.99	510.85	508.94	1.91	509.67	10.87	0.95	509.67	8.82	1.16	0.71
115.13	292	26	8			PVC	0.012	7.24	3.52	3.79	512.00	508.54	3.46	511.92	510.45	1.47	509.67	8.00	2.57	510.90	5.38	3.58	0.90
115.13	293	15	10			PVC	0.012	13.44	8.70	9.36	512.00	508.54	3.46	511.87	510.56	1.31	509.67	10.00	4.60	511.26	8.44	5.11	2.51
115.11	115.13	42	10			Terracotta	0.013	-0.53	1.60	1.72	510.75	508.76	1.99	512.00	508.54	3.46	509.67	10.00	0.00	509.67	10.00	0.00	3.38
115.1	115.11	44	18			CMP	0.024	2.72	9.39	10.10	510.54	507.58	2.97	510.75	508.76	1.99	509.23	18.00	2.31	509.54	9.28	4.44	4.08
115	115.1	18	30			RCP	0.013	0.67	33.62	36.17	509.79	506.46	3.33	510.54	506.58	3.97	508.62	25.88	6.25	508.65	24.91	6.46	28.16
114	115	106		33	47	RCP	0.013	0.67	87.55	110.39	509.12	505.76	3.36	509.79	506.47	3.32	507.93	26.02	3.34	507.93	17.50	5.16	28.34
114.2	114	33		33	47	Brick	0.015	0.75	80.04	100.93	509.00	505.51	3.49	509.12	505.76	3.36	507.82	27.70	3.12	507.82	24.70	3.51	28.25
114.1	114.2	6		33	47	Brick	0.015	0.84	84.95	107.11	510.00	505.46	4.54	509.00	505.51	3.49	507.82	28.31	3.04	507.82	27.70	3.10	28.05
114.1	281	11	12			PVC	0.012	7.21	10.37	11.15	510.00	505.46	4.54	508.91	506.23	2.68	507.82	12.00	0.87	507.82	12.00	0.87	0.68
113.1	114.1	46		33	47	Brick	0.015	0.76	80.85	101.94	508.75	505.11	3.64	510.00	505.46	4.54	507.82	32.46	2.69	507.82	28.27	3.09	28.50
113	113.1	56		37	54	Brick	0.015	0.80	115.75	146.32	509.78	504.66	5.12	508.75	505.11	3.64	505.97	15.67	4.80	506.18	12.82	5.86	28.18
112	113	18		37	54	Brick	0.015	1.06	133.49	168.74	508.33	504.47	3.86	509.78	504.66	5.12	505.97	17.94	4.16	505.97	15.67	5.08	27.98
111.13	112	7		37	54	Brick	0.015	0.83	117.88	149.01	508.46	504.24	4.22	508.33	504.30	4.03	505.31	12.82	5.80	505.36	12.73	5.84	27.90
111.12	111.13	15		37	54	Brick	0.015	0.83	117.89	149.03	509.07	504.12	4.95	508.46	504.24	4.22	505.31	14.34	5.18	505.31	12.82	5.84	27.88
271.1	271	11	8			RCP	0.013	4.41	2.54	2.73	509.70	506.93	2.77	509.21	507.42	1.79	508.25	8.00	1.88	508.29	8.00	1.88	0.66

Existing Storm Sewer Pipe Summary Data - 1 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		1 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
271.1	272	11	12			PVC	0.012	11.18	12.91	13.88	509.70	506.93	2.77	510.01	508.14	1.87	508.47	12.00	6.18	509.05	10.91	6.48	4.86
111.12	271.1	49	12			PVC	0.012	5.78	9.28	9.98	509.07	504.12	4.95	509.70	506.93	2.77	505.31	12.00	7.02	507.87	11.28	7.20	5.51
111.11	111.12	76		37	54	Brick	0.015	0.83	117.87	149.00	509.45	503.49	5.96	509.07	504.12	4.95	504.91	17.06	5.21	505.31	14.34	6.20	33.34
261.0	261	10	18			CMP	0.024	26.14	29.09	31.29	509.21	503.96	5.25	509.06	506.66	2.40	504.95	11.86	1.00	507.07	4.98	3.09	1.23
262.0	262	11	15			PVC	0.012	0.97	6.89	7.41	510.50	508.15	2.35	510.26	508.26	2.00	509.41	15.00	4.91	509.49	14.71	4.93	6.02
263	264	328	15			Terracotta	0.013	2.76	10.73	11.55	510.88	508.69	2.19	522.31	517.75	4.56	509.48	9.43	3.44	518.42	8.06	4.16	2.79
262.0	263	9	15			Terracotta	0.013	7.56	17.76	19.10	510.50	508.00	2.50	510.88	508.70	2.18	509.29	15.00	1.99	509.32	7.50	3.97	2.44
261.0	262.0	47	30			Terracotta	0.013	8.63	120.50	129.62	509.21	503.96	5.25	510.50	508.00	2.50	505.07	13.37	3.99	508.97	11.60	4.81	8.43
111.11	261.0	57		48	48	Brick	0.015	0.83	144.23	174.73	509.45	503.49	5.96	509.21	503.96	5.25	504.91	17.06	1.68	504.91	11.43	2.55	9.58
111.10	111.11	290		48	48	Brick	0.015	0.83	144.23	174.72	506.50	501.09	5.41	509.45	503.49	5.96	503.93	34.02	3.39	504.91	17.06	6.76	38.47
111.10	254	5	15			PVC	0.012	46.45	47.69	51.30	506.50	501.09	5.41	505.70	503.35	2.35	504.51	15.00	10.13	504.66	15.00	10.13	12.44
111.10	255	12	18			CMP	0.024	17.74	23.97	25.78	506.50	501.09	5.41	506.24	503.29	2.95	503.91	18.00	2.61	504.11	9.89	4.63	4.61
111.9	111.10	29		48	48	Brick	0.015	0.83	144.24	174.73	506.00	500.85	5.15	506.50	501.09	5.41	502.41	18.66	8.24	502.65	18.66	8.24	51.27
252.1	252	11	12			Cast Iron	0.015	13.02	11.14	11.98	506.10	503.00	3.10	506.41	504.47	1.94	503.00	0.00	0.00	504.47	0.00	0.00	0.00
252.1	253	6	15			PVC	0.012	7.38	19.01	20.45	506.10	503.00	3.10	505.66	503.41	2.25	503.00	0.00	0.00	503.41	0.00	0.00	0.00
111.9	252.1	39	15			PVC	0.012	5.50	16.41	17.65	506.00	500.85	5.15	506.10	503.00	3.10	500.85	0.00	0.00	503.00	0.00	0.00	0.00
111.8	111.9	16		48	48	Brick	0.015	0.83	144.25	174.75	506.00	500.72	5.28	506.00	500.85	5.15	502.27	18.64	8.24	502.41	18.64	8.24	51.17
251.1	251	9	15			PVC	0.012	11.90	24.15	25.97	506.36	503.00	3.36	506.42	504.06	2.36	503.00	0.00	0.00	504.06	0.00	0.00	0.00
111.8	251.1	35	15			PVC	0.012	6.53	17.88	19.23	506.00	500.72	5.28	506.36	503.00	3.36	500.72	0.00	0.00	503.00	0.00	0.00	0.00
111.7	111.8	30		48	48	Brick	0.015	0.83	144.23	174.73	506.00	500.47	5.53	506.00	500.72	5.28	502.43	23.44	6.54	502.44	20.62	7.44	51.12
233	234	31	15			CMP	0.024	3.14	6.20	6.67	519.08	517.01	2.07	520.77	517.99	2.78	597.84	15.00	0.98	597.87	15.00	0.98	1.21
235.1	236	8	15			Terracotta	0.013	0.37	3.93	4.22	526.30	525.07	1.23	526.30	525.10	1.20	1,010.86	15.00	2.32	1,010.87	15.00	2.32	2.85
235.1	237	40		12	12	RCP	0.013	3.32	8.27	10.00	526.30	525.07	1.23	527.41	526.41	1.00	1,010.86	12.00	2.08	1,010.94	12.00	2.08	2.08
235	235.1	164		4	8	Brick	0.015	3.32	0.93	1.21	521.29	519.62	1.67	526.30	525.07	1.23	864.38	4.00	21.69	1,010.86	4.00	21.69	4.82
233	235	178		4	8	Brick	0.015	1.36	0.59	0.78	519.08	517.19	1.89	521.29	519.62	1.67	602.55	4.00	27.54	859.07	4.00	27.54	6.12
232	233	399	12			Terracotta	0.013	2.58	5.72	6.16	509.62	506.96	2.66	519.08	517.26	1.82	515.60	12.00	20.44	596.16	12.00	20.44	16.05
231.5	232	7	18			CMP	0.024	4.96	12.67	13.63	509.80	506.90	2.90	509.62	507.26	2.36	512.23	18.00	8.74	512.76	18.00	8.74	15.44
231.5	256	40	18			CMP	0.024	1.27	6.42	6.91	509.80	506.90	2.90	509.41	507.41	2.00	506.90	0.00	0.00	507.41	0.00	0.00	0.00
231.4	231.5	252	18			PVC	0.012	1.50	13.92	14.98	506.04	503.12	2.92	509.80	506.90	2.90	506.16	18.00	8.73	510.77	18.00	8.73	15.43
231.3	231.4	18	18			PVC	0.012	0.68	9.37	10.08	506.71	503.00	3.71	506.04	503.12	2.93	505.84	18.00	8.57	506.16	18.00	8.57	15.15
231.2	231.3	15	18			PVC	0.012	1.42	13.58	14.61	505.75	502.78	2.97	506.71	503.00	3.71	505.58	18.00	8.56	505.84	18.00	8.56	15.13
231.1	231.2	11	18			PVC	0.012	1.61	14.44	15.53	505.85	502.60	3.25	505.75	502.78	2.97	505.38	18.00	8.55	505.58	18.00	8.55	15.12
231	231.1	3	18			PVC	0.012	-7.97	32.12	34.55	505.76	502.84	2.92	505.85	502.60	3.25	505.38	18.00	0.00	505.38	18.00	0.00	15.10
111.7	231	43	15			PVC	0.012	5.54	16.46	17.71	506.00	500.47	5.53	505.76	502.84	2.92	502.43	15.00	12.31	504.41	15.00	12.31	15.10
111.6	111.7	320		48	48	Brick	0.015	0.83	144.23	174.72	503.00	497.82	5.18	506.00	500.47	5.53	500.84	36.18	5.14	502.43	23.44	7.93	61.95
224.1	224	9	10			PVC	0.012	23.05	11.40	12.26	504.00	500.00	4.00	503.63	502.01	1.62	501.34	10.00	2.52	502.53	6.29	3.80	1.37
224.1	225	6	12			PVC	0.012	8.99	11.57	12.45	504.00	500.00	4.00	503.05	500.56	2.49	501.44	12.00	4.83	501.46	10.82	5.09	3.80

Existing Storm Sewer Pipe Summary Data - 1 Year Storm Event

Notes:

