City Council
Meeting Agenda

Tuesday, April 14, 2026

City Council Chambers
City Hall, One Twin Pines Lane, Belmont, California

General order of Business

1. CALL TO ORDER
2. ROLL CALL
3. ITEMS BEFORE 7:00 PM
4. PLEDGE OF ALLEGIANCE
5. REPORT FROM CLOSED SESSION - none
6. SPECIAL PRESENTATIONS
7. PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA
8. COUNCILMEMBER ANNOUNCEMENTS
9. CONSENT BUSINESS
10. PUBLIC HEARINGS
11. GENERAL BUSINESS
12. BRIEF VERBAL REPORTS FROM MEMBERS AND STAFF
13. MATTERS OF INTEREST/CLARIFICATION
14. ADJOURNMENT

City Council
Julia Mates, Mayor
Cathy Jordan, Vice Mayor
Robin Pang-Maganaris, Councilmember
Gina Latimerlo, Councilmember
Tom McCune, Councilmember

Staff
Afshin Oskoui, City Manager
Scott Rennie, City Attorney
Kathy Kleinbaum, Assistant City Manager
Ken Stenquist, Police Chief
Grace Castaneda, Finance Director
Ann Ritzma, Interim Admin Services Director
Carlos deMelo, Community Development Director
Brigitte Shearer, Parks and Recreation Director
Edric Kwan, Public Works Director
Jozi Plut, City Clerk

MEETING ATTENDANCE:
Council meetings, unless otherwise noted, are broadcast live to Belmont residents on

1. Comcast Cable Channel 27
2. Streamed live via the City's website at www.Belmont.gov
3. ZOOM https://belmont-gov.zoom.us/ **Meeting ID: 95745673035**
4. Attend the meeting in the Council Chambers, Belmont City Hall 2nd floor

PUBLIC COMMENT:

- Public in the Council Chamber present the Clerk a request to speak slip found at the table at the rear of the chamber.
- If participating virtually use the Raise Hand feature to request to speak.
  - For dial- in comments, call *67 1-(669) 900-6833 (your phone number will appear on the live broadcast if *67 is not dialed prior to the phone number)
  - enter **Meeting ID: 95745673035**, and press *9 to request to speak

All public comments are subject to a **3-minute time limit** unless otherwise determined by the Chair.

To submit a written public comment:
E-mail cclerk@belmont.gov before the Council discusses the item, noting the agenda topic or number in the subject line. Comments received up to three hours before the meeting will be distributed to the Council and included in the record but not read aloud during the meeting..

The Mayor has the authority to rule any speaker out of order, including speakers during the Public Comment period; If the subject raised is not within the subject matter jurisdiction of the City Council, during a public hearing or a general business item if the speaker is not presenting testimony or evidence relevant to the matter or if the speaker becomes disruptive to the proceedings and conduct of the meeting.

The Mayor also has the authority to order any person who willfully interrupts the meeting to be removed. All persons are expected to always conduct themselves with civility and courtesy. All persons giving comments shall speak directly to the Council and address issues, not individuals. Personal attacks, cursing and outbursts from the audience in support or opposition to a speaker are not tolerated to foster an environment where everyone feels welcome to speak.

LEVINE ACT:

The Levine Act (California Government Code Section 84308) limits campaign contributions that may be made to elected or appointed City officials (including councilmembers and the mayor) and certain candidates for elective city offices. The Act prohibits an agent of a party from contributing any amount to councilmember while a proceeding for a contract valued at $50,000 or more, permit, license, or other entitlement for use is pending that does not solely involve purely ministerial decisions. The Act also prohibits parties and participants in the above entitlement proceedings from contributing more than $500 during the proceeding and for 12 months after the proceeding and requires disclosure of the prohibited contributions. The Act prohibits certain officials, including local elected officials, from taking part in an entitlement proceeding if the official has received a contribution exceeding $500 from a party or participant in the proceeding within the preceding 12 months. An official is also prohibited from accepting, soliciting, or directing a contribution exceeding $500 from a party or participant in the proceeding for 12 months after a final decision is rendered in such a proceeding. The law is complex, and this brief description is not legal advice. If you or an agent have made any campaign contributions to a councilmember in the 12 months before a proceeding in which you have an interest or you are contemplating making a contribution within the 12 months after such a proceeding, you are urged to review the Levine Act and consider consulting an attorney. The California Fair Political Practices Commission (FPPC) is responsible for administering the Levine Act. More information about the Act and its implementing regulations can be found on the FPPC's website here: https://www.fppc.ca.gov/learn/pay-to-play-limits-and-prohibitions.html

ACCESSIBILITY

If you need assistance to participate in this meeting, please contact the City Clerk at (650) 595-7413. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

AGENDA POSTING: I declare a copy of this agenda was posted at City Hall, One Twin Pines Lane, and the City's website www.Belmont.gov Date: Time: /s/:

City of Belmont

City Council Regular Meeting Agenda
April 14, 2026
City Council Chambers
City Hall, One Twin Pines Lane, Belmont, California

NOTICE REGARDING MEETING SCHEDULE

The City Council may meet prior to 7:00 PM for Study Sessions, Closed Sessions, or other Special Topics. All other business will commence at 7:00 PM as a time-certain agenda item.

1. CALL TO ORDER

2. ROLL CALL

3. ITEMS BEFORE 7:00 PM

A. CLOSED SESSION - none

B. STUDY SESSION - none

The public will have an opportunity to address the City Council concerning this item.

C. SPECIAL SESSION/OTHER TOPICS

ITEMS STARTING AT 7:00 PM

4. PLEDGE OF ALLEGIANCE

5. REPORT FROM CLOSED SESSION - none

6. SPECIAL PRESENTATIONS

A. Belmont Teen Services Update

B. Proclamation Recognizing Parks, Recreation and Culture Director Brigitte Shearer Upon Her Retirement

C. Peninsula Clean Energy (PCE) Presentation

Attachments:
Presentation

D. Proclamation Observing April 2026 National Poetry Month

E. Proclamation Observing Earth Day

F. Proclamation Observing Arbor Day

7. PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA

This portion of the meeting is reserved for persons wishing to address the Body on any City matter not on the agenda. The period for public comment at this point in the agenda is limited to 15 minutes, with a maximum of 3 minutes per speaker. Speakers who requested but did not receive an opportunity to speak during this comment period will be given an opportunity to address the Body later in the meeting. State law prohibits the Body from acting on non-agenda items.

8. COUNCILMEMBER ANNOUNCEMENTS

9. CONSENT BUSINESS

Consent business items are considered to be routine in nature and will be enacted by one motion. There will be no separate discussion on these items unless a member or staff request specific items to be removed for separate action. The City Attorney will read the title of ordinances to be adopted.

A. Monthly Financial Report - January 2026

Attachments:
Monthly Report

B. Approval of Minutes

Recommendation: Consider modifications and approve minutes.
Attachments:
February 24, 2026 Meeting Minutes
March 10, 2026 Meeting Minutes
March 31, 2026 Joint Meeting Minutes

C. Fire Station No. 14 Fence & Automatic Gate

Recommendation: Adopt resolutions to: (1) approve the plans and specifications, authorize advertisement for sealed bids, and authorize the City Manager to negotiate and execute a construction contract with the lowest responsive and responsible bidder for the Fire Station No. 14 Fence and Automatic Gate Project (City Contract Number 2025-642) in an amount not to exceed $175,000 plus a ten percent construction contingency; and (2) approve a supplemental appropriation of $142,000 from the Belmont Fire Protection District Fund to the Capital Improvement Program (CIP) Station 14 Gate Project (Project No.8121).
Attachments:
Staff Report
Resolution

D. Approval of an Administrative Amendment to the Peninsula Clean Energy Joint Powers Agreement to Reflect the Agency's Name Change to West Light Energy

Recommendation: Adopt a Resolution approving an amendment to Paragraph 2.2 of the Peninsula Clean Energy Authority Joint Powers Agreement to reflect the new agency name previously approved by the Peninsula Clean Energy Authority Board of Directors on October 23, 2025.
Attachments:
Staff Report
Resolution
Approved-Third-Amended

E. San Juan Pump Station and Force Main Rehabilitation Project

Recommendation: Adopt a Resolution approving plans and specifications; authorizing advertisement for sealed bids; authorizing the City Manager to negotiate and execute a construction contract with the lowest responsible and responsive bidder for the San Juan Pump Station and Force Main Rehabilitation Project (City Contract Number 2026-645) in the amount of $6,280,000 for a total not-to-exceed 6,908,000, including a 10% construction contingency; and approving a task order with Tanner Pacific, Inc. for construction management services in an amount not to exceed $1,265,000.
Attachments:
Staff Report

Resolution
Proposal
Plans
Specifications

F. Belmont Creek Habitat Maintenance and Monitoring Project– Amendment #1
Recommendation: Motion to authorize the City Manager to negotiate and execute Amendment #1 with Hanford ARC for the Belmont Creek Habitat Maintenance and Monitoring Project for the installation of animal exclusion caging around new plantings in the amount not to exceed $29,009, for a total contract amount not to exceed $96,809, and authorize the City Manager to negotiate and execute additional contract amendments up to a total contract amount not to exceed $106,809, if needed.
Attachments:
Staff Report

G. Parking and Traffic Safety Committee – Cipriani Elementary School Loading Zone
Recommendation: Motion to approve the Parking and Traffic Safety Committee (PTSC) recommendation to convert eight existing angled parking stalls and adjacent curb space in front of Cipriani Elementary School from unrestricted parking to a passenger loading zone (8:00 AM to 5:00 PM on school days), allow unrestricted parking at all other times, and reconfigure the curb space from angled to parallel parking to provide ten parking spaces.
Attachments:
Saff Report

H. Hillcrest Sinkhole Emergency Repair Project
Recommendation: Adopt a resolution ratifying the existence of an emergency that required the immediate repair of four sinkholes and related stormwater infrastructure within an easement near Hillcrest Drive; ratifying the City Manager's authorization to proceed with the emergency work without competitive bidding; ratifying the City Manager's execution of a contract with Casey Construction, Inc. in the amount of $102,520; and authorizing payment for the completed emergency repair work.
Attachments:
Staff Report
Resolution
Project Proposal
Project Plans

I. 730 El Camino Real – Termination of 1995 Regulatory Agreement
Recommendation: Adopt a resolution terminating the Regulatory Agreement and Declaration of Restrictive Covenants (Regulatory Agreement) dated March 1, 1995, and recorded March 13, 1995, between The Belmont Redevelopment Agency and Mercy Housing California for the property at 730 El Camino Real, and authorize the City Manager to execute all documents necessary to effectuate its termination.
Attachments:
Staff Report
Resolution
Termination and Release of Regulatory Agreement Draft
Regulatory Agreement and Restrictive Covenants 1995

10. PUBLIC HEARINGS

A. Comprehensive Sewer Rate Study and Proposed Sewer Charges for Fiscal Years 2026-27, 2027-28, and 2028-29

Recommendation: Adopt a resolution proposing sewer charges for fiscal years 2026-27, 2027-28, and 2028-29, setting a Proposition 218 hearing for June 9, 2026, directing staff to provide notice of the hearing as required by law, and adopting protest procedures.

Attachments:

Staff Report
Resolution
Sewer Rate Study
Presentation

11. GENERAL BUSINESS

General Business items are considered separately, typically in the order listed. The chair will call for public comment on each item when the body considers the item.

A. Age-Friendly City Action Plan Update

Recommendation: Receive a presentation providing progress and updates on the City's Age-Friendly Action Plan

Attachments:

Staff Report
Action Plan
Presentation

12. BRIEF VERBAL REPORTS FROM MEMBERS AND STAFF

A. **Verbal report from Councilmembers on Intergovernmental (IGR) and Subcommittee Assignments**
B. **Verbal report from City Manager**

13. MATTERS OF INTEREST/CLARIFICATION

Items in this category are for discussion and direction to staff only. However, Council/Board may take final action on an item if there is no need for additional staff analysis.

14. ADJOURNMENT

ADA Notice: If you require assistance to participate in this meeting, please contact the City Clerk at (650) 595-7413 in advance so reasonable accommodations can be arranged.
Agenda Materials: Meeting materials are available at www.belmont.gov. Documents distributed to a majority of the City Council, District Board, or Commission regarding agenda items will be available at the City Clerk's Office, One Twin Pines Lane, during normal business hours and at the meeting.

PENINSULA CLEAN ENERGY

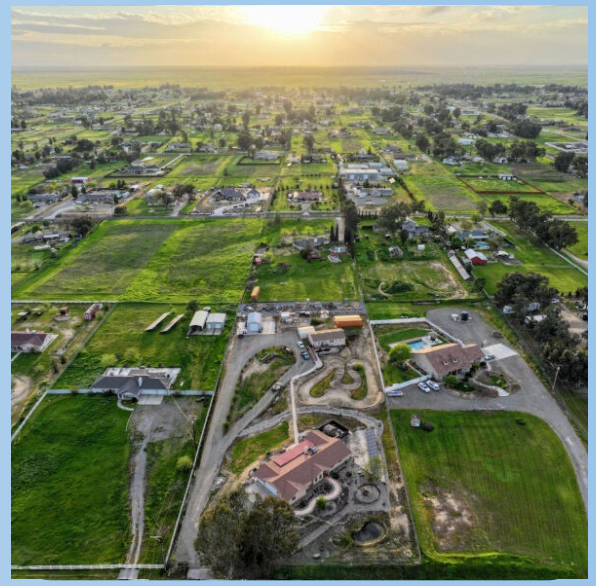




Peninsula Clean Energy Update

City of Belmont
April 14, 2026







Generation → **Delivery** → **Savings**

PENINSULA CLEAN ENERGY

PG&E



Moving Local Climate Goals Forward in Belmont

10 Years of Local Impact, Delivered Together

- Lower costs
- Clean energy
- Infrastructure investment
  - 177 Completed EV Charging Ports

A Decade of Delivery in Belmont



$5.1M in savings…

7 free days of electricity per year for each household

$2.8M in community reinvestment

Bill credits, solar system credits, customer rebates, and Zero-interest loans

100% clean energy sources

Provided from solar, wind, hydro & geothermal

Our role has expanded

From electricity provider
focused on greening the grid while maintaining lower rates…



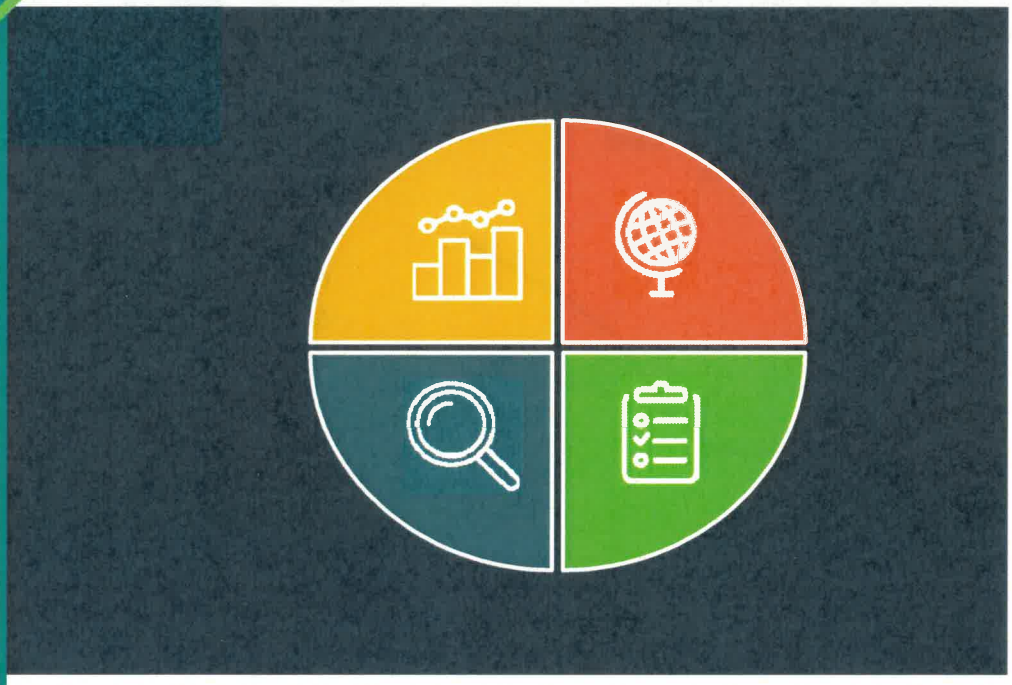


…to **long-term partnerships** that help customers make energy investment decisions for their homes and businesses.

CITY OF BELMONT

FISCAL YEAR 2025-26

MONTHLY FINANCIAL REPORT - JANUARY 31, 2026



HIGHLIGHTS

PERFORMANCE AT A GLANCE REPORT

- General Fund balance increased compared to prior YTD

FUND RECAP AT A GLANCE REPORT

Notable Fund Balance Increase compared to prior YTD:

- General Fund
- Measure I
- Belmont Fire Protection District
- Sewer Collection System
- Fleet & Equipment Management

Notable Fund Balance Decrease compared to prior YTD:

- Measure W
- Affordable Housing Successor
- Sewer Treatment

BUDGET VARIANCE REPORT

- Management Discussion & Analysis
- Tax Trends

CASH DISBURSEMENTS & PURCHASE ORDER ACTIVITY REPORT

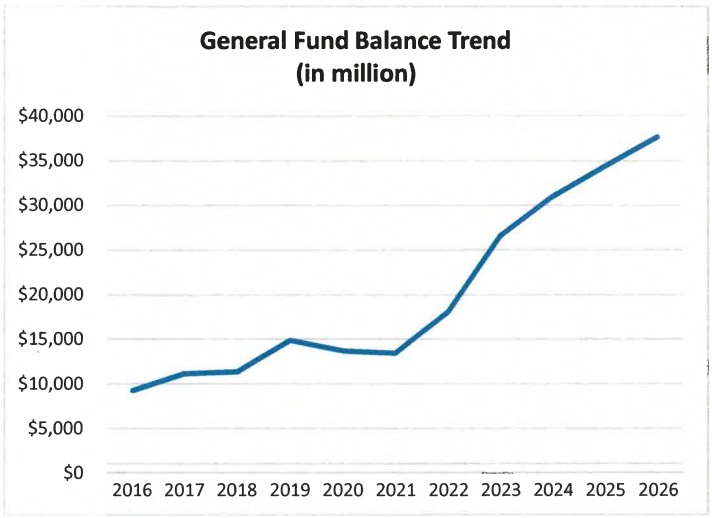
- Amounts equal to and above $50,000

This report contains financial information which has not been reviewed or audited by an independent auditor, does not reflect the application of generally accepted accounting principles in all instances and is subject to future revision. This report has not been prepared with a view to informing an investment decision in any of the City's bonds, notes or other obligations. Any projections, plans or other forward-looking statements included in this report are subject to a variety of uncertainties that could cause any actual plans or results to differ materially from any such statement. The information herein is not intended to be used by investors or potential investors in considering the purchase or sale of the City's bonds, notes or other obligations and investors and potential investors should rely only on information filed by the City on the Municipal Securities Rulemaking Board's Electronic Municipal Market Access System for municipal securities disclosures and website, maintained on the World Wide Web at https://emma.msrb.org/

These financial reports are designed to provide a general overview of the City of Belmont's interim finances. Questions concerning any information provided in these reports should be addressed to financedept@belmont.gov or for additional information regarding the City's financial activities, including past award winning audited financial statements, transparency efforts and best practices please visit the City at www.belmont.gov.

CALIFORNIA BELMONT

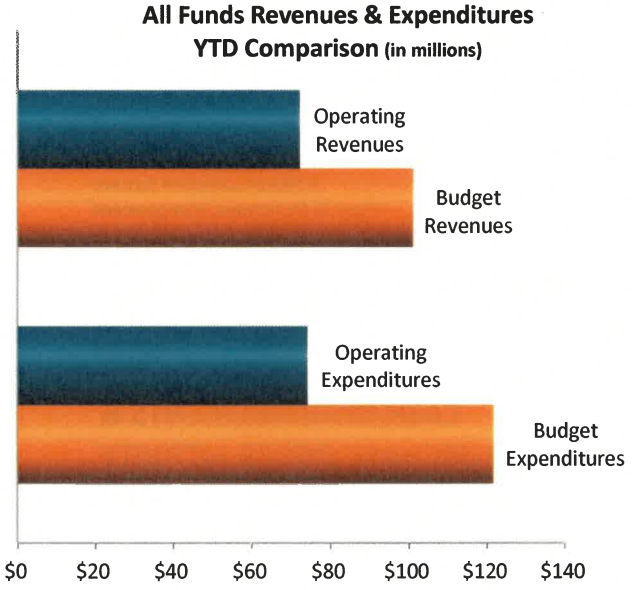
City of Belmont
Performance at a Glance
Results for the Period Ended January 31, 2026
(000's)

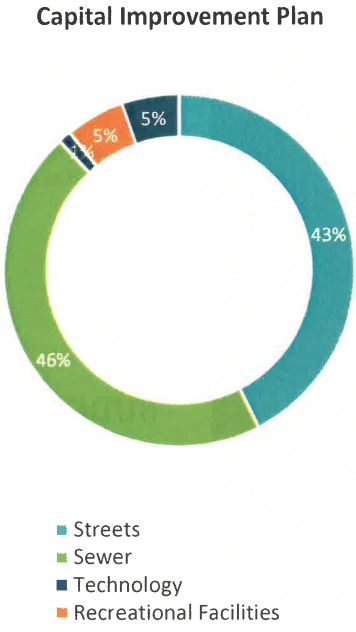


General Fund Balance Trend*

6/30/2016	2016	$9,177	Audited
6/30/2017	2017	$11,128	Audited
6/30/2018	2018	$11,325	Audited
6/30/2019	2019	$14,846	Audited
6/30/2020	2020	$13,637	Audited
6/30/2021	2021	$13,398	Audited
6/30/2022	2022	$18,013	Audited
6/30/2023	2023	$26,586	Audited
6/30/2024	2024	$31,003	Audited
6/30/2025	2025	$34,416	Audited
1/31/2026	2026	$37,660	Unaudited

* excludes Measure I





General Fund

The General Fund balance is $37.7 million, an increase of $3.2 million compared to the amount at the prior fiscal year end. This is primarily due to the timing of the Prop Tax In-lieu of VLF and ERAF Refund receipts.

Fund Balance - YTD Fund Deficits

As shown on the Fund Recap at a Glance (page 3), the Recreation Fund has a deficit that is expected to be eliminated in a future period.

City of Belmont
Fund Recap at a Glance
Results for the Period Ended January 31, 2026
(000's)

Fund	Fund Name	Audited Fund Balance 06/30/25 (1)	Revenues YTD Budget	YTD Actual (2)	Variance (Under) Over	%	PY YTD Actual	Expenditures YTD Budget	YTD Actual (3)	Variance Under (Over)	%	PY YTD Actual	Unaudited Fund Balance 01/31/26 (1)+(2)-(3)	PY YTD Fund Balance 1/31/2025
GENERAL FUND														
101	General	*34,416*	19,250	18,633	(617)	97%	17,703	20,177	15,389	4,788	76%	14,759	*37,660*	*33,947*
102	Measure I	*3,599*	1,461	1,017	(444)	70%	973	4,316	359	3,957	8%	3,205	*4,258*	*2,232*
SPECIAL REVENUE FUNDS														
205	Recreation	*609*	2,462	1,443	(1,019)	59%	1,449	2,499	2,318	182	93%	2,248	*(266)*	*(402)*
206	Library Maintenance & Operation	*211*	377	185	(192)	49%	172	346	307	40	89%	236	*89*	*713*
207	Athletic Field Maintenance	*446*	109	116	7	106%	129	201	63	138	31%	87	*499*	*434*
208	City Tree	*230*	9	8	(1)	93%	8	29	26	3	90%	25	*213*	*235*
209	Senior Services Donation	*105*	8	5	(3)	61%	9	9	0	9	4%	0	*109*	*105*
210	Development Services	*2,814*	3,346	3,895	549	116%	4,120	3,827	3,604	223	94%	3,826	*3,105*	*2,314*
212	General Plan Maintenance	*854*	733	315	(418)	43%	255	1,049	710	339	68%	610	*460*	*1,137*
223	Belmont Fire Protection District	*31,502*	11,607	11,554	(54)	100%	9,945	8,873	11,596	(2,724)	131%	10,243	*31,460*	*25,584*
225	Police Grants and Donations	*35*	1	1	(0)	79%	1	14	3	11	22%	0	*33*	*36*
227	Supplemental Law Enforcement	*166*	111	157	46	141%	149	126	117	9	93%	57	*207*	*164*
231	Street Maintenance	*1,988*	1,695	764	(932)	45%	956	1,779	1,560	219	88%	1,395	*1,192*	*926*
232	RMRA Street Project	*798*	441	403	(38)	91%	400	886	658	228	74%	296	*543*	*602*
233	Measure W	*2,618*	299	215	(84)	72%	223	1,808	2,142	(334)	118%	118	*691*	*2,401*
234	Street Improvements	*3,210*	653	544	(109)	83%	588	1,990	53	1,938	3%	409	*3,701*	*3,113*
237	Traffic Impact	*511*	132	17	(115)	13%	160	0	0	0	N/A	0	*528*	*260*
239	Public Art	*438*	27	120	92	437%	9	152	0	152	0%	0	*557*	*429*
275	Affordable Housing Successor	*4,034*	387	78	(309)	20%	124	1,144	200	944	17%	245	*3,912*	*5,935*
277	Inclusionary Housing	*3,541*	25	21	(3)	87%	202	0	0	0	N/A	0	*3,562*	*3,456*
	Total Special Revenue	*54,111*	22,423	19,840	(2,582)	88%	18,899	24,733	23,356	1,377	94%	19,795	*50,595*	*47,440*
CAPITAL PROJECT FUNDS														
308	General Facilities	*581*	14	11	(3)	77%	12	352	59	293	17%	16	*532*	*617*
310	Infrastructure	*2,383*	54	45	(9)	84%	46	1,443	680	764	47%	(172)	*1,748*	*2,509*
312	Comcast PEG Program	*364*	37	42	5	114%	9	27	0	27	0%	0	*406*	*430*
341	Planned Park	*482*	249	8	(241)	3%	17	406	334	72	82%	337	*156*	*765*
342	Park Impact	*1,083*	34	33	(2)	95%	31	636	1	636	0%	19	*1,115*	*692*
343	Open Space	*54*	2	1	(1)	49%	2	65	0	65	0%	53	*56*	*53*
399	Capital Improvement Projects	*2,705*	31,829	7,045	(24,785)	22%	7,092	34,201	7,121	27,080	21%	7,418	*2,629*	*2,966*
704	Special Assessment Districts	*341*	8	7	(1)	85%	7	0	0		N/A	0	*348*	*335*
	Total Capital Projects	*7,995*	32,227	7,191	(25,036)	22%	7,216	37,131	8,195	28,936	22%	7,671	*6,990*	*8,366*
DEBT SERVICE & OTHER FUNDS														
406	Library Bond Debt Service	*346*	417	408	(8)	98%	354	571	649	(79)	114%	657	*105*	*16*
501-505	Sewer Collection System	*48,625*	13,551	14,187	636	105%	14,859	20,958	10,695	10,263	51%	14,683	*52,117*	*40,483*
507	Sewer Treatment	*30,304*	2,033	1,959	(74)	96%	1,936	2,516	6,957	(4,441)	277%	3,338	*25,307*	*27,432*
525	Storm Drainage Enterprise	*879*	1,810	605	(1,205)	33%	675	1,937	1,171	766	60%	980	*313*	*1,100*
530	Solid Waste Management	*2,370*	452	380	(73)	84%	371	379	300	79	79%	316	*2,450*	*2,166*
570	Worker's Compensation	*1,940*	636	622	(14)	98%	595	545	799	(253)	146%	758	*1,764*	*1,674*
571	Liability Insurance	*3,233*	664	1,358	694	205%	552	840	766	74	91%	866	*3,825*	*3,011*
573	Fleet & Equipment Management	*9,239*	3,393	3,386	(7)	100%	3,099	4,195	2,774	1,421	66%	2,771	*9,851*	*8,591*
574	Facilities Management	*925*	1,882	1,914	31	102%	1,823	2,326	1,696	630	73%	1,518	*1,142*	*671*
575	Benefit Prefunding	*1,627*	935	859	(76)	92%	859	1,053	1,261	(209)	120%	579	*1,225*	*1,593*
	Total Debt & Other	99,489	25,773	25,678	(95)	100%	25,123	35,319	27,069	6,501	77%	26,467	98,097	86,737
	Total All Funds	**$199,609**	**$101,133**	**$72,359**	**($28,774)**	**72%**	**$69,914**	**$121,676**	**$74,368**	**$45,558**	**61%**	**$71,896**	**$197,600**	**$178,722**

Fund Types:

General Fund - Used to account for and report all financial resources not accounted for and reported in another fund.

Special Revenue Funds - Used to account for and report the proceeds of specific revenue sources that are restricted or committed to expenditure for specific purposes other than debt service or capital projects.