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Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
111.6	224.1	30	15			PVC	0.012	7.26	18.86	20.28	503.00	497.82	5.18	504.00	500.00	4.00	500.84	15.00	4.22	500.92	11.07	5.33	5.17
111.5	111.6	8		48	48	Brick	0.015	0.83	144.26	174.75	503.00	497.76	5.24	503.00	497.82	5.18	500.82	36.81	5.24	500.82	36.03	5.36	64.35
111.4	111.5	8		48	48	Brick	0.015	0.83	144.26	174.75	503.00	497.69	5.31	503.00	497.76	5.24	500.82	37.60	5.13	500.82	36.81	5.24	64.30
111.4	221	33	15			Terracotta	0.013	6.85	16.90	18.18	503.00	497.69	5.31	503.28	499.97	3.31	497.69	0.00	0.00	499.97	0.00	0.00	0.00
222.1	222	9	12			PVC	0.012	4.79	8.45	9.09	504.89	502.50	2.39	504.28	502.94	1.34	502.50	0.00	0.00	502.94	0.00	0.00	0.00
222.1	223	10	12			PVC	0.012	4.62	8.30	8.93	504.89	502.50	2.39	504.52	502.94	1.58	504.20	12.00	7.98	504.45	12.00	7.98	6.27
111.4	222.1	46	15			PVC	0.012	10.38	22.54	24.25	503.00	497.69	5.31	504.89	502.50	2.39	500.82	15.00	5.12	503.51	12.14	5.90	6.28
226.1	226	6	15			PVC	0.012	11.06	23.27	25.04	503.50	500.00	3.50	504.00	500.64	3.36	500.66	7.95	0.43	500.85	2.49	2.15	0.29
111.4	226.1	18	15			PVC	0.012	12.59	24.83	26.71	503.00	497.69	5.31	503.50	500.00	3.50	500.66	15.00	0.23	500.66	7.92	0.44	0.29
111.3	111.4	303		48	48	Brick	0.015	0.83	144.22	174.71	502.00	495.18	6.82	503.00	497.69	5.31	497.75	30.87	6.63	499.77	24.99	8.19	68.18
111.3	213	23	15			Cast Iron	0.015	8.64	16.45	17.70	502.00	495.18	6.82	501.31	497.17	4.14	497.75	15.00	1.81	497.76	7.14	3.85	2.22
111.2	111.3	1		48	48	Brick	0.015	0.83	144.39	174.91	502.00	495.17	6.83	502.00	495.18	6.82	497.75	30.95	6.71	497.75	30.82	6.73	69.18
216	217	113	12			PVC	0.012	4.82	8.47	9.11	510.49	504.12	6.37	512.91	509.56	3.35	504.32	2.42	6.66	509.76	2.42	6.66	0.75
215	216	158	12			PVC	0.012	2.20	5.72	6.16	503.05	500.41	2.64	510.49	503.89	6.60	500.89	5.73	1.94	504.24	4.24	2.89	0.72
214	215	18	12			PVC	0.012	1.99	5.45	5.86	502.10	500.00	2.10	503.05	500.36	2.69	500.24	2.90	4.76	500.60	2.90	4.76	0.70
111.2	214	40	15			Terracotta	0.013	4.55	13.79	14.83	502.00	495.17	6.83	502.10	497.00	5.10	497.75	15.00	2.48	497.75	8.99	4.02	3.04
111.1	111.2	6		48	48	Brick	0.015	0.86	146.91	177.97	502.00	495.12	6.88	502.00	495.17	6.83	497.74	31.54	6.61	497.74	30.88	6.77	69.48
111.1	212	19	15			Terracotta	0.013	11.48	21.88	23.54	502.00	495.12	6.88	501.04	497.30	3.74	497.74	15.00	2.34	497.98	8.18	4.20	2.88
111	111.1	3		48	48	Brick	0.015	0.83	144.31	174.82	501.50	495.09	6.41	502.00	495.12	6.88	497.74	31.84	6.11	497.74	31.54	6.18	64.90
110.5	111	4		48	48	Brick	0.015	0.71	133.28	161.46	501.50	495.05	6.45	501.50	495.08	6.42	497.01	23.53	8.27	497.04	23.53	8.27	64.88
110.5	211	21	15			Terracotta	0.013	11.42	21.83	23.48	501.50	495.05	6.45	501.57	497.47	4.10	495.05	0.00	0.00	497.47	0.00	0.00	0.00
110.4	110.5	15		48	48	Brick	0.015	0.81	142.23	172.29	501.00	494.93	6.07	501.50	495.05	6.45	496.80	22.42	8.68	496.92	22.42	8.68	64.87
110.3	110.4	152		48	48	Brick	0.015	0.82	143.18	173.45	500.00	493.69	6.31	501.00	494.93	6.07	496.55	34.32	5.66	496.94	24.16	8.05	64.81
110.2	110.3	3		48	48	Brick	0.015	1.04	161.39	195.51	500.00	493.66	6.34	500.00	493.69	6.31	496.55	34.67	5.54	496.55	34.31	5.61	64.07
110.2	205	27	15			Terracotta	0.013	13.16	23.44	25.21	500.00	493.66	6.34	499.46	497.26	2.20	496.55	15.00	14.27	498.55	15.00	14.27	17.51
110.1	110.2	9		48	48	Brick	0.015	0.79	141.13	170.97	500.00	493.59	6.41	500.00	493.66	6.34	496.55	35.51	6.72	496.55	34.67	6.89	79.55
110	110.1	9		48	48	Brick	0.015	0.80	141.68	171.63	499.04	493.52	5.52	500.00	493.59	6.41	496.55	36.35	6.56	496.55	35.51	6.72	79.51
109.3	110	3		48	48	Brick	0.015	0.73	135.04	163.59	499.04	493.46	5.58	499.04	493.48	5.56	495.72	27.14	8.78	495.74	27.14	8.78	79.46
109.2	109.3	273		48	48	Brick	0.015	0.73	134.98	163.52	498.94	491.48	7.46	499.04	493.46	5.58	495.09	43.34	5.50	495.77	27.67	8.61	79.45
109.1	109.2	7		48	48	Brick	0.015	0.71	133.37	161.57	499.10	491.43	7.67	498.94	491.48	7.46	495.09	43.87	5.34	495.09	43.34	5.41	78.15
109	109.1	2		48	48	Brick	0.015	0.73	135.50	164.15	499.06	491.41	7.64	499.10	491.43	7.67	495.09	44.07	5.32	495.09	43.87	5.34	78.11
108.2	109	7	48			RCP	0.013	0.73	122.35	131.61	499.12	491.36	7.76	499.06	491.41	7.64	495.08	44.60	6.42	495.09	44.07	6.46	78.09
108.1	108.2	10		48	48	RCP	0.013	0.72	155.70	188.62	499.36	491.29	8.07	499.12	491.36	7.76	495.08	45.45	5.15	495.08	44.60	5.25	78.05
108	108.1	90	48			RCP	0.013	0.72	122.31	131.57	496.65	490.64	6.01	499.36	491.29	8.07	494.86	48.00	6.21	495.08	45.45	6.34	77.99
107.1	108	77	48			RCP	0.013	0.28	76.33	82.11	497.92	490.35	7.57	496.65	490.57	6.08	494.27	47.05	6.43	494.49	47.02	6.43	80.44
203	204	5		18	18	Brick	0.015	7.33	31.39	38.02	498.18	495.14	3.04	497.51	495.51	2.00	495.41	3.20	9.06	495.78	3.20	9.06	3.63
107.1	203	19	12			RCP	0.013	12.26	12.47	13.42	497.92	490.35	7.57	498.18	492.68	5.50	494.27	12.00	4.62	494.47	12.00	4.62	3.63
107	107.1	40		48	48	RCP	0.013	0.28	96.79	117.26	496.02	490.24	5.78	497.92	490.35	7.57	494.22	47.77	5.16	494.26	46.92	5.25	82.18
106.6	107	31		51	51	Brick	0.015	0.77	163.35	197.83	496.00	490.13	5.87	496.02	490.37	5.65	492.26	25.62	9.05	492.51	25.62	9.05	82.16
106.5	106.6	31		51	51	Brick	0.015	0.78	164.36	199.05	496.00	489.89	6.11	496.00	490.13	5.87	492.01	25.48	9.09	492.25	25.48	9.09	82.04

Existing Storm Sewer Pipe Summary Data - 1 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																	1 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
106.4	106.5	42		51	51	Brick	0.015	0.78	164.34	199.03	496.00	489.56	6.44	496.00	489.89	6.11	491.68	25.45	9.09	492.01	25.45	9.09	81.93
202.1	202	28	15			RCP	0.013	1.16	6.95	7.47	496.10	493.22	2.88	495.65	493.54	2.11	494.04	9.90	2.95	494.18	7.65	4.02	2.53
106.4	202.1	57	15			RCP	0.013	6.42	16.37	17.61	496.00	489.56	6.44	496.10	493.22	2.88	491.76	15.00	2.06	493.86	7.64	4.02	2.52
106.3	106.4	14		51	51	Brick	0.015	0.76	162.11	196.33	496.00	489.45	6.55	496.00	489.56	6.44	491.62	26.04	9.03	491.73	26.04	9.03	83.32
106.2	106.3	29		51	51	Brick	0.015	0.78	164.34	199.03	495.14	489.23	5.91	496.00	489.45	6.55	491.37	25.76	9.13	491.60	25.76	9.13	83.26
106.1	106.2	29		51	51	Brick	0.015	0.78	164.34	199.03	494.21	489.00	5.21	495.14	489.23	5.91	491.14	25.74	9.12	491.37	25.74	9.12	83.16
106	106.1	71		51	51	Brick	0.008	0.82	316.44	383.23	494.01	488.42	5.59	494.21	489.00	5.21	489.75	15.95	14.70	490.33	15.95	14.70	83.05
105	106	93		51	51	Brick	0.015	0.71	157.19	190.37	493.02	487.76	5.26	494.01	488.42	5.59	489.97	26.54	8.82	490.63	26.54	8.82	82.88
104	105	224		51	51	Brick	0.015	0.67	152.01	184.09	491.81	486.27	5.54	493.02	487.76	5.26	488.68	28.91	8.06	490.03	27.26	8.55	82.53
103	104	101		51	51	Brick	0.015	0.59	142.54	172.63	490.86	485.68	5.18	491.81	486.27	5.54	487.93	27.06	8.52	488.68	28.91	7.98	81.63
102	103	117		51	51	Brick	0.015	2.10	270.30	327.35	486.81	483.21	3.60	490.86	485.68	5.18	486.17	35.50	6.46	487.93	26.97	8.50	81.23
102	201	35	18			RCP	0.013	2.67	17.18	18.48	486.81	483.18	3.63	486.92	484.11	2.81	485.92	18.00	1.48	485.94	18.00	1.48	2.62
101.1	102	328	48			RCP	0.013	2.00	203.35	218.75	480.72	476.72	4.00	486.81	483.29	3.52	478.53	21.67	15.46	485.10	21.67	15.46	85.12
101	101.1	10	48			RCP	0.013	1.97	201.64	216.91	484.95	476.53	8.42	480.72	476.72	4.00	478.34	21.67	15.32	478.53	21.67	15.32	84.40

Existing Storm Sewer Pipe Summary Data - 2 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		2 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
311	312	65	10			CMP	0.024	1.94	1.65	1.78	512.19	509.50	2.69	512.26	510.76	1.50	535.62	10.00	3.24	537.05	10.00	3.24	1.77
304	311	117	10			CMP	0.024	0.88	1.11	1.20	510.01	508.47	1.54	512.19	509.50	2.69	517.54	10.00	8.50	535.31	10.00	8.50	4.64
120.2	304	12	10			CMP	0.024	4.76	2.59	2.79	510.89	507.92	2.97	510.01	508.47	1.54	512.60	10.00	11.41	515.76	10.00	11.41	6.23
120.2	121	9	18			CMP	0.024	0.67	4.65	5.00	510.89	507.92	2.97	509.72	507.98	1.74	512.60	18.00	2.90	512.67	18.00	2.90	5.12
120.1	120.2	33	18			CMP	0.024	0.67	4.67	5.02	510.50	507.70	2.80	510.89	507.92	2.97	511.11	18.00	5.76	512.17	18.00	5.76	10.17
120.3	302	10	8			CMP	0.024	5.02	1.47	1.58	510.00	507.36	2.64	508.88	507.86	1.02	510.91	8.00	6.37	512.05	8.00	6.37	2.22
120.3	301	11	18			CMP	0.024	-0.87	5.30	5.70	510.00	507.36	2.64	509.21	507.27	1.94	510.91	18.00	0.00	510.91	18.00	0.00	4.41
120.1	120.3	39	18			CMP	0.024	-0.86	5.26	5.66	510.50	507.70	2.80	510.00	507.36	2.64	510.91	18.00	0.00	510.91	18.00	0.00	6.64
120.1	303	13	10			CMP	0.024	8.61	3.48	3.75	510.50	507.70	2.80	509.94	508.85	1.09	510.93	10.00	2.04	511.05	10.00	2.04	1.11
120.4	305	14	10			CMP	0.024	1.20	1.30	1.40	510.00	508.90	1.10	510.14	509.07	1.07	511.16	10.00	5.63	512.10	10.00	5.63	3.07
120.5	306	8		12	24	Brick	0.015	2.46	14.95	19.57	510.45	509.15	1.30	510.01	509.34	0.67	511.18	12.00	1.91	511.19	12.00	1.91	3.83
120.4	120.5	9		12	24	Brick	0.015	2.91	16.25	21.27	510.00	508.90	1.10	510.45	509.15	1.30	511.16	12.00	1.91	511.18	12.00	1.91	3.83
120.1	120.4	46		12	24	Brick	0.015	2.62	15.42	20.18	510.50	507.70	2.80	510.00	508.90	1.10	510.97	12.00	3.11	511.16	12.00	3.11	6.22
120	120.1	115	30			RCP	0.013	0.68	33.76	36.32	509.42	506.92	2.50	510.50	507.70	2.80	510.39	30.00	4.52	510.73	30.00	4.52	22.17
119	120	47	30			RCP	0.013	-0.45	27.52	29.60	510.00	506.67	3.33	509.42	506.46	2.96	510.27	30.00	0.00	510.27	30.00	0.00	22.58
118	119	36	30			RCP	0.013	-0.08	11.79	12.68	509.74	506.58	3.16	510.00	506.55	3.45	510.27	30.00	0.00	510.27	30.00	0.00	23.46
117	118	25	30			RCP	0.013	-0.16	16.54	17.79	509.79	506.62	3.17	509.74	506.58	3.16	510.27	30.00	0.00	510.27	30.00	0.00	24.60
116	117	56	30			RCP	0.013	0.41	26.39	28.39	509.52	506.38	3.14	509.79	506.61	3.18	509.96	30.00	5.24	510.18	30.00	5.24	25.73
115.2	116	8	30			RCP	0.013	-0.25	20.35	21.89	509.55	506.38	3.17	509.52	506.36	3.16	509.79	30.00	0.00	509.79	30.00	0.00	27.34
115.2	295	41	10			Terracotta	0.013	5.31	5.05	5.43	509.55	506.38	3.17	510.08	508.54	1.54	509.79	10.00	3.45	510.09	10.00	3.45	1.88
115.1	115.2	67	30			RCP	0.013	-0.30	22.29	23.98	510.54	506.58	3.97	509.55	506.38	3.17	509.79	30.00	0.00	509.79	30.00	0.00	28.75
115.1	294	52	10			PVC	0.012	5.39	5.51	5.93	510.54	506.58	3.97	511.22	509.37	1.85	509.88	10.00	3.68	510.25	10.00	3.68	2.01
115.12	291	9	12			CMP	0.024	2.66	3.15	3.39	510.85	508.93	1.92	510.99	509.17	1.82	510.34	12.00	1.09	510.35	12.00	1.09	0.86
115.11	115.12	6	12			PVC	0.012	2.66	6.29	6.77	510.75	508.76	1.99	510.85	508.94	1.91	510.33	12.00	1.08	510.34	12.00	1.08	0.85
115.13	292	26	8			PVC	0.012	7.24	3.52	3.79	512.00	508.54	3.46	511.92	510.45	1.47	510.33	8.00	3.06	510.94	5.89	3.88	1.07
115.13	293	15	10			PVC	0.012	13.44	8.70	9.36	512.00	508.54	3.46	511.87	510.56	1.31	510.33	10.00	5.49	511.31	9.01	5.78	2.99
115.11	115.13	42	10			Terracotta	0.013	-0.53	1.60	1.72	510.75	508.76	1.99	512.00	508.54	3.46	510.33	10.00	0.00	510.33	10.00	0.00	4.04
115.1	115.11	44	18			CMP	0.024	2.72	9.39	10.10	510.54	507.58	2.97	510.75	508.76	1.99	509.84	18.00	2.75	510.12	16.32	2.89	4.86
115	115.1	18	30			RCP	0.013	0.67	33.62	36.17	509.79	506.46	3.33	510.54	506.58	3.97	509.05	30.00	6.92	509.17	30.00	6.92	33.98
114	115	106		33	47	RCP	0.013	0.67	87.55	110.39	509.12	505.76	3.36	509.79	506.47	3.32	508.38	31.42	3.34	508.38	22.90	4.66	34.20
114.2	114	33		33	47	Brick	0.015	0.75	80.04	100.93	509.00	505.51	3.49	509.12	505.76	3.36	508.26	33.00	3.16	508.27	30.14	3.46	34.05
114.1	114.2	6		33	47	Brick	0.015	0.84	84.95	107.11	510.00	505.46	4.54	509.00	505.51	3.49	508.25	33.00	3.14	508.26	33.00	3.14	33.80
114.1	281	11	12			PVC	0.012	7.21	10.37	11.15	510.00	505.46	4.54	508.91	506.23	2.68	508.25	12.00	1.03	508.26	12.00	1.03	0.81
113.1	114.1	46		33	47	Brick	0.015	0.76	80.85	101.94	508.75	505.11	3.64	510.00	505.46	4.54	508.19	33.00	3.19	508.25	33.00	3.19	34.35
113	113.1	56		37	54	Brick	0.015	0.80	115.75	146.32	509.78	504.66	5.12	508.75	505.11	3.64	506.18	18.30	4.95	506.32	14.53	6.24	34.00
112	113	18		37	54	Brick	0.015	1.06	133.49	168.74	508.33	504.47	3.86	509.78	504.66	5.12	506.18	20.57	4.38	506.18	18.30	5.15	33.76
111.13	112	7		37	54	Brick	0.015	0.83	117.88	149.01	508.46	504.24	4.22	508.33	504.30	4.03	505.48	14.78	6.07	505.50	14.43	6.22	33.67
111.12	111.13	15		37	54	Brick	0.015	0.83	117.89	149.03	509.07	504.12	4.95	508.46	504.24	4.22	505.48	16.30	5.50	505.48	14.78	6.22	33.65
271.1	271	11	8			RCP	0.013	4.41	2.54	2.73	509.70	506.93	2.77	509.21	507.42	1.79	508.52	8.00	3.09	508.61	8.00	3.09	1.08

Existing Storm Sewer Pipe Summary Data - 2 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		2 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
271.1	272	11	12			PVC	0.012	11.18	12.91	13.88	509.70	506.93	2.77	510.01	508.14	1.87	508.80	12.00	7.31	509.09	11.37	7.46	5.74
111.12	271.1	49	12			PVC	0.012	5.78	9.28	9.98	509.07	504.12	4.95	509.70	506.93	2.77	505.48	12.00	8.68	507.90	11.67	8.75	6.82
111.11	111.12	76		37	54	Brick	0.015	0.83	117.87	149.00	509.45	503.49	5.96	509.07	504.12	4.95	505.10	19.31	5.58	505.48	16.30	6.61	40.40
261.0	261	10	18			CMP	0.024	26.14	29.09	31.29	509.21	503.96	5.25	509.06	506.66	2.40	505.14	14.17	1.24	507.17	6.15	3.47	1.85
262.0	262	11	15			PVC	0.012	0.97	6.89	7.41	510.50	508.15	2.35	510.26	508.26	2.00	509.56	15.00	5.71	509.67	15.00	5.71	7.01
263	264	328	15			Terracotta	0.013	2.76	10.73	11.55	510.88	508.69	2.19	522.31	517.75	4.56	509.54	10.26	3.52	518.46	8.57	4.34	3.14
262.0	263	9	15			Terracotta	0.013	7.56	17.76	19.10	510.50	508.00	2.50	510.88	508.70	2.18	509.38	15.00	2.13	509.38	8.21	4.07	2.62
261.0	262.0	47	30			Terracotta	0.013	8.63	120.50	129.62	509.21	503.96	5.25	510.50	508.00	2.50	505.22	15.17	3.85	509.03	12.41	5.01	9.60
111.11	261.0	57		48	48	Brick	0.015	0.83	144.23	174.73	509.45	503.49	5.96	509.21	503.96	5.25	505.10	19.31	1.76	505.10	13.68	2.51	11.35
111.10	111.11	290		48	48	Brick	0.015	0.83	144.23	174.72	506.50	501.09	5.41	509.45	503.49	5.96	504.61	42.22	3.29	505.10	19.31	7.20	46.32
111.10	254	5	15			PVC	0.012	46.45	47.69	51.30	506.50	501.09	5.41	505.70	503.35	2.35	505.48	15.00	12.35	505.71	15.00	12.35	15.15
111.10	255	12	18			CMP	0.024	17.74	23.97	25.78	506.50	501.09	5.41	506.24	503.29	2.95	504.59	18.00	3.06	504.68	16.73	3.16	5.41
111.9	111.10	29		48	48	Brick	0.015	0.83	144.24	174.73	506.00	500.85	5.15	506.50	501.09	5.41	502.91	24.65	7.55	503.05	23.46	7.93	62.02
252.1	252	11	12			Cast Iron	0.015	13.02	11.14	11.98	506.10	503.00	3.10	506.41	504.47	1.94	503.00	0.00	0.00	504.47	0.00	0.00	0.00
252.1	253	6	15			PVC	0.012	7.38	19.01	20.45	506.10	503.00	3.10	505.66	503.41	2.25	503.00	0.00	0.00	503.41	0.00	0.00	0.00
111.9	252.1	39	15			PVC	0.012	5.50	16.41	17.65	506.00	500.85	5.15	506.10	503.00	3.10	500.85	0.00	0.00	503.00	0.00	0.00	0.00
111.8	111.9	16		48	48	Brick	0.015	0.83	144.25	174.75	506.00	500.72	5.28	506.00	500.85	5.15	502.69	23.68	7.84	502.81	23.44	7.93	61.93
251.1	251	9	15			PVC	0.012	11.90	24.15	25.97	506.36	503.00	3.36	506.42	504.06	2.36	503.00	0.00	0.00	504.06	0.00	0.00	0.00
111.8	251.1	35	15			PVC	0.012	6.53	17.88	19.23	506.00	500.72	5.28	506.36	503.00	3.36	500.72	0.00	0.00	503.00	0.00	0.00	0.00
111.7	111.8	30		48	48	Brick	0.015	0.83	144.23	174.73	506.00	500.47	5.53	506.00	500.72	5.28	502.69	26.65	6.97	502.69	23.68	7.92	61.87
233	234	31	15			CMP	0.024	3.14	6.20	6.67	519.08	517.01	2.07	520.77	517.99	2.78	641.33	15.00	1.07	641.38	15.00	1.07	1.32
235.1	236	8	15			Terracotta	0.013	0.37	3.93	4.22	526.30	525.07	1.23	526.30	525.10	1.20	1,150.63	15.00	2.64	1,150.65	15.00	2.64	3.24
235.1	237	40		12	12	RCP	0.013	3.32	8.27	10.00	526.30	525.07	1.23	527.41	526.41	1.00	1,150.63	12.00	2.21	1,150.73	12.00	2.21	2.21
235	235.1	164		4	8	Brick	0.015	3.32	0.93	1.21	521.29	519.62	1.67	526.30	525.07	1.23	972.21	4.00	23.94	1,150.63	4.00	23.94	5.32
233	235	178		4	8	Brick	0.015	1.36	0.59	0.78	519.08	517.19	1.89	521.29	519.62	1.67	647.18	4.00	30.69	965.69	4.00	30.69	6.82
232	233	399	12			Terracotta	0.013	2.58	5.72	6.16	509.62	506.96	2.66	519.08	517.26	1.82	521.80	12.00	24.65	638.94	12.00	24.65	19.36
231.5	232	7	18			CMP	0.024	4.96	12.67	13.63	509.80	506.90	2.90	509.62	507.26	2.36	516.90	18.00	10.50	517.67	18.00	10.50	18.56
231.5	256	40	18			CMP	0.024	1.27	6.42	6.91	509.80	506.90	2.90	509.41	507.41	2.00	506.90	0.00	0.00	507.41	0.00	0.00	0.00
231.4	231.5	252	18			PVC	0.012	1.50	13.92	14.98	506.04	503.12	2.92	509.80	506.90	2.90	508.12	18.00	10.50	514.80	18.00	10.50	18.55
231.3	231.4	18	18			PVC	0.012	0.68	9.37	10.08	506.71	503.00	3.71	506.04	503.12	2.93	507.67	18.00	10.34	508.12	18.00	10.34	18.28
231.2	231.3	15	18			PVC	0.012	1.42	13.58	14.61	505.75	502.78	2.97	506.71	503.00	3.71	507.28	18.00	10.33	507.67	18.00	10.33	18.26
231.1	231.2	11	18			PVC	0.012	1.61	14.44	15.53	505.85	502.60	3.25	505.75	502.78	2.97	507.00	18.00	10.32	507.28	18.00	10.32	18.24
231	231.1	3	18			PVC	0.012	-7.97	32.12	34.55	505.76	502.84	2.92	505.85	502.60	3.25	507.00	18.00	0.00	507.00	18.00	0.00	18.23
111.7	231	43	15			PVC	0.012	5.54	16.46	17.71	506.00	500.47	5.53	505.76	502.84	2.92	502.69	15.00	14.85	505.58	15.00	14.85	18.23
111.6	111.7	320		48	48	Brick	0.015	0.83	144.23	174.72	503.00	497.82	5.18	506.00	500.47	5.53	501.28	41.53	5.42	502.69	26.65	8.45	75.08
224.1	224	9	10			PVC	0.012	23.05	11.40	12.26	504.00	500.00	4.00	503.63	502.01	1.62	501.96	10.00	3.60	502.64	7.55	4.45	1.97
224.1	225	6	12			PVC	0.012	8.99	11.57	12.45	504.00	500.00	4.00	503.05	500.56	2.49	502.08	12.00	5.62	502.16	12.00	5.62	4.42

Existing Storm Sewer Pipe Summary Data - 2 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		2 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
111.6	224.1	30	15			PVC	0.012	7.26	18.86	20.28	503.00	497.82	5.18	504.00	500.00	4.00	501.28	15.00	5.21	501.53	15.00	5.21	6.39
111.5	111.6	8		48	48	Brick	0.015	0.83	144.26	174.75	503.00	497.76	5.24	503.00	497.82	5.18	501.26	42.03	5.59	501.26	41.24	5.69	78.28
111.4	111.5	8		48	48	Brick	0.015	0.83	144.26	174.75	503.00	497.69	5.31	503.00	497.76	5.24	501.26	42.81	5.48	501.26	42.03	5.58	78.23
111.4	221	33	15			Terracotta	0.013	6.85	16.90	18.18	503.00	497.69	5.31	503.28	499.97	3.31	497.69	0.00	0.00	499.97	0.00	0.00	0.00
222.1	222	9	12			PVC	0.012	4.79	8.45	9.09	504.89	502.50	2.39	504.28	502.94	1.34	502.50	0.00	0.00	502.94	0.00	0.00	0.00
222.1	223	10	12			PVC	0.012	4.62	8.30	8.93	504.89	502.50	2.39	504.52	502.94	1.58	504.44	12.00	9.15	504.77	12.00	9.15	7.18
111.4	222.1	46	15			PVC	0.012	10.38	22.54	24.25	503.00	497.69	5.31	504.89	502.50	2.39	501.28	15.00	5.87	503.57	12.87	6.43	7.21
226.1	226	6	15			PVC	0.012	11.06	23.27	25.04	503.50	500.00	3.50	504.00	500.64	3.36	501.07	12.90	0.43	501.07	5.22	1.38	0.49
111.4	226.1	18	15			PVC	0.012	12.59	24.83	26.71	503.00	497.69	5.31	503.50	500.00	3.50	501.07	15.00	0.40	501.07	12.86	0.43	0.49
111.3	111.4	303		48	48	Brick	0.015	0.83	144.22	174.71	502.00	495.18	6.82	503.00	497.69	5.31	498.41	38.73	6.41	500.06	28.44	8.73	82.77
111.3	213	23	15			Cast Iron	0.015	8.64	16.45	17.70	502.00	495.18	6.82	501.31	497.17	4.14	498.41	15.00	2.04	498.45	15.00	2.04	2.50
111.2	111.3	1		48	48	Brick	0.015	0.83	144.39	174.91	502.00	495.17	6.83	502.00	495.18	6.82	498.40	38.81	6.48	498.40	38.68	6.50	83.84
216	217	113	12			PVC	0.012	4.82	8.47	9.11	510.49	504.12	6.37	512.91	509.56	3.35	504.34	2.64	7.01	509.78	2.64	7.01	0.90
215	216	158	12			PVC	0.012	2.20	5.72	6.16	503.05	500.41	2.64	510.49	503.89	6.60	500.94	6.39	2.02	504.28	4.66	3.05	0.86
214	215	18	12			PVC	0.012	1.99	5.45	5.86	502.10	500.00	2.10	503.05	500.36	2.69	500.26	3.18	5.02	500.62	3.18	5.02	0.84
111.2	214	40	15			Terracotta	0.013	4.55	13.79	14.83	502.00	495.17	6.83	502.10	497.00	5.10	498.40	15.00	2.80	498.52	15.00	2.80	3.43
111.1	111.2	6		48	48	Brick	0.015	0.86	146.91	177.97	502.00	495.12	6.88	502.00	495.17	6.83	498.40	39.38	6.41	498.40	38.72	6.52	84.14
111.1	212	19	15			Terracotta	0.013	11.48	21.88	23.54	502.00	495.12	6.88	501.04	497.30	3.74	498.40	15.00	2.68	498.43	13.57	2.81	3.29
111	111.1	3		48	48	Brick	0.015	0.83	144.31	174.82	501.50	495.09	6.41	502.00	495.12	6.88	498.40	39.68	5.91	498.40	39.38	5.95	78.11
110.5	111	4		48	48	Brick	0.015	0.71	133.28	161.46	501.50	495.05	6.45	501.50	495.08	6.42	497.71	31.95	7.33	497.72	31.62	7.41	78.09
110.5	211	21	15			Terracotta	0.013	11.42	21.83	23.48	501.50	495.05	6.45	501.57	497.47	4.10	495.05	0.00	0.00	497.47	0.00	0.00	0.00
110.4	110.5	15		48	48	Brick	0.015	0.81	142.23	172.29	501.00	494.93	6.07	501.50	495.05	6.45	497.71	33.39	7.01	497.71	31.95	7.37	78.07
110.3	110.4	152		48	48	Brick	0.015	0.82	143.18	173.45	500.00	493.69	6.31	501.00	494.93	6.07	497.67	47.73	4.90	497.71	33.39	7.00	77.98
110.2	110.3	3		48	48	Brick	0.015	1.04	161.39	195.51	500.00	493.66	6.34	500.00	493.69	6.31	497.66	48.00	4.81	497.67	47.72	4.84	76.97
110.2	205	27	15			Terracotta	0.013	13.16	23.44	25.21	500.00	493.66	6.34	499.46	497.26	2.20	497.66	15.00	17.85	500.79	15.00	17.85	21.91
110.1	110.2	9		48	48	Brick	0.015	0.79	141.13	170.97	500.00	493.59	6.41	500.00	493.66	6.34	497.63	48.00	6.03	497.66	48.00	6.03	96.48
110	110.1	9		48	48	Brick	0.015	0.80	141.68	171.63	499.04	493.52	5.52	500.00	493.59	6.41	497.60	48.00	6.03	497.63	48.00	6.03	96.42
109.3	110	3		48	48	Brick	0.015	0.73	135.04	163.59	499.04	493.46	5.58	499.04	493.48	5.56	497.19	44.77	6.46	497.19	44.54	6.49	96.36
109.2	109.3	273		48	48	Brick	0.015	0.73	134.98	163.52	498.94	491.48	7.46	499.04	493.46	5.58	496.37	48.00	6.02	497.19	44.77	6.46	96.34
109.1	109.2	7		48	48	Brick	0.015	0.71	133.37	161.57	499.10	491.43	7.67	498.94	491.48	7.46	496.34	48.00	5.91	496.37	48.00	5.91	94.59
109	109.1	2		48	48	Brick	0.015	0.73	135.50	164.15	499.06	491.41	7.64	499.10	491.43	7.67	496.33	48.00	5.91	496.34	48.00	5.91	94.54
108.2	109	7	48			RCP	0.013	0.73	122.35	131.61	499.12	491.36	7.76	499.06	491.41	7.64	496.30	48.00	7.52	496.33	48.00	7.52	94.53
108.1	108.2	10		48	48	RCP	0.013	0.72	155.70	188.62	499.36	491.29	8.07	499.12	491.36	7.76	496.28	48.00	5.91	496.30	48.00	5.91	94.49
108	108.1	90	48			RCP	0.013	0.72	122.31	131.57	496.65	490.64	6.01	499.36	491.29	8.07	495.89	48.00	7.51	496.28	48.00	7.51	94.42
107.1	108	77	48			RCP	0.013	0.28	76.33	82.11	497.92	490.35	7.57	496.65	490.57	6.08	495.00	48.00	7.76	495.35	48.00	7.76	97.49
203	204	5		18	18	Brick	0.015	7.33	31.39	38.02	498.18	495.14	3.04	497.51	495.51	2.00	496.24	13.25	2.55	496.24	8.81	4.49	4.22
107.1	203	19	12			RCP	0.013	12.26	12.47	13.42	497.92	490.35	7.57	498.18	492.68	5.50	495.00	12.00	5.37	495.26	12.00	5.37	4.22
107	107.1	40		48	48	RCP	0.013	0.28	96.79	117.26	496.02	490.24	5.78	497.92	490.35	7.57	494.87	48.00	6.22	494.98	48.00	6.22	99.57
106.6	107	31		51	51	Brick	0.015	0.77	163.35	197.83	496.00	490.13	5.87	496.02	490.37	5.65	492.60	29.66	9.49	492.84	29.66	9.49	99.73
106.5	106.6	31		51	51	Brick	0.015	0.78	164.36	199.05	496.00	489.89	6.11	496.00	490.13	5.87	492.34	29.50	9.53	492.59	29.50	9.53	99.59