Capital Projects Funds - Used to account for and report financial resources that are restricted, committed, or assigned to expenditure for capital outlays, including the acquisition or construction of capital facilities and other capital assets.

Debt Service & Other Funds - Includes funds used to account for and report financial resources that are restricted, committed, or assigned to expenditure for principal and interest; funds used to finance and account for special activities and services performed by a designated department for other departments in the City on a cost reimbursement basis; and funds to account for operations financed and operated in a manner similar to a private business enterprise with the intent that the cost of providing goods and services is primarily financed through user charges; and funds used to account for assets held by the City as an agent.

City of Belmont
Budget Variance Report
General Fund / All Other Funds
Results for the Period Ended January 31, 2026
(000's)

	General Fund						All Other Funds					
	Year to Date (YTD)				Annual	PY YTD	Year to Date (YTD)				Annual	PY YTD
	Budget	Actual	Variance	%	Budget	Actual	Budget	Actual	Variance	%	Budget	Actual
REVENUES												
Taxes	14,340	14,291	(49)	100%	24,584	12,998	13,073	13,254	181	101%	22,411	11,197
Licenses and permits	716	483	(233)	67% a	1,227	552	1,395	1,851	455	133%	2,392	1,938
Intergovernmental	245	265	19	108%	420	247	7,143	1,678	(5,464)	23% f	12,244	1,623
Charge for services	2,750	2,582	(168)	94% b	4,714	2,467	23,841	24,124	284	101%	40,870	21,384
Fines and forfeits	54	50	(4)	93%	93	55	12	-	(12)	0%	20	-
Use of money and property	1,128	930	(198)	82% c	1,934	1,263	3,761	2,768	(993)	74% c	6,447	3,319
Miscellaneous	187	32	(155)	17% d	321	123	329	1,352	1,023	411%	564	475
Transfers in	522	-	(522)	0% e	894	-	31,638	8,698	(22,939)	27% e	54,236	12,268
Total Revenues	**19,942**	**18,633**	**(1,309)**	**93%**	**34,186**	**17,703**	**81,191**	**53,726**	**(27,465)**	**66%**	**139,185**	**52,211**
EXPENDITURES												
General Government	4,876	4,282	(594)	88%	8,359	4,275	5,360	5,535	176	103% g	9,188	4,893
Public Safety	10,165	9,471	(694)	93%	17,425	8,842	8,795	11,344	2,548	129% h	15,078	10,352
Streets and Utilities	-	-	-	N/A	0	0	42,141	19,629	(22,512)	47%	72,242	16,877
Culture and Recreation	1,811	1,637	(174)	90%	3,105	1,642	6,808	4,581	(2,226)	67%	11,670	4,298
Urban Redevelopment	-	-	-	N/A	0	0	4,752	3,476	(1,277)	73%	8,147	3,734
Non Departmental	-	-	-	N/A	0	0	1,328	84	(1,244)	6%	2,277	152
Debt Service	-	-	-	N/A	0	0	3,480	5,631	2,151	162% i	5,965	4,561
Transfers out	3,325	-	(3,325)	0%	5,700	0	28,835	8,698	(20,136)	30%	49,431	12,268
Total Expenditures	**20,177**	**15,389**	**(4,788)**	**76%**	**34,589**	**14,759**	**101,499**	**58,979**	**(42,520)**	**58%**	**173,998**	**57,137**
EXCESS OF REVENUES OVER/ (UNDER) EXPENDITURES	**($235)**	**$3,244**			**($403)**	**$2,944**	**($20,308)**	**($5,253)**			**($34,814)**	**($4,926)**

Management Discussion and Analysis

(Items with unfavorable budget variance more than $0.1 million)

Revenues

a) Licenses and Permits - The budget variance is primarily due to the Business License Tax Revenue. All businesses' licensing periods (i.e., the "tax period") have transitioned to January 1 to December 31 and part of the revenue will be received in February due to the timing of receipts.

b) Charges for Services - The budget variance is primarily due to the quarterly fire prevention and protection fee, which will be received in a future reporting period.

c) Use of Money and Property - The budget variance is primarily due to quarterly interest revenues which will be posted in March.

d) Miscellaneous - The budget variance is primarily due to the timing of the annual Crystal Springs Uplands School (CSUS) Public Service Fee, which will be received in a future reporting period.

e) Transfers In - Transfer amount was budgeted based on full CIP commitments. Actual expenditures and CIP transfers are recorded as the project progresses, and any remaining budget will be carried forward to the next fiscal year or released back to the funding source upon project completion.

f) Intergovermental - Grant revenue will be received and reported in a future period.

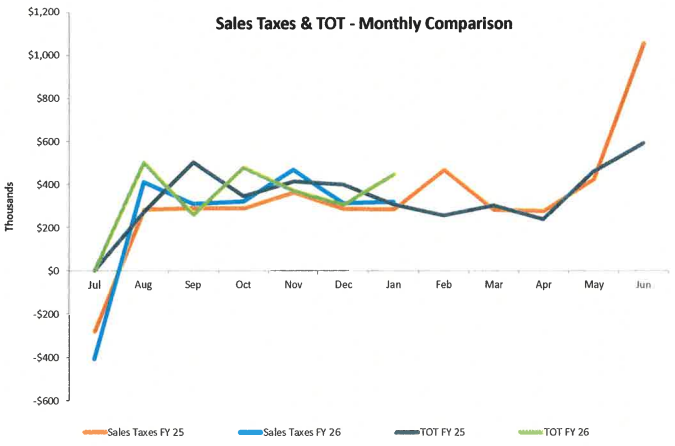
Expenditures

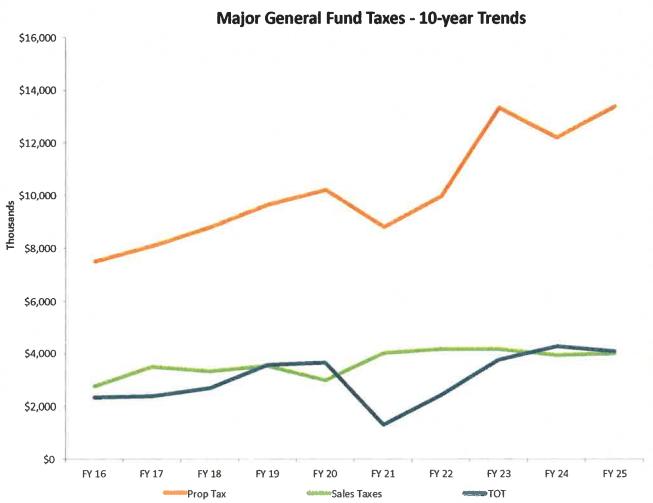
g) General Government - The variance is due to annual insurance premiums, pensions, and OPEB contributions paid in July.

h) Public Safety - The budget variance is primarily due to the annual BSCFD contribution of $2.1M made in July and three quarterly payments for San Mateo Fire Fees that were made as of January.

i) Debt Service - Annual debt service on library and sewer bonds were made in July and the semi-annual interest payments were made in January.

Trends





City of Belmont
Disbursements & Purchase Order Activity Report
Results for the Period Ended January 31, 2026

Disbursements Amounts Equal to $50,000 and Above

Vendor	Description	Date	No.	Amount
CALPERS	COB CONTRIBUTION PPE 12-26-25	1/6/26	DAJ000010242	139,107.28
CALPERS	COB CONTRIBUTION PPE 12-26-25	1/9/26	DAJ000010243	139,107.28
CALPERS	COB HEATLH PREMIUM-JANUARY	1/12/26	DAJ000010244	241,954.87
CALPERS	COB CONTRIBUTIONS PPE 01/23/26	1/30/26	DAJ000010245	147,841.31
CALPERS	COB CONTRIBUTION PPE 12/26/25	1/9/26	DAJ000010247	143,522.21
BNY	2018 SEWER REVENUE BOND	1/23/26	DAJ000010257	435,169.58
BNY	2019 SEWER REVENUE BOND	1/23/26	DAJ000010258	356,786.54
MISSIONSQUARE	DEF COMP ACCT#302442	1/26/26	DAJ000010262	59,323.57
MISSIONSQUARE	DEF COMP ACCT 302442	1/12/26	DAJ000010250	59,199.56
BNY	2004 LIBRARY SPECIAL TAX BOND	1/23/26	DAJ000010254	77,838.58
BNY	2016 SEWER REVENUE BOND	1/23/26	DAJ000010256	143,744.12
OCT - DEC 25 LAIF INTEREST	OCT - DEC 25 LAIF INTEREST	1/15/26	IAJ000010269	791,204.37
OCT - DEC 25 LAIF INTEREST	OCT - DEC 25 LAIF INTEREST	1/15/26	IAJ000010270	758,242.23
CardKnox DITJanuary 2026	CardKnox DITJanuary 2026	1/31/26	DAJ000010274	73,466.77
ADP WAGE PPE 01/03/26	ADP WAGE PPE 01/03/26	1/9/26	DAJ000010285	474,878.49
ADP TAX PPE 01/03/26	ADP TAX PPE 01/03/26	1/9/26	DAJ000010287	109,530.92
ADP WAGE PPE 01/17/26	ADP WAGE PPE 01/17/26	1/23/26	DAJ000010288	502,718.87
ADP TAX PPE 01/17/26	ADP TAX PPE 01/17/26	1/23/26	DAJ000010291	115,436.48
		Total Disbursements in Excess of $50,000		**$ 4,769,073.03**
			Total Count	**18**

Purchase Order Amounts Equal to $50,000 and Above

Vendor	Description	Date	No.	Amount
ECONOMIC & PLANNING SYSTEMS	DEVELOPMENT IMPACT FEE ST	1/12/26	26 00078	128,000.00
RAFTELIS FINANCIAL CONSULTANTS	COMDEV STRATEGIC COACHING	1/12/26	26 00079	50,000.00
INCHARGE ENERGY INC	EV CHARGING STATIONS	1/27/26	26 00084	346,367.33
		Total Purchase Orders Issued in Excess of $50,000		**$ 524,367.33**
			Total Count	**3**

CITY OF BELMONT
TREASURER'S REPORT
January 31, 2026

Agency Receipts and Disbursements Summary

	Beginning Balance December 31, 2025	Receipts	Disbursements	Ending Balance January 31, 2026
City of Belmont	$ 136,200,683.23	$ 9,001,463.24	$ (5,332,028.15)	$ 139,870,118.32
Belmont Fire Protection District	30,130,827.93	1,370,276.81	(40,931.03)	$ 31,460,173.71
Total	**$ 166,331,511.16**	**$ 10,371,740.05**	**$ (5,372,959.18)**	**$ 171,330,292.03**

Balance Summary

	Deposit	Investments	Pool Total
City of Belmont & Belmont Fire Protection District	**$ 28,745,833.71**	**$ 142,584,458.32**	**$ 171,330,292.03**

I certify that this report accurately reflects all investments of City of Belmont and Belmont Fire Protection District, and is in conformance with the adopted Investment Policy mandated by Government Code 53646. Furthermore, I certify to the best of my knowledge, sufficient investment liquidity and anticipated revenues are available to meet the Agency's budgeted expenditure requirement for the next six months.

Respectfully Submitted,

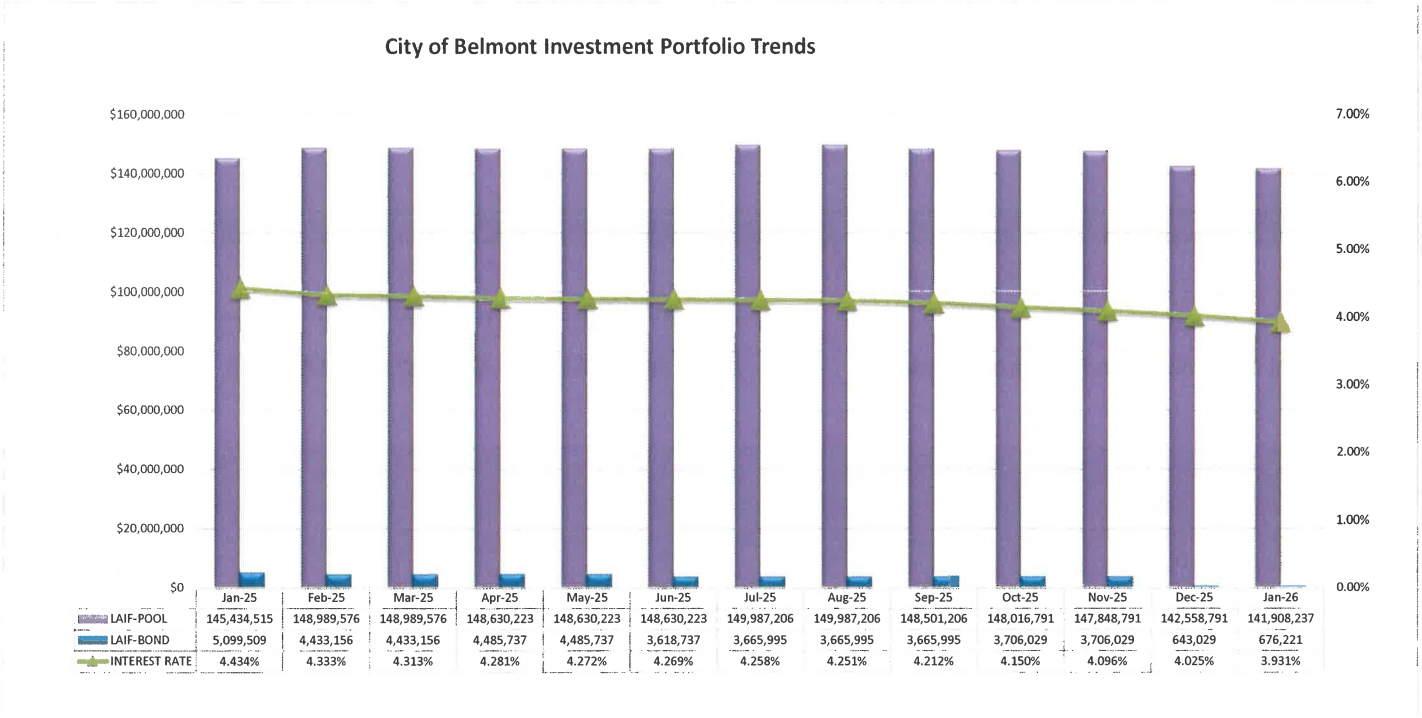
s/b Grace Castaneda *Grace Castaneda*

Grace Castaneda
City Treasurer

CITY OF BELMONT
TREASURER'S REPORT
January 31, 2026

Investment Detail

Investment Type	Issuer	Maturity Date	Par Amount	Current Market Value	Interest Total	Investment Period	Rate	Pricing Source	Manager
Deposit									
General Account	Wells Fargo		$ 28,745,833.71	$ 28,745,833.71				Bank	Bank
Investments:									
L.A.I.F.-POOL	State of California	Daily	141,908,237.31	142,217,807.72	464,867.73	90 days	3.931%	LAIF	LAIF
L.A.I.F.-BONDS	State of California	Daily	676,221.01	677,696.17	2,215.19	90 days	3.931%	LAIF	LAIF
Total			**$ 171,330,292.03**	**$ 171,641,337.60**	**$ 467,082.92**				



	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26
LAIF-POOL	145,434,515	148,989,576	148,989,576	148,630,223	148,630,223	148,630,223	149,987,206	149,987,206	148,501,206	148,016,791	147,848,791	142,558,791	141,908,237
LAIF-BOND	5,099,509	4,433,156	4,433,156	4,485,737	4,485,737	3,618,737	3,665,995	3,665,995	3,665,995	3,706,029	3,706,029	643,029	676,221
INTEREST RATE	4.434%	4.333%	4.313%	4.281%	4.272%	4.269%	4.258%	4.251%	4.212%	4.150%	4.096%	4.025%	3.931%

MEETING MINUTES BELMONT OF THE FIRE PROTECTION DISTRICT BOARD OF DIRECTORS REGULAR MEETING
City Council Chambers, City Hall, One Twin Pines Lane, Belmont, California

This meeting is concurrent with the City Council Meeting

February 24, 2026

1. **CALL TO ORDER: 7:00 PM**
   ROLL CALL
   DIRECTORS PRESENT: Jordan, McCune, Pang-Maganaris, Latimerlo, Mates
   DIRECTORS ABSENT: None

2. **PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA**
   None

3. **DIRECTOR ANNOUNCEMENTS**
   None

4. **CONSENT BUSINESS**
   A. Minutes November 25, 2025

ACTION: On a motion made by Director Pang-Maganaris and seconded by Director McCune the consent business was approved by roll call vote (5-0).

5. **PUBLIC HEARINGS**
   None
6. **GENERAL BUSINESS**

   A. Report on Mid-Year Financial Results as of December 31, 2025
   Concurrent item with City Council meeting.

   Finance Director Castaneda provided an executive summary of the budget, highlighting the State's takeaway of key revenue sources, including Vehicle License Fee (VLF) revenues. She discussed the impacts of a slowdown in development activity, noting that while 100% affordable housing projects support the City's housing goals, they do not generate the same level of property tax revenue. She emphasized that maintaining City services and infrastructure remains a priority and provided Council with the City's financial results and forecast.

   Recess: at 7:35 pm for technical issues
   Reconvene: 7:40 pm

Council discussion ensued.
No public comment received.

ACTION: On a motion made by and seconded by Director Pang-Maganaris and seconded by Vice Chair Jordan **Resolution 2026 – 01** Amending The Fiscal Year 2025-26 Budget By Approving Revisions To Revenue And Authorizing Supplemental Appropriations was approved by a roll call vote (5-0).

7. **MATTERS OF INTEREST/CLARIFICATION**
   None

8. **ADJOURNMENT** at 9:58 pm

Submitted by,
Jozi Plut, District Secretary

DRAFT

CITY COUNCIL REGULAR MEETING MINUTES
City Council Chambers, City Hall, One Twin Pines Lane, Belmont, California March 10, 2026

1. CALL TO ORDER

2. ROLL CALL
Councilmembers Present: McCune, Latimerlo, Pang-Maganaris, Mates
Councilmembers Absent: Jordan

3. ITEMS BEFORE 7:00 PM - none
A. CLOSED SESSION
B. STUDY SESSION
C. SPECIAL SESSION/OTHER TOPICS

ITEMS STARTING AT 7:00 PM

4. PLEDGE OF ALLEGIANCE
Led by Mayor Mates

5. **REPORT FROM CLOSED SESSION** - none

6. SPECIAL PRESENTATIONS

A. Proclamation Observing March 2026 as Women's History Month
Mayor Mates read the proclamation

B. Fourth Annual Dr. Martin Luther King, Jr. Poetry & Essay Contest Recitals
Belmont Poet Laureate McCulloh introduced the winners, and each recited their winning piece.

7. PUBLIC COMMENTS ON ITEMS NOT ON THE AGENDA
None

8. COUNCILMEMBER ANNOUNCEMENTS
Councilmembers announced upcoming community events.

9. CONSENT BUSINESS

A. Salson Trail Culvert Replacement Project Design Task Order #1 Amendment #2
Motion authorizing the City Manager to negotiate and execute Amendment No. 2 to Task Order No. 1 with Mott MacDonald Group, Inc. for additional design and environmental permit services required by the California Department of Fish and Wildlife for the Salson Trail Culvert Replacement Project, in the amount of $165,341, for a total revised contract amount not-to-exceed $426,428.

B. 1301 Shoreway Road Commercial Development Project
Resolution 2026-11 adopting the CEQA Findings of Fact, certifying the Environmental Impact Report, and adopting the Mitigation Monitoring and Reporting Program.

2. Adopt an **Ordinance 2026-1194** Rezoning 1301 Shoreway Road from Regional Commercial (RC) to Planned Unit Development (PD), adopting the Conceptual Development Plan, and approving the Development Agreement.
3. Adopt a **Resolution 2026-12** approving the Detailed Development Plan, Conditional Use Permit, Design Review, Grading Plan and Permit, and Tree Removal Permit.

C. Crystal Springs Cross Country Course Memorandum of Agreement
Authorizing to the City Manager to negotiate and execute a Memorandum of Agreement regarding the operations and responsibilities for the Crystal Springs Cross Country Course with the San Mateo County Community College District and the San Mateo County Superintendent of Schools.

Councilmember McCune stated that he would recuse himself from consideration of Item C on the Consent Business due to the proximity of his residence to the course.

Written comments were received Consent Business items.

ACTION: On a motion made by Councilmember Pang Maganaris and seconded by Councilmember Latimerlo the Consent Business was approved by a roll call vote (4-1, Jordan Absent, 3-2 Item C, Jordan absent, McCune recused).

10. PUBLIC HEARINGS - none

11. GENERAL BUSINESS

A. Redwood Shores Sea Level Rise Protection Project Contract – Island Park Evaluation
Senior Civil Engineer Wada provided an overview of the Belmont Island Park Levee project proposal. She noted that staff is requesting approval of Task 1, which does not commit the City to construction costs but provides the necessary foundation to advance the project design, with the City's cost share of 60%.

Written comments received.

Council discussion ensued.

ACTION: On a motion made by Councilmember Pang-Maganaris and seconded by Councilmember McCune authorized the City Manager to negotiate and execute an Architectural & Engineering Services Agreement with Schaaf & Wheeler for Task 1 - Preliminary Planning, Outreach and Alternatives Evaluation of the Belmont Island Park Levee Design Proposal, in an amount not to exceed $208,787 by a roll call vote (4-1 Jordan absent)

B. Annual Transportation and Mobility Update
This is an informational item only; no action is required.
This item was continued to the March 24, 2025 regular meeting agenda.

12. BRIEF VERBAL REPORTS FROM MEMBERS AND STAFF

A. <u>Verbal report from Councilmembers on Intergovernmental (IGR) and Subcommittee Assignments</u>
Councilmembers reported on their assignments.

B. <u>Verbal report from City Manager</u>
City Manager Oskoui outlined more upcoming community events.

13. MATTERS OF INTEREST/CLARIFICATION - None

14. ADJOURNMENT at 7:37 PM

Meeting was video recorded.

Submitted by,
Jozi Plut, City Clerk

DRAFT

CITY COUNCIL AND A CITY ADVISORY BODY SPECIAL MEETING MINUTES
Emergency Operations Center (EOC) Room 210, 2nd Floor,
City Hall, One Twin Pines Lane, Belmont, California

MARCH 31, 2026

1. CALL TO ORDER: 6:00 PM

2. ROLL CALL:
COUNCILMEMBERS PRESENT: Jordan, Mates
PLANNING COMMISSIONERS PRESENT: Adamkewicz, Jadallah, Takahaahi, Twigg, Kramer, Kulich, Majeski,
PARKS, RECREATION AND CULTURE COMMISSION: Whitmore, Cunha, Hill, Hetal, Sathyanarayanan, Hallinan

3. ITEMS OF BUSINESS

A. STUDY SESSION

City Advisory Body Orientation

City Attorney Rennie and City Clerk Plut provided a presentation outlining the roles, responsibilities, and requirements of City Advisory Body members, including expectations for participation, ethics compliance, and effective governance.

The meeting was informal with discussion led by Vice Mayor Jordan, Mayor Mates and staff.
No action was taken.

5. **ADJOURNMENT** at 8:10 PM

This meeting was not recorded, in person participation only.

Submitted by,
Jozi Plut, City Clerk

DRAFT

STAFF REPORT

Meeting Date:	April 14, 2026
Agencies:	City of Belmont, Belmont Fire Protection District
Staff Contact:	Brigitte Shearer, Parks and Recreation Director, 650-595-7488, bshearer@belmont.gov
Agenda Title:	Fire Station No. 14 Fence & Automatic Gate
Agenda Action:	Resolution

Recommendation

Adopt resolutions to: (1) approve the plans and specifications, authorize advertisement for sealed bids, and authorize the City Manager to negotiate and execute a construction contract with the lowest responsive and responsible bidder for the Fire Station No. 14 Fence and Automatic Gate Project (City Contract Number 2025-642) in an amount not to exceed $175,000 plus a ten percent construction contingency; and (2) approve a supplemental appropriation of $142,000 from the Belmont Fire Protection District Fund to the Capital Improvement Program (CIP) Station 14 Gate Project (Project No.8121).

Strategic Focus Area

Infrastructure and Mobility

Background

Fire Station No. 14, located at 911 Granada Street, is currently unfenced and accessible to the public from both the front of the station along Ralston Avenue, which serves as the primary public access, and from the rear along Masonic Way, which is intended for staff parking and operational access.

To enhance site security and operational safety, the Fire Department has requested installation of a perimeter fence enclosing the rear portion of the property, including the staff parking area, as well as an automatic vehicle gate at the entrance of the driveway along Masonic Way.

In June 2025, the Parks & Recreation Department entered into an agreement with S.R. Rose Engineering, Inc. for project and construction management services in the amount of $24,190. In October 2025, the City executed an agreement with Sanbell for design services in the amount of $24,732.

Analysis

The project plans have been reviewed by staff and are complete, and a building permit has been issued. The project scope includes installation of anew automatic vehicle gate, two pedestrian gates, associated electrical work, driveway and sidewalk repairs, installation of wheel stops, and restoration of pavers.

The current budget includes a $100,000 appropriation for this project. Due to increased costs associated with design, construction management, and construction, an additional $142,000 appropriation from BFPD is required to complete the project.

The updated total project cost estimate is as follows:

- Project and Construction Management: $24,190
- Design: $24,732
- Construction: $175,000
- Construction Contingency (10%): $17,500

Total: $241,422 (rounded to $242,000)

CEQA Compliance

The project is categorically exempt from the California Environmental Quality Act (CEQA) under the CEQA Section 15301(c) because the project performs maintenance, repair, or minor alteration of existing facilities. Staff filed a Notice of Exemption with the San Mateo County Clerk's Office.

Alternatives

1. Take no action.
2. Refer to staff for more information.

Attachments

A. Resolution
B. Project Plans

Fiscal Impact

☐ No Fiscal Impact

☒ Funding Source Confirmed:	The total estimated construction cost is $175,000 plus a ten percent construction contingency. The FY 2025-26 budget includes a $100,000 appropriation for this project. Given the added costs for design, construction management, and construction costs, an additional $142,000 appropriation from BFPD to CIP Station 14 Gate Project# 8121 (Account# 399-4-802-8121-9030) is necessary to complete this capital improvement.

Source:	**Purpose:**	**Public Outreach:**
Staff	Discretionary Action	Posting of Agenda

RESOLUTION NO. 2026 –

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BELMONT FIRE PROTECTION DISTRICT APPROVING A $142,000 BUDGET APPROPRIATION TO THE CAPITAL IMPROVEMENT PROGRAM (CIP) STATION 14 GATE PROJECT# 8121 TO REFLECT A TOTAL BUDGET OF $242,000 (ACCOUNT# 399-3-802-8121-9030), FROM THE BELMONT FIRE PROTECTION DISTRICT FUND

WHEREAS, the Fire Department requested the installation of a fence around the perimeter of the rear of Fire Station 14 located at 911 Granada Street, and an automatic gate at the entrance to the staff parking spaces off Masonic Way; and,

WHEREAS, in June 2025, the City entered into an agreement with S.R. Rose Engineering Inc. for project and construction management in the amount of $24,190 and with Sanbell in October 2025 for the design in the amount of $24,732.00; and,

WHEREAS, the project includes installation of a new 6-foot galvanized iron fence, automatic gate, two pedestrian gates, electrical work associated with the new automatic gate, driveway and sidewalk repairs, wheel stops and paver restoration; and,

WHEREAS, staff plans to bid the construction in April 2026, award the construction contract in May 2026, and complete construction between June and October 2026; and,

WHEREAS, the project is categorically exempt from the California Environmental Quality Act (CEQA) under the CEQA Section 15301(c) because the project performs maintenance, repair, or minor alteration of existing facilities; and,

WHEREAS, the total project cost estimate is $241,422 (rounded to $242,000), including design and construction, for which $100,000 was previously included in the FY 2025/26 Belmont Fire Protection District budget; and

NOW, THEREFORE, the Directors of the Belmont Fire Protection District resolves as follows:

SECTION 1. Approves an appropriation of $142,000 from the Belmont Fire Protection District Fund to the Capital Improvement Program Station 14 Gate Project# 8121 (Account# 399-3-802-8121-9030).

* * *

ADOPTED April 14, 2026 by the Directors of the Belmont Fire Protection District by the following vote:

Ayes:

Noes:

Absent:
Abstain:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

City Attorney

STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Edric Kwan, Public Works Director, ekwan@belmont.gov, 650-7459
Agenda Title:	Approval of an Administrative Amendment to the Peninsula Clean Energy Joint Powers Agreement to Reflect the Agency's Name Change to WestLight Energy
Agenda Action:	Resolution

Recommendation

Adopt a Resolution approving an amendment to Paragraph 2.2 of the Peninsula Clean Energy Authority Joint Powers Agreement to reflect the new agency name previously approved by the Peninsula Clean Energy Authority Board of Directors on October 23, 2025.