Existing Storm Sewer Pipe Summary Data - 2 Year Storm Event

Notes:

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Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		2 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
106.4	106.5	42		51	51	Brick	0.015	0.78	164.34	199.03	496.00	489.56	6.44	496.00	489.89	6.11	492.01	29.47	9.53	492.34	29.47	9.53	99.46
202.1	202	28	15			RCP	0.013	1.16	6.95	7.47	496.10	493.22	2.88	495.65	493.54	2.11	494.17	11.39	3.03	494.24	8.41	4.28	3.03
106.4	202.1	57	15			RCP	0.013	6.42	16.37	17.61	496.00	489.56	6.44	496.10	493.22	2.88	492.11	15.00	2.47	493.92	8.40	4.28	3.03
106.3	106.4	14		51	51	Brick	0.015	0.76	162.11	196.33	496.00	489.45	6.55	496.00	489.56	6.44	491.97	30.17	9.47	492.07	30.17	9.47	101.16
106.2	106.3	29		51	51	Brick	0.015	0.78	164.34	199.03	495.14	489.23	5.91	496.00	489.45	6.55	491.71	29.84	9.56	491.94	29.84	9.56	101.10
106.1	106.2	29		51	51	Brick	0.015	0.78	164.34	199.03	494.21	489.00	5.21	495.14	489.23	5.91	491.48	29.81	9.56	491.71	29.81	9.56	100.97
106	106.1	71		51	51	Brick	0.008	0.82	316.44	383.23	494.01	488.42	5.59	494.21	489.00	5.21	489.95	18.32	15.54	490.53	18.32	15.54	100.85
105	106	93		51	51	Brick	0.015	0.71	157.19	190.37	493.02	487.76	5.26	494.01	488.42	5.59	490.32	30.77	9.24	490.98	30.77	9.24	100.66
104	105	224		51	51	Brick	0.015	0.67	152.01	184.09	491.81	486.27	5.54	493.02	487.76	5.26	489.08	33.67	8.41	490.35	31.03	9.12	100.26
103	104	101		51	51	Brick	0.015	0.59	142.54	172.63	490.86	485.68	5.18	491.81	486.27	5.54	488.25	30.82	9.09	489.08	33.67	8.32	99.23
102	103	117		51	51	Brick	0.015	2.10	270.30	327.35	486.81	483.21	3.60	490.86	485.68	5.18	486.51	39.62	7.04	488.24	30.73	9.08	98.78
102	201	35	18			RCP	0.013	2.67	17.18	18.48	486.81	483.18	3.63	486.92	484.11	2.81	486.22	18.00	1.74	486.25	18.00	1.74	3.07
101.1	102	328	48			RCP	0.013	2.00	203.35	218.75	480.72	476.72	4.00	486.81	483.29	3.52	478.74	24.22	16.24	485.31	24.22	16.24	103.20
101	101.1	10	48			RCP	0.013	1.97	201.64	216.91	484.95	476.53	8.42	480.72	476.72	4.00	478.55	24.22	16.10	478.74	24.22	16.10	102.37

Existing Storm Sewer Pipe Summary Data - 10 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		10 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
311	312	65	10			CMP	0.024	1.94	1.65	1.78	512.19	509.50	2.69	512.26	510.76	1.50	560.62	10.00	4.46	563.34	10.00	4.46	2.43
304	311	117	10			CMP	0.024	0.88	1.11	1.20	510.01	508.47	1.54	512.19	509.50	2.69	526.08	10.00	11.75	560.03	10.00	11.75	6.41
120.2	304	12	10			CMP	0.024	4.76	2.59	2.79	510.89	507.92	2.97	510.01	508.47	1.54	516.61	10.00	15.82	522.67	10.00	15.82	8.63
120.2	121	9	18			CMP	0.024	0.67	4.65	5.00	510.89	507.92	2.97	509.72	507.98	1.74	516.61	18.00	3.95	516.74	18.00	3.95	6.98
120.1	120.2	33	18			CMP	0.024	0.67	4.67	5.02	510.50	507.70	2.80	510.89	507.92	2.97	513.84	18.00	7.85	515.81	18.00	7.85	13.88
120.3	302	10	8			CMP	0.024	5.02	1.47	1.58	510.00	507.36	2.64	508.88	507.86	1.02	513.46	8.00	8.77	515.62	8.00	8.77	3.06
120.3	301	11	18			CMP	0.024	-0.87	5.30	5.70	510.00	507.36	2.64	509.21	507.27	1.94	513.46	18.00	0.00	513.46	18.00	0.00	6.07
120.1	120.3	39	18			CMP	0.024	-0.86	5.26	5.66	510.50	507.70	2.80	510.00	507.36	2.64	513.46	18.00	0.00	513.46	18.00	0.00	9.14
120.1	303	13	10			CMP	0.024	8.61	3.48	3.75	510.50	507.70	2.80	509.94	508.85	1.09	513.51	10.00	2.81	513.73	10.00	2.81	1.53
120.4	305	14	10			CMP	0.024	1.20	1.30	1.40	510.00	508.90	1.10	510.14	509.07	1.07	513.93	10.00	7.75	515.71	10.00	7.75	4.22
120.5	306	8		12	24	Brick	0.015	2.46	14.95	19.57	510.45	509.15	1.30	510.01	509.34	0.67	513.96	12.00	2.61	513.98	12.00	2.61	5.22
120.4	120.5	9		12	24	Brick	0.015	2.91	16.25	21.27	510.00	508.90	1.10	510.45	509.15	1.30	513.93	12.00	2.61	513.96	12.00	2.61	5.22
120.1	120.4	46		12	24	Brick	0.015	2.62	15.42	20.18	510.50	507.70	2.80	510.00	508.90	1.10	513.57	12.00	4.25	513.93	12.00	4.25	8.50
120	120.1	115	30			RCP	0.013	0.68	33.76	36.32	509.42	506.92	2.50	510.50	507.70	2.80	512.49	30.00	6.19	513.12	30.00	6.19	30.36
119	120	47	30			RCP	0.013	-0.45	27.52	29.60	510.00	506.67	3.33	509.42	506.46	2.96	512.25	30.00	0.00	512.25	30.00	0.00	31.09
118	119	36	30			RCP	0.013	-0.08	11.79	12.68	509.74	506.58	3.16	510.00	506.55	3.45	512.25	30.00	0.00	512.25	30.00	0.00	32.30
117	118	25	30			RCP	0.013	-0.16	16.54	17.79	509.79	506.62	3.17	509.74	506.58	3.16	512.25	30.00	0.00	512.25	30.00	0.00	33.86
116	117	56	30			RCP	0.013	0.41	26.39	28.39	509.52	506.38	3.14	509.79	506.61	3.18	511.68	30.00	7.22	512.09	30.00	7.22	35.43
115.2	116	8	30			RCP	0.013	-0.25	20.35	21.89	509.55	506.38	3.17	509.52	506.36	3.16	511.36	30.00	0.00	511.36	30.00	0.00	37.71
115.2	295	41	10			Terracotta	0.013	5.31	5.05	5.43	509.55	506.38	3.17	510.08	508.54	1.54	511.36	10.00	4.75	511.92	10.00	4.75	2.59
115.1	115.2	67	30			RCP	0.013	-0.30	22.29	23.98	510.54	506.58	3.97	509.55	506.38	3.17	511.36	30.00	0.00	511.36	30.00	0.00	39.67
115.1	294	52	10			PVC	0.012	5.39	5.51	5.93	510.54	506.58	3.97	511.22	509.37	1.85	511.52	10.00	5.07	512.21	10.00	5.07	2.77
115.12	291	9	12			CMP	0.024	2.66	3.15	3.39	510.85	508.93	1.92	510.99	509.17	1.82	512.44	12.00	1.50	512.48	12.00	1.50	1.18
115.11	115.12	6	12			PVC	0.012	2.66	6.29	6.77	510.75	508.76	1.99	510.85	508.94	1.91	512.44	12.00	1.49	512.44	12.00	1.49	1.17
115.13	292	26	8			PVC	0.012	7.24	3.52	3.79	512.00	508.54	3.46	511.92	510.45	1.47	512.44	8.00	4.22	512.77	8.00	4.22	1.47
115.13	293	15	10			PVC	0.012	13.44	8.70	9.36	512.00	508.54	3.46	511.87	510.56	1.31	512.44	10.00	7.55	512.89	10.00	7.55	4.12
115.11	115.13	42	10			Terracotta	0.013	-0.53	1.60	1.72	510.75	508.76	1.99	512.00	508.54	3.46	512.44	10.00	0.00	512.44	10.00	0.00	5.57
115.1	115.11	44	18			CMP	0.024	2.72	9.39	10.10	510.54	507.58	2.97	510.75	508.76	1.99	511.45	18.00	3.80	512.05	18.00	3.80	6.71
115	115.1	18	30			RCP	0.013	0.67	33.62	36.17	509.79	506.46	3.33	510.54	506.58	3.97	509.95	30.00	9.55	510.17	30.00	9.55	46.88
114	115	106		33	47	RCP	0.013	0.67	87.55	110.39	509.12	505.76	3.36	509.79	506.47	3.32	508.93	33.00	4.38	509.08	31.28	4.62	47.21
114.2	114	33		33	47	Brick	0.015	0.75	80.04	100.93	509.00	505.51	3.49	509.12	505.76	3.36	508.67	33.00	4.37	508.75	33.00	4.37	47.10
114.1	114.2	6		33	47	Brick	0.015	0.84	84.95	107.11	510.00	505.46	4.54	509.00	505.51	3.49	508.65	33.00	4.35	508.67	33.00	4.35	46.83
114.1	281	11	12			PVC	0.012	7.21	10.37	11.15	510.00	505.46	4.54	508.91	506.23	2.68	508.65	12.00	1.42	508.66	12.00	1.42	1.12
113.1	114.1	46		33	47	Brick	0.015	0.76	80.85	101.94	508.75	505.11	3.64	510.00	505.46	4.54	508.52	33.00	4.42	508.64	33.00	4.42	47.61
113	113.1	56		37	54	Brick	0.015	0.80	115.75	146.32	509.78	504.66	5.12	508.75	505.11	3.64	507.47	33.76	3.73	507.47	28.35	4.48	47.26
112	113	18		37	54	Brick	0.015	1.06	133.49	168.74	508.33	504.47	3.86	509.78	504.66	5.12	507.47	36.03	3.46	507.47	33.76	3.71	46.80
111.13	112	7		37	54	Brick	0.015	0.83	117.88	149.01	508.46	504.24	4.22	508.33	504.30	4.03	507.36	37.00	3.36	507.36	36.75	3.39	46.66
111.12	111.13	15		37	54	Brick	0.015	0.83	117.89	149.03	509.07	504.12	4.95	508.46	504.24	4.22	507.34	37.00	3.36	507.36	37.00	3.36	46.59
271.1	271	11	8			RCP	0.013	4.41	2.54	2.73	509.70	506.93	2.77	509.21	507.42	1.79	511.94	8.00	6.39	512.31	8.00	6.39	2.23