Strategic Focus Area

Fiscal and Organizational Sustainability

Background

On October 23, 2025, the Peninsula Clean Energy Authority Board of Directors voted to adopt a new market-facing agency name of WestLight Energy following extensive research and a lengthy stakeholder engagement process. The name was selected in part to address several challenges that limit the effectiveness of the name Peninsula Clean Energy with deeper decarbonization goals across Peninsula Clean Energy's service territory, including ongoing confusion with PG&E. The acronym "PCE" is often mistaken for PG&E, causing persistent brand confusion. Further, Peninsula Clean Energy reflects a geographic limitation given that the word "Peninsula" no longer reflects PCE's full-service territory. The Peninsula Clean Energy Board of Directors' October 23, 2025, action included direction to amend the Joint Powers Agreement (JPA) to formally reflect the new name.

Analysis

The action before the City Council is not a reconsideration of the name itself. The Peninsula Clean Energy Board of Directors has already approved the name change. Member agencies are now requested to approve an administrative amendment to Paragraph 2.2 of the JPA to formally update the agency's legal name in that paragraph and throughout the JPA document.

Approval of the Resolution ensures the City of Belmont remains aligned with the governing documents of the Joint Powers Authority and allows Peninsula Clean Energy the opportunity to implement the name transition in coordination with its 10-year anniversary and broader brand rollout.

Alternatives

1. Take no action.

Attachments

A. Resolution approving amendment to agreement
B. PCE JPA Agreement

Fiscal Impact

☒ No Fiscal Impact
☐ Funding Source Confirmed:

Source:	**Purpose:**	**Public Outreach:**
Staff	Discretionary Action	Posting of Agenda

RESOLUTION NO. 2026 –

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BELMONT APPROVING AN ADMINISTRATIVE AMENDMENT TO PARAGRAPH 2.2 OF THE PENINSULA CLEAN ENERGY JOINT POWERS AGREEMENT REFLECTING THE NAME CHANGE OF PENINSULA CLEAN ENERGY TO WESTLIGHT ENERGY

WHEREAS, the Peninsula Clean Energy Authority ("Peninsula Clean Energy" or "Authority") was formed as a community choice aggregation agency ("CCA") on February 29, 2016, under the Joint Exercise of Powers Act, California Government Code sections 6500 et seq., among the County of San Mateo and its cities and towns, and later expanded to include the City of Los Banos in Merced County; and;

WHEREAS, the Authority has grown to serve a diverse customer base across San Mateo County and the City of Los Banos; and,

WHEREAS, Paragraph 2.2 of the Peninsula Clean Energy Joint Powers Agreement sets forth the name of the Authority; and,

WHEREAS, amendment of Paragraph 2.2 of said Agreement requires approval of each Joint Powers Authority member including the City of Belmont; and

WHEREAS, the City Council of the City of Belmont finds that approving the amendment to Paragraph 2.2 of the Joint Powers Agreement reflecting Peninsula Clean Energy Authority's new market-facing name of WestLight Energy is in the best interest of the City and its residents.

NOW, THEREFORE, the City Council of the City of Belmont resolves as follows:

SECTION 1. Approve the amendment to Paragraph 2.2 of the Peninsula Clean Energy Joint Powers Agreement to reflect the PCE Board of Directors adopted Resolution No. 2025-36 approving the selection of the new market-facing name of WestLight Energy; and

SECTION 3. Authorize the Mayor or City Manager to execute any documents and take any actions necessary to effectuate the amendment of paragraph 2.2 of the Peninsula Clean Energy Joint Powers Agreement consistent with this Resolution.

* * *

ADOPTED April 14, 2026 by the City of Belmont City Council by the following vote:

Ayes:

Noes:

Absent:

Abstain:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

City Attorney

THIRD AMENDED JOINT EXERCISE OF POWERS AGREEMENT RELATING TO AND CREATING THE

PENINSULA CLEAN ENERGY AUTHORITY

This Joint Exercise of Powers Agreement, effective on the date determined by Section 2.1, is made and entered into pursuant to the provisions of Title 1, Division 7, Chapter 5, Article 1 (Sections 6500 et seq.) of the California Government Code relating to the joint exercise of powers among the Parties set forth in Exhibit B, and establishes the Peninsula Clean Energy Authority ("Authority"), is by and between the County of San Mateo ("County") and those counties, cities and towns within the State of California who become signatories to this Agreement, and relates to the joint exercise of powers among the signatories hereto.

RECITALS

A. The Parties share various powers under California law, including but not limited to the power to purchase, supply, and aggregate electricity for themselves and customers within their jurisdictions.

B. In 2006, the State Legislature adopted AB 32, the Global Warming Solutions Act, which mandates a reduction in greenhouse gas emissions in 2020 to 1990 levels. The California Air Resources Board is promulgating regulations to implement AB 32 which will require local governments to develop programs to reduce greenhouse gas emissions.

C. The purposes for entering into this Agreement include:

   a. Reducing greenhouse gas emissions related to the use of power in San Mateo County and the State of California;

   b. Providing electric power and other forms of energy to customers at a competitive cost;

   c. Carrying out programs to reduce energy consumption;

   d. Stimulating and sustaining the local economy by developing local jobs in renewable energy; and

   e. Promoting long-term electric rate stability and energy security and reliability for residents through local control of electric generation resources.

D. It is the intent of this Agreement to promote the development and use of a wide range of renewable energy sources and energy efficiency programs, including but not limited to solar, wind, and biomass energy production. The purchase of renewable power and greenhouse gas-free energy sources will be the desired approach to decrease regional greenhouse gas emissions and accelerate the State's transition to clean power resources to the extent feasible. The Agency will also add increasing levels of locally generated renewable

resources as these projects are developed and customer energy needs expand.

E. The Parties desire to establish a separate public agency, known as the Peninsula Clean Energy Authority, under the provisions of the Joint Exercise of Powers Act of the State of California (Government Code Section 6500 et seq.) ("Act") in order to collectively study, promote, develop, conduct, operate, and manage energy programs.

F. The Parties anticipate adopting an ordinance electing to implement through the Authority a common Community Choice Aggregation (CCA) program, an electric service enterprise available to cities and counties pursuant to California Public Utilities Code Sections 331.1(c) and 366.2. The first priority of the Authority will be the consideration of those actions necessary to implement the CCA Program.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual promises, covenants, and conditions hereinafter set forth, it is agreed by and among the Parties as follows:

ARTICLE 1: DEFINITIONS AND EXHIBITS

1.1 Definitions. Capitalized terms used in the Agreement shall have the meanings specified in Exhibit A, unless the context requires otherwise.

1.2 Documents Included. This Agreement consists of this document and the following exhibits, all of which are hereby incorporated into this Agreement.

Exhibit A: Definitions
Exhibit B: List of the Parties
Exhibit C: Annual Energy Use
Exhibit D: Voting Shares
Exhibit E: Signatures

ARTICLE 2: FORMATION OF PENINSULA CLEAN ENERGY AUTHORITY

2.1 Effective Date and Term. This Agreement shall become effective and Peninsula Clean Energy Authority shall exist as a separate public agency on February 29, 2016 or when the County of San Mateo and at least two municipalities execute this Agreement, whichever occurs later. The Authority shall provide notice to the Parties of the Effective Date. The Authority shall continue to exist, and this Agreement shall be effective, until this Agreement is terminated in accordance with Section 6.4, subject to the rights of the Parties to withdraw from the Authority.

2.2 Formation. There is formed as of the Effective Date a public agency named the Peninsula Clean Energy Authority. Pursuant to Sections 6506 and 6507 of the Act, the Authority is a public agency separate from the Parties. Pursuant to Sections 6508.1 of the Act, the debts, liabilities or

obligations of the Authority shall not be debts, liabilities or obligations of the individual Parties unless the governing board of a Party agrees in writing to assume any of the debts, liabilities or obligations of the Authority. A Party who has not agreed to assume an Authority debt, liability or obligation shall not be responsible in any way for such debt, liability or obligation even if a majority of the Parties agree to assume the debt, liability or obligation of the Authority. Notwithstanding Section 7.4 of this Agreement, this Section 2.2 may not be amended unless such amendment is approved by the governing board of each Party.

2.3 Purpose. The purpose of this Agreement is to establish an independent public agency in order to exercise powers common to each Party to study, promote, develop, conduct, operate, and manage energy, energy efficiency and conservation, and other energy-related programs, and to exercise all other powers necessary and incidental to accomplishing this purpose. Without limiting the generality of the foregoing, the Parties intend for this Agreement to be used as a contractual mechanism by which the Parties are authorized to participate in the CCA Program, as further described in Section 4.1. The Parties intend that other agreements shall define the terms and conditions associated with the implementation of the CCA Program and any other energy programs approved by the Authority.

2.4 Powers. The Authority shall have all powers common to the Parties and such additional powers accorded to it by law. The Authority is authorized, in its own name, to exercise all powers and do all acts necessary and proper to carry out the provisions of this Agreement and fulfill its purposes, including, but not limited to, each of the following powers, subject to the voting requirements set forth in Section 3.7 through 3.7.5:

2.4.1 to make and enter into contracts;

2.4.2 to employ agents and employees, including but not limited to a Chief Executive Officer;

2.4.3 to acquire, contract, manage, maintain, and operate any buildings, infrastructure, works, or improvements;

2.4.4 to acquire property by eminent domain, or otherwise, except as limited under Section 6508 of the Act, and to hold or dispose of any property; however, the Authority shall not exercise the power of eminent domain within the jurisdiction of a Party over its objection without first meeting and conferring in good faith.

2.4.5 to lease any property;

2.4.6 to sue and be sued in its own name;

2.4.7 to incur debts, liabilities, and obligations, including but not limited to loans from private lending sources pursuant to its temporary borrowing powers such as Government Code Sections 53850 et seq. and authority under the Act;

2.4.8 to form subsidiary or independent corporations or entities if necessary, to carry out energy supply and energy conservation programs at the lowest possible cost or to take advantage of legislative or regulatory changes;

2.4.9 to issue revenue bonds and other forms of indebtedness;

2.4.10 to apply for, accept, and receive all licenses, permits, grants, loans or other aids from any federal, state, or local public agency;

2.4.11 to submit documentation and notices, register, and comply with orders, tariffs and agreements for the establishment and implementation of the CCA Program and other energy programs;

2.4.12 to adopt Operating Rules and Regulations; and

2.4.13 to make and enter into service agreements relating to the provision of services necessary to plan, implement, operate and administer the CCA Program and other energy programs, including the acquisition of electric power supply and the provision of retail and regulatory support services.

2.4.14 to permit additional Parties to enter into this Agreement after the Effective Date and to permit another entity authorized to be a community choice aggregator to designate the Authority to act as the community choice aggregator on its behalf.

2.5 Limitation on Powers. As required by Government Code Section 6509, the power of the Authority is subject to the restrictions upon the manner of exercising power possessed by San Mateo County.

2.6 Compliance with Local Zoning and Building Laws and CEQA. Unless state or federal law provides otherwise, any facilities, buildings or structures located, constructed, or caused to be constructed by the Authority within the territory of the Authority shall comply with the General Plan, zoning and building laws of the local jurisdiction within which the facilities, buildings or structures are constructed and comply with the California Environmental Quality Act ("CEQA").

ARTICLE 3: GOVERNANCE AND INTERNAL ORGANIZATION

3.1 Board of Directors. The governing body of the Authority shall be a Board of Directors ("Board"). The Board shall consist of 2 (two) directors appointed by the San Mateo County Board of Supervisors and 1 (one) director appointed by each County, City or Town that becomes a signatory to the Agreement ("Directors"). Each Director shall serve at the pleasure of the governing board of the Party who appointed such Director and may be removed as Director by such governing board at any time. If at any time a vacancy occurs on the Board, a replacement shall be appointed to fill the position of the previous Director within 90 days of the date that such position becomes vacant. Directors must be members of the Board of Supervisors or members of the governing board of the municipality that is the signatory to this Agreement. Each Party may appoint an alternate(s) to serve in the absence of its Director(s). Alternates may be either (1) members of the Board of Supervisors or members of the governing board of the municipality that is the signatory to this Agreement, or (2) staff members of the County or any such municipality.

3.2 Quorum. A majority of the appointed Directors shall constitute a quorum, except that less

than a quorum may adjourn from time to time in accordance with law.

3.3 Powers and Functions of the Board. The Board shall exercise general governance and oversight over the business and activities of the Authority, consistent with this Agreement and applicable law. The Board shall provide general policy guidance to the CCA Program. Board approval shall be required for any of the following actions:

3.3.1 The issuance of bonds or any other financing even if program revenues are expected to pay for such financing.

3.3.2 The hiring or termination of the Chief Executive Officer and General Counsel.

3.3.3 The appointment or removal of officers described in Section 3.9, subject to Section 3.9.3.

3.3.4 The adoption of the Annual Budget.

3.3.5 The adoption of an ordinance.

3.3.6 The approval of agreements, except as provided by Section 3.4.

3.3.7 The initiation or resolution of claims and litigation where the Authority will be the defendant, plaintiff, petitioner, respondent, cross complainant, or cross petitioner, or intervenor; provided, however, that the Chief Executive Officer or General Counsel or by delegation thereof, on behalf of the Authority, may intervene in, become a party to, or file comments with respect to any proceeding pending at the California Public Utilities Commission, the Federal Energy Regulatory Commission, or any other administrative agency, without approval of the Board as long as such action is consistent with any adopted Board policies.

3.3.8 The setting of rates for power sold by the Authority and the setting of charges for any other category of service provided by the Authority.

3.3.9 Termination of the CCA Program.

3.4 Chief Executive Officer. The Board of Directors shall appoint a Chief Executive Officer for the Authority, who shall be responsible for the day-to-day operation and management of the Authority and the CCA Program. The Chief Executive Officer may exercise all powers of the Authority, including the power to hire, discipline, and terminate employees as well as the power to approve any agreement if the total amount payable under the agreement is equal to or less than the amount specified in the Operating Rules and Regulations (Policy 14 , "Delegation of Non-Energy Contract Authority") except for the powers specifically set forth in Section 3.3 or those powers which by law must be exercised by the Board of Directors.

3.5 Commissions, Boards, and Committees. The Board may establish any advisory commissions, boards, and committees as the Board deems appropriate to assist the Board in carrying out its functions and implementing the CCA Program, other energy programs and the provisions of

this Agreement which shall comply with the requirements of the Ralph M. Brown Act. The Board may establish rules, regulations, policies, bylaws or procedures to govern any such commissions, boards, or committees if the Board deems appropriate to appoint such commissions, boards or committees, and shall determine whether members shall be compensated or entitled to reimbursement for expenses.

3.6 Director Compensation. Directors shall serve without compensation from the Authority. However, Directors may be compensated by their respective appointing authorities. The Board, however, may adopt by resolution a policy relating to the reimbursement by the Authority of expenses incurred by Directors.

3.7 Voting In general, as described below in Section 3.7.3, action by the Authority Board will be taken solely by a majority vote of the Directors present. However, as described below in Section 3.7.4, upon request of a Director, a weighted vote by shares will also be conducted. When such a request is made, an action must be approved by both a majority vote of Directors present and a majority of the weighted vote by shares present. No action may be approved solely by a vote by shares. The voting shares of Directors and approval requirements for actions of the Board shall be as follows:

3.7.1. Voting Shares.

Each Director shall have a voting share as determined by the following formula: (Annual Energy Use/Total Annual Energy) multiplied by 100, where:

(a) "Annual Energy Use" means, (i) with respect to the first year following the Effective Date, the annual electricity usage, expressed in kilowatt hours ("kWh"), within the Party's respective jurisdiction and (ii) with respect to the period after the anniversary of the Effective Date, the annual electricity usage, expressed in kWh, of accounts within a Party's respective jurisdiction that are served by the Authority; and

(b) "Total Annual Energy" means the sum of all Parties' Annual Energy Use. The initial values for Annual Energy Use will be designated in Exhibit C, and shall be adjusted annually as soon as reasonably practicable after January 1, but no later than March 1 of each year. These adjustments shall be approved by the Board.

(c) The combined voting share of all Directors representing the County of San Mateo shall be based upon the annual electricity usage within the unincorporated area of San Mateo County.

For the purposes of Weighted Voting, if a Party has more than one director, then the voting shares allocated to the entity shall be equally divided amongst its Directors.

3.7.2. Exhibit Showing Voting Shares. The initial voting shares will be set forth in Exhibit D. Exhibit D shall be revised no less than annually as necessary to account for changes in the number of Parties and changes in the Parties' Annual Energy Use. Exhibit D and adjustments shall be approved by the Board.

3.7.3. Approval Requirements Relating to CCA Program. Except as provided in Sections 3.7.4 and 3.7.5 below, action of the Board shall require the affirmative vote of a majority of Directors present at the meeting.

3.7.4. Option for Approval by Voting Shares. Notwithstanding Section 3.7.3, any Director present at a meeting may demand that approval of any matter related to the CCA Program be determined on the basis of both voting shares and by the affirmative vote of a majority of Directors present at the meeting. If a Director makes such a demand with respect to approval of any such matter, then approval of such matter shall require the affirmative vote of a majority of Directors present at the meeting and the affirmative vote of Directors having a majority of voting shares present, as determined by Section 3.7.1 except as provided in Section 3.7.5.

3.7.5. Special Voting Requirements for Certain Matters.

(a) Two-Thirds and Weighted Voting Approval Requirements Relating to Sections 6.2 and 7.4. Action of the Board on the matters set forth in Section 6.2 (involuntary termination of a Party), or Section 7.4 (amendment of this Agreement) shall require the affirmative vote of at least two-thirds of Directors present; provided, however, that (i) notwithstanding the foregoing, any Director present at the meeting may demand that the vote be determined on the basis of both voting shares and by the affirmative vote of Directors, and if a Director makes such a demand, then approval shall require the affirmative vote of both at least two-thirds of Directors present and the affirmative vote of Directors having at least two-thirds of the voting shares present, as determined by Section 3.7.1; (ii) but, at least two Parties must vote against a matter for the vote to fail; and (iii) for votes to involuntarily terminate a Party under Section 6.2, the Director(s) for the Party subject to involuntary termination may not vote, and the number of Directors constituting two-thirds of all Directors, and the weighted vote of each Party shall be recalculated as if the Party subject to possible termination were not a Party.

(b) Seventy Five Percent Special Voting Requirements for Eminent Domain and Contributions or Pledge of Assets.

(i) A decision to exercise the power of eminent domain on behalf of the Authority to acquire any property interest other than an easement, right-of-way, or temporary construction easement shall require a vote of at least 75% of all Directors.

(ii) The imposition on any Party of any obligation to make contributions or pledge assets as a condition of continued participation in the CCA Program shall require a vote of at least 75% of all Directors and the approval of the governing boards of the Parties who are being asked to make such contribution or pledge.

(iii) Notwithstanding the foregoing, any Director present at the meeting may demand that a vote under subsections (i) or (ii) be determined on the basis of voting shares and by the affirmative vote of Directors, and if a Director makes such a demand, then approval shall require both the affirmative vote of at least 75% of

Directors present and the affirmative vote of Directors having at least 75% of the voting shares present, as determined by Section 3.7.1, but at least two Parties must vote against a matter for the vote to fail. For purposes of this section, "imposition on any Party of any obligation to make contributions or pledge assets as a condition of continued participation in the CCA Program" does not include any obligations of a withdrawing or terminated party imposed under Section 6.3.

3.8 Meetings and Special Meetings of the Board. The Board shall hold at least six regular meetings per year, but the Board may provide for the holding of regular meetings at more frequent intervals. The date, hour and place of each regular meeting shall be fixed by resolution or ordinance of the Board. Regular meetings may be adjourned to another meeting time. Special and Emergency Meetings of the Board may be called in accordance with the provisions of California Government Code Sections 54956 and 54956.5. Directors may participate in meetings telephonically, with full voting rights, only to the extent permitted by law. All meetings shall be conducted in accordance with the provisions of the Ralph M. Brown Act (California Government Code Sections 54950 et seq.).

3.9 Selection of Board Officers.

3.9.1 Chair and Vice Chair. The Directors shall select, from among themselves, a Chair, who shall be the presiding officer of all Board meetings, and a Vice Chair, who shall serve in the absence of the Chair. The term of office for and term limits of the Chair and Vice Chair shall be set forth in the policies and procedures established by the Board. The office of either the Chair or Vice Chair shall be declared vacant and a new selection shall be made if:

(a) the person serving dies, resigns, or the Party that the person represents removes the person as its representative on the Board or
(b) the Party that he or she represents withdraws from the Authority pursuant to the provisions of this Agreement.

3.9.2 Secretary. The Board shall appoint a Secretary, who need not be a member of the Board, who shall be responsible for keeping the minutes of all meetings of the Board and all other official records of the Authority.

3.9.3 Treasurer and Auditor. The Chief Financial Officer shall, among other duties, act as the Treasurer for the Authority. Unless otherwise exempted from such requirement, the Authority shall cause an independent audit to be made by a certified public accountant, or public accountant, in compliance with Section 6505 of the Act. The Treasurer shall act as the depository of the Authority and have custody of all the money of the Authority, from whatever source, and as such, shall have all of the duties and responsibilities specified in Section 6505.5 of the Act. The Treasurer shall report directly to the Board and shall comply with the requirements of treasurers of incorporated municipalities. The Board may transfer the responsibilities of Treasurer to any person or entity as the law may provide at the time. The duties and obligations of the Treasurer are further specified in Article 5.

3.10 Administrative Services Provider. The Board may appoint one or more administrative

services providers to serve as the Authority's agent for planning, implementing, operating and administering the CCA Program, and any other program approved by the Board, in accordance with the provisions of an Administrative Services Agreement. The appointed administrative services provider may be one of the Parties. An Administrative Services Agreement shall set forth the terms and conditions by which the appointed administrative services provider shall perform or cause to be performed all tasks necessary for planning, implementing, operating and administering the CCA Program and other approved programs. The Administrative Services Agreement shall set forth the term of the Agreement and the circumstances under which the Administrative Services Agreement may be terminated by the Authority. This section shall not in any way be construed to limit the discretion of the Authority to hire its own employees to administer the CCA Program or any other program.

ARTICLE 4: IMPLEMENTATION ACTION AND AUTHORITY DOCUMENTS

4.1 Preliminary Implementation of the CCA Program.

4.1.1 Enabling Ordinance. To be eligible to participate in the CCA Program, each Party must adopt an ordinance in accordance with Public Utilities Code Section 366.2(c)(12) for the purpose of specifying that the Party intends to implement a CCA Program by and through its participation in the Authority.

4.1.2 Implementation Plan. The Authority shall cause to be prepared an Implementation Plan meeting the requirements of Public Utilities Code Section 366.2 and any applicable Public Utilities Commission regulations as soon after the Effective Date as reasonably practicable. The Implementation Plan shall not be filed with the Public Utilities Commission until it is approved by the Board in the manner provided by Section 3.7.3.

4.1.3 Termination of CCA Program. Nothing contained in this Article or this Agreement shall be construed to limit the discretion of the Authority to terminate the implementation or operation of the CCA Program at any time in accordance with any applicable requirements of state law.

4.2 Authority Documents. The Parties acknowledge and agree that the affairs of the Authority will be implemented through various documents duly adopted by the Board through Board resolution. The Parties agree to abide by and comply with the terms and conditions of all such documents that may be adopted by the Board, subject to the Parties' right to withdraw from the Authority as described in Article 6.

4.3 Addition of Parties. Other incorporated municipalities and counties may become Parties subject to all applicable terms of this Agreement, including but not limited to those in Article 6, upon (a) the adoption of a resolution by the governing body of such incorporated municipality or such county requesting that the incorporated municipality or county, as the case may be, become a member of the Authority, (b) the adoption, by an affirmative vote of the Board satisfying the requirements described in Section 3.7, of a resolution authorizing membership of the additional incorporated municipality or county, specifying the membership payment, if any, to be made by the additional incorporated municipality or county to reflect its pro rata share of organizational, planning and other

pre-existing expenditures, and describing additional conditions, if any, associated with membership, (c) the adoption of an ordinance required by Public Utilities Code Section 366.2(c)(12) and execution of this Agreement and other necessary program agreements by the incorporated municipality or county as required by the Board, (d) payment of the membership payment, if any, and (e) satisfaction of any conditions established by the Board.

4.3.1 Continuing Participation. The Parties acknowledge that membership in the Authority may change by the addition and/or withdrawal or termination of Parties. The Parties agree to participate with such other Parties as may later be added, as described in Section 4.3. The Parties also agree that the withdrawal or termination of a Party shall not affect this Agreement or the remaining Parties' continuing obligations under this Agreement.

4.3.2 Termination by Additional Parties. In addition to any financial obligations under Article 6, and in the events that the Board does not require a membership payment to reflect the additional party's pro rata share of organizational planning and other pre-existing expenditures as allowed by Section 4.3(b) and the additional party withdraws its membership in the Authority within the first five years of becoming a party, the party shall be obligated to reimburse the Authority for all the costs related to the cost of launch, including but not limited to the costs of updating the Implementation Plan and mailings to party's accounts.

ARTICLE 5: FINANCIAL PROVISIONS

5.1 Fiscal Year. The Authority's fiscal year shall be 12 months commencing July 1 or the date selected by the Agency and ending June 30. The fiscal year may be changed by Board resolution.

5.2 Depository.

5.2.1 All funds of the Authority shall be held in separate accounts in the name of the Authority and not commingled with funds of any Party or any other person or entity.

5.2.2 All funds of the Authority shall be strictly and separately accounted for, and regular reports shall be rendered of all receipts and disbursements, at least quarterly during the fiscal year. The books and records of the Authority shall be open to inspection by the Parties at all reasonable times. The Board shall contract with a certified public accountant or public accountant to make an annual audit of the accounts and records of the Authority, which shall be conducted in accordance with the requirements of Section 6505 of the Act.

5.2.3 All expenditures shall be made in accordance with the approved budget and upon the approval of any officer so authorized by the Board in accordance with its Operating Rules and Regulations. The Treasurer shall draw checks or warrants or make payments by other means for claims or disbursements not within an applicable budget only upon the prior approval of the Board.

5.3 Budget and Recovery of Costs.

5.3.1 Budget. The annual budget shall be approved by the Board. Staff shall report to the Board quarterly budget results and any significant budget variances. The Board may revise the budget as needed to address any significant changes and/or unexpected expenses incurred.

5.3.2 Funding of Initial Costs. The County of San Mateo has funded certain activities necessary to implement the CCA Program. If the CCA Program becomes operational, these Initial Costs paid by the County of San Mateo shall be included in the customer charges for electric services as provided by Section 5.3.3 to the extent permitted by law, and the County of San Mateo shall be reimbursed from the payment of such charges by customers of the Authority. Prior to such reimbursement, the County of San Mateo shall provide such documentation of costs paid as the Board may request. The Authority may establish a reasonable time period over which such costs are recovered. In the event that the CCA Program does not become operational, the County of San Mateo shall not be entitled to any reimbursement of the Initial Costs it has paid from the Authority or any Party.

5.3.3 CCA Program Costs. The Parties desire that all costs incurred by the Authority that are directly or indirectly attributable to the provision of electric, conservation, efficiency, incentives, financing, or other services provided under the CCA Program, including but not limited to the establishment and maintenance of various reserves and performance funds and administrative, accounting, legal, consulting, and other similar costs, shall be recovered through charges to CCA customers receiving such electric services, or from revenues from grants or other third-party sources.

ARTICLE 6: WITHDRAWAL AND TERMINATION

6.1 Withdrawal.

6.1.1 Right to Withdraw. A Party may withdraw its participation in the CCA Program, effective as of the beginning of the Authority's fiscal year, by giving no less than 12 months advance written notice of its election to do so, which notice shall be given to the Authority and each Party. Withdrawal of a Party shall require an affirmative vote of the Party's governing board.

6.1.2 Right to Withdraw After Amendment. Notwithstanding Section 6.1.1, a Party may withdraw its membership in the Authority following an amendment to this Agreement adopted by the Board which the Party's Director(s) voted against provided such notice is given in writing within thirty (30) days following the date of the vote. Withdrawal of a Party shall require an affirmative vote of the Party's governing board and shall not be subject to the twelve month advance notice provided in Section 6.1.1. In the event of such withdrawal, the Party shall be subject to the provisions of Section 6.3.

6.1.3 The Right to Withdraw Prior to Program Launch. After receiving bids from power suppliers, the Authority must provide to the Parties the report from the electrical utility consultant retained by the Authority that compares the total estimated electrical rates that

the Authority will be charging to customers as well as the estimated greenhouse gas emissions rate and the amount of estimated renewable energy used with that of the incumbent utility. If the report provides that the Authority is unable to provide total electrical rates, as part of its baseline offering, to the customers that are equal to or lower than the incumbent utility or to provide power in a manner that has a lower greenhouse gas emissions rate or uses more renewable energy than the incumbent utility, a Party may immediately withdraw its membership in the Authority without any financial obligation, as long as the Party provides written notice of its intent to withdraw to the Authority Board no more than fifteen days after receiving the report.