Existing Storm Sewer Pipe Summary Data - 10 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		10 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
271.1	272	11	12			PVC	0.012	11.18	12.91	13.88	509.70	506.93	2.77	510.01	508.14	1.87	512.26	12.00	9.63	512.67	12.00	9.63	7.57
111.12	271.1	49	12			PVC	0.012	5.78	9.28	9.98	509.07	504.12	4.95	509.70	506.93	2.77	507.34	12.00	12.47	510.46	12.00	12.47	9.80
111.11	111.12	76		37	54	Brick	0.015	0.83	117.87	149.00	509.45	503.49	5.96	509.07	504.12	4.95	507.17	37.00	4.05	507.31	37.00	4.05	56.24
261.0	261	10	18			CMP	0.024	26.14	29.09	31.29	509.21	503.96	5.25	509.06	506.66	2.40	507.20	18.00	1.95	507.37	8.50	4.20	3.45
262.0	262	11	15			PVC	0.012	0.97	6.89	7.41	510.50	508.15	2.35	510.26	508.26	2.00	509.87	15.00	7.34	510.06	15.00	7.34	9.00
263	264	328	15			Terracotta	0.013	2.76	10.73	11.55	510.88	508.69	2.19	522.31	517.75	4.56	509.73	12.42	3.54	518.54	9.52	4.68	3.85
262.0	263	9	15			Terracotta	0.013	7.56	17.76	19.10	510.50	508.00	2.50	510.88	508.70	2.18	509.57	15.00	2.46	509.57	10.49	3.75	3.02
261.0	262.0	47	30			Terracotta	0.013	8.63	120.50	129.62	509.21	503.96	5.25	510.50	508.00	2.50	507.21	30.00	2.44	509.16	13.94	5.37	11.99
111.11	261.0	57		48	48	Brick	0.015	0.83	144.23	174.73	509.45	503.49	5.96	509.21	503.96	5.25	507.17	44.14	1.04	507.17	38.51	1.19	15.29
111.10	111.11	290		48	48	Brick	0.015	0.83	144.23	174.72	506.50	501.09	5.41	509.45	503.49	5.96	506.79	48.00	3.96	507.17	44.14	4.31	63.41
111.10	254	5	15			PVC	0.012	46.45	47.69	51.30	506.50	501.09	5.41	505.70	503.35	2.35	508.56	15.00	17.35	509.01	15.00	17.35	21.30
111.10	255	12	18			CMP	0.024	17.74	23.97	25.78	506.50	501.09	5.41	506.24	503.29	2.95	506.79	18.00	3.99	506.98	18.00	3.99	7.05
111.9	111.10	29		48	48	Brick	0.015	0.83	144.24	174.73	506.00	500.85	5.15	506.50	501.09	5.41	506.33	48.00	5.30	506.41	48.00	5.30	84.88
252.1	252	11	12			Cast Iron	0.015	13.02	11.14	11.98	506.10	503.00	3.10	506.41	504.47	1.94	503.00	0.00	0.00	504.47	0.00	0.00	0.00
252.1	253	6	15			PVC	0.012	7.38	19.01	20.45	506.10	503.00	3.10	505.66	503.41	2.25	503.00	0.00	0.00	503.41	0.00	0.00	0.00
111.9	252.1	39	15			PVC	0.012	5.50	16.41	17.65	506.00	500.85	5.15	506.10	503.00	3.10	500.85	0.00	0.00	503.00	0.00	0.00	0.00
111.8	111.9	16		48	48	Brick	0.015	0.83	144.25	174.75	506.00	500.72	5.28	506.00	500.85	5.15	506.28	48.00	5.29	506.33	48.00	5.29	84.69
251.1	251	9	15			PVC	0.012	11.90	24.15	25.97	506.36	503.00	3.36	506.42	504.06	2.36	503.00	0.00	0.00	504.06	0.00	0.00	0.00
111.8	251.1	35	15			PVC	0.012	6.53	17.88	19.23	506.00	500.72	5.28	506.36	503.00	3.36	500.72	0.00	0.00	503.00	0.00	0.00	0.00
111.7	111.8	30		48	48	Brick	0.015	0.83	144.23	174.73	506.00	500.47	5.53	506.00	500.72	5.28	506.20	48.00	5.29	506.28	48.00	5.29	84.59
233	234	31	15			CMP	0.024	3.14	6.20	6.67	519.08	517.01	2.07	520.77	517.99	2.78	778.29	15.00	1.25	778.35	15.00	1.25	1.53
235.1	236	8	15			Terracotta	0.013	0.37	3.93	4.22	526.30	525.07	1.23	526.30	525.10	1.20	1,517.47	15.00	3.29	1,517.50	15.00	3.29	4.03
235.1	237	40		12	12	RCP	0.013	3.32	8.27	10.00	526.30	525.07	1.23	527.41	526.41	1.00	1,517.47	12.00	2.46	1,517.59	12.00	2.46	2.46
235	235.1	164		4	8	Brick	0.015	3.32	0.93	1.21	521.29	519.62	1.67	526.30	525.07	1.23	1,263.69	4.00	28.55	1,517.47	4.00	28.55	6.34
233	235	178		4	8	Brick	0.015	1.36	0.59	0.78	519.08	517.19	1.89	521.29	519.62	1.67	786.88	4.00	37.18	1,254.28	4.00	37.18	8.26
232	233	399	12			Terracotta	0.013	2.58	5.72	6.16	509.62	506.96	2.66	519.08	517.26	1.82	543.89	12.00	34.52	773.77	12.00	34.52	27.12
231.5	232	7	18			CMP	0.024	4.96	12.67	13.63	509.80	506.90	2.90	509.62	507.26	2.36	534.27	18.00	14.73	535.79	18.00	14.73	26.03
231.5	256	40	18			CMP	0.024	1.27	6.42	6.91	509.80	506.90	2.90	509.41	507.41	2.00	506.90	0.00	0.00	507.41	0.00	0.00	0.00
231.4	231.5	252	18			PVC	0.012	1.50	13.92	14.98	506.04	503.12	2.92	509.80	506.90	2.90	517.01	18.00	14.72	530.14	18.00	14.72	26.02
231.3	231.4	18	18			PVC	0.012	0.68	9.37	10.08	506.71	503.00	3.71	506.04	503.12	2.93	516.10	18.00	14.58	517.01	18.00	14.58	25.77
231.2	231.3	15	18			PVC	0.012	1.42	13.58	14.61	505.75	502.78	2.97	506.71	503.00	3.71	515.33	18.00	14.57	516.10	18.00	14.57	25.76
231.1	231.2	11	18			PVC	0.012	1.61	14.44	15.53	505.85	502.60	3.25	505.75	502.78	2.97	514.78	18.00	14.57	515.33	18.00	14.57	25.74
231	231.1	3	18			PVC	0.012	-7.97	32.12	34.55	505.76	502.84	2.92	505.85	502.60	3.25	514.78	18.00	0.00	514.78	18.00	0.00	25.73
111.7	231	43	15			PVC	0.012	5.54	16.46	17.71	506.00	500.47	5.53	505.76	502.84	2.92	506.20	15.00	20.97	511.94	15.00	20.97	25.73
111.6	111.7	320		48	48	Brick	0.015	0.83	144.23	174.72	503.00	497.82	5.18	506.00	500.47	5.53	504.77	48.00	6.63	506.20	48.00	6.63	106.00
224.1	224	9	10			PVC	0.012	23.05	11.40	12.26	504.00	500.00	4.00	503.63	502.01	1.62	506.17	10.00	6.05	506.34	10.00	6.05	3.30
224.1	225	6	12			PVC	0.012	8.99	11.57	12.45	504.00	500.00	4.00	503.05	500.56	2.49	506.28	12.00	7.33	506.42	12.00	7.33	5.76

Existing Storm Sewer Pipe Summary Data - 10 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		10 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
111.6	224.1	30	15			PVC	0.012	7.26	18.86	20.28	503.00	497.82	5.18	504.00	500.00	4.00	504.77	15.00	7.39	505.27	15.00	7.39	9.06
111.5	111.6	8		48	48	Brick	0.015	0.83	144.26	174.75	503.00	497.76	5.24	503.00	497.82	5.18	504.68	48.00	6.93	504.71	48.00	6.93	110.92
111.4	111.5	8		48	48	Brick	0.015	0.83	144.26	174.75	503.00	497.69	5.31	503.00	497.76	5.24	504.64	48.00	6.93	504.68	48.00	6.93	110.87
111.4	221	33	15			Terracotta	0.013	6.85	16.90	18.18	503.00	497.69	5.31	503.28	499.97	3.31	497.69	0.00	0.00	499.97	0.00	0.00	0.00
222.1	222	9	12			PVC	0.012	4.79	8.45	9.09	504.89	502.50	2.39	504.28	502.94	1.34	502.50	0.00	0.00	502.94	0.00	0.00	0.00
222.1	223	10	12			PVC	0.012	4.62	8.30	8.93	504.89	502.50	2.39	504.52	502.94	1.58	506.73	12.00	11.49	507.25	12.00	11.49	9.02
111.4	222.1	46	15			PVC	0.012	10.38	22.54	24.25	503.00	497.69	5.31	504.89	502.50	2.39	504.68	15.00	7.37	505.45	15.00	7.37	9.05
226.1	226	6	15			PVC	0.012	11.06	23.27	25.04	503.50	500.00	3.50	504.00	500.64	3.36	504.36	15.00	0.88	504.36	15.00	0.88	1.09
111.4	226.1	18	15			PVC	0.012	12.59	24.83	26.71	503.00	497.69	5.31	503.50	500.00	3.50	504.34	15.00	0.88	504.35	15.00	0.88	1.09
111.3	111.4	303		48	48	Brick	0.015	0.83	144.22	174.71	502.00	495.18	6.82	503.00	497.69	5.31	502.39	48.00	7.31	504.04	48.00	7.31	117.04
111.3	213	23	15			Cast Iron	0.015	8.64	16.45	17.70	502.00	495.18	6.82	501.31	497.17	4.14	502.39	15.00	2.51	502.46	15.00	2.51	3.08
111.2	111.3	1		48	48	Brick	0.015	0.83	144.39	174.91	502.00	495.17	6.83	502.00	495.18	6.82	502.37	48.00	7.39	502.38	48.00	7.39	118.20
216	217	113	12			PVC	0.012	4.82	8.47	9.11	510.49	504.12	6.37	512.91	509.56	3.35	504.89	9.23	1.91	510.03	5.63	3.42	1.24
215	216	158	12			PVC	0.012	2.20	5.72	6.16	503.05	500.41	2.64	510.49	503.89	6.60	502.65	12.00	1.55	504.36	5.59	3.40	1.22
214	215	18	12			PVC	0.012	1.99	5.45	5.86	502.10	500.00	2.10	503.05	500.36	2.69	502.60	12.00	1.46	502.62	12.00	1.46	1.15
111.2	214	40	15			Terracotta	0.013	4.55	13.79	14.83	502.00	495.17	6.83	502.10	497.00	5.10	502.37	15.00	3.46	502.55	15.00	3.46	4.24
111.1	111.2	6		48	48	Brick	0.015	0.86	146.91	177.97	502.00	495.12	6.88	502.00	495.17	6.83	502.32	48.00	7.42	502.36	48.00	7.42	118.69
111.1	212	19	15			Terracotta	0.013	11.48	21.88	23.54	502.00	495.12	6.88	501.04	497.30	3.74	502.32	15.00	3.36	502.40	15.00	3.36	4.12
111	111.1	3		48	48	Brick	0.015	0.83	144.31	174.82	501.50	495.09	6.41	502.00	495.12	6.88	502.31	48.00	6.83	502.32	48.00	6.83	109.23
110.5	111	4		48	48	Brick	0.015	0.71	133.28	161.46	501.50	495.05	6.45	501.50	495.08	6.42	501.85	48.00	6.83	501.87	48.00	6.83	109.20
110.5	211	21	15			Terracotta	0.013	11.42	21.83	23.48	501.50	495.05	6.45	501.57	497.47	4.10	495.05	0.00	0.00	497.47	0.00	0.00	0.00
110.4	110.5	15		48	48	Brick	0.015	0.81	142.23	172.29	501.00	494.93	6.07	501.50	495.05	6.45	501.78	48.00	6.82	501.85	48.00	6.82	109.17
110.3	110.4	152		48	48	Brick	0.015	0.82	143.18	173.45	500.00	493.69	6.31	501.00	494.93	6.07	501.07	48.00	6.82	501.78	48.00	6.82	109.06
110.2	110.3	3		48	48	Brick	0.015	1.04	161.39	195.51	500.00	493.66	6.34	500.00	493.69	6.31	501.05	48.00	6.74	501.07	48.00	6.74	107.91
110.2	205	27	15			Terracotta	0.013	13.16	23.44	25.21	500.00	493.66	6.34	499.46	497.26	2.20	501.05	15.00	26.09	507.74	15.00	26.09	32.02
110.1	110.2	9		48	48	Brick	0.015	0.79	141.13	170.97	500.00	493.59	6.41	500.00	493.66	6.34	500.99	48.00	8.56	501.05	48.00	8.56	136.92
110	110.1	9		48	48	Brick	0.015	0.80	141.68	171.63	499.04	493.52	5.52	500.00	493.59	6.41	500.92	48.00	8.55	500.99	48.00	8.55	136.87
109.3	110	3		48	48	Brick	0.015	0.73	135.04	163.59	499.04	493.46	5.58	499.04	493.48	5.56	500.22	48.00	8.55	500.24	48.00	8.55	136.81
109.2	109.3	273		48	48	Brick	0.015	0.73	134.98	163.52	498.94	491.48	7.46	499.04	493.46	5.58	498.20	48.00	8.55	500.22	48.00	8.55	136.79
109.1	109.2	7		48	48	Brick	0.015	0.71	133.37	161.57	499.10	491.43	7.67	498.94	491.48	7.46	498.15	48.00	8.45	498.20	48.00	8.45	135.12
109	109.1	2		48	48	Brick	0.015	0.73	135.50	164.15	499.06	491.41	7.64	499.10	491.43	7.67	498.13	48.00	8.44	498.15	48.00	8.44	135.08
108.2	109	7	48			RCP	0.013	0.73	122.35	131.61	499.12	491.36	7.76	499.06	491.41	7.64	498.07	48.00	10.75	498.13	48.00	10.75	135.07
108.1	108.2	10		48	48	RCP	0.013	0.72	155.70	188.62	499.36	491.29	8.07	499.12	491.36	7.76	498.02	48.00	8.44	498.07	48.00	8.44	135.03
108	108.1	90	48			RCP	0.013	0.72	122.31	131.57	496.65	490.64	6.01	499.36	491.29	8.07	497.23	48.00	10.74	498.02	48.00	10.74	134.97
107.1	108	77	48			RCP	0.013	0.28	76.33	82.11	497.92	490.35	7.57	496.65	490.57	6.08	495.39	48.00	11.11	496.12	48.00	11.11	139.61
203	204	5		18	18	Brick	0.015	7.33	31.39	38.02	498.18	495.14	3.04	497.51	495.51	2.00	496.57	17.10	2.53	496.57	12.66	3.82	5.41
107.1	203	19	12			RCP	0.013	12.26	12.47	13.42	497.92	490.35	7.57	498.18	492.68	5.50	495.39	12.00	6.91	495.83	12.00	6.91	5.42
107	107.1	40		48	48	RCP	0.013	0.28	96.79	117.26	496.02	490.24	5.78	497.92	490.35	7.57	495.12	48.00	8.91	495.36	48.00	8.91	142.48
106.6	107	31		51	51	Brick	0.015	0.77	163.35	197.83	496.00	490.13	5.87	496.02	490.37	5.65	493.40	39.30	10.28	493.65	39.30	10.28	143.15
106.5	106.6	31		51	51	Brick	0.015	0.78	164.36	199.05	496.00	489.89	6.11	496.00	490.13	5.87	493.14	39.07	10.33	493.39	39.07	10.33	142.98

Existing Storm Sewer Pipe Summary Data - 10 Year Storm Event

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

																		10 Year Storm Event						
Downstream Node	Upstream Node	Length (ft)	Diameter (in)	Rise (in)	Span (in)	Material	Manning's n	Slope (%)	Full Flow (cfs)	Maximum Flow (cfs)	Downstream Rim Elev (ft)	Downstream Invert (ft)	Downstream Structure Depth	Upstream Rim Elev (ft)	Upstream Invert (ft)	Upstream Structure Depth	Downstream HGL (ft)	Downstream Flow Depth (in)	Downstream Velocity (fps)	Upstream HGL (ft)	Upstream Flow Depth (in)	Upstream Velocity (fps)	Total Flow (cfs)
106.4	106.5	42		51	51	Brick	0.015	0.78	164.34	199.03	496.00	489.56	6.44	496.00	489.89	6.11	492.90	40.13	10.05	493.16	39.29	10.26	142.82
202.1	202	28	15			RCP	0.013	1.16	6.95	7.47	496.10	493.22	2.88	495.65	493.54	2.11	494.30	12.94	3.67	494.36	9.88	4.82	4.14
106.4	202.1	57	15			RCP	0.013	6.42	16.37	17.61	496.00	489.56	6.44	496.10	493.22	2.88	492.90	15.00	3.36	494.04	9.87	4.82	4.13
106.3	106.4	14		51	51	Brick	0.015	0.76	162.11	196.33	496.00	489.45	6.55	496.00	489.56	6.44	492.76	39.74	10.32	492.87	39.81	10.31	145.30
106.2	106.3	29		51	51	Brick	0.015	0.78	164.34	199.03	495.14	489.23	5.91	496.00	489.45	6.55	492.52	39.56	10.36	492.75	39.56	10.36	145.23
106.1	106.2	29		51	51	Brick	0.015	0.78	164.34	199.03	494.21	489.00	5.21	495.14	489.23	5.91	492.29	39.53	10.36	492.52	39.53	10.36	145.07
106	106.1	71		51	51	Brick	0.008	0.82	316.44	383.23	494.01	488.42	5.59	494.21	489.00	5.21	491.81	40.73	10.05	492.30	39.68	10.31	144.92
105	106	93		51	51	Brick	0.015	0.71	157.19	190.37	493.02	487.76	5.26	494.01	488.42	5.59	491.15	40.71	10.02	491.81	40.73	10.02	144.54
104	105	224		51	51	Brick	0.015	0.67	152.01	184.09	491.81	486.27	5.54	493.02	487.76	5.26	489.98	44.52	9.14	491.15	40.71	9.99	144.05
103	104	101		51	51	Brick	0.015	0.59	142.54	172.63	490.86	485.68	5.18	491.81	486.27	5.54	488.95	39.29	10.26	489.98	44.52	9.06	142.80
102	103	117		51	51	Brick	0.015	2.10	270.30	327.35	486.81	483.21	3.60	490.86	485.68	5.18	487.29	48.97	8.20	488.95	39.19	10.25	142.26
102	201	35	18			RCP	0.013	2.67	17.18	18.48	486.81	483.18	3.63	486.92	484.11	2.81	486.90	18.00	2.28	486.96	18.00	2.28	4.03
101.1	102	328	48			RCP	0.013	2.00	203.35	218.75	480.72	476.72	4.00	486.81	483.29	3.52	479.25	30.38	17.65	485.82	30.38	17.65	147.97
101	101.1	10	48			RCP	0.013	1.97	201.64	216.91	484.95	476.53	8.42	480.72	476.72	4.00	479.06	30.42	17.50	479.25	30.42	17.50	146.95

APPENDIX D

EXISTING STORM SEWER INLET SUMMARY DATA

Existing Storm Sewer Inlet Summary Data

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

						1 Year Storm Event					2 Year Storm Event					10 Year Storm Event				
Inlet ID	Structure Name	"C" Factor	Time to Inlet (min)	Catchment Area (Acres)	Profile	Gutter Spread (ft)	Ponding Depth (in)	Rainfall Intensity (in/hr)	Intercepted Flow (cfs)	Bypass Flow (cfs)	Gutter Spread (ft)	Ponding Depth (in)	Rainfall Intensity (in/hr)	Intercepted Flow (cfs)	Bypass Flow (cfs)	Gutter Spread (ft)	Ponding Depth (in)	Rainfall Intensity (in/hr)	Intercepted Flow (cfs)	Bypass Flow (cfs)
28'' X 28'' Grate	**121**	0.60	10	2.28	Sag	19.2	2.30	3.12	4.27	-	20.5	2.46	3.74	5.12	-	23.0	2.76	5.10	6.98	-
4' Open Throat	**311**	0.90	5	0.69	Sag	15.6	1.87	3.90	2.47	-	16.7	2.00	4.67	2.95	-	18.8	2.26	6.46	4.06	-
24'' X 12'' Grate	**304**	0.85	5	0.42	Sag	12.7	1.52	3.84	1.42	-	13.6	1.63	4.61	1.70	-	15.3	1.83	6.39	2.33	-
24'' X 18'' Grate	**303**	0.90	5	0.26	Sag	10.8	1.30	3.98	0.93	-	11.6	1.39	4.75	1.11	-	13.0	1.57	6.54	1.53	-
28'' X 28'' Grate	**305**	0.85	5	0.76	Sag	15.8	1.90	3.98	2.57	-	16.9	2.03	4.75	3.07	-	19.1	2.29	6.54	4.22	-
Triple 10" Culvert Inlet	**306**	0.80	10	1.28	Sag	1.6	10.20	3.12	3.19	-	1.8	10.21	3.74	3.83	-	2.0	10.24	5.10	5.22	-
28'' X 28'' Grate	**302**	0.90	5	0.52	Sag	14.0	1.69	3.98	1.86	-	15.0	1.80	4.75	2.22	-	16.9	2.03	6.54	3.06	-
28'' X 28'' Grate	**301**	0.80	5	1.16	Sag	18.2	2.18	3.98	3.69	-	19.4	2.33	4.75	4.41	-	21.9	2.62	6.54	6.07	-
28'' X 28'' Grate	**120**	0.90	5	0.26	Sag	10.8	1.30	3.00	0.93	-	11.6	1.39	3.61	1.11	-	13.0	1.57	4.97	1.53	-
36'' X 18'' Grate	**119**	0.90	5	0.27	Sag	11.0	1.32	3.00	0.97	-	11.7	1.41	3.61	1.15	-	13.2	1.59	4.97	1.59	-
33'' X 33'' Grate	**118**	0.90	5	0.35	Sag	12.1	1.45	3.00	1.25	-	12.9	1.55	3.61	1.50	-	14.6	1.75	4.97	2.06	-
33'' X 33'' Grate	**117**	0.90	5	0.35	Sag	12.1	1.45	3.00	1.25	-	12.9	1.55	3.61	1.50	-	14.6	1.75	4.97	2.06	-
28'' X 28'' Grate	**116**	0.90	5	0.56	Sag	14.4	1.73	2.97	2.01	-	15.4	1.85	3.58	2.39	-	17.4	2.09	4.94	3.30	-
36'' X 24'' Grate	**295**	0.90	5	0.44	Sag	13.2	1.58	3.98	1.58	-	14.1	1.69	4.75	1.88	-	15.9	1.91	6.54	2.59	-
48'' X 18'' Grate	**294**	0.90	5	0.47	Sag	13.5	1.62	3.98	1.68	-	14.4	1.73	4.75	2.01	-	16.3	1.95	6.54	2.77	-
48'' X 18'' Grate	**293**	0.90	5	0.70	Sag	15.7	1.88	3.98	2.51	-	16.8	2.01	4.75	2.99	-	18.9	2.27	6.54	4.12	-
24'' X 18'' Grate	**292**	0.90	5	0.25	Sag	10.7	1.28	3.98	0.90	-	11.4	1.37	4.75	1.07	-	12.9	1.54	6.54	1.47	-
36'' X 18'' Combo Grate	**291**	0.90	5	0.20	Sag	9.8	1.18	3.98	0.72	-	10.5	1.26	4.75	0.86	-	11.8	1.42	6.54	1.18	-
24'' X 24'' Grate	**115**	0.90	5	0.09	Sag	7.3	0.87	2.96	0.32	-	7.8	0.93	3.58	0.38	-	8.8	1.05	4.94	0.53	-
36'' X 18'' Combo Grate	**114**	0.90	5	0.16	Sag	9.0	1.08	2.91	0.57	-	9.6	1.16	3.51	0.68	-	10.9	1.31	4.85	0.94	-
36'' X 18'' Combo Grate	**281**	0.90	5	0.19	Sag	9.6	1.16	3.98	0.68	-	10.3	1.23	4.75	0.81	-	11.6	1.39	6.54	1.12	-
36'' X 18'' Grate-Grade	**112**	-	-	-	Grade	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36'' X 18'' Combo Grate-Grade	**272**	-	-	-	Grade	21.1	2.53	3.12	5.51	-	22.8	2.74	3.74	6.81	-	26.2	3.14	5.10	9.80	0.01
36'' X 18'' Combo Grate-Grade	**271**	-	-	-	Grade	0.7	0.09	3.98	0.00	-	1.2	0.14	4.75	0.00	-	2.1	0.25	6.54	0.01	-
48'' X 24'' Grate-Grade	**264**	0.52	15	6.24	Grade	24.6	2.95	2.56	2.79	5.51	26.3	3.16	3.07	3.14	6.82	29.6	3.56	4.21	3.85	9.81
36'' X 18'' Grate-Grade	**263**	0.85	10	3.51	Grade	25.7	3.08	2.42	2.06	7.25	27.5	3.30	2.93	2.30	8.86	30.9	3.70	4.05	2.77	12.45
36'' X 18'' Combo Grate-Grade	**262**	-	-	-	Grade	23.4	2.81	3.12	7.25	-	25.2	3.02	3.74	8.85	0.01	28.6	3.44	5.10	12.43	0.03
36'' X 18'' Grate	**261**	-	-	-	Sag	1.3	0.16	3.12	0.00	-	1.8	0.21	3.74	0.01	-	2.8	0.34	5.10	0.03	0.00
36'' X 18'' Combo Grate-Grade	**255**	-	-	-	Grade	20.6	2.47	3.98	5.16	-	22.2	2.67	4.75	6.32	-	25.3	3.03	6.54	8.91	0.01
36'' X 18'' Combo Grate	**254**	0.85	10	4.48	Sag	28.1	3.38	3.12	11.88	-	30.1	3.61	3.74	14.24	-	33.8	4.06	5.10	19.43	0.00
36'' X 18'' Combo Grate	**253**	-	-	-	Sag	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36'' X 18'' Combo Grate	**252**	-	-	-	Sag	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36'' X 18'' Combo Grate-Grade	**251**	-	-	-	Grade	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2' Open Throat-Grade	**237**	0.55	20	10.27	Grade	26.1	7.13	2.19	2.08	10.27	28.4	7.40	2.63	2.21	12.66	32.8	7.93	3.68	2.46	18.31
33'' X 33'' Grate-Grade	**236**	-	-	-	Grade	26.6	3.20	3.98	2.85	7.42	28.8	3.46	4.75	3.24	9.43	33.1	3.97	6.54	4.03	14.28
24'' X 18'' Grate-Grade	**235**	-	-	-	Grade	23.6	2.83	2.16	1.34	6.07	25.8	3.09	2.60	1.55	7.88	30.1	3.62	3.64	1.97	12.31
4' Open Throat-Grade	**234**	0.62	10	2.92	Grade	21.3	2.55	3.12	1.21	4.44	22.8	2.73	3.74	1.32	5.45	25.6	3.07	5.10	1.53	7.70
48'' X 48'' Grate	**233**	-	-	-	Sag	26.9	3.22	2.15	10.52	-	29.4	3.52	2.60	13.33	-	34.2	4.11	3.64	20.02	-

Existing Storm Sewer Inlet Summary Data

Notes:

Grate Inlets Evaluated as having 1) 50% Open Area, 2) 0% Clogging, 3) Weir Coefficient = 3.00 4) Orifice Coefficient = 0.67 & 5) Splash Over Velocity = 1.00 fps