6.1.4 Continuing Financial Obligation; Further Assurances. Except as provided by Section 6.1.3, a Party that withdraws its participation in the CCA Program may be subject to certain continuing financial obligations, as described in Section 6.3. Each withdrawing Party and the Authority shall execute and deliver all further instruments and documents, and take any further action that may be reasonably necessary, as determined by the Board, to effectuate the orderly withdrawal of such Party from participation in the CCA Program.

6.2 Involuntary Termination of a Party. Participation of a Party in the CCA program may be terminated for material non-compliance with provisions of this Agreement or any other agreement relating to the Party's participation in the CCA Program upon a vote of Board members as provided in Section 3.7.5. Prior to any vote to terminate participation with respect to a Party, written notice of the proposed termination and the reason(s) for such termination shall be delivered to the Party whose termination is proposed at least 30 days prior to the regular Board meeting at which such matter shall first be discussed as an agenda item. The written notice of proposed termination shall specify the particular provisions of this Agreement or other agreement that the Party has allegedly violated. The Party subject to possible termination shall have the opportunity at the next regular Board meeting to respond to any reasons and allegations that may be cited as a basis for termination prior to a vote regarding termination. A Party that has had its participation in the CCA Program terminated may be subject to certain continuing liabilities, as described in Section 6.3.

6.3 Continuing Financial Obligations; Refund. Except as provided by Section 6.1.3, upon a withdrawal or involuntary termination of a Party, the Party shall remain responsible for any claims, demands, damages, or other financial obligations arising from the Party membership or participation in the CCA Program through the date of its withdrawal or involuntary termination, it being agreed that the Party shall not be responsible for any financial obligations arising after the date of the Party's withdrawal or involuntary termination. Claims, demands, damages, or other financial obligations for which a withdrawing or terminated Party may remain liable include, but are not limited to, losses from the resale of power contracted for by the Authority to serve the Party's load. With respect to such financial obligations, upon notice by a Party that it wishes to withdraw from the CCA Program, the Authority shall notify the Party of the minimum waiting period under which the Party would have no costs for withdrawal if the Party agrees to stay in the CCA Program for such period. The waiting period will be set to the minimum duration such that there are no costs transferred to remaining ratepayers. If the Party elects to withdraw before the end of the minimum waiting period, the charge for exiting shall be set at a dollar amount that would offset actual costs to the remaining ratepayers, and may not include punitive charges that exceed actual costs. In addition, such Party shall also be responsible for any costs or obligations associated with the Party's participation in any program in accordance with the provisions of any agreements relating to such program provided such costs or

obligations were incurred prior to the withdrawal of the Party. The Authority may withhold funds otherwise owing to the Party or may require the Party to deposit sufficient funds with the Authority, as reasonably determined by the Authority and approved by a vote of the Board of Directors, to cover the Party's financial obligations for the costs described above. Any amount of the Party's funds held on deposit with the Authority above that which is required to pay any financial obligations shall be returned to the Party. The liability of any Party under this section 6.3 is subject and subordinate to the provisions of Section 2.2, and nothing in this section 6.3 shall reduce, impair, or eliminate any immunity from liability provided by Section 2.2.

6.4 Mutual Termination. This Agreement may be terminated by mutual agreement of all the Parties; provided, however, the foregoing shall not be construed as limiting the rights of a Party to withdraw its participation in the CCA Program, as described in Section 6.1.

6.5 Disposition of Property upon Termination of Authority. Upon termination of this Agreement, any surplus money or assets in possession of the Authority for use under this Agreement, after payment of all liabilities, costs, expenses, and charges incurred under this Agreement and under any program documents, shall be returned to the then-existing Parties in proportion to the contributions made by each.

ARTICLE 7: MISCELLANEOUS PROVISIONS

7.1 Dispute Resolution. The Parties and the Authority shall make reasonable efforts to informally settle all disputes arising out of or in connection with this Agreement. Should such informal efforts to settle a dispute, after reasonable efforts, fail, the dispute shall be mediated in accordance with policies and procedures established by the Board.

7.2 Liability of Directors, Officers, and Employees. The Directors, officers, and employees of the Authority shall use ordinary care and reasonable diligence in the exercise of their powers and in the performance of their duties pursuant to this Agreement. No current or former Director, officer, or employee will be responsible for any act or omission by another Director, officer, or employee. The Authority shall defend, indemnify and hold harmless the individual current and former Directors, officers, and employees for any acts or omissions in the scope of their employment or duties in the manner provided by Government Code Sections 995 et seq. Nothing in this section shall be construed to limit the defenses available under the law, to the Parties, the Authority, or its Directors, officers, or employees.

7.3 Indemnification of Parties. The Authority shall acquire such insurance coverage as is necessary to protect the interests of the Authority, the Parties, and the public. The Authority shall defend, indemnify, and hold harmless the Parties and each of their respective Board or Council members, officers, agents and employees, from any and all claims, losses, damages, costs, injuries, and liabilities of every kind arising directly or indirectly from the conduct, activities, operations, acts, and omissions of the Authority under this Agreement.

7.4 Amendment of this Agreement. This Agreement may not be amended except by a written amendment approved by a vote of Board members as provided in Section 3.7.5. The Authority shall provide written notice to all Parties of amendments to this Agreement, including the effective date

of such amendments, at least 30 days prior to the date upon which the Board votes on such amendments.

7.5 Assignment. Except as otherwise expressly provided in this Agreement, the rights and duties of the Parties may not be assigned or delegated without the advance written consent of all of the other Parties, and any attempt to assign or delegate such rights or duties in contravention of this Section 7.5 shall be null and void. This Agreement shall inure to the benefit of, and be binding upon, the successors and assigns of the Parties. This Section 7.5 does not prohibit a Party from entering into an independent agreement with another agency, person, or entity regarding the financing of that Party's contributions to the Authority, or the disposition of proceeds which that Party receives under this Agreement, so long as such independent agreement does not affect, or purport to affect, the rights and duties of the Authority or the Parties under this Agreement.

7.6 Severability. If one or more clauses, sentences, paragraphs or provisions of this Agreement shall be held to be unlawful, invalid or unenforceable, it is hereby agreed by the Parties, that the remainder of the Agreement shall not be affected thereby. Such clauses, sentences, paragraphs or provision shall be deemed reformed so as to be lawful, valid and enforced to the maximum extent possible.

7.7 Further Assurances. Each Party agrees to execute and deliver all further instruments and documents, and take any further action that may be reasonably necessary, to effectuate the purposes and intent of this Agreement.

7.8 Execution by Counterparts. This Agreement may be executed in any number of counterparts, and upon execution by all Parties, each executed counterpart shall have the same force and effect as an original instrument and as if all Parties had signed the same instrument. Any signature page of this Agreement may be detached from any counterpart of this Agreement without impairing the legal effect of any signatures thereon, and may be attached to another counterpart of this Agreement identical in form hereto but having attached to it one or more signature pages.

7.9 Parties to be Served Notice. Any notice authorized or required to be given pursuant to this Agreement shall be validly given if served in writing either personally, by deposit in the United States mail, first class postage prepaid with return receipt requested, or by a recognized courier service. Notices given (a) personally or by courier service shall be conclusively deemed received at the time of delivery and receipt and (b) by mail shall be conclusively deemed given 48 hours after the deposit thereof (excluding Saturdays, Sundays and holidays) if the sender receives the return receipt. All notices shall be addressed to the office of the clerk or secretary of the Authority or Party, as the case may be, or such other person designated in writing by the Authority or Party. Notices given to one Party shall be copied to all other Parties. Notices given to the Authority shall be copied to all Parties.

Exhibit A
Definitions

"Act" means the Joint Exercise of Powers Act of the State of California (Government Code Section 6500 *et seq*.)

"Administrative Services Agreement" means an agreement or agreements entered into after the Effective Date by the Authority with an entity that will perform tasks necessary for planning, implementing, operating and administering the CCA Program or any other energy programs adopted by the Authority.

"Agreement" means this Joint Powers Agreement.

"Annual Energy Use" has the meaning given in Section 3.7.1.

"Authority" means the Peninsula Clean Energy Authority.

"Authority Document(s)" means document(s) duly adopted by the Board by resolution or motion implementing the powers, functions, and activities of the Authority, including but not limited to the Operating Rules and Regulations, the annual budget, and plans and policies.

"Board" means the Board of Directors of the Authority.

"CCA" or "Community Choice Aggregation" means an electric service option available to cities and counties pursuant to Public Utilities Code Section 366.2.

"CCA Program" means the Authority's program relating to CCA that is principally described in Sections 2.3, 2.4, and 4.1.

"Director" means a member of the Board of Directors representing a Party.

"Effective Date" means February 29, 2016 or when the County of San Mateo and at least two municipalities execute this Agreement, whichever occurs later, as further described in Section 2.1.

"Implementation Plan" means the plan generally described in Section 4.1.2 of this Agreement that is required under Public Utilities Code Section 366.2 to be filed with the California Public Utilities Commission for the purpose of describing a proposed CCA Program.

"Initial Costs" means all costs incurred by the County and/or Authority relating to the establishment and initial operation of the Authority, such as the hiring of a Chief Executive Officer and any administrative staff, and any required accounting, administrative, technical, or legal services in support of the Authority's initial activities or in support of the negotiation, preparation, and approval of one or more Administrative Services Agreements.

Exhibit A (cont.)
Definitions

"Operating Rules and Regulations" means the rules, regulations, policies, bylaws and procedures governing the operation of the Authority.

"Parties" means, collectively, any municipality or county that executes this Agreement.

"Party" means a signatory to this Agreement.

"Total Annual Energy" has the meaning given in Section 3.7.1.

Exhibit B
List of Parties

Parties:

Atherton
Belmont
Brisbane
Burlingame
Colma
County of San Mateo
Daly City
East Palo Alto
Foster City
Half Moon Bay
Hillsborough
Los Banos
Menlo Park
Millbrae
Pacifica
Portola Valley
Redwood City
San Bruno
San Carlos
San Mateo
South San Francisco
Woodside

Exhibits C and D
Annual Energy Use and Voting Shares

ANNUAL ENERGY USE WITHIN PCE JURISDICTIONS AND VOTING SHARES		
Twelve Months Ended November [date]		
Party	Total kWh	Voting Share
SAN MATEO COUNTY		
Total		100

STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Bozhena Palatnik, Senior Civil Engineer, Public Works, (650) 595-7463, bpalatnik@belmont.gov
Agenda Title:	San Juan Pump Station and Force Main Rehabilitation Project
Agenda Action:	Resolution

Recommendation

Adopt a Resolution approving plans and specifications; authorizing advertisement for sealed bids; authorizing the City Manager to negotiate and execute a construction contract with the lowest responsible and responsive bidder for the San Juan Pump Station and Force Main Rehabilitation Project (City Contract Number 2026-645) in the amount of $6,280,000 for a total not-to-exceed 6,908,000, including a 10% construction contingency; and approving a task order with Tanner Pacific, Inc. for construction management services in an amount not to exceed $1,265,000.

Strategic Focus Area

Infrastructure and Mobility

Background

The San Juan Pump Station, located at 3118 East Laurel Creek, is the largest of the City's ten sanitary sewer pump stations. Originally built in 1956, the facility has undergone several upgrades, including major rehabilitations in 1977 and 1997. More recent improvements include a generator upgrade in 2008, roof replacement in 2009, and installation of new pumps and exhaust fans in 2012.

In 2015, City retained Pure Engineering Services Inc. to evaluate the condition of sanitary sewer force mains citywide. The project included engineering analysis, soil corrosion survey, pipe condition assessment, and a list of necessary repair or replacement recommendations. The San Juan sanitary sewer force main, which is the longest force main in Belmont at nearly 5,000 linear feet, was identified for future rehabilitation due to severely corrosive soil conditions.

In 2017, City staff hired HydroScience Engineers to conduct a condition and capacity assessment of the City's sanitary sewer pump stations. The results of the assessment were summarized in a report containing recommendations and approximate cost estimates for repairs and upgrades. The San Juan and North Road Pump Stations were identified as top priorities for rehabilitation and upgrade due to their aging infrastructure, end-of-life condition, and capacity limitations.

In 2025, the City adopted the Belmont Sanitary Sewer Master Plan, which identified upgrades to the San Juan Pump Station, associated force main, and the downstream gravity pipe at the point of discharge as a priority short-term capital project.

Analysis

The City retained Schaaf & Wheeler to prepare the design, drawing on their extensive experience with similar sanitary sewer pump station projects. Plans and specifications have been completed, and the project is now ready to be advertised for construction.

Construction will include installation of a new precast concrete wet well and valve vault; four new pumps, discharge piping and valves, and related appurtenances; a new electric service and motor control center with associated wiring and sensors; and miscellaneous improvements to the existing pump station building. The project also includes construction of a new force main with access structures, a new gravity sewer main pipe; and manhole coating and modifications. These improvements are critical to maintaining reliable wastewater infrastructure and reducing the risk of sanitary sewer overflows.

Bids are anticipated to open in May 2026 with construction expected to begin in July 2026. Due to long lead times for specialized pump station equipment, project completion is anticipated in 2028. The Engineer's Estimate for construction is $6,908,000, including a 10% contingency.

Given the project's complexity, anticipated construction traffic impacts, and the need for ongoing coordination with the public, complexity of construction elements, dedicated construction management and inspection support is essential to maintain schedule, manage risks, and ensure successful project delivery. Staff solicited fee proposals from three on-call consultant firms, and Tanner Pacific, Inc. (TPI) was selected based on their demonstrated experience delivering similar underground utility construction projects. The cost for construction management, engineering support, inspection, and quality assurance services is $1,265,000.

Construction will result in significant traffic impacts throughout the duration of the project during working hours, particularly along San Juan Boulevard where the new force main will be constructed. Other affected areas include Cipriani Boulevard between Ralston Avenue and San Juan Boulevard, East Laurel Creek between San Juan Boulevard and Bay Court, and Lyall Way between Lake Road and Ralston Avenue. The City will implement a comprehensive public outreach program to keep residents informed and minimize disruptions throughout construction.

Alternatives

1. Take no action.
2. Refer to staff for additional information.

Attachments

A. Resolution
B. Plans
C. Specifications
D. Construction Management and Inspection Proposal from Tanner Pacific, Inc.

Fiscal Impact

☐ No Fiscal Impact

☒ Funding Source Confirmed:	The construction cost, including contingency, plus construction management services totaling $8,173,000 will come from the San Juan Pump Station Project (Account # 399-3-730-7089-9030 with $5,198,607 coming from the Sewer Collection Capital Fund and $2,774,653 from the Sewer Connection Fees Fund), and $199,740 will come from the Lyall Way Sewer Capacity Improvement Project funded by Sewer Connection Fees Fund (Account #399-3-710-7098-9030).

Source:	**Purpose:**	**Public Outreach:**
Staff	Statutory/Contractual Requirement	Posting of Agenda

RESOLUTION NO. 2026 –

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BELMONT APPROVING THE SAN JUAN PUMP STATION AND FORCE MAIN REHABILITATION PROJECT PLANS, BIDDING, AND CONSTRUCTION MANAGEMENT SERVICES (CONTRACT NO. 2026-645)

WHEREAS, the Department of Public Works and Schaaf & Wheeler have completed preparation of plans and specifications for the San Juan Pump Station and Force Main Rehabilitation Project, CCN 2026-645; and

WHEREAS, the project was budgeted from the Account #399-3-730-7089-9030/San Juan Pump Station Project, and Account #399-3-710-7098-9030/Lyall Way Sewer Capacity Improvement Project; and

WHEREAS, the construction phase of the project is estimated to be $6,280,000 plus a 10% construction contingency; and

WHEREAS, Tanner Pacific, Inc. was selected to provide the City with construction management and inspection services for an amount not to exceed $1,265,000.

NOW, THEREFORE, the City Council of the City of Belmont resolves as follows:

SECTION 1.
Approve Plans and Specifications for the San Juan Pump Station and Force Main Rehabilitation Project (City Contract No. 2026-645) are hereby approved.

SECTION 2. **Authorize to Advertise for Bids**
The City Clerk is authorized to advertise for sealed bids for the Project in accordance with applicable laws and procedures.

SECTION 3. **Authorize to Award Construction Contract**
The City Manager is authorized to negotiate and execute a construction contract with the lowest responsible and responsive bidder in an amount not to exceed $6,280,000, plus a contingency of up to 10%.

SECTION 4. **Approve Construction Management Services**
The City Manager is authorized to execute a task order with Tanner Pacific, Inc. for construction management services in an amount not to exceed $1,265,000.

* * *

ADOPTED April 14, 2026 by the City of Belmont City Council by the following vote:

Ayes:
Noes:
Absent:
Abstain:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

City Attorney

TANNER
PACIFIC

751 Laurel Street, Suite 609
San Carlos, CA 94070

March 20, 2026

Bozhena Palatnik, PE
Senior Engineer
Public Works Department
City of Belmont
One Twin Pines Lane, Suite 385 Belmont, CA 94002

Subject: Construction Management and Inspection Service for the City of Belmont
Project: San Juan Pump Station & Force Main Rehabilitation Project
City Contract 2025-645

Dear Ms. Palatnik,

Tanner Pacific, Inc. is pleased to submit the following proposal to provide Pre-Construction, Construction Management, and Inspection services for the San Juan Pump Station & Force Main Rehabilitation Project. Our proposed Preconstruction and Construction Management scope of services and proposed budget are attached, as requested.

The City of Belmont seeks a trusted, responsive partner to help guide this high-profile project to a successful outcome. TPI has the available resources, experience working together as a trusted partner with the City of Belmont, and a proven track record of successfully providing full CM and Inspection services on a variety of similar, complex projects.

Based on discussions with the City, we have included full-time inspection for the project with an option to add a second inspector. Should this project take longer than anticipated, we will need to discuss an amendment to our budget for the extra time.

Please contact me at (925) 260-0727 or jbrosnan@tannerpacific.com with any questions regarding this proposal. We appreciate this opportunity to provide continued services to the City of Belmont.

Sincerely,
Tanner Pacific, Inc.

J.D. Brosnan, P.E.
Director of Construction Management Services

Attachments
Exhibit I: Scope of Services
Exhibit II: Proposed Work Hours and Budget

EXHIBIT I

City of Belmont
San Juan Pump Station Project
Tanner Pacific, Inc.
Proposed Scope of Services Construction Management &Inspection

I. Construction Manager (CM)
A. Project Responsibilities
1. Construction Administration
a. Provide administrative services on a part-time basis to manage all documentation and communications throughout the project duration.
2. Meetings
a. Prepare Agendas, facilitate and provide record of discussions for all project related meetings including the Pre-Construction meeting.
3. Submittals
a. Receive all submittals, manage routing through the online Procore system and coordinate all comments to and from Pavement Engineering Inc. and the City.
4. Requests for Information (RFI)
a. Receive all requests for information (RFIs) from the Contractor and determine if the request is a valid RFI; if not, Tanner Pacific will return the RFI to the Contractor.
b. Route all other RFIs to Pavement Engineering Inc. and the City.
c. Review the response, verify acceptability of response and transmit the RFI response to the Contractor.
5. Change Order Preparation, Negotiation & Processing
a. Assist the City in preparing any change requests by the City. Work with all parties to negotiate an equitable resolution.
b. Prepare all documentation to adjust the original contract for any and all time and cost impacts.
6. Field Orders (FO) and Field Directives (FD)
a. In the event that the Contractor encounters a time sensitive problem where it is not practical to take time to negotiate a settlement, the CM will issue a FO. All work done under a FO will be completed on a time and material basis. The CM and the City will execute the FO.
7. Progress Payments
a. Assist the City with review and processing of the monthly progress payments.

8. Scheduling
    a. Document and transmit the City's written comments to the Contractor on the project schedule.

II. Field Inspection
A. Project Responsibilities
    1. Field Observation (When in the field)
        a. Provide full-time field observation services to monitor compliance with Contract Documents.
        b. Prepare a daily observation report documenting all observed field activities, field crews, Contractor equipment, and field problems. Information in the report will only reflect observations for the time the inspector was on site.
        c. Maintain the database, implemented by Tanner Pacific, for daily observation reports and photographs.
        d. Provide photographic documentation of the Project prior to construction and maintain photographs of observed field activities for status monitoring of the project.
        e. Tanner Pacific will not be responsible for information, photos or other actions that take place when our inspector is not on site.

III. Special Inspections, Testing **(City to contract these services)**
A. Schedule and coordinate special inspections materials testing, as needed. At a minimum:
    a. Backfill sampling and compaction testing
    b. Concrete quality, if needed
B. The City will contract for all other design-related services.

IV. Project Closeout
A. The Contractor will furnish record drawings, which Tanner Pacific will review for accuracy and completeness.
B. Tanner Pacific will forward accepted Record Drawings to Pavement Engineering Inc. and the City to prepare the final Record Drawings.
C. Final Inspection and Punch List.
    1. The City and Pavement Engineering Inc (if necessary) will participate and provide input on final inspection.
    2. Tanner Pacific will compile and issue the punch list with input from the City and Pavement Engineering Inc.
    3. Tanner Pacific to provide the City with notification when all Punch List items are complete, so the City may formally accept the project for record purposes.
D. Tanner Pacific to provide the City with project documentation electronically.

V. Warranty Coordination
A. The City will coordinate warranty work after the start of the warranty period.

(650) 585-4484 phone
www.tannerpacific.com

EXHIBIT II

City of Belmont
San Juan Pump Station & Force Main Rehabilitation Project
City Contract No. 2025-645
Construction Management/Inspection Services
Proposed Work Hours and Budget
Tanner Pacific, Inc.

19-Mar-26

Personnel/Service	Hours and Hourly Rates				Pre-Construction	Construction																	Close-Out
	Months	Hours	Rate	Amount	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26	Jan-27	Feb-27	Mar-27	Apr-27	May-27	Jun-27	Jul-27	Aug-27	Sep-27	Oct-27	Nov-27	Dec-27
Tanner Pacific Labor																								
Pre-Construction																								
Project Advisor/Principal		8	$ 300	$ 2,400	8																			
CM/PM		20	$ 240	$ 4,800	20																			
Office Engineer		40	$ 160	$ 6,400	40																			
Inspector		40	$ 235	$ 9,400	40																			
Pre-Construction Subtotal				$ 23,000																				
Construction																								
Project Advisor/Principal		76	$ 300	$ 22,800		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
CM/PM		1,120	$ 240	$ 268,800		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	40
Office Engineer		1,520	$ 160	$ 243,200		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Inspector		2,880	$ 235	$ 676,800		80	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	80
Construction Subtotal				$ 1,211,800																				
Other Direct Costs																								
Inspector Vehicle	19		$1,600	$ 30,400		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ODC Subtotal				$ 30,400																				
Optional Services																								
Additional Inspection		1,360	$250	$ 340,000				80	160	160	160	160	160	160	160	160								
Additional ODC (Inspector Vehicle)	8.0		$1,600	$ 12,800					1	1	1	1	1	1	1	1								
Optional Services Subtotal				$ 352,800																				
Total (w/out Optional Services)				$ 1,265,000																				
Total (w/ Optional Services)				*$ 1,617,800*																				

Notes and Assumptions:

Start of Services	1-Jun-26
Construction NTP	15-Apr-26
Close Out	31-Dec-27

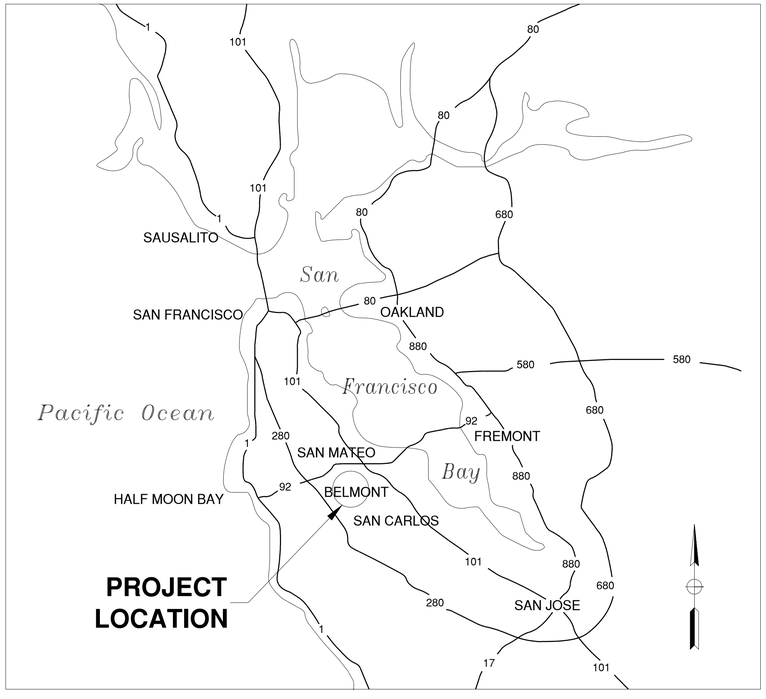
1. Budget is based on the service start dates laid out above.
2. TPI rates include normal operating and home office expenses such as telephone, computers, in-house reproduction. The budget does not include any expenses for a field trailer.
3. Budget is based on the construction duration shown above. Time extensions will require an amendment to cover the additional costs.
4. Hours shown for preconstruction are for document review, setup of preconstruction meeting, etc. Constructability review scope is not requested for this work.
5. Services are provided on an hourly basis. Tanner Pacific, Inc. has no obligation to provide services above the budget without a fee adjustment.
6. This estimate is being provided based on incomplete construction documents without a firm date for start of services.
7. Project involves construction work which may continue beyond scheduled work hours. This budget does not include OT. OT rates are one and one-half times the standard hourly rate.
8. Inspector hourly wages are subject to California Prevailing Wage.
9. An escalation rate not to exceed 5% will be applied to proposed Billing Rates for the prior year on January 1st of each subsequent year of the contract.
10. All Subconsultants invoiced at cost plus 10 percent markup.

CITY OF BELMONT

SAN MATEO COUNTY, CALIFORNIA

SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT

CITY CONTRACT NUMBER 2025-645



VICINITY MAP

NO SCALE

CITY COUNCIL

MAYOR	JULIA MATES
VICE MAYOR	CATHY JORDAN
COUNCILMEMBER	ROBIN PANG-MAGANARIS
COUNCILMEMBER	GINA LATIMERLO
COUNCILMEMBER	TOM MCCUNE

STAFF

CITY MANAGER	AFSHIN OSKOUI
CITY ATTORNEY	SCOTT RENNIE
CITY CLERK	JOZI PLUT

APPROVED BY CITY COUNCIL ON _____

EDRIC KWAN - DIRECTOR OF PUBLIC WORKS

DRAWING INDEX

SHEET #	DRAWING #	TITLE
1	T1	TITLE SHEET
2	T2	NOTES, LEGEND, & ABBREVIATIONS
3	T3	MAP INDEX
4	C1	SSFM PLAN & PROFILE
5	C2	SSFM PLAN & PROFILE
6	C3	SSFM PLAN & PROFILE
7	C4	SSFM PLAN & PROFILE
8	C5	SSFM PLAN & PROFILE
9	C6	SSFM PLAN & PROFILE
10	C7	SSFM PLAN & PROFILE
11	C8	SSFM PLAN & PROFILE
12	C9	SSFM PLAN & PROFILE
13	C10	SSFM PLAN & PROFILE
14	C11	GRAVITY SEWER PLAN & PROFILE
15	C12	LYALL GRAVITY SEWER PLAN & PROFILE
16	C13	BUILDING DEMOLITION PLAN
17	C14	BUILDING DEMOLITION SECTIONS
18	C15	BUILDING IMPROVEMENT SECTIONS
19	C16	BUILDING IMPROVEMENT PLAN
20	C17	PUMP STATION PLAN
21	C18	PUMP STATION SECTION
22	C19	VALVE VAULT SECTION
23	D1	DETAILS
24	D2	DETAILS
25	D3	DETAILS
26	D4	DETAILS
27	D5	DETAILS
28	E01	ELECTRICAL SYMBOLS & ABBREVIATIONS
29	E02	SWITCHBOARD ONE-LINE & ELEVATION
30	E03	ONE-LINE & ELEVATIONS
31	E04	ELEMENTARY DIAGRAM
32	E05	MIXER PANEL ELEMENTARY & ELEVATION
33	E06	CONTROL PANEL ELEVATION & LAYOUT
34	E07	CONTROL PANEL POWER DISTRIBUTION DIAGRAM
35	E08	APPLICATION MANAGER WIRING DIAGRAM
36	E09	PLC I/O WIRING DIAGRAMS
37	E10	PLC I/O WIRING DIAGRAMS
38	E11	PLC I/O WIRING DIAGRAMS
39	E12	PLC I/O WIRING DIAGRAMS
40	E13	BUILDING POWER & CONTROL PLAN
41	E14	LIGHTING & RECEPTACLE PLAN
42	E15	WETWELL AREA ELECTRICAL PLAN
43	E16	UTILITY PLAN
44	E17	ELECTRICAL DEMOLITION PLAN
45	E18	MISSION WIRING DIAGRAM
46	E19	WETWELL TERMINATION PANELS
47	E20	ELECTRICAL DETAILS 1
48	E21	ELECTRICAL DETAILS 1
49	I01	INSTRUMENTATION SYMBOLS & ABBREVIATIONS
50	I02	SAN JUAN PUMP STATION P&ID
51	I03	SAN JUAN PUMP STATION P&ID
52	S1	TYPICAL NOTES, SPECIFICATIONS, & DETAILS
53	S2	STATEMENT OF SPECIAL INSPECTIONS
54	S3	FOUNDATION PLANS & DETAILS
55	S4	ROOF FRAMING PLAN & DETAILS

USA AGENCY INDEX

CITY OF BELMONT - PUBLIC WORKS	(650) 595-7427
CITY OF BELMONT - POLICE	(650) 595-7400
AT&T	(800) 210-2355
PACIFIC GAS & ELECTRIC	(800) 743-5000
MID PENINSULA WATER DISTRICT	(650) 591-8941
COMCAST	(800) 266-2278
RECOLOGY	(650) 595-3900
SAN MATEO COUNTY TRANSIT DISTRICT	(800) 660-4287

NO	REVISIONS	DATE	APPR
1			
2			
3			
4			
5			
6			
7			

CITY OF BELMONT PUBLIC WORKS

SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
(707) 528-4848

REGISTERED PROFESSIONAL ENGINEER — BRIAN L. PRICE — NO. 74913 — CIVIL — STATE OF CALIFORNIA

04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
TITLE SHEET

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

T1

SHEET: 1 OF 55

GENERAL NOTES

1. CONTRACTOR SHALL MAINTAIN A COPY OF THE PROJECT PLANS ON THE JOBSITE AT ALL TIMES.
2. ALL WORK SHALL CONFORM TO THE PROJECT PLANS AND THE CITY OF BELMONT STANDARD DETAIL DRAWINGS FOR CONSTRUCTION AND OTHER SPECIFICATIONS REFERENCED THEREIN.
3. CONTRACTOR SHALL CONDUCT WORK IN ACCORDANCE WITH THE GREENBOOK STANDARD SPECIFICATIONS, CALTRANS STANDARD SPECIFICATIONS, AND CITY'S SPECIFICATIONS.
4. NO CHANGE TO THE PROJECT IMPROVEMENT PLANS SHALL BE PERMITTED WITHOUT PRIOR APPROVAL BY THE CITY ENGINEER AND DESIGN ENGINEER.
5. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CITY AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT TO THE EXTENT ARISING FROM THE SOLE NEGLIGENCE OF THE CITY OR ENGINEER.
6. CONTRACTOR SHALL SECURE A NO FEE ENCROACHMENT PERMIT FROM THE CITY ENGINEERING DEPARTMENT PRIOR TO COMMENCEMENT OF WORK.
7. CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY OWNERS 48 HOURS PRIOR TO COMMENCEMENT OF WORK ADJACENT TO THE UTILITY. CONTACT UNDERGROUND SERVICE ALERT (USA) AT 811 OR 1-800-227-2600. CONTRACTOR SHALL ENSURE UTILITIES ARE MARKED PRIOR TO START OF EXCAVATION ACTIVITIES. MARKINGS OF EXISTING WATER LINES AND FORCE MAINS MAY BE APPROXIMATE AND CONTRACTOR SHALL USE CAUTION WHEN EXCAVATING NEAR UTILITY MARKINGS.
8. THE CONTRACTOR SHALL NOTIFY, BY CIRCULAR, ALL BUSINESS ESTABLISHMENTS AND RESIDENCES LOCATED IN AREAS AFFECTED BY THE WORK ONE WEEK PRIOR TO START OF CONSTRUCTION. AT A MINIMUM, ALL RESIDENTS AND BUSINESS ESTABLISHMENTS WITHIN 100 FEET OF THE WORK AREAS SHALL BE NOTIFIED. A DRAFT OF THE CIRCULAR SHALL BE SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL.
9. ALL SURPLUS AND UNSUITABLE MATERIAL SHALL BE REMOVED FROM PUBLIC RIGHT-OF-WAY.
10. CONTRACTOR SHALL PROVIDE ADEQUATE DUST CONTROL AND KEEP MUD AND DEBRIS OFF THE PUBLIC RIGHT-OF-WAY AT ALL TIMES.
11. ALL TRENCHES AND EXCAVATIONS SHALL BE CONSTRUCTED IN STRICT COMPLIANCE WITH THE APPLICABLE SECTIONS OF CALIFORNIA AND FEDERAL O.S.H.A. REQUIREMENTS AND OTHER APPLICABLE SAFETY ORDINANCES. CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR TRENCH SHORING DESIGN AND INSTALLATION.
12. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT IN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE PERMITTED, EXCEPT AT LOCATION(S) APPROVED BY THE CITY TRAFFIC ENGINEER.
13. CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MEN, CONES OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH THE SPECIFICATIONS.
14. THE CONTRACTOR SHALL OBTAIN A PERMIT/WATER METER AND BACKFLOW FROM MID-PENINSULA WATER DISTRICT (MPWD) FOR CONSTRUCTION WATER OBTAINED FROM THE CITY HYDRANT, CALL (650) 591-8941, A FEE AND DEPOSIT WILL BE REQUIRED.
15. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY. ALL EXCAVATIONS SHALL BE PLATED WITH NON-SKID PLATES WHEN INACTIVE. BARRICADES WITH LIGHTS SHALL DELINEATE CONSTRUCTION ZONE.
16. CONTRACTOR SHALL COMPLY WITH BEST MANAGEMENT PRACTICES OF CITY'S NPDES PERMIT FOR PROTECTION OF STORM WATER QUALITY.
17. CONTRACTOR SHALL VISIT SITES WITHIN THE STREET RIGHT OF WAY PRIOR TO SUBMITTING BID.
18. CONTRACTOR SHALL RESTORE SURFACE TO PRE-CONSTRUCTION CONDITIONS.
19. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPLACE ALL STREET MONUMENTS, LOT CORNER PIPES, AND GRADE STAKES DISTURBED DURING THE PROCESS OF CONSTRUCTION AT THE DIRECTION OF THE CITY. LOCATIONS OF ANTICIPATED STREET MONUMENT REPLACEMENT IS INDICATED ON THE PLANS. STREET MONUMENT REPLACEMENT SHALL BE DONE IN CONFORMANCE W/ DETAIL (9/D3) & SPECIFICATION SECTION 02318-3.04.
20. ALL DISTURBED PAVEMENT STRIPING AND MARKERS SHALL BE REPLACED BY THE CONTRACTOR. ALL DISTURBED MARKINGS AND STENCILS SHALL BE REPLACED IN FULL. ALL STRIPING, MARKINGS, AND STENCILS SHALL BE THERMOPLASTIC. PAVEMENT STRIPING AND MARKINGS SHALL ADHERE TO THE CALTRANS STANDARD SPECIFICATION SECTION 84 AND 85.
21. SURVEY DATA IS LIMITED TO THE SITE OF THE PUMP STATION AND DISCHARGE MANHOLE. ELEVATION DATA FOR ALL OTHER LOCATIONS IS APPROXIMATE AND IS BASED ON THE CITY'S BASEMAP DATA.
22. EXCEPT FOR SURVEYED LOCATIONS; ELEVATIONS, SLOPES, LENGTHS AND STATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE BASED ON GIS DATA, ORIGINAL UTILITY DRAWINGS, AND FIELD MEASUREMENTS. THE CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS, DISTANCES, AND ALIGNMENTS. WHERE REPLACING GRAVITY SEWER, CONSTRUCT (N) PIPES WITH CONTINUOUS SLOPE BETWEEN (E) MH INVERT ELEVATIONS.
23. IF FIELD ELEVATIONS AND MEASUREMENTS ARE SIGNIFICANTLY DIFFERENT THAN WHAT IS SHOWN ON THE PLANS, CONTRACTOR SHALL NOTIFY THE CITY PRIOR TO PROCEEDING WITH CONSTRUCTION OF THE IMPROVEMENTS. FIELD ADJUSTMENTS MAY BE NECESSARY TO PROVIDE ADEQUATE PIPE SLOPE, PIPE COVER, CLEARANCE FROM EXISTING UTILITIES, AND TO CONSTRUCT THE IMPROVEMENTS. FORCE MAIN CANNOT CHANGE FROM POSITIVE SLOPE TO NEGATIVE SLOPE WITHOUT THE INSTALLATION OF AN AIR VALVE.
24. NOT ALL EXISTING UTILITIES ARE SHOWN ON THE DRAWINGS. THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE AND BASED ON UTILITY MAPS PROVIDED BY THE CITY, AT&T, COMCAST, MPWD, AND PG&E. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCURATELY LOCATE ALL EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES THAT MAY BE AFFECTED BY NEW FACILITIES IN THIS CONTRACT. REPORT POTENTIAL CONFLICTS TO THE CITY ENGINEER PRIOR TO EXCAVATING FOR NEW FACILITIES.
25. EXISTING UTILITY SERVICE LINES ARE NOT SHOWN ON PLANS. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL POTENTIAL UTILITY CONFLICTS PRIOR TO INSTALLING NEW PIPE.

OPEN TRENCH CONSTRUCTION

1. OPEN TRENCH CONSTRUCTION SHALL BE DONE IN CONFORMANCE W/ DETAIL (1/D1) W/ A TRENCH CUTOFF CUTOFF WALL AT APPROXIMATELY 200-FOOT INTERVALS PER (2/D1) WHERE (N) GRAVITY SEWER OR FORCE MAIN PIPE IS 5-FEET OR LESS FROM WATER MAIN, BACKFILL W/ CDF PER DETAIL (4/D1)
2. ANY DAMAGED OR REMOVED CONCRETE CURB AND GUTTERS SHALL BE REPLACED PER (7/D1) & (8/D1)

WATER NOTES

1. LOCATIONS WHERE NEW GRAVITY SEWER OR FORCE MAIN IS TO BE CONSTRUCTED MUST MEET THE FOLLOWING REQUIREMENTS WHERE HORIZONTAL SEPARATION WITH THE WATER MAIN IS LESS THAN 10 FEET:
   - 1.1. ALL PIPE SHALL EITHER BE INSTALLED WITH RUBBER RING JOINTS OR FUSED JOINTS IN ACCORDANCE WITH THE SPECIFICATIONS.
   - 1.2. LOCATIONS WHERE HORIZONTAL FORCE MAIN AND WATER MAIN SEPARATION DISTANCE IS LESS THAN 5 FEET: BACKFILL USING CDF PER DETAIL (4/D1).
   - 1.3. BACKFILL EXPOSED WATER MAIN W/ CDF. WRAP EXPOSED PORTION OF WATER MAIN W/ V-BIO POLYETHYLENE PRIOR TO BACKFILLING W/ CDF.
   - 1.4. WATER MAIN SHUT DOWN REQUIREMENTS:
     - 1.4.1. IS TYPICALLY REQUIRED WHEN EXCAVATION OCCUR WITHIN 5 FEET OF THE WATER MAIN. CONTRACTOR SHALL CONTACT MPWD AT LEAST 3 WORKING DAYS PRIOR TO BURSTING OR EXCAVATION WITHIN 5 FEET OF WATER MAIN SO THE DISTRICT CAN SHUT DOWN THE WATER MAIN.
     - 1.4.2. CONTRACTOR SHALL LIMIT SHUT DOWNS TO RESIDENCES A MAXIMUM OF TWO TIMES FOR A MAXIMUM 6 HOUR PERIOD. CONTRACTOR SHALL CONTACT MPWD AT LEAST 3 DAYS IN ADVANCE TO SCHEDULE A TEMPORARY WATER SHUT DOWN. TEMPORARY WATER SHUT DOWNS ARE ONLY PERMITTED FROM TUESDAY THOUGH FRIDAY.
2. WATER SERVICE LATERALS WILL BE ENCOUNTERED DURING OPEN TRENCH CONSTRUCTION. WATER SERVICE LINES ARE NOT SHOWN ON THE PLANS. CONTRACTOR SHALL USE CARE WHEN WORKING AROUND WATER SYSTEMS. CONTRACTOR SHALL LOCATE, CAREFULLY EXPOSE, AND PROTECT WATER SERVICE CROSSINGS DURING CONSTRUCTION. ANY REPAIRS PERFORMED BY MPWD DUE TO A WATER MAIN OR SERVICE BREAK DUE TO CONTRACTOR ACTIVITIES WILL BE BILLED TO THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY REPAIRS TO PUBLIC AND PRIVATE IMPROVEMENTS INCLUDING, BUT NOT LIMITED TO PROPERTY DAMAGE AND LANDSCAPING THAT IS A RESULT OF THE CONTRACTOR'S CONSTRUCTION ACTIVITIES. IN THE EVENT THAT A WATER MAIN OR SERVICE IS DAMAGED, CONTRACTOR SHALL NOTIFY MID-PENINSULA WATER DISTRICT (MPWD) IMMEDIATELY.
3. **CONTRACTOR SHALL HAVE AT LEAST TWO (2) WATER SERVICE REPAIR CLAMPS, SMITH-BLAIR 244 FULL CIRCLE RED-CLAMP W/ 304 SS BAND AND SS BOLTS, FOR 6" CAST IRON PIPE, ON SITE DURING ALL GROUND DISTURBING ACTIVITIES.** CONTRACTOR SHALL SUBMIT REPAIR CLAMP PRODUCT DATA AND RECEIVE APPROVAL PRIOR TO ANY POTHOLING OR EXCAVATION WORK. CONTRACTOR SHALL REPAIR ANY SERVICE LATERALS AND ALLOW MPWD TO INSPECT IT PRIOR TO BACKFILLING.
4. EXISTING WATER MAIN BENDS ARE LIKELY TO HAVE THRUST BLOCKS. DO NOT DISTURB THE SOIL NEAR WATER MAIN BENDS WITHOUT MPWD APPROVAL. REPLACE ALL DISTURBED OR REMOVED THRUST BLOCKS.
5. CONTRACTOR SHALL POTHOLE ALL WATER MAINS AND WATER SERVICE LINES PRIOR TO CONSTRUCTION. POTHLING REPORTS SHALL BE SUBMITTED TO THE ENGINEER AND MPWD A MINIMUM OF TWO WEEKS PRIOR TO INSTALLING NEW PIPE AT THE WATER MAIN OR SERVICE CROSSING LOCATION. THE FORCE MAIN ALIGNMENT MAY NEED TO BE ADJUSTED TO MEET MINIMUM CLEARANCE REQUIREMENTS.
6. 6. THE NEW SEWER FORCE MAIN SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 18 INCHES BETWEEN ALL WATER MAIN CROSSINGS AND 12 INCHES BETWEEN WATER SERVICE LINE CROSSINGS. THE FORCE MAIN ALIGNMENT MAY NEED TO BE ADJUSTED TO MEET THE CLEARANCE REQUIREMENTS.

BENCHMARK

1. CINQUINI & PASSARINO CONTROL POINT NO. 6, BEING A SET MAG NAIL & WASHER "CINQUINI & PASSARINO CONTROL" ALONG SAN JUAN BOULEVARD AS SHOWN HEREON.
   ELEVATION = 385.94' (NAVD 88)
2. THE ORTHOMETRIC ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 1988) AND WERE DETERMINED BY STATIC GPS TIES TO CGPS STATION P178 WITH A PUBLISHED ELLIPSOIDAL HEIGHT OF 425.081,' IN ADDITION TO APPLYING THE NGS GEOID HEIGHT MODEL "GEOID2018."

BASIS OF BEARINGS

1. THE BASIS OF BEARINGS FOR THE SURVEY IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 3, NAD 83, EPOCH 2017.50 AS DETERMINED LOCALLY BY A LINE BETWEEN CONTINUOUS GLOBAL POSITIONING SYSTEMS (CGPS) STATION P176 AND STATION P178; BEING NORTH 18'35'30" EAST AS DERIVED FROM GEODETIC VALUES PUBLISHED BY THE CALIFORNIA SPATIAL REFERENCE CENTER (CSRC).

FLOW RATES

1. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SEWER SERVICE AT ALL TIMES DURING CONSTRUCTION.
2. THE ESTIMATED PEAK WET WEATHER FLOW (PWWF) RATES AT VARIOUS LOCATIONS ARE LISTED IN THE TABLE BELOW. PWWF IS APPROXIMATELY 6X HIGHER THAN PEAK DRY WEATHER FLOW (PDWF)
3. SEE TECHNICAL SPECIFICATIONS SECTION 01531 FOR ADDITIONAL REQUIREMENTS.

SEWER FLOW DATA	
LOCATION	FLOW RATE (GPM)
HASKINS PS PWWF (AT SSMH # 432401B)	354
GRAVITY PWWF (AT SSMH # 432406)	1,329
SAN JUAN PS PWWF	1,683
EXISTING MEASURED SAN JUAN PS FLOW RATE	940
PROPOSED PUMP STATION FIRM CAPACITY	1780

ARBORIST NOTES AND TREE PRESERVATION

1. NO CUTTING OF ANY PART OF PRIVATE OR CITY TREES, INCLUDING ROOTS, SHALL BE DONE WITHOUT SECURING APPROVAL AND DIRECT SUPERVISION FROM THE CITY ARBORIST.
2. CONTRACTOR SHALL NOTIFY CITY ARBORIST 72-HOURS IN ADVANCE OF ANY WORK REQUIRING DIGGING AROUND OR WITHIN THE DRIP LINE OF EXISTING TREES.
3. NO TRENCHING SHALL BE DONE WITHIN THE DRIP LINE OF EXISTING TREES WITHOUT THE APPROVAL OF THE CITY ARBORIST. OPEN TRENCHING IN THE ROOT ZONE OF A PUBLIC TREE IS PROHIBITED EXCEPT IN CASES WHERE THE TRENCHING FALLS OUTSIDE THE DRIP LINE OF THE TREE INVOLVED. EXCEPTIONS WILL BE ALLOWED IF , IN THE OPINION OF THE CITY ARBORIST, THE IMPACT OF TRENCHING UPON THE TREE WILL BE NEGLIGIBLE.
4. IF INJURY SHOULD OCCUR TO ANY TREE DURING CONSTRUCTION, IT MUST BE REPORTED TO THE CITY/PROJECT ARBORIST WITHIN 6 HOURS SO THAT APPROPRIATE TREATMENTS CAN BE APPLIED. THE CITY ARBORIST SHALL BE THE SOLE JUDGE OF THE CONDITION OF ANY TREE.
5. NO MATERIALS, EQUIPMENT, FUELS, PAINT, SPOIL, WASTE, OR WASH-OUT WATER MAY BE DEPOSITED, STORED, OR PARKED WITHIN THE DRIP-LINE OF A TREE.
6. IT IS THE CONTRACTORS RESPONSIBILITY TO CLEAR VEGETATION AS REQUIRED FOR ACCESS TO THE SITES. NO ADDITIONAL COST SHALL BE PAID BY THE CITY FOR THIS WORK.

TRAFFIC CONTROL

1. CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL PRIOR TO THE PRE-CONSTRUCTION MEETING AS SPECIFIED IN SPECIFICATION SECTION 01120-1.10.
2. CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC TO THE MAXIMUM EXTENT POSSIBLE. CONTRACTOR MAY PERFORM TEMPORARY STREET SHUT DOWNS AND DETOUR TRAFFIC WHEN NECESSARY. NECESSARY ROAD CLOSURE IS LIMITED TO THE HOURS OF 9 AM TO 3 PM.
3. CONTRACTOR SHALL INSTALL A CHANGEABLE MESSAGE SIGN (CMS) ON SAN JUAN BLVD AT LEAST 2 WEEKS PRIOR TO CONSTRUCTION. THE CMS SHALL REMAIN ONSISTE UNTIL ALL WORK IS COMPLETE. ALL MESSAGES SHALL BE APPROVED BY THE CITY.

PROJECT STATION LINE

1. THE PROJECT STATION LINE IS BASED ON THE ALIGNMENT OF THE EXISTING GRAVITY SEWER SYSTEM FROM THE CENTER OF MANHOLE TO CENTER OF MANHOLE AS SHOWN ON THE PLANS. THE LOCATION OF THE MANHOLES IS APPROIMATE BASED ON CITY BASEMAPS AND FIELD MEASUREMENTS.

FORCE MAIN ALIGNMENT

1. THE PROPOSED FORCE MAIN ALIGNMENT IS APPROXIMATE AND IS BASED ON CITY BASEMAPS, AVAILABLE UTILITY DATA, AND FIELD MEASUREMENTS. THE ALIGNMENT INCORPORATES MULTIPLE CURVES AND BENDS TO AVOID CONFLICTS WITH EXISTING UTILITIES AND TO MAINTAIN REQUIRED CLEARANCES FROM EXISTING WATER MAINS AND SERVICES. THE CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING UTILITIES. THE CONTRACTOR SHALL ALSO MARK THE PROPOSED FORCE MAIN ALIGNMENT USING STATIONING AND OFFSETS FROM THE GRAVITY SEWER MAIN (WHICH SERVES AS THE BASIS FOR THE PROJECT STATION LINE). WHERE STATION AND OFFSET DATA IS NOT PROVIDED, THE CONTRACTOR SHALL UTILIZE SCALED MEASUREMENTS FROM THE PLANS TO MARK THE PROPOSED FORCE MAIN ALIGNMENT.
2. THE CONTRACTOR SHALL MARK THE EXISTING UTILITIES AND PROPOSED FORCE MAIN ALIGNMENT A MINIMUM OF TWO WEEKS PRIOR TO CONSTRUCTION AND SHALL SCHEDULE A SITE VISIT WITH THE CITY AND ENGINEER TO REVIEW AND ADJUST THE ALIGNMENT AS NECESSARY TO AVOID CONFLICTS AND TO MEET MINIMUM CLEARANCES TO EXISTING WATER MAINS AND SERVICES.
3. NOT ALL FORCE MAIN ELBOWS ARE SHOWN ON THE PLANS. THE CONTRACTOR SHALL BEND THE PIPE WITHIN THE MANUFACTURER'S RECOMMENDED LIMITS AS NECESSARY TO ACCOMMODATE THE FORCE MAIN ALIGNMENT, AND INSTALL FABRICATED ELBOWS WHERE NECESSARY. NO ADDITIONAL COMPENSATION WILL BE GRANTED FOR FORCE MAIN FITTINGS AND ELBOWS.
4. THE FORCE MAIN ALIGNMENT IS IDENTIFIED IN THE TABLE BELOW WITH THE STATION AND OFFSET FROM THE PROJECT STATION LINE (EXISTING GRAVITY SEWER ALIGNMENT).

STATION	REFERENCE	OFFSET	INVERT ELEVATION (ft)
1+42	SSMH 431644A	4.66' LT	181.39
2+58	SSMH 431644	3.36' LT	182.87
4+58	SSMH 431645A	7.37' LT	189.75
5+78	SSMH 431645	5.77' LT	190.04
6+16	SSMH 431602	8.56'LT	190.15
7+39	SSMH 431604	6.32' LT	195.61
8+64	SSMH 431605	7.95' LT	202.03
9+70	SSMH 431606	8.59' LT	210.07
11+83	SSMH 431607	7.11' LT	210.96
12+63	SSMH 431608A	4.64' LT	214.29
13+62	SSMH 431608	5.25' LT	216.10
14+06	SSMH 431609	8.08' LT	216.90
17+28	SSMH 431610	5.78' LT	231.03
18+74	SSMH 431611	5.19' LT	232.56
19+93	SSMH 431701	8.36' LT	233.80
21+24	SSMH 431702	3.93' LT	238.17
23+23	SSMH 431703	4.08' LT	243.62
23+95	SSMH 431704	3.61' LT	246.49
25+67	SSMH 431705	29.45'LT	248.01
26+84	SSMH 431706	6.01' LT	254.12
27+91	SSMH 431707	2.90' RT	255.47
29+99	SSMH 431708A	5.68' RT	265.84
30+82	SSMH 431708	6.14' LT	274.87
32+43	SSMH 431709	14.97' LT	289.00
33+05	SSMH 431710	3.43' RT	291.70
33+95	SSMH 431801	3.33' RT	304.89
35+25	SSMH 433201	5.73' LT	310.48
35+75	SSMH 433202	7.24' LT	312.64
38+71	SSMH 433203	8.42' LT	328.54
40+95	SSMH 433204	5.71' LT	339.98
43+81	SSMH 433205	6.64' LT	351.11
46+90	SSMH 433206	6.88' LT	368.59
48+55	SSMH 442605	21.34' RT	380.17

LEGEND

	EXISTING	PROPOSED
STORM DRAIN	SD	
SANITARY SEWER	SS	SS
ABANDONED SANITARY SEWER	/SS/ /SS/	
SANITARY SEWER FORCE MAIN	SSFM	SSFM
ABANDONED FORCE MAIN	/FM/ /FM/	
WATER LINE	W	
GAS LINE	G	
ABANDONED GAS LINE	/G/	
UNDERGROUND ELECTRICAL	UE UE	
UNDERGROUND TELECOMMUNICATION	T T	
OVERHEAD ELECTRICAL/ TELECOMMUNICATION	OHE OHE	
EDGE OF PAVEMENT		
SIDEWALK		
FENCE	x x x	
PROPERTY LINE		
SANITARY SEWER MANHOLE		
STORM DRAIN MANHOLE		
STORM DRAIN INLET		
WATER VALVE		
FIRE HYDRANT		
SURVEY MONUMENT		
SEWER FLOW DIRECTION		

ABBREVIATIONS

AB	AGGREGATE BASE	FM	FORCE MAIN
ABS	ACRYLONITRILE BUTADIENE STYRENE PIPE	FRP	FIBER REINFORCED PLASTIC
AC	ASPHALTIC CONCRETE	FT	FOOT
ACP	ASPHALTIC CONCRETE PIPE	GND	GROUND
APPROX	APPROXIMATE	GPM	GALLONS PER MINUTE
APN	ASSESSORS PARCEL NUMBER	HB	HOSE BIB
ASPH	ASPHALT	HDPE	HIGH DENSITY POLYETHYLENE
CB	CATCH BASIN	HOR.	HORIZONTAL
CCTV	CLOSED CIRCUIT TELEVISION	I.D.	INSIDE DIAMETER
CIPP	CAST IN PLACE PIPE	INV	INVERT
CONC	CONCRETE	L	LENGTH
CDF	CONTROLLED DENSITY FILL	LF	LINEAR FOOT
CLR	CLEARANCE	LH	LAMPHOLE
CMP	CORRUGATED METAL PIPE	LT.	LEFT
CMU	CONCRETE MASONRY UNIT	MH	MANHOLE
CVR	COVER	MAX	MAXIMUM
CI	CAST IRON	MIN	MINIMUM
CIP	CAST IRON PIPE	MPWD	MID-PENINSULA WATER DISTRICT
CIPP	CURED IN PLACE PIPE	(N)	NEW
CO	CLEANOUT	N	NORTH
DEG	DEGREE	NTS	NOT TO SCALE
DIA	DIAMETER	OD	OUTSIDE DIAMETER
DIP	DUCTILE IRON PIPE	(P)	PROPOSED
DE	DRAINAGE EASEMENT	PCC	PORTLAND CEMENT CONCRETE
DEPT.	DEPARTMENT	PDWF	PEAK DRY WEATHER FLOW
DO	DOWN STREAM	PH	POTHOLE
E	EAST	PT	PRESSURE TREATED
ELEV, EL	ELEVATION	PUE	PUBLIC UTILITY EASEMENT
EXIST, (E)	EXISTING	PVC	POLYVINYL CHLORIDE PIPE
FL	FLOW LINE	PWWF	PEAK WET WEATHER FLOW
Q	FLOW RATE		
R	RADIUS		
RCB	REINFORCED CONCRETE BOX		
RCP	REINFORCED CONCRETE PIPE		
REINF.	REINFORCED, REINFORCING		
REL	RELATIVE		
REQD	REQUIRED		
RT.	RIGHT		
S	SOUTH, SLOPE		
SD	STORM DRAIN		
SDE	STORM DRAIN EASEMENT		
SDR	STANDARD DIMENSION RATIO		
SIM	SIMILAR		
SPECS	SPECIFICATIONS		
SS	STAINLESS STEEL, SANITARY SEWER		
SSMH	SANITARY SEWER MANHOLE		
SSLH	SANITARY SEWER LAMPHOLE		
STA	STATION		
STD	STANDARD		
STR.	STRUCTURE		
TFL	TOP OF FLOW LINE		
TG	TOP GRATE		
TYP	TYPICAL		
U.N.O.	UNLESS NOTED OTHERWISE		
UP	UPSTREAM		
VCP	VITRIFIED CLAY PIPE		
VER.	VERTICAL		
W	WEST, WATER		
W/	WITH		
X-ING	CROSSING		

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CITY OF BELMONT PUBLIC WORKS