Curb Inlets Evaluated as having 1) Weir Coefficient = 2.30 & 2) Orifice Coefficient = 0.67

Miscellaneous Inmputs Evaluated 1) Pavement Longitudinal Slope = 1.00%, 2) Pavement Cross Slope = 1.00% & 3) Pavement manning's "n" = 0.016

						1 Year Storm Event					2 Year Storm Event					10 Year Storm Event				
Inlet ID	Structure Name	"C" Factor	Time to Inlet (min)	Catchment Area (Acres)	Profile	Gutter Spread (ft)	Ponding Depth (in)	Rainfall Intensity (in/hr)	Intercepted Flow (cfs)	Bypass Flow (cfs)	Gutter Spread (ft)	Ponding Depth (in)	Rainfall Intensity (in/hr)	Intercepted Flow (cfs)	Bypass Flow (cfs)	Gutter Spread (ft)	Ponding Depth (in)	Rainfall Intensity (in/hr)	Intercepted Flow (cfs)	Bypass Flow (cfs)
36'' X 18'' Grate-Grade	**232**	0.85	10	2.59	Grade	22.9	2.75	2.13	1.71	5.16	24.5	2.94	2.58	1.91	6.32	27.5	3.30	3.62	2.31	8.92
36'' X 18'' Combo Grate-Grade	**231**	-	-	-	Grade	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36'' X 18'' Combo Grate-Grade	**225**	0.85	10	1.54	Grade	18.9	2.26	3.12	4.08	-	20.2	2.42	3.74	4.90	-	22.7	2.72	5.10	6.67	-
36'' X 18'' Combo Grate-Grade	**224**	-	-	-	Grade	1.4	0.17	3.12	0.00	-	1.9	0.23	3.74	0.01	-	2.8	0.34	5.10	0.03	-
36'' X 18'' Combo Grate-Grade	**226**	-	-	-	Grade	0.2	0.02	3.12	0.00	-	0.5	0.06	3.74	0.00	-	1.1	0.13	5.10	0.00	-
36'' X 18'' Combo Grate-Grade	**223**	0.85	10	2.88	Grade	23.8	2.86	3.12	7.63	-	25.5	3.06	3.74	9.15	0.01	28.7	3.44	5.10	12.46	0.03
36'' X 18'' Combo Grate	**222**	-	-	-	Sag	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36'' X 18'' Combo Grate	**221**	-	-	-	Sag	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10' Open Throat-Grade	**213**	0.66	15	-	Grade	24.3	2.92	2.56	3.34	4.70	26.4	3.17	3.07	3.76	6.31	30.5	3.66	4.21	4.57	10.14
33'' X 33'' Grate	**217**	0.90	5	0.21	Sag	10.0	1.20	3.98	0.75	-	10.7	1.28	4.75	0.90	-	12.0	1.45	6.54	1.24	-
10' Open Throat-Grade	**214**	0.66	15	7.22	Grade	28.4	3.41	2.56	4.15	8.05	30.4	3.65	3.07	4.56	10.07	34.2	4.11	4.21	5.35	14.71
10' Open Throat-Grade	**212**	-	-	-	Grade	25.8	3.09	2.56	3.63	5.78	28.8	3.45	3.07	4.23	8.39	34.4	4.12	4.21	5.38	14.89
10' Open Throat	**211**	-	-	-	Sag	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28'' X 28'' Grate	**205**	0.85	10	2.09	Sag	24.0	2.88	3.12	7.74	-	26.4	3.17	3.74	10.02	-	31.0	3.72	5.10	15.42	-
24'' X 18'' Grate	**110**	-	-	-	Sag	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28'' X 28'' Grate	**108**	0.45	10	3.35	Sag	19.9	2.39	1.93	4.70	-	21.3	2.55	2.35	5.64	-	23.9	2.87	3.36	7.69	-
36'' X 18'' Combo Grate-Grade	**204**	0.62	10	2.00	Grade	18.5	2.22	3.12	3.87	-	19.8	2.37	3.74	4.64	-	22.2	2.67	5.10	6.32	-
36'' X 18'' Combo Grate-Grade	**107**	-	-	-	Grade	0.1	0.02	1.92	0.00	-	0.3	0.07	2.33	0.00	-	0.7	0.18	3.35	0.00	-
36'' X 18'' Combo Grate	**202**	0.52	10	1.56	Sag	9.0	2.16	3.12	2.53	-	9.6	2.31	3.74	3.03	-	10.8	2.59	5.10	4.14	-
36'' X 18'' Combo Grate-Grade	**201**	0.85	5	0.79	Grade	16.1	1.93	3.98	2.67	-	17.2	2.06	4.75	3.19	-	19.4	2.32	6.54	4.39	-
36'' X 18'' Combo Grate-Grade	**102**	0.85	10	2.98	Grade	24.1	2.90	1.85	7.90	-	25.8	3.10	2.25	9.46	0.01	29.0	3.48	3.25	12.89	0.03

APPENDIX E

EXISTING STORM SEWER STRUCTURE SUMMARY DATA

Existing Storm Sewer Structure Summary Data

Structure Number	Bypass Structure	Area (Acres)	Rim Elevation	Invert Out	Structure Depth	Storm Structure (As Modeled)	1 Year Storm HGL Depth (ft)	2 Year Storm HGL Depth (ft)	10 Year Storm HGL Depth (ft)
Note: Tributary Line Structures are Identified by colored fills.									
121	304	2.28	509.72	507.98	**1.74**	28'' x 28'' Box	**1.44**	**2.95**	**6.98**
312	None	0.62	512.26	510.76	**1.50**	10'' Culvert Inlet	**15.87**	**24.79**	**51.03**
311	None	0.69	512.19	509.50	**2.69**	24'' x 24'' Box	**14.93**	**23.42**	**48.38**
304	None	0.42	510.01	508.47	**1.54**	24'' x 12'' Box	**4.52**	**7.53**	**16.03**
303	120	0.26	509.94	508.85	**1.09**	24'' x 18'' Box	**0.10**	**1.11**	**3.74**
306	302	1.28	510.01	509.34	**0.67**	24'' x 12'' Box	**0.11**	**1.18**	**3.93**
305	306	0.76	510.14	509.07	**1.07**	28'' x 28'' Box	**0.63**	**1.96**	**5.53**
302	None	0.52	508.88	507.86	**1.02**	28'' x 28'' Box	**1.86**	**3.17**	**6.70**
301	None	1.16	509.21	507.27	**1.94**	28'' x 28'' Box	**0.73**	**1.70**	**4.21**
120	119	0.26	509.42	506.46	**2.96**	Inlet Riser	**0.19**	**0.97**	**3.03**
119	118	0.27	510.00	506.55	**3.45**	Inlet Riser	**-0.48**	**0.27**	**2.21**
118	117	0.35	509.74	506.58	**3.16**	Inlet Riser	**-0.22**	**0.53**	**2.47**
117	116	0.35	509.79	506.61	**3.18**	Inlet Riser	**-0.27**	**0.48**	**2.42**
116	None	0.56	509.52	506.36	**3.16**	Inlet Riser	**-0.21**	**0.44**	**2.12**
295	None	0.44	510.08	508.54	**1.54**	36'' x 24'' Box	**-0.68**	**0.01**	**1.80**
294	None	0.47	511.22	509.37	**1.85**	48'' x 18'' Box	**-1.27**	**-0.97**	**0.95**
293	None	0.70	511.87	510.56	**1.31**	48'' x 18'' Box	**-0.61**	**-0.56**	**0.97**
292	None	0.25	511.92	510.45	**1.47**	24'' x 18'' Box	**-1.02**	**-0.98**	**0.81**
291	115.1	0.20	510.99	509.17	**1.82**	48'' x 72'' Box	**-1.32**	**-0.64**	**1.44**
115	None	0.09	509.79	506.46	**3.33**	48'' x 48'' Box	**-1.17**	**-0.74**	**0.11**
114	None	0.16	509.12	505.76	**3.36**	Inlet Riser	**-1.19**	**-0.74**	**-0.33**
281	None	0.19	508.91	506.23	**2.68**	Inlet Riser	**-1.09**	**-0.65**	**-0.51**
113	None	0.00	509.78	504.66	**5.12**	Capped Inlet	**-3.81**	**-3.59**	**-2.11**
112	253	0.00	508.33	504.30	**4.03**	Inlet Riser	**-2.36**	**-2.15**	**-0.68**
272	271	0.00	510.01	508.14	**1.87**	36'' x 18'' Box	**-0.93**	**-0.84**	**3.24**
271	112	0.00	509.21	507.42	**1.79**	36'' x 18'' Box	**-1.79**	**-1.79**	**2.38**
264	272	6.24	522.31	517.75	**4.56**	48'' x 24'' Box	**-3.89**	**-3.85**	**-3.77**
263	262	3.51	510.88	508.69	**2.19**	36'' x 18'' Box	**-1.39**	**-1.23**	**-0.84**
262	261	0.00	510.26	508.26	**2.00**	36'' x 18'' Box	**-0.56**	**-0.25**	**0.63**
261	254	0.00	509.06	506.66	**2.40**	36'' x 18'' Box	**-2.40**	**-2.40**	**-1.71**
111.11	None	0.00	509.45	503.49	**5.96**	Tributary Junction	**-4.54**	**-4.35**	**-2.10**
255	254	0.00	506.24	503.29	**2.95**	36'' x 18'' Box	**-2.07**	**-1.49**	**1.12**
254	253	4.48	505.70	503.35	**2.35**	36'' x 18'' Box	**-1.13**	**-0.14**	**3.13**
253	None	0.00	505.66	503.41	**2.25**	36'' x 24'' Box	**-2.25**	**-2.25**	**-2.25**
252	253	0.00	506.41	504.47	**1.94**	36'' x 18'' Box	**-1.94**	**-1.94**	**-1.94**
251	225	0.00	506.42	504.06	**2.36**	36'' x 18'' Box	**-2.36**	**-2.36**	**-2.36**
237	236	10.27	527.41	526.41	**1.00**	12'' x 12'' Box	**483.53**	**623.32**	**990.41**

Existing Storm Sewer Structure Summary Data

Structure Number	Bypass Structure	Area (Acres)	Rim Elevation	Invert Out	Structure Depth	Storm Structure (As Modeled)	1 Year Storm HGL Depth (ft)	2 Year Storm HGL Depth (ft)	10 Year Storm HGL Depth (ft)
Note: Tributary Line Structures are Identified by colored fills.									
236	235	0.00	526.30	525.10	**1.20**	33'' x 33'' Box	**484.57**	**624.35**	**991.43**
235	233	0.00	521.29	519.62	**1.67**	Inlet Riser	**343.09**	**450.92**	**742.63**
234	233	2.92	520.77	517.99	**2.78**	48'' x 24'' Box	**77.10**	**120.61**	**257.81**
233	262	0.00	519.08	517.01	**2.07**	48'' x 48'' Box	**83.47**	**128.10**	**268.03**
256	233	0.00	509.41	507.41	**2.00**	18'' Culvert Inlet	**-2.00**	**-2.00**	**-2.00**
232	255	2.59	509.62	506.96	**2.66**	36'' x 18'' Box	**5.98**	**12.18**	**34.50**
231	226	0.00	505.76	502.84	**2.92**	36'' x 18'' Box	**-0.38**	**1.24**	**9.25**
111.7	None	0.00	506.00	500.47	**5.53**	Tributary Junction	**-3.57**	**-3.31**	**0.43**
225	226	1.54	503.05	500.56	**2.49**	36'' x 18'' Box	**-1.64**	**-1.06**	**3.19**
224	225	0.00	503.63	502.01	**1.62**	36'' x 18'' Box	**-1.62**	**-1.62**	**1.97**
226	213	0.00	504.00	500.64	**3.36**	36'' x 18'' Box	**-3.36**	**-3.36**	**-3.36**
223	224	2.88	504.52	502.94	**1.58**	36'' x 18'' Box	**0.41**	**1.02**	**5.63**
222	222.1	0.00	504.28	502.94	**1.34**	36'' x 18'' Box	**-1.34**	**-1.34**	**-1.34**
221	111.4	0.00	503.28	499.97	**3.31**	36'' x 18'' Box	**-3.31**	**-3.31**	**-3.31**
213	212	0.00	501.31	497.17	**4.14**	48'' x 48'' Box	**-3.36**	**-2.70**	**1.51**
217	None	0.21	512.91	509.56	**3.35**	33'' x 33'' Box	**-3.15**	**-3.13**	**-2.88**
216	None	0.00	510.49	503.89	**6.60**	48'' Manhole	**-6.17**	**-6.15**	**-5.60**
215	None	0.00	503.05	500.36	**2.69**	48'' Manhole	**-2.16**	**-2.11**	**0.09**
214	213	7.22	502.10	497.00	**5.10**	24'' x 12'' Box	**-1.86**	**-1.84**	**1.00**
212	205	0.00	501.04	497.30	**3.74**	48'' x 48'' Box	**-2.97**	**-2.49**	**1.64**
111	None	0.00	501.50	495.08	**6.42**	48'' Manhole	**-3.58**	**-3.03**	**1.03**
211	110	0.00	501.57	497.47	**4.10**	48'' x 48'' Box	**-4.10**	**-4.10**	**-4.10**
205	None	2.09	499.46	497.26	**2.20**	28'' x 28'' Box	**-0.99**	**-0.37**	**5.36**
110	None	0.00	499.04	493.48	**5.56**	24'' x 18'' Box	**-2.49**	**-1.47**	**1.91**
109	None	0.00	499.06	491.41	**7.64**	Capped Inlet	**-3.96**	**-2.71**	**-0.90**
108	None	3.35	496.65	490.57	**6.08**	Inlet Riser	**-1.79**	**-0.74**	**0.60**
204	107	2.00	497.51	495.51	**2.00**	36'' x 18'' Box	**-1.72**	**-1.33**	**-0.49**
203	None	0.00	498.18	492.68	**5.50**	48'' Manhole	**-2.76**	**-2.25**	**-1.17**
107	102	0.00	496.02	490.24	**5.78**	Inlet Riser	**-1.80**	**-1.14**	**-0.89**
202	None	1.56	495.65	493.54	**2.11**	36'' x 18'' Box	**-1.47**	**-1.41**	**-1.29**
106	None	0.00	494.01	488.42	**5.59**	Capped Inlet	**-4.26**	**-4.06**	**-2.19**
105	None	0.00	493.02	487.76	**5.26**	Capped Inlet	**-3.05**	**-2.69**	**-1.87**
104	None	0.00	491.81	486.27	**5.54**	Capped Inlet	**-3.13**	**-2.73**	**-1.83**
103	None	0.00	490.86	485.68	**5.18**	Capped Inlet	**-2.93**	**-2.61**	**-1.90**
201	None	0.79	486.92	484.11	**2.81**	36'' x 18'' Box	**-0.95**	**-0.63**	**0.12**
102	None	2.98	486.81	483.21	**3.60**	54'' x 54'' Box	**-0.86**	**-0.55**	**0.16**
101	None	0.00	484.95	476.53	**8.42**	Headwall Outfall	**-6.60**	**-6.37**	**-5.84**

APPENDIX F

EXISTING STORM SEWER ASBUILT SURVEY SHEETS

S. WEST ST.

LAWRENCE ST.