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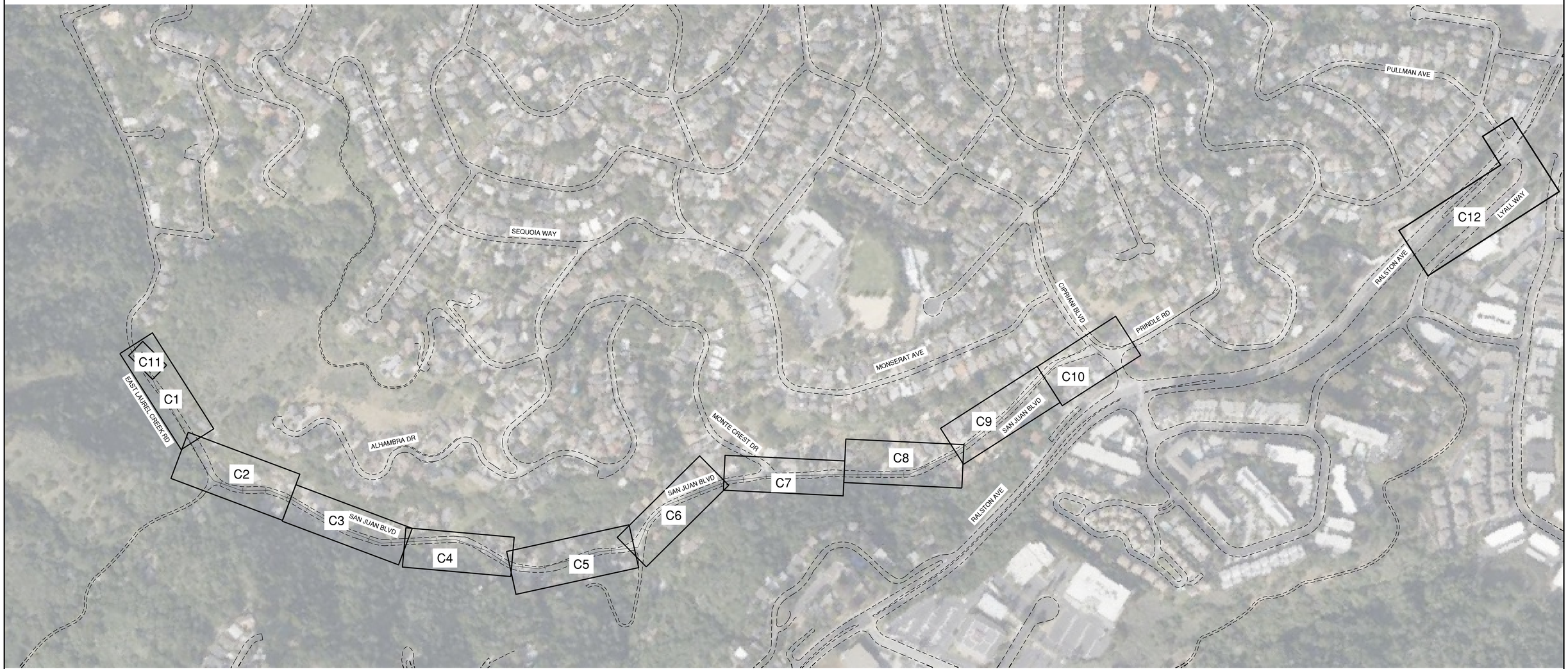
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04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
NOTES, LEGEND, AND ABBREVIATIONS

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

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SHEET: 2 OF 55



INDEX MAP
SCALE: 1" = 200'

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SCALE: 1 INCH = 200 FEET

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CITY OF BELMONT PUBLIC WORKS

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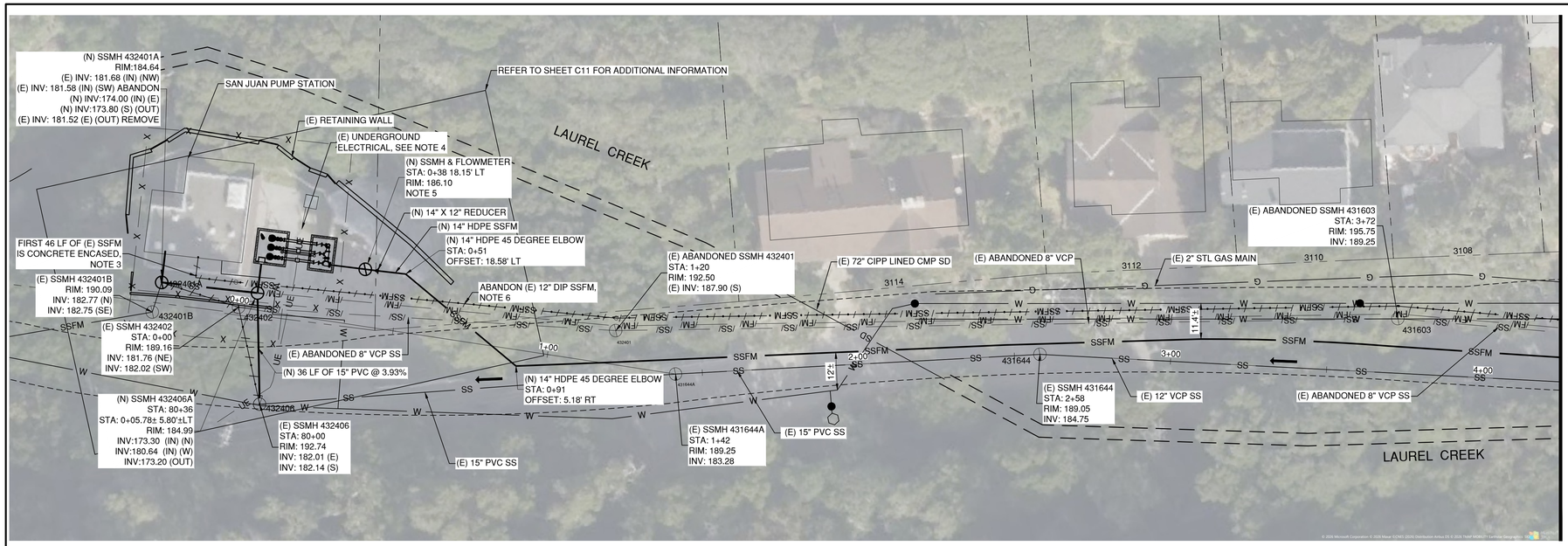
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BRIAN L. PRICE
No. 74813
CIVIL
STATE OF CALIFORNIA
04/10/26

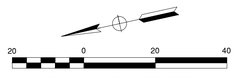
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
MAP INDEX

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SHEET: 3 OF 55





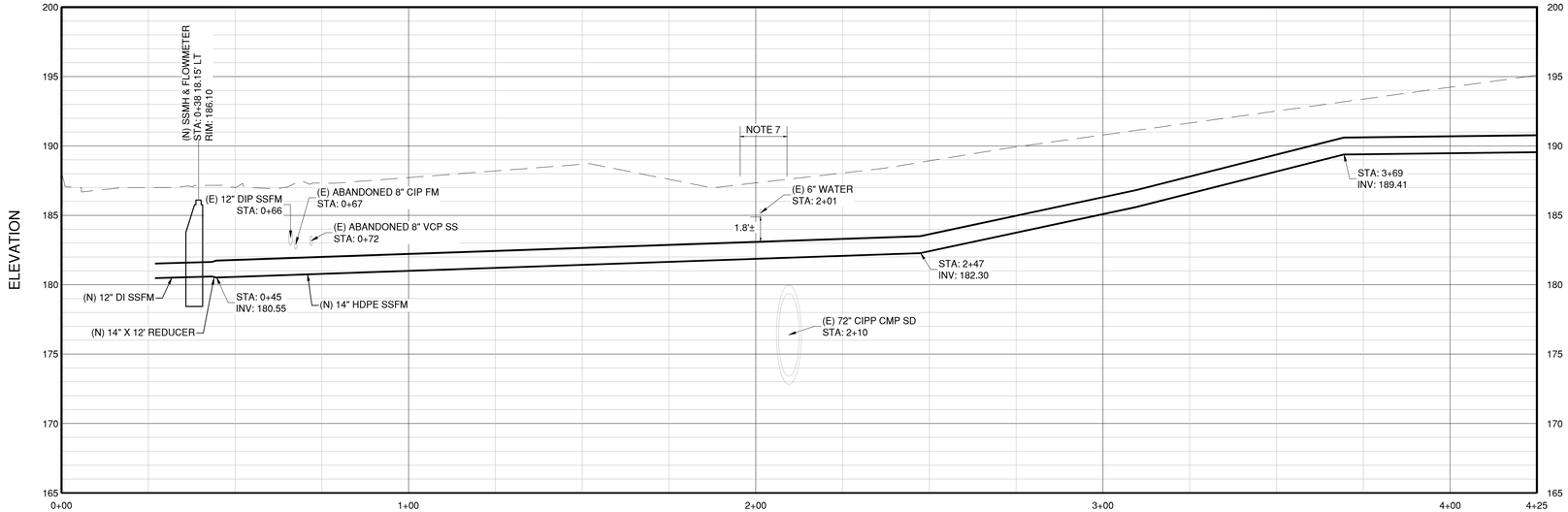
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PLAN VIEW

SCALE: 1" = 20'

NOTES

1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL LOCATE AND POTHOLE ALL UTILITIES AND ADJUST THE FORCE MAIN ALIGNMENT AS NECESSARY TO AVOID CONFLICTS. CONTRACTOR SHALL MARK THE PROPOSED FORCE MAIN ALIGNMENT AND OBTAIN APPROVAL FROM THE CITY PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL POTHOLE ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION, REFERENCE THE WATER MAIN POTHOLING AND CLEARANCE NOTES ON SHEET T2 FOR ADDITIONAL REQUIREMENTS. A CONCRETE SADDLE SHALL BE INSTALLED BETWEEN THE (E) UTILITY AND THE (N) SSFM IN LOCATIONS WHERE 6" MIN. CLEARANCE IS NOT FEASIBLE PER DETAIL 3/D3
3. (E) 12" SSFM IS CONCRETE ENCASED W/ 8" OF CONCRETE ON EITHER SIDE AND 12" OF CONCRETE ABOVE AND BELOW THE FORCE MAIN PIPE FOR THE FIRST 46 LF OUT OF THE PUMP STATION.
4. CONTRACTOR SHALL DETERMINE SIZE AND DEPTH OF ELECTRICAL CONDUIT PRIOR TO INSTALLATION OF NEW SEWER PIPE. CONTRACTOR SHALL COORDINATE WITH PG&E PRIOR TO CONSTRUCTION TO CONFIRM THAT THE ALL NECESSARY CLEARANCE REQUIREMENTS ARE MET. CONTRACTOR SHALL NOTIFY THE CITY OF ANY POTENITAL CONFLICTS.
5. INSTALL (N) SSMH & FLOWMETER PER 5/D2
6. EXISTING FORCE MAIN SHALL BE ABANDONED AFTER THE NEW PUMP STATION AND FORCE MAIN HAS BEEN FULLY TESTED AND ACCEPTED BY THE CITY. THE FORCE MAIN SHALL BE ABANDONED PER SPECIFICATION SECTION 02532.
7. WATER MAIN SEPARATION IS LESS THAN 5'. NOTIFY MPWD FOR POTENTIAL WATER MAIN SHUTDOWN AND BACKFILL WITH CDF PER DETAIL 4/D1



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

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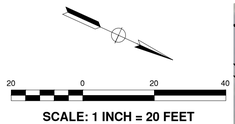
REGISTERED PROFESSIONAL ENGINEER BRIAN L. PHILLIPS No. 74813 CIVIL STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

DATE: 4/10/2026
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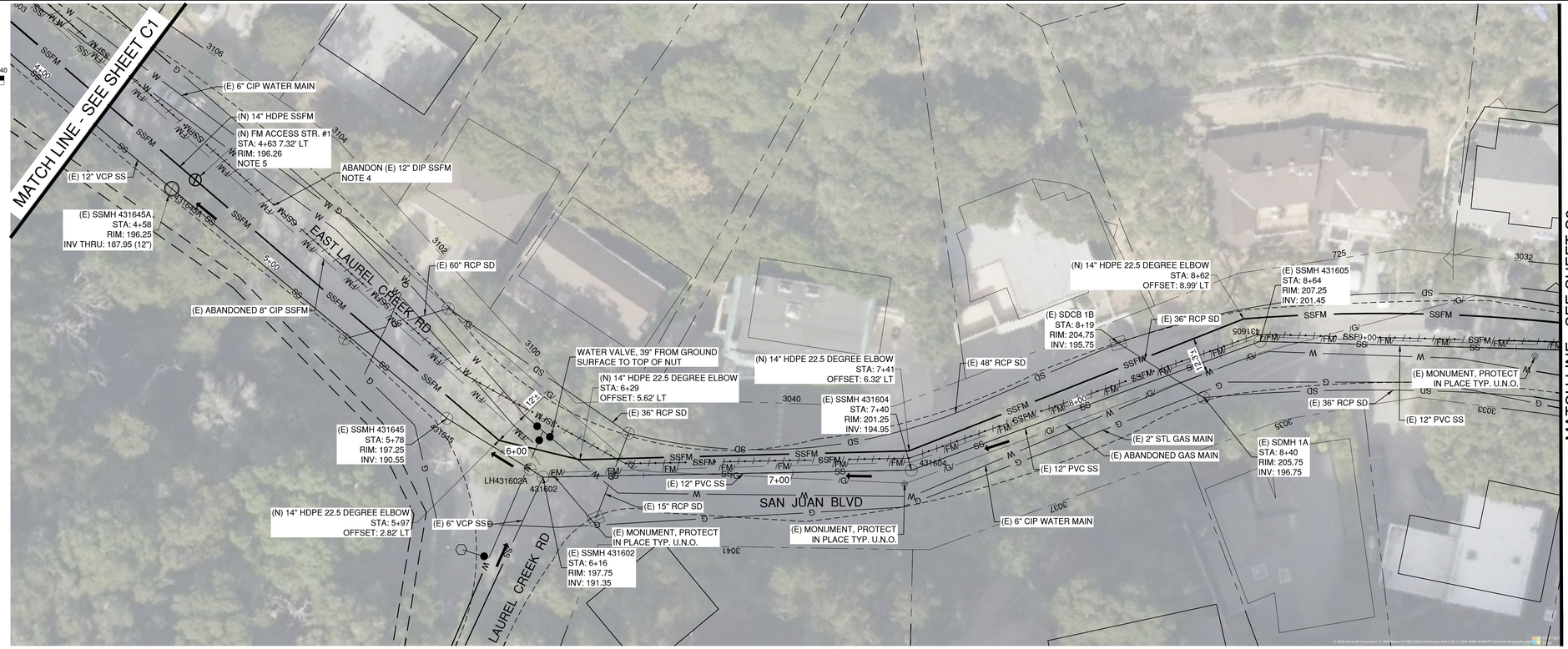
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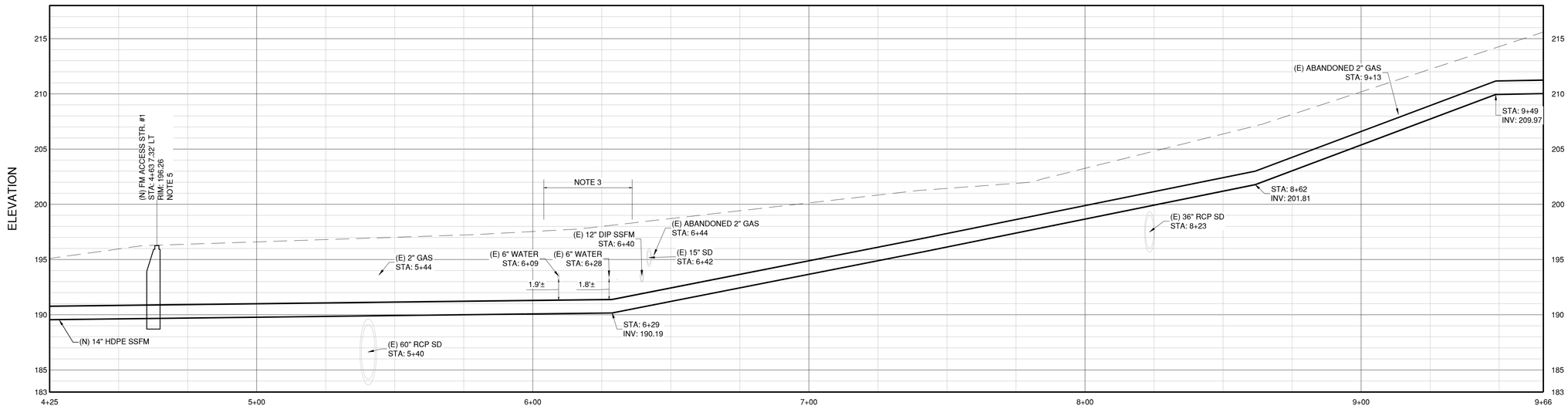
SCALE: 1 INCH = 20 FEET

NOTES

1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL LOCATE AND POTHOLE ALL UTILITIES AND ADJUST THE FORCE MAIN ALIGNMENT AS NECESSARY TO AVOID CONFLICTS. CONTRACTOR SHALL MARK THE PROPOSED FORCE MAIN ALIGNMENT AND OBTAIN APPROVAL FROM THE CITY PRIOR TO CONSTRUCTION.
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3. WATER MAIN SEPARATION IS LESS THAN 5 FEET. NOTIFY MPWD FOR POTENTIAL WATER MAIN SHUTDOWN AND BACKFILL WITH CDF PER DETAIL 4/D1.
4. EXISTING FORCE MAIN SHALL BE ABANDONED AFTER THE NEW PUMP STATION AND FORCE MAIN HAS BEEN FULLY TESTED AND ACCEPTED BY THE CITY. THE FORCE MAIN SHALL BE ABANDONED PER SPECIFICATION SECTION 02532.
5. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER 5/D4 & 3/D2.



PLAN VIEW
SCALE: 1" = 20'



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

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CITY OF BELMONT PUBLIC WORKS

SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
(707) 528-4848

REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
No. 74013
CIVIL
STATE OF CALIFORNIA
04/10/26

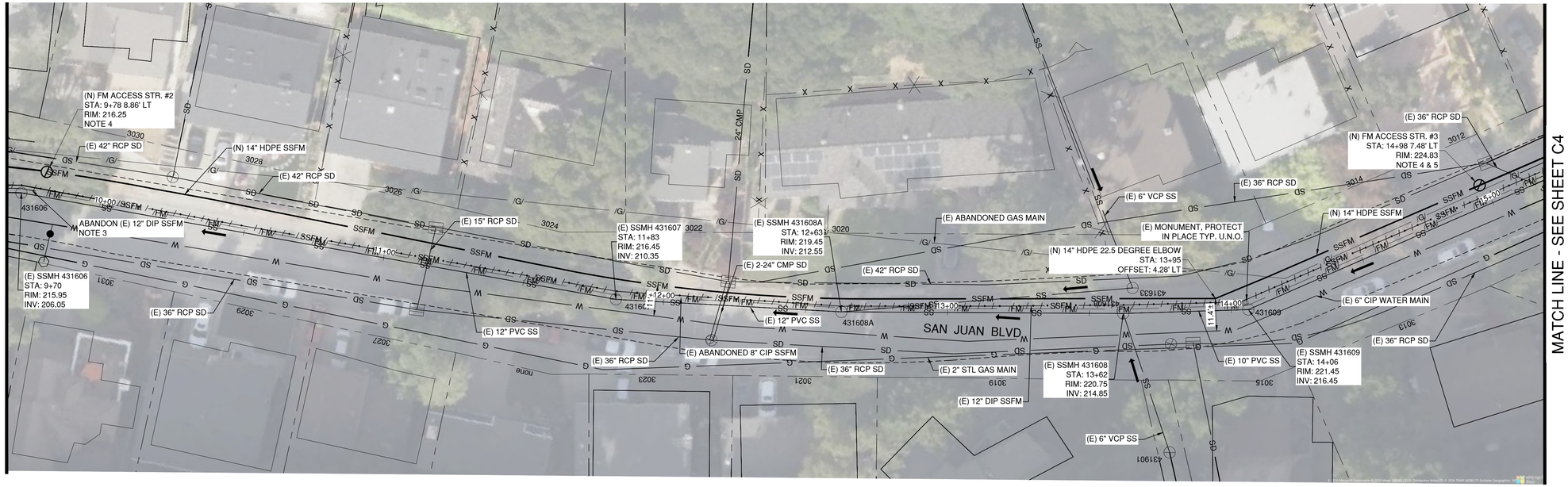
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C2

SHEET: 5 OF 55

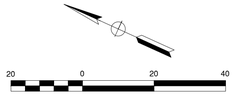
MATCH LINE - SEE SHEET C2



PLAN VIEW

SCALE: 1" = 20'

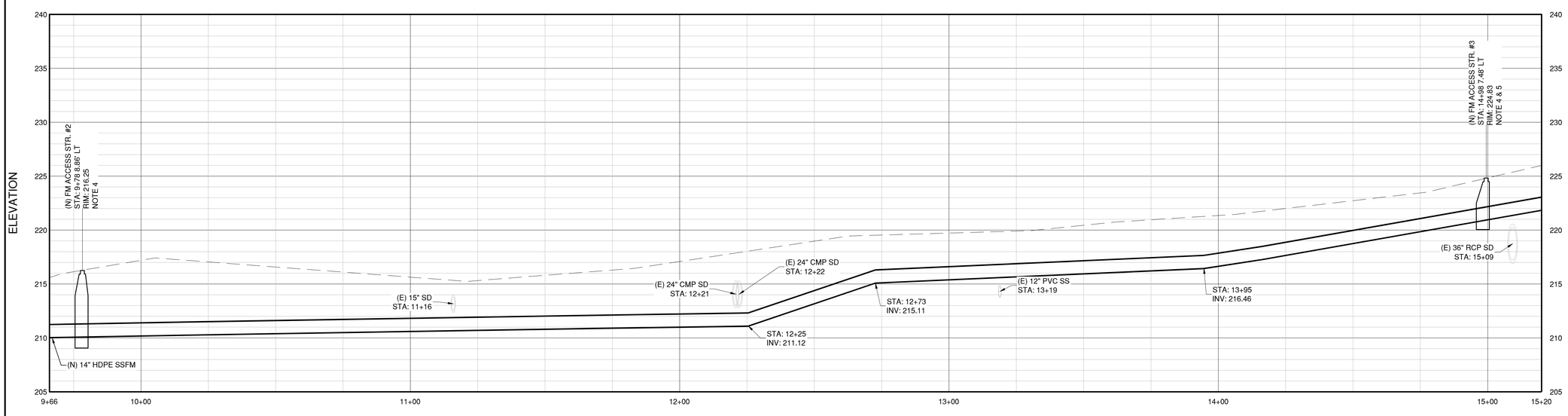
MATCH LINE - SEE SHEET C4



SCALE: 1 INCH = 20 FEET

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4. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER 5/D4 & 3/D2.
5. INSTALL AIR VALVE PER 6/D4.



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

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CITY OF BELMONT PUBLIC WORKS

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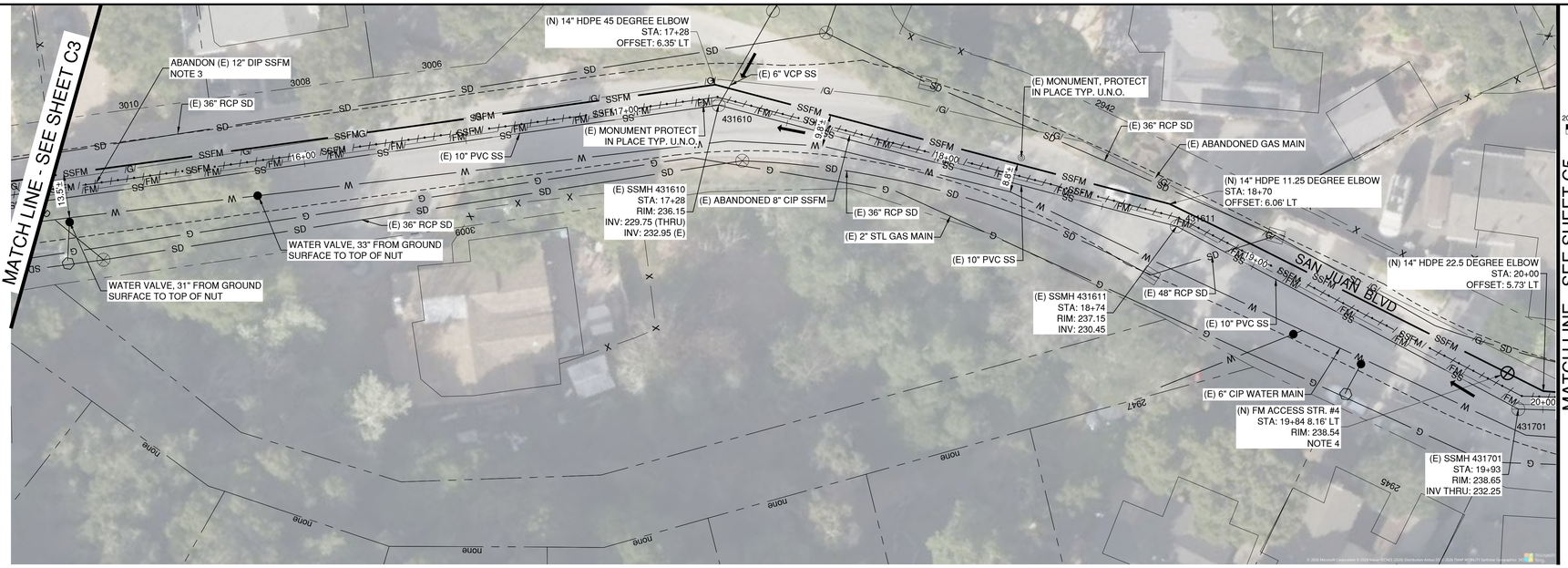
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
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STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

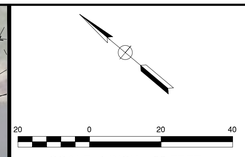
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DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C3

SHEET: 6 OF 55



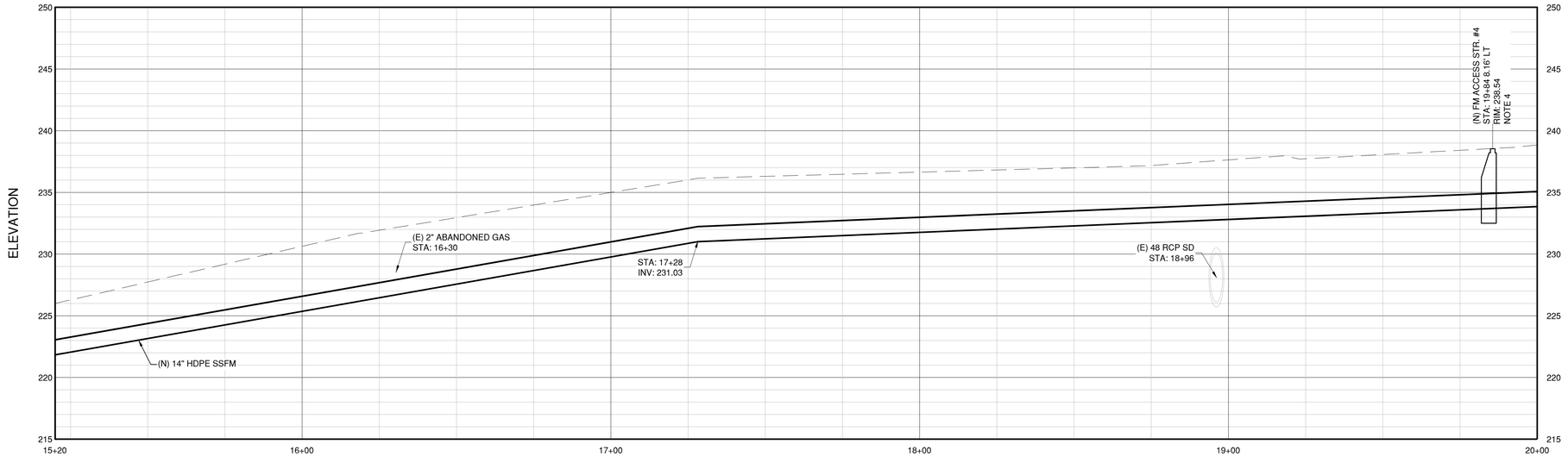
PLAN VIEW
SCALE: 1" = 20'



SCALE: 1 INCH = 20 FEET

NOTES

1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL LOCATE AND POTHOLE ALL UTILITIES AND ADJUST THE FORCE MAIN ALIGNMENT AS NECESSARY TO AVOID CONFLICTS. CONTRACTOR SHALL MARK THE PROPOSED FORCE MAIN ALIGNMENT AND OBTAIN APPROVAL FROM THE CITY PRIOR TO CONSTRUCTION.
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4. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER 5/D4 & 3/D2.



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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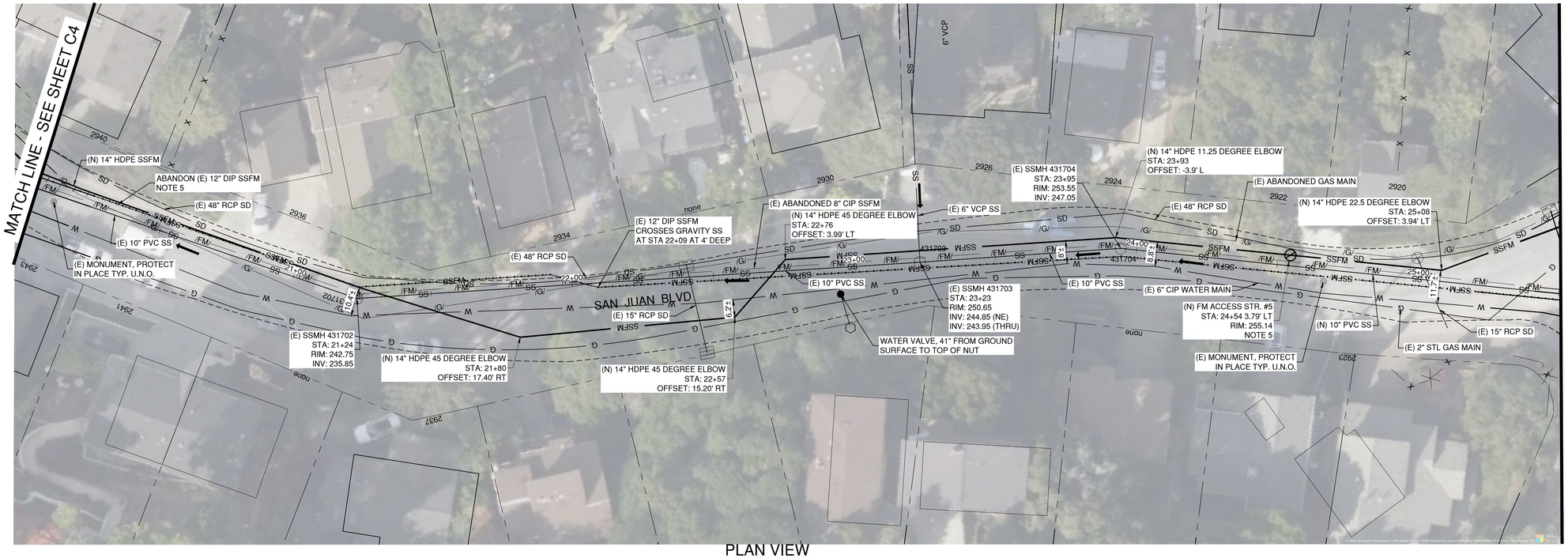
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
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STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C4

SHEET: 7 OF 55



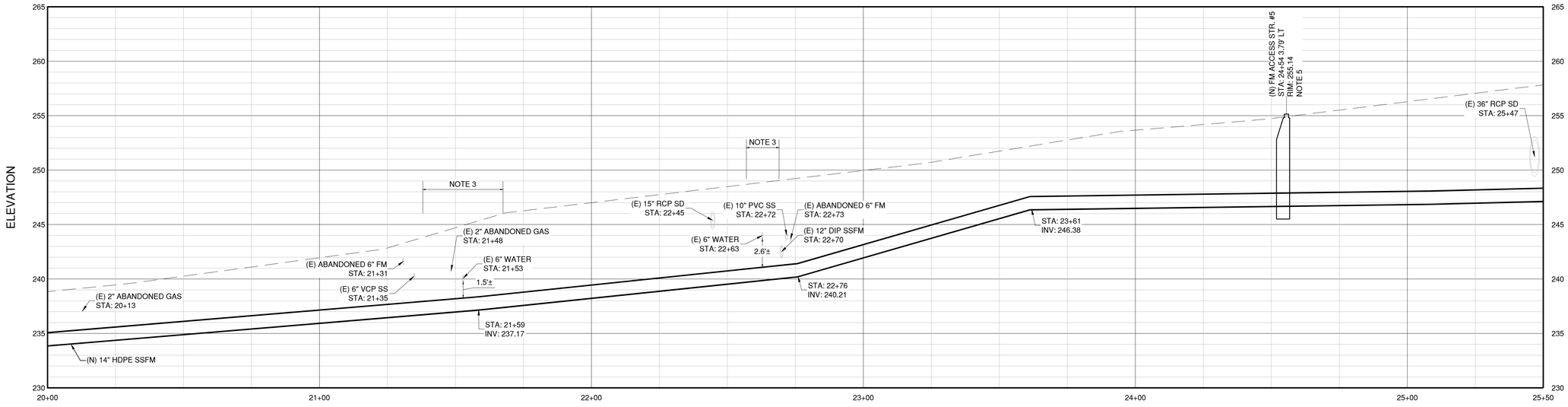
PLAN VIEW
SCALE: 1" = 20'

20 0 20 40

SCALE: 1 INCH = 20 FEET

NOTES

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5. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER 5/D4 3/D2



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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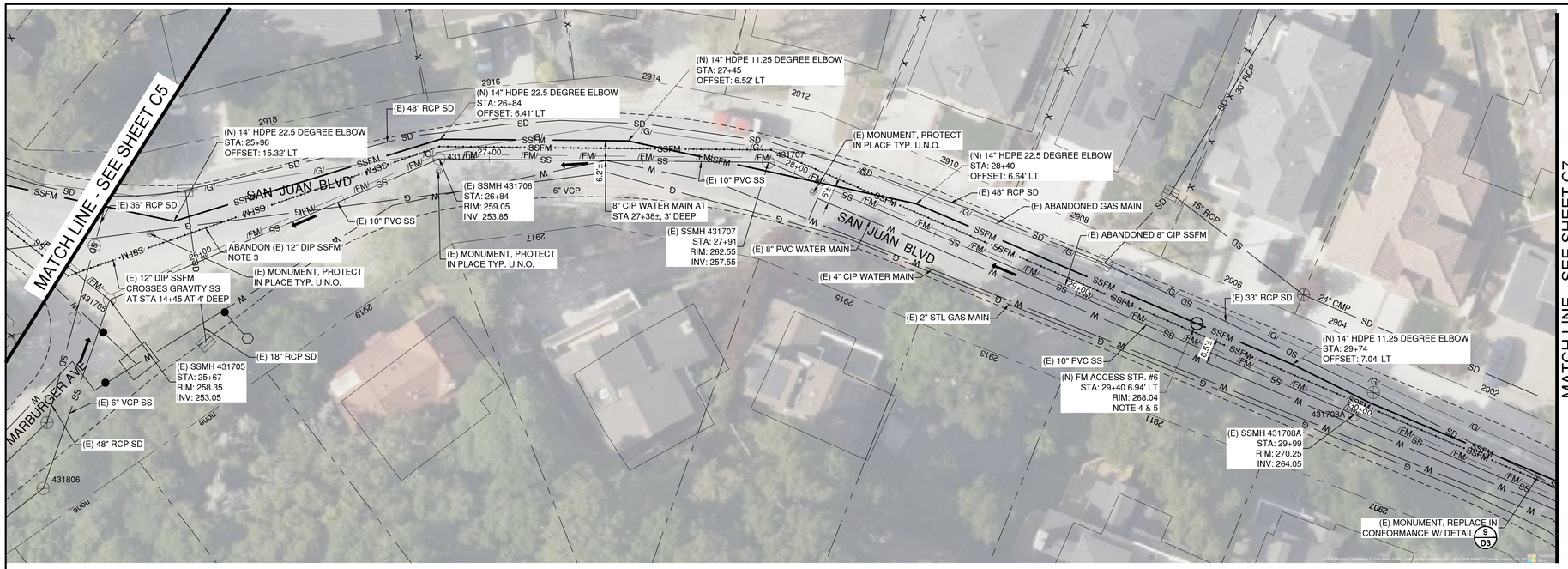
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
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STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

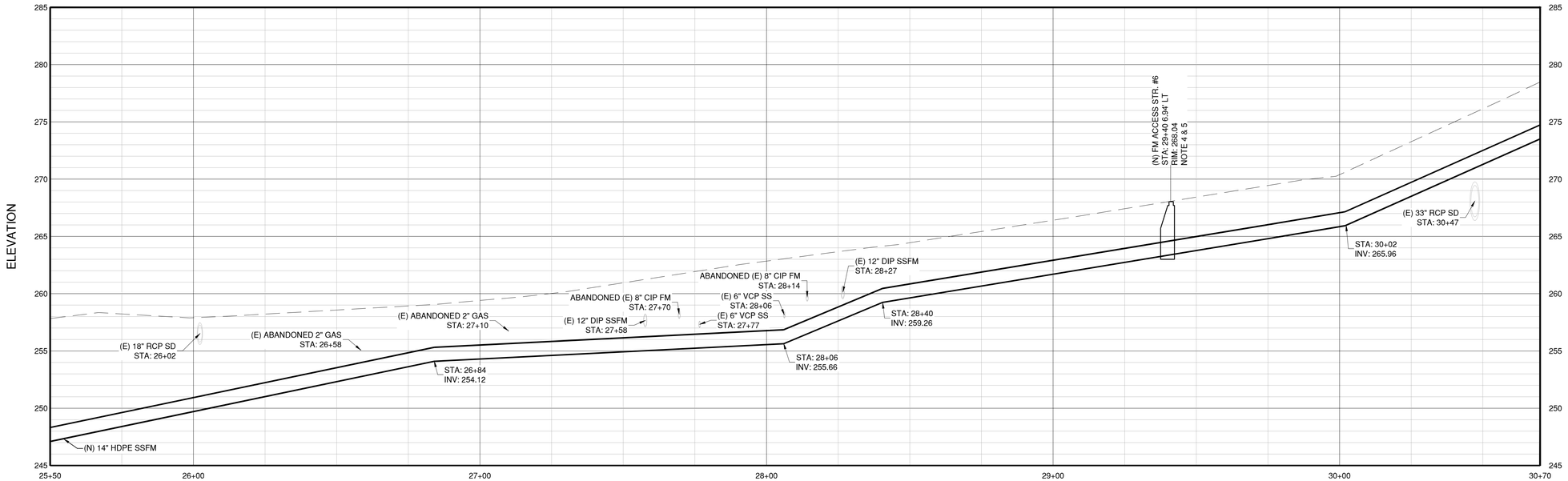
C5

SHEET: 8 OF 55



PLAN VIEW

SCALE: 1" = 20'



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

SCALE: 1 INCH = 20 FEET

NOTES

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4. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER 5/D4 & 3/D2.
5. INSTALL AIR VALVE PER 6/D4.

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CITY OF BELMONT PUBLIC WORKS

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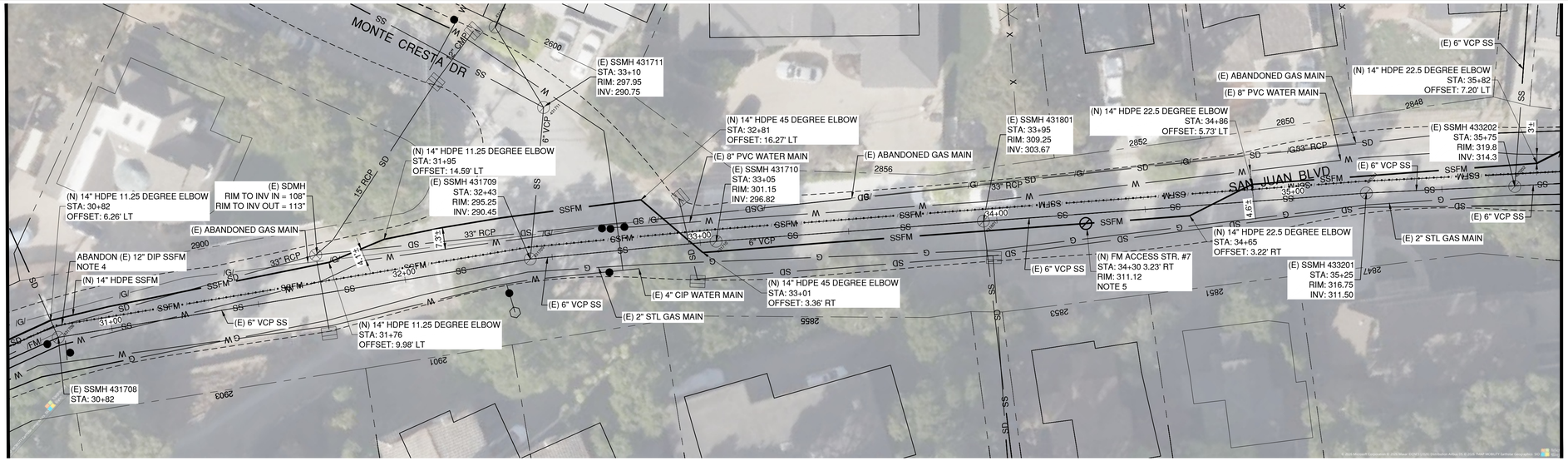
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C6

SHEET: 9 OF 55

MATCH LINE - SEE SHEET C6



PLAN VIEW

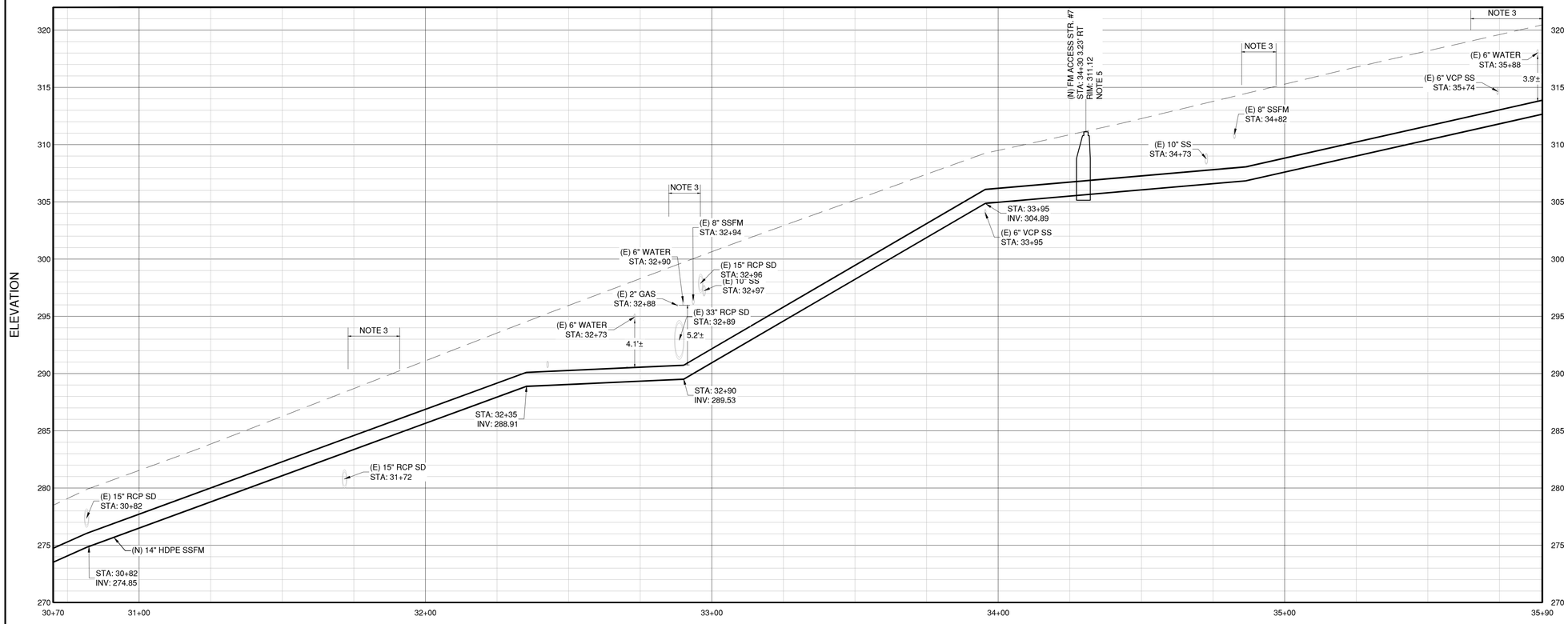
SCALE: 1" = 20'

MATCH LINE - SEE SHEET C8

SCALE: 1 INCH = 20 FEET

NOTES

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5. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER 5/D4 & 3/D2



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
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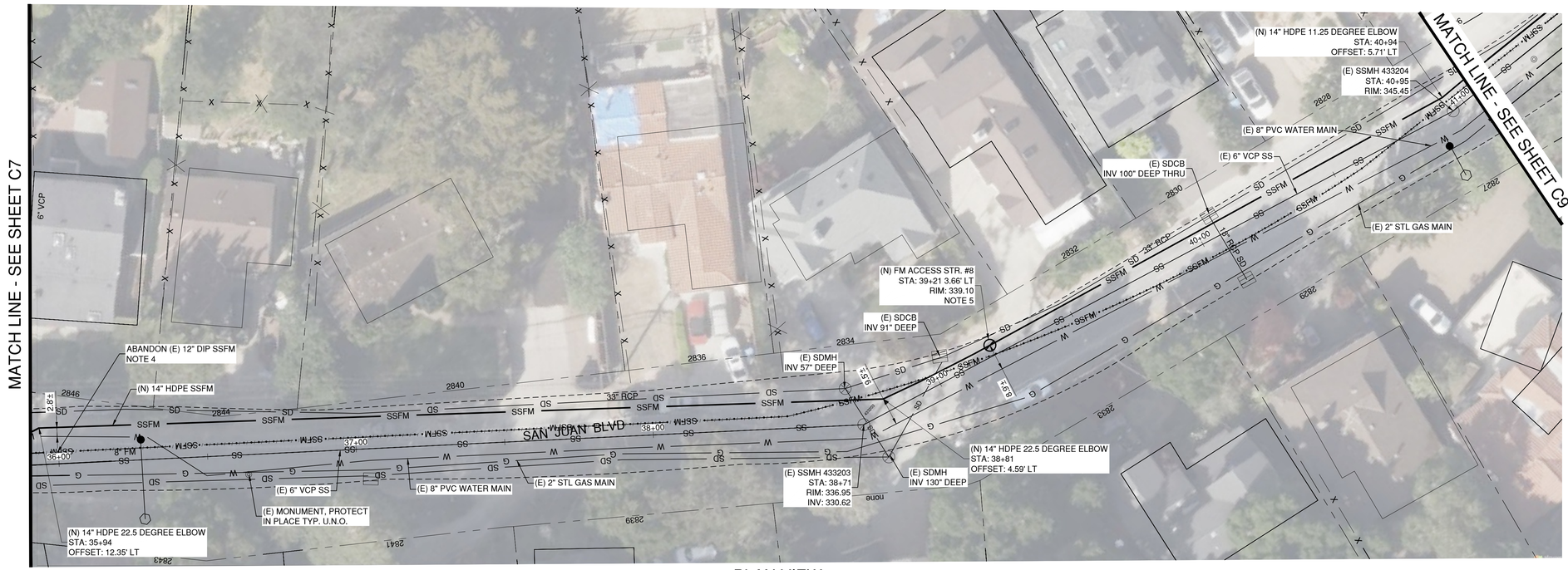
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
No. 74813
CIVIL
STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

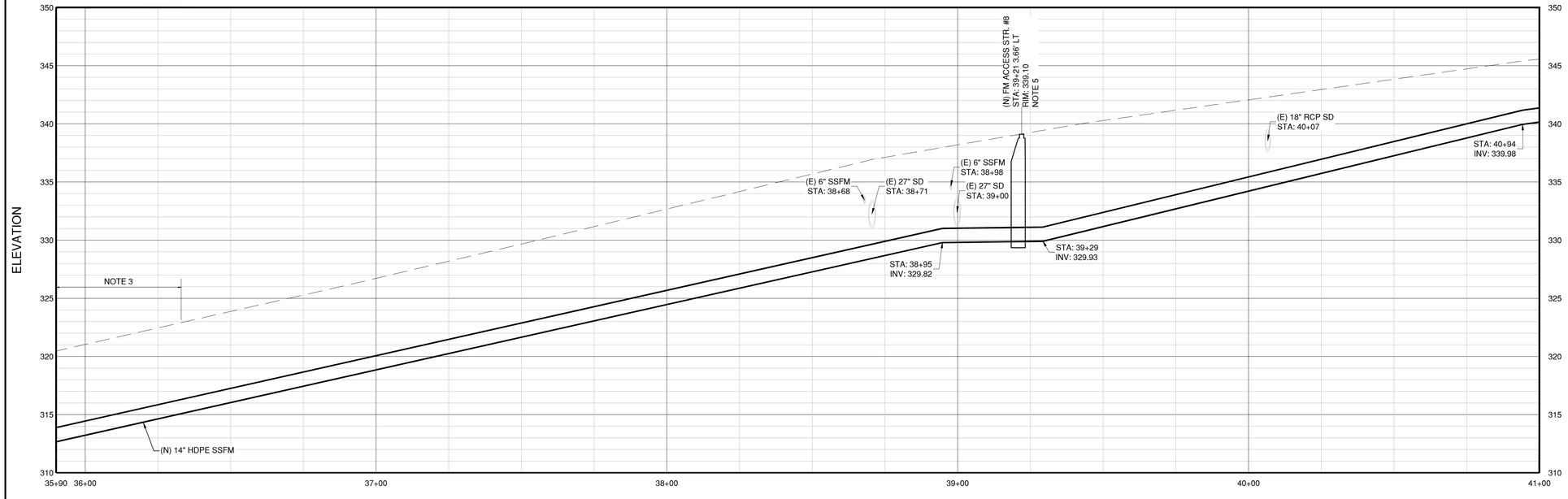
C7

SHEET: 10 OF 55



PLAN VIEW

SCALE: 1" = 20'



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

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SCALE: 1 INCH = 20 FEET

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5. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER 5/D4 & 3/D2.

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CITY OF BELMONT PUBLIC WORKS

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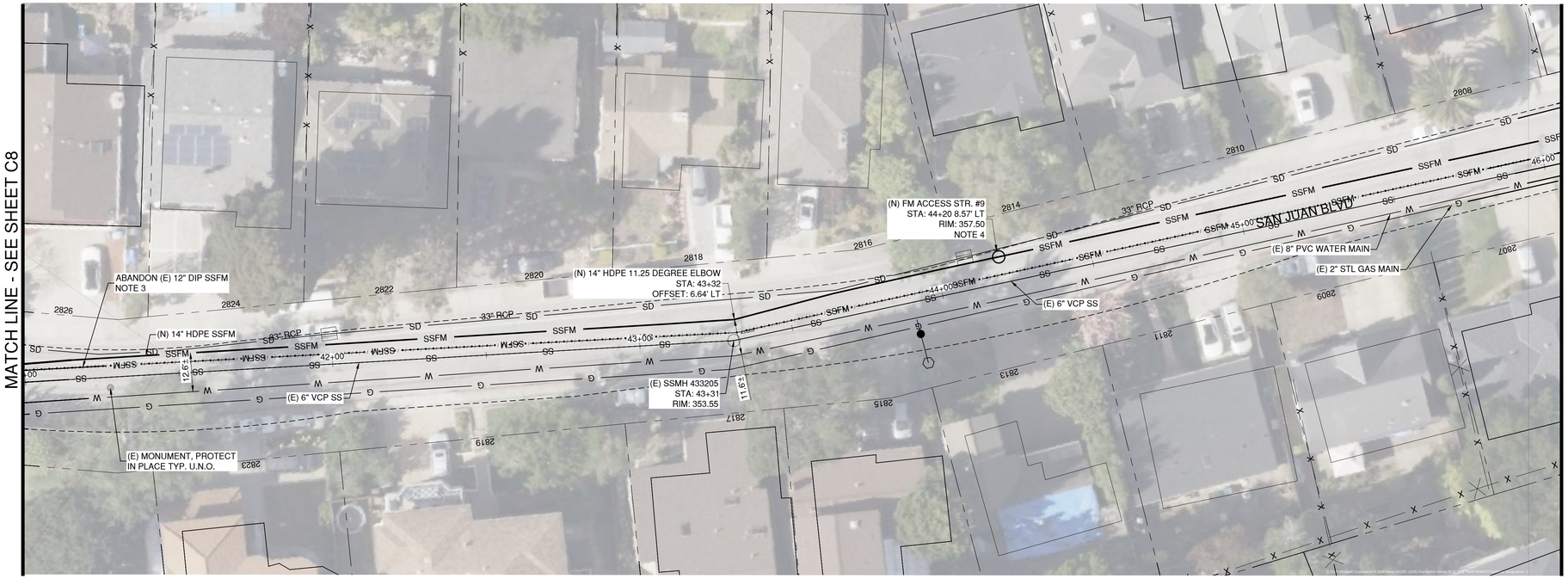
REGISTERED PROFESSIONAL ENGINEER BRIAN L. PRICE NO. 74913 CIVIL STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
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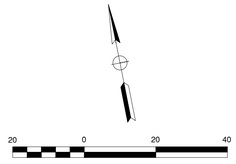
C8

SHEET: 11 OF 55



PLAN VIEW

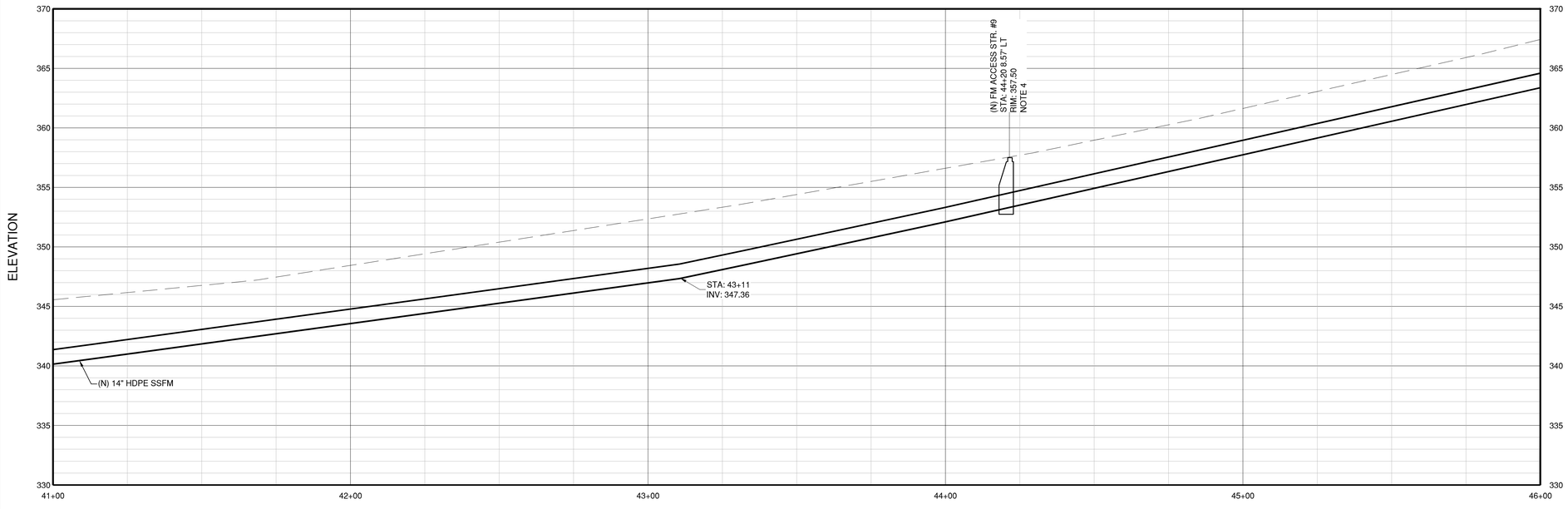
SCALE: 1" = 20'



SCALE: 1 INCH = 20 FEET

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4. INSTALL (N) FORCEMAIN ACCESS STRUCTURE PER (5/D4) & (3/D2).