W. AVIS ST.

W. ACADEMY ST.

AUGUSTINE AVE.

WEIRICKS ROW

MORDINGTON AVE

ANN ST.

MATCHLINE "A"

48" BRICK LINED BOX CULVERT

STR #A217
TOP/INV = 512.91
12" PVC OUT = 509.56

12" PVC

STR #A216
TOP = 510.49
12" PVC IN = 504.12
12" PVC OUT = 503.89

STR #A203
TOP = 498.18
THROAT IN = 495.14
12" RCP OUT = 492.68

STR #A204
TOP= 497.51
THROAT OUT = 495.81

STR #A108
TOP= 496.65
48" RCP IN = 490.64
48" RCP OUT = 490.57

48" RCP

STR #A109
PAVED OVER

51"X51" STONE BOX CULVERT SIDEWALK IS THE TOP CAP

STR #A107
TOP = 496.02
48" RCP IN = 490.24
48" RCP OUT = 490.37

15" RCP

STR #A202
TOP = 495.65
15" RCP OUT = 493.54

STR #A106
TOP = 494.01
51"X51" STONE IN = 488.45
51"X51" STONE OUT = 488.42

STR #A105
TOP = 493.02
51"X51" STONE IN = 487.76
51"X51" STONE OUT = 487.76

STR #A104
TOP = 491.81
51"X51" STONE IN = 486.24
51"X51" STONE OUT = 486.27

STR #A103
TOP = 490.86
51"X51" STONE IN = 485.62
51"X51" STONE OUT = 485.68

STR #A102
TOP = 486.81
51"X51" STONE IN = 483.21
18" RCP IN = 483.18
48" RCP OUT = 483.29

18" RCP

STR #A201
TOP = 486.92
18" RCP OUT = 484.11

STR #A101
48" RCP OUT = 476.53

48" RCP

50 0 50
GRAPHIC SCALE (IN FEET)

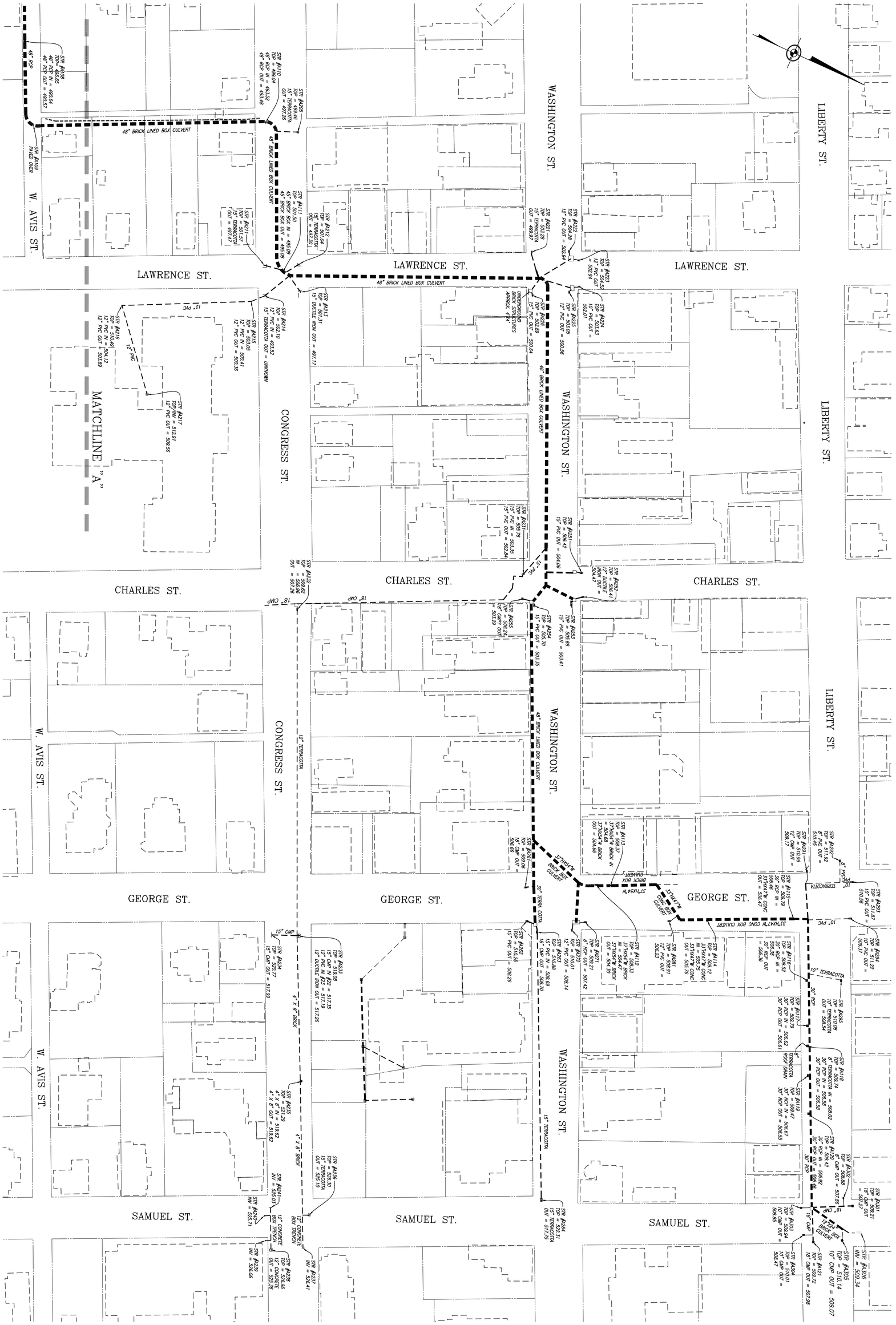
GREENWAY ENGINEERING
PROUDLY SERVING WEST VIRGINIA & VIRGINIA
OFFICES IN: MARTINSBURG, WV WINCHESTER, VA & ASHBURN, VA

CITY OF CHARLES TOWN

STORMWATER INFRASTRUCTURE AS-BUILT EXHIBIT

JEFFERSON COUNTY, WV

DATE:	08/26/2020
SCALE:	1" = 50'
DRAFTED BY:	THM
FILE NO.	7037
SHEET	01 OF 02



CITY OF CHARLES TOWN

STORMWATER INFRASTRUCTURE AS-BUILT EXHIBIT

JEFFERSON COUNTY, WV

DATE: 08/26/2020

SCALE: 1" = 50'

DRAFTED BY: THM

FILE NO. 7037

SHEET 02 OF 02

GREENWAY ENGINEERING

PROUDLY SERVING WEST VIRGINIA & VIRGINIA

OFFICES IN: MARTINSBURG, WV WINCHESTER, VA & ASHBURN, VA

Infrastructure Committee
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

AGENDA ITEM (ID #)

Meeting: 08/28/23
Department: Infrastructure Committee
Category: Information Only
Initiator:

2023-760: City Signage - Audit and Designs

City Signage - Audit and Designs

ATTACHMENTS:

Infrastructure Committee
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

AGENDA ITEM (ID #)

Meeting: 08/28/23
Department: Infrastructure Committee
Category: Information Only
Initiator:

2023-761: Staff/City Manager Suggested Item(s) from Attached List

City Signage - Audit and Designs

ATTACHMENTS:

- Infrastructure Projects running list_.pdf

CITY OF CHARLES TOWN updated 8/2023
INFRASTRUCTURE PROJECTS - running list

- Paving / re-paving RFPs
    - Pavement condition study

- Connect CT app requests: quantity, type, and areas of town
    - Work that can be done in-house versus needing outside contractor

- Augustine Ave Trail
    - Phase 1 and 2 updates
    - Eminent domain issues with grant funds
    - phase 3 options
    - combine public outreach with Parks and Rec or separate public input initiatives?

- Sidewalks
    - Sidewalk study (previously completed)
    - George Street sidewalk update - resolution needed?
    - Mordington Ave sidewalk
    - Sidewalk/trail/midblock crossing to Charles Town Middle School
    - Eagle Avenue

    Coordinate with the Ordinance committee as they address sidewalks.

- Lawrence and Congress Street intersection damage- engineering update from Kimley Horne

- Pavement Art - assess conditions, future project standards
    - Use in heat mitigation

- State DOH projects

    West End Y- intersection / State DOH
    - roundabout versus new roadway (3 options previously presented)
    - public concerns - public input session - coordinate with HEPMPO

    Rt 115 Hilldale roundabout

    Other?

- Lead and copper pipe inventory- CTUB

- CTUB trail project

- Charles Street redesign

- Cross walks
    - Library / E. Washington St
    - Jefferson Ave /CTM
    - West St. /Wright Denny

- City signage
    - Signage audit and new way-finding

- Complaints about light pollution
    - Jefferson Memorial Park
    - Police Station
    - Baptist Church on Mildred

- City Hall updates/renovations - has own special committee

- Street traffic pattern issues:
    - Park Street & Potato Hill – traffic flow problems – should it be one way? *Mrs. Taylor*
    - Liberty Street & Seminary - new stop sign
    - Liberty Street & Lawrence - new stop sign

- Happy Retreat/Evitts Run walking bridges

- Seating downtown and in parks – benches?

- Designated fishing access points on Evitts Run

- Carbon Neutrality Overall

- HOAs versus City responsibility for neighborhood streets and curbs

- Storm water / Drainage issues:
    - Citywide study by Greenway Engineering (video?)
    - Liberty Street
        - draft letter to suggest council send to county

    - Shutter Street – *Ann Bailey and Edna Downey*

    - Perry Pond
    - Ability to fix ponding issues - storm drain grates

    questions for each topic:
        What is the status of these projects?
        What documents exist pertaining to each project?
        What funding has been received (grants)?
        What funding has been allocated in FY budget?
        What are the next steps?

Infrastructure Committee
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

AGENDA ITEM (ID #)

Meeting: 08/28/23
Department: Infrastructure Committee
Category: Information Only
Initiator:

2023-762: Accessible Parking Request - Referral from City Council

Accessible Parking Request - Referral from City Council

ATTACHMENTS:
- Email from JCSO and WVDOH.pdf

Alissa Meeks

From: Bob Trainor
Sent: Monday, August 14, 2023 4:03 PM
To: John Nissel; Alissa Meeks; Elizabeth Ricketts
Cc: Chris Kutcher
Subject: FW: FW: Handicap Parking

I recommend adding this to the referrals (to Infrastructure) on the 21 Aug agenda.

v/r - Bob

Robert M. Trainor
City of Charles Town, Mayor
101 E. Washington Street
Charles Town, WV 25414
btrainor@charlestownwv.us
304.724.3254

From: Clohan, Kenneth L <kenneth.l.clohan@wv.gov>
Sent: Wednesday, August 9, 2023 1:26 PM
To: Bob Trainor <btrainor@charlestownwv.us>; Chris Kutcher <ckutcher@charlestownwv.us>
Cc: Tina Renner <Tina.Renner@courtswv.gov>; Jesse Jones <jjones@jcsdwv.com>; thansen@jcsdwv.com; J Lee Thorne <lee.j.thorne@wv.gov>; Deborah Lowe <dlowe@jeffersoncountywv.org>
Subject: Fwd: FW: Handicap Parking

Good afternoon Mayor Trainor and Chief Kutcher,

Please see the request below for handicapped parking in front of 110 N. George St. where it is currently marked as "Law Enforcement Parking Only". I concur with this request but refer this request to the City of Charles Town since the City handles the enforcement duties. If assistance is needed with pavement marking and signage, please let me know.

Ken
Kenneth L. Clohan, Jr., P.E.
District Five Traffic Engineer - WVDOH
304-260-4392

---------- Forwarded message ---------
From: **Deborah Lowe** <dlowe@jeffersoncountywv.org>
Date: Tue, Aug 8, 2023 at 2:54 PM
Subject: FW: Handicap Parking
To: kenneth.l.clohan@wv.gov <kenneth.l.clohan@wv.gov>

From: Deborah Lowe
Sent: Tuesday, August 8, 2023 2:53 PM
To: 'Kenneth.L.Colhan@WV.Gov' <Kenneth.L.Colhan@WV.Gov>
Cc: 'Renner, Tina' <Tina.Renner@courtswv.gov>; Jesse Jones <jjones@jcsdwv.com>; Thomas Hansen <thansen@jcsdwv.com>
Subject: Handicap Parking

The Jefferson County Sheriff's Office on behalf of Sheriff Tom Hansen, as well as, Circuit Clerk Tina Renner, and Chief Bailiff Jesse Jones, request the creation of two handicap parking spaces near the entrance of 110 N George St, Charles Town WV 25414. The lack of handicap parking is a concern for those with limitations who come to do business at the facility and one that we would like to remedy.

We are hoping that you will be able to aid us in addressing this issue. If you could guide me toward any information you may need to honor this request, I would greatly appreciate it.

Sincerely,

Debbie Lowe

Executive Assistant to the Sheriff, Chief, and Lieutenants

Grants and Conservatorship Manager

Jefferson County Sheriff's Office

Beware - This email comes from outside the City of Charles Town.