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

NO	REVISIONS	DATE	APPR
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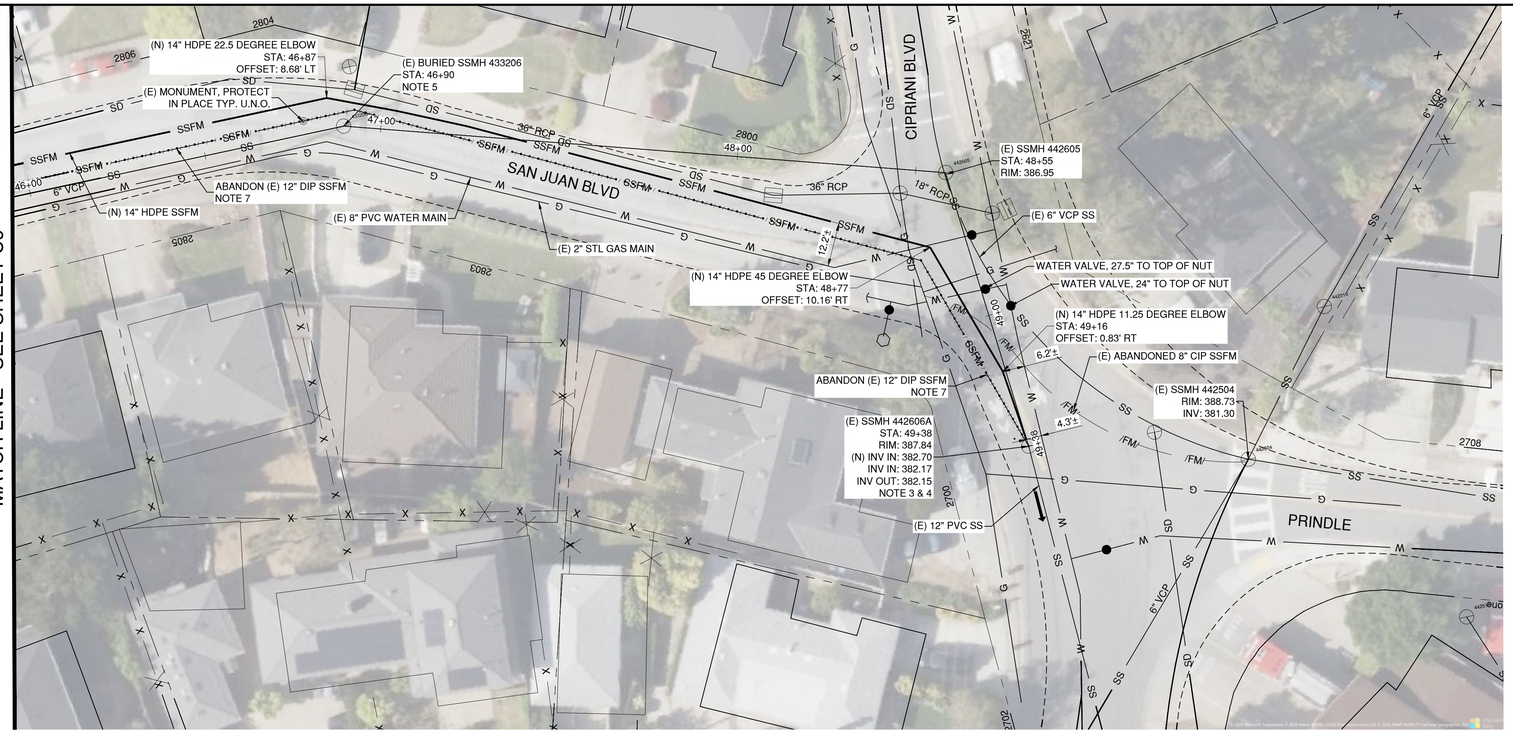
DEPT. OF PUBLIC WORKS CCN 2026-645
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SSFM PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
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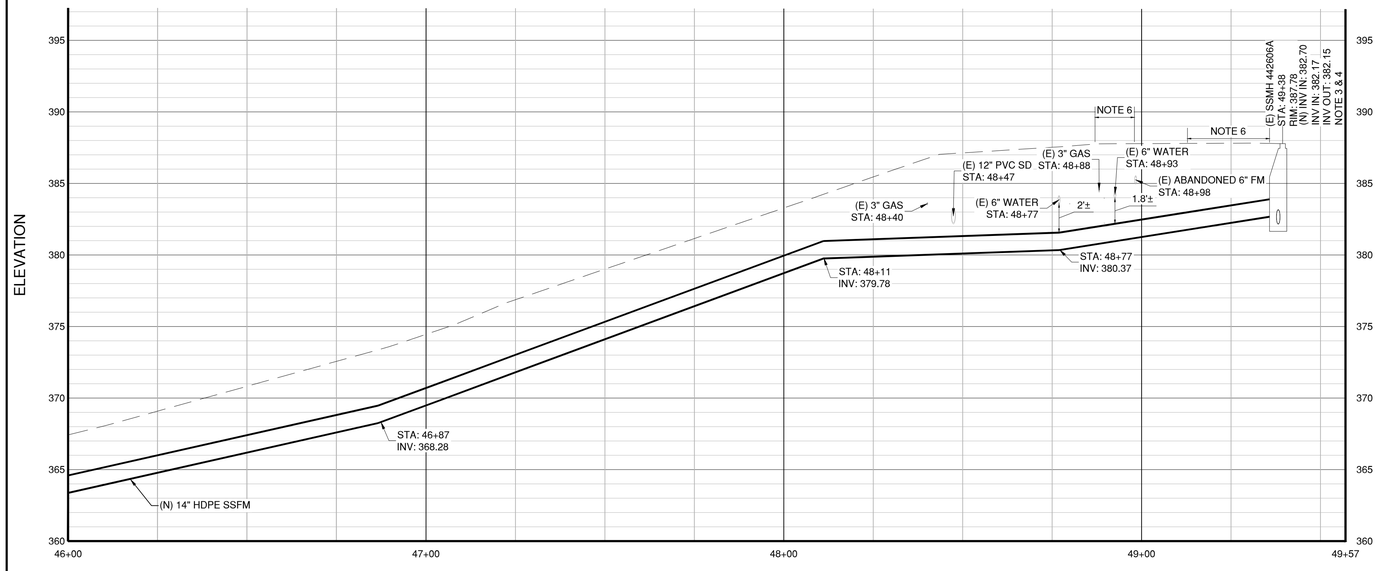
SHEET: 12 OF 55

MATCH LINE - SEE SHEET C9



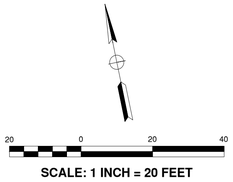
PLAN VIEW

SCALE: 1" = 20'



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'



SCALE: 1 INCH = 20 FEET

NOTES

1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL INSTALL THE NEW SEWER PIPE ALONG THE EXISTING SEWER ALIGNMENT AT A CONSTANT GRADE FROM MANHOLE TO MANHOLE.
2. AN (E) ABANDON 8" CIP SSFM IS LOCATED 18" MIN. FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF ABANDONED SSFM ON THE NORTH TO EAST OF THE (E) 6" SS. THE (E) ABANONED SSFM IS AT THE SAME APPROXIMATE INVERT ELEVATION OF THE GRAVITY SEWER. SOME PORTIONS OF THE ABANDONED SSFM HAVE BEEN PREVIOUSLY REMOVED. CONTRACTOR SHALL REMOVE ANY REMAINING PORTIONS OF THE (E) ABANDONED 8" CIP THAT ARE WITHIN THE EXCAVATIONS AND INSTALL SHORING TO AVOID THE ABANDONED SSFM. THE ACTIVE (E) 12" SSFM IS TYPICALLY 28" TO 32" FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF (E) 12" SSFM.
2. CONTRACTOR SHALL POTHOLE ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION, REFERENCE THE WATER MAIN POTHOLING AND CLEARANCE NOTES ON SHEET T2 FOR ADDITIONAL REQUIREMENTS. A CONCRETE SADDLE SHALL BE INSTALLED BETWEEN THE (E) UTILITY AND THE (N) SSFM IN LOCATIONS WHERE 6" MIN. CLEARANCE IS NOT FEASIBLE PER DETAIL 3/D3.
3. CHIP AND REFORM (E) MANHOLE INVERT AND BENCH TO ACCOMMODATE (N) PIPE SIZE PER 3/D1.
4. REMOVE & RAISE (E) MANHOLE FRAME, COVER, & CONCRETE COLLAR TO MATCH (E) PAVEMENT SURFACE PER .
5. LOCATE, REMOVE, & RAISE (E) MANHOLE FRAME, COVER, & CONCRETE COLLAR TO MATCH (E) PAVEMENT SURFACE PER .
6. WATER MAIN SEPARATION IS LESS THAN 5 FEET. NOTIFY MPWD FOR POTENTIAL WATER MAIN SHUTDOWN AND BACKFILL W/ CDF PER DETAIL 4/D1.
7. EXISTING FORCE MAIN SHALL BE ABANDONED AFTER THE NEW PUMP STATION AND FORCE MAIN HAS BEEN FULLY TESTED AND ACCEPTED BY THE CITY. THE FORCE MAIN SHALL BE ABANDONED PER SPECIFICATION SECTION 02532.

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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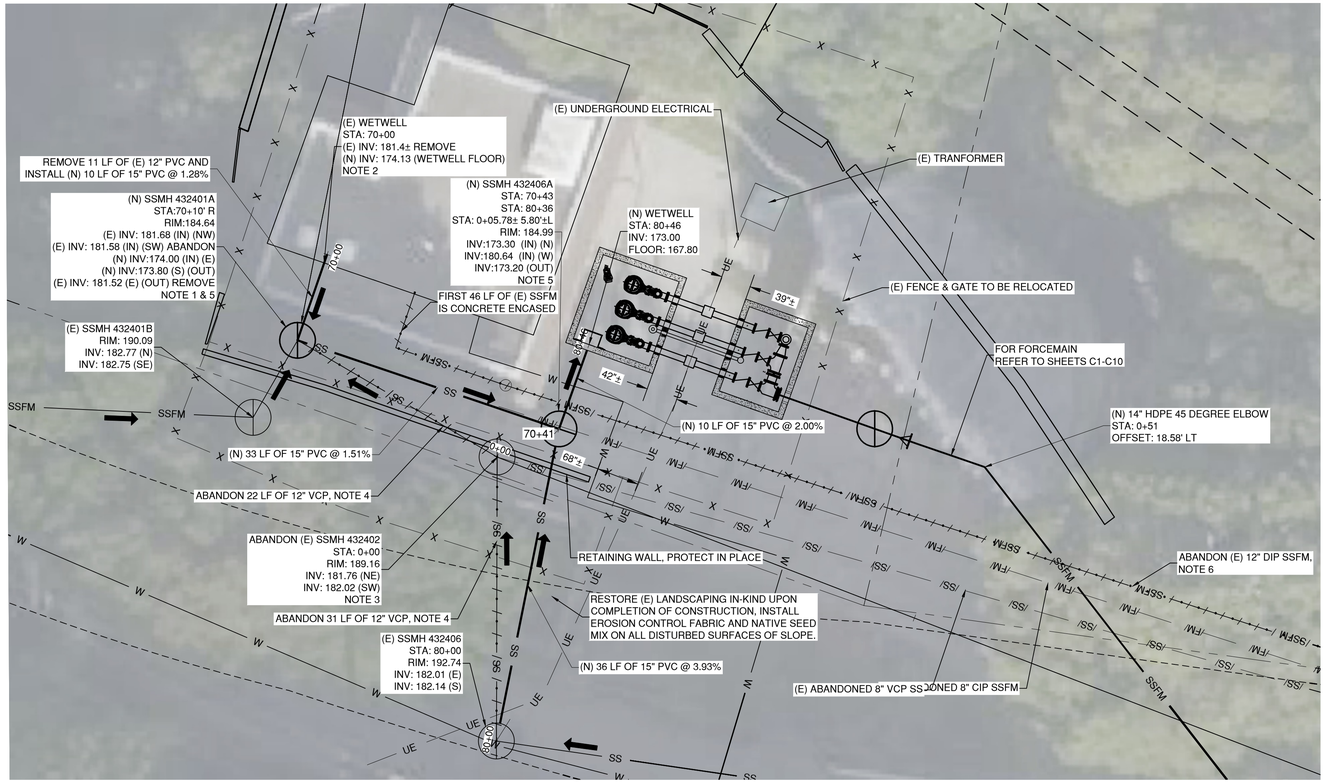
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PINCOLINI
No. 74913
CIVIL
STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
SSFM PLAN AND PROFILE

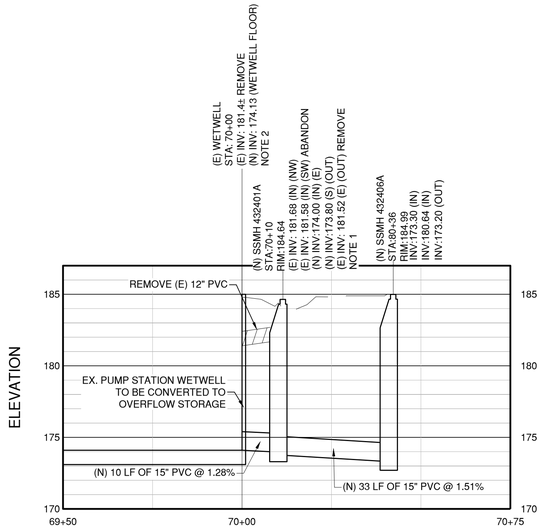
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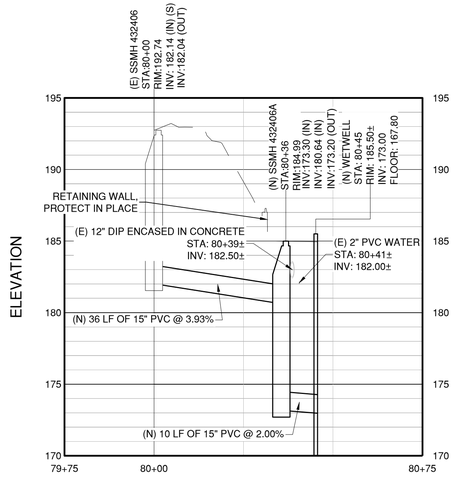
SHEET: 13 OF 55



PLAN VIEW
SCALE: 1" = 4'



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

4 0 4 8

SCALE: 1 INCH = 4 FEET

NOTES

1. REMOVE (E) MANHOLE (SHALLOW CONE) AND INSTALL (N) MANHOLE. NEW MANHOLE LOCATION SHALL BE OFFSET 1' TOWARDS THE (E) WETWELL AS NECESSARY TO AVOID CONFLICT WITH THE EXISTING RETAINING WALL FOOTING THAT EXTENDS 8" FROM FACE OF WALL.
2. CONTRACTOR SHALL CONFIRM (E) WETWELL FLOOR ELEVATION PRIOR TO ORDERING PRECAST COMPONENTS. NOTIFY ENGINEER IF (E) FLOOR IS LOWER THAN INDICATED.
3. ABANDON (E) MANHOLE PER 6/D2.
4. ABANDON BY PLUGGING ENDS W/ 3' OF CONCRETE AND FILLING W/ CDF.
5. COAT INTERIOR OF MANHOLE PER SPECIFICATION SECTION 09900.
6. EXISTING FORCE MAIN SHALL BE ABANDONED AFTER THE NEW PUMP STATION AND FORCE MAIN HAS BEEN FULLY TESTED AND ACCEPTED BY THE CITY. THE FORCE MAIN SHALL BE ABANDONED PER SPECIFICATION SECTION 02532.
7. RESTORE ALL ASPHALT SURFACES WITHIN THE PUMP STATION SITE PER DETAIL 1/D1.

NO	REVISIONS	DATE	APPR
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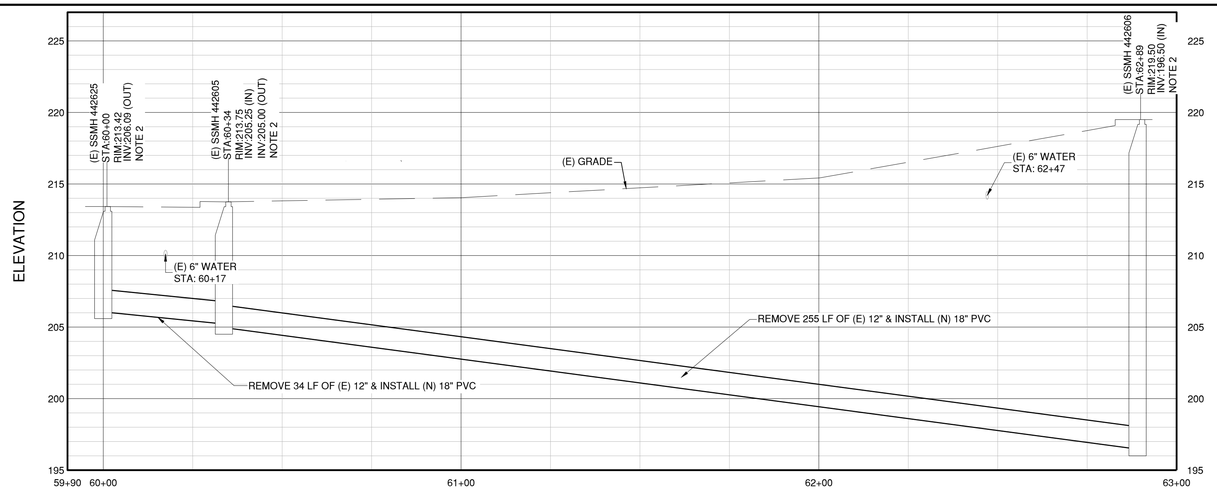
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PEARCE
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CIVIL
STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
GRAVITY SEWER PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

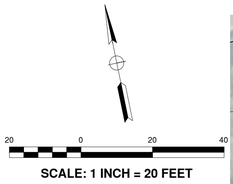
C11

SHEET: 14 OF 55



PROFILE VIEW

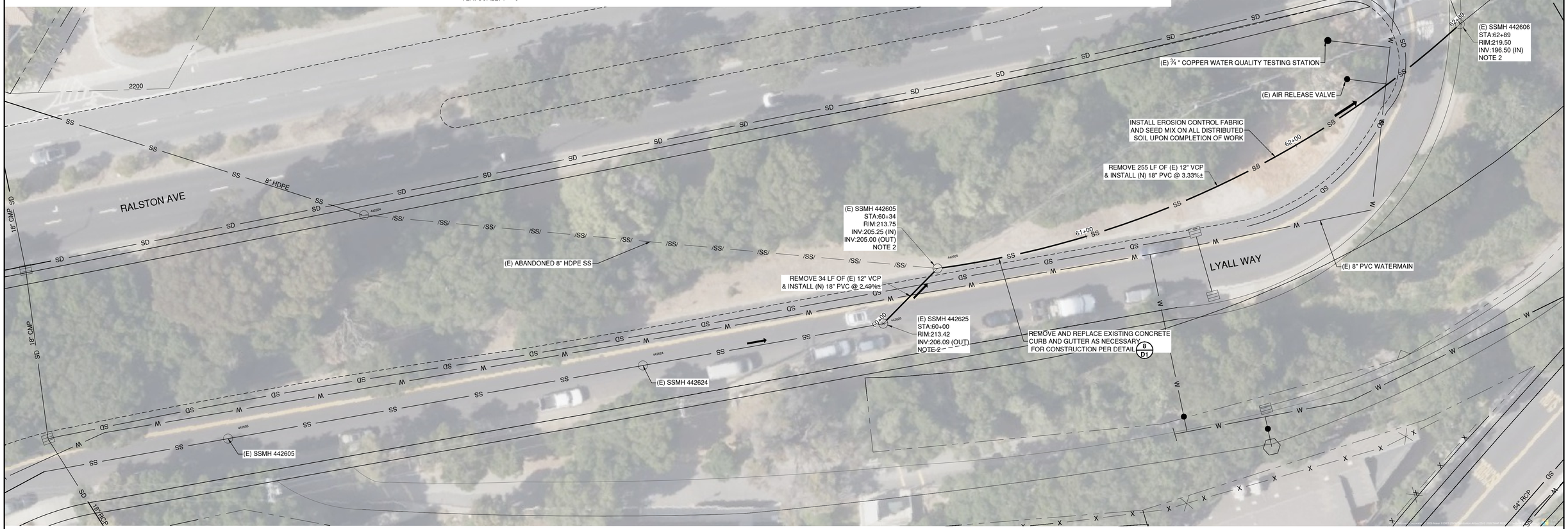
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'



SCALE: 1 INCH = 20 FEET

NOTES

1. SITE WAS NOT SURVEYED, SEWERMAINS SHALL BE INSTALLED AT A CONSTANT GRADE FROM THE INVERT OF THE EXISTING MANHOLES.
2. CHIP & REFORM (E) MANHOLE INVERT & BENCH TO ACCOMMODATE (N) PIPE SIZE PER (3/D1)
3. INSTALL NEW SEWER MAIN PER TRENCH DETAIL (1/D1)



PLAN VIEW

SCALE: 1" = 20'

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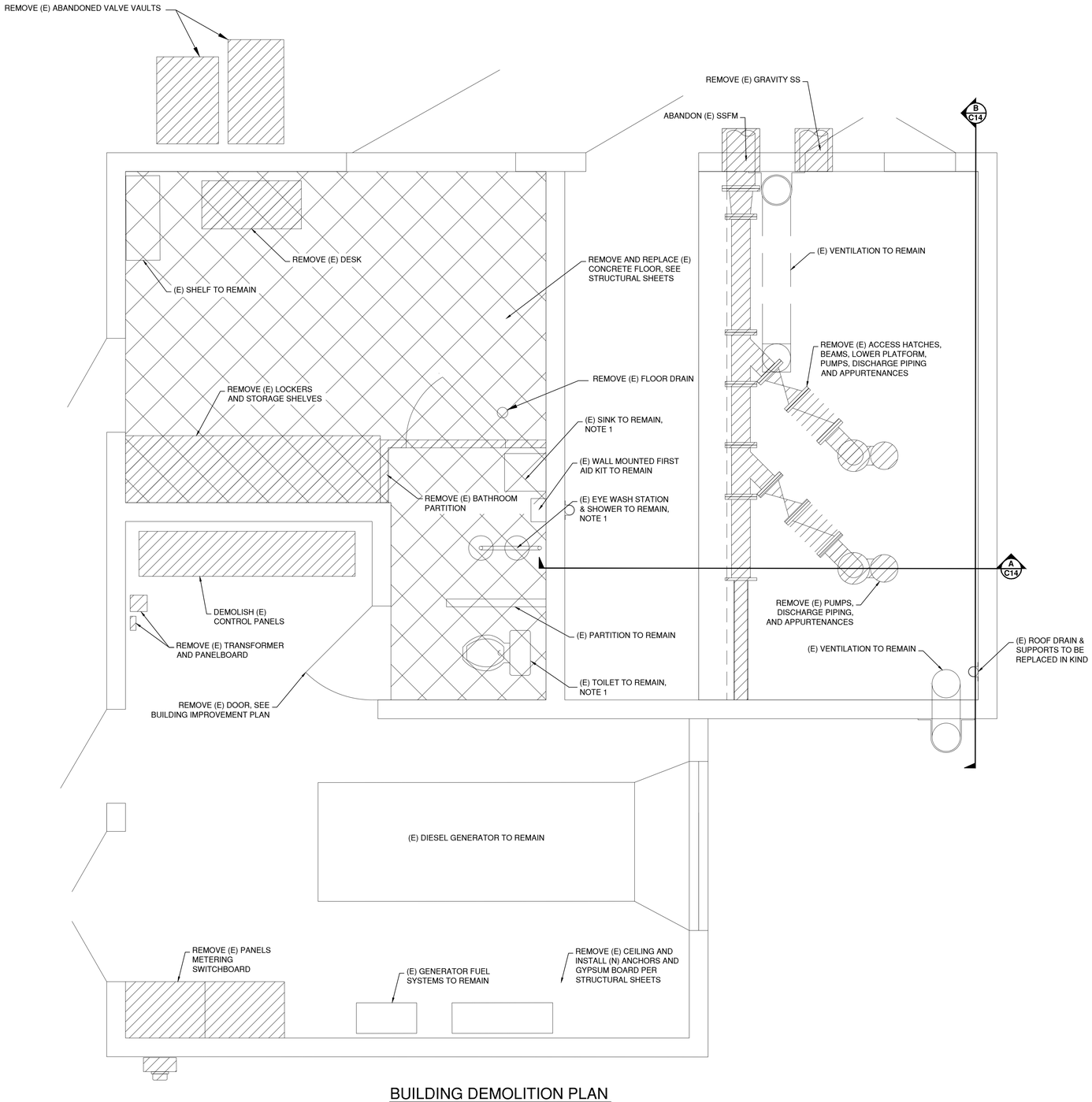
REGISTERED PROFESSIONAL ENGINEER
CIERAN L. PRATT
NO. 74013
CIVIL
STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
LYALL GRAVITY SEWER PLAN AND PROFILE

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C12

SHEET: 15 OF 55



BUILDING DEMOLITION PLAN

SCALE: 1/2"=1'

2 0 2 4

SCALE: 1/2 INCH = 1 FOOT

NOTES

1. REPLACE AND RE-ROUTE (E) EYE WASH, SHOWER DRAIN, SINK AND TOILET DRAIN SEE IMPROVEMENT PLAN ON SHEET C18.
2. SEE ELECTRICAL AND STRUCTURAL SHEETS FOR ADDITIONAL REQUIREMENTS

NO	REVISIONS	DATE	APPR
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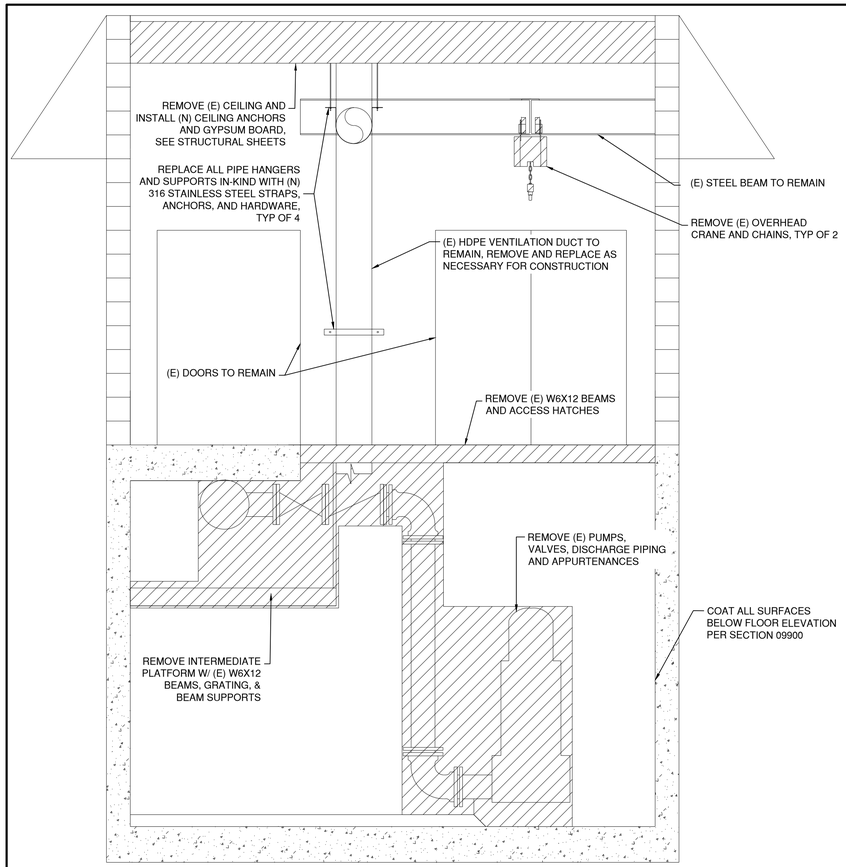
04/10/26

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SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
BUILDING DEMOLITION PLAN

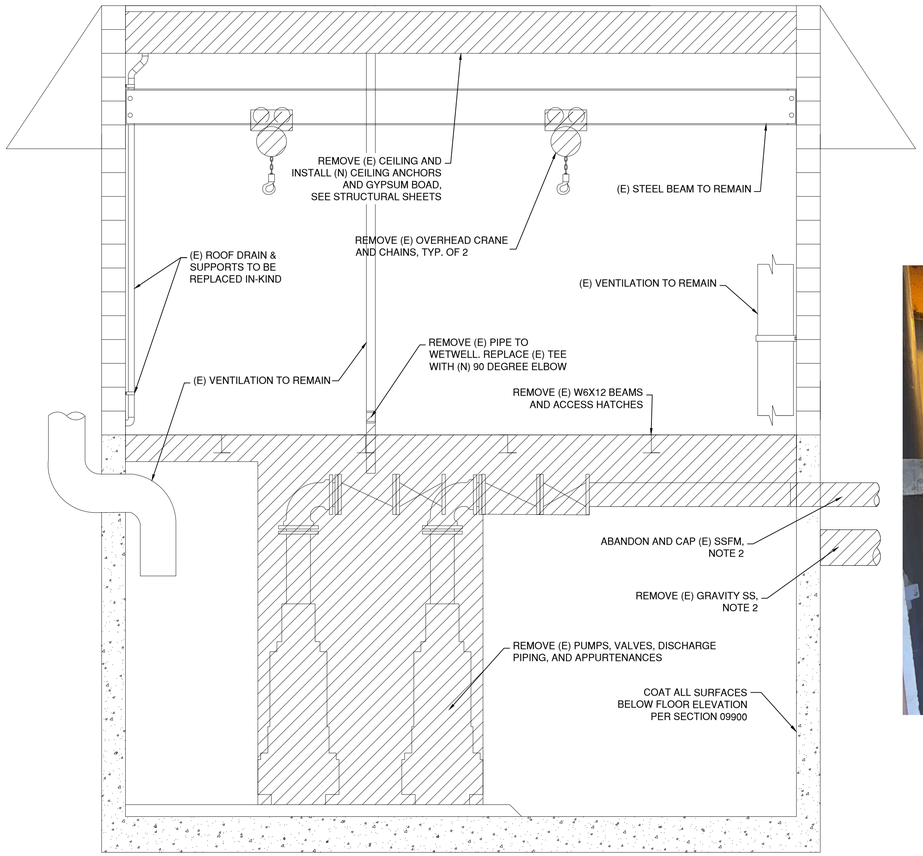
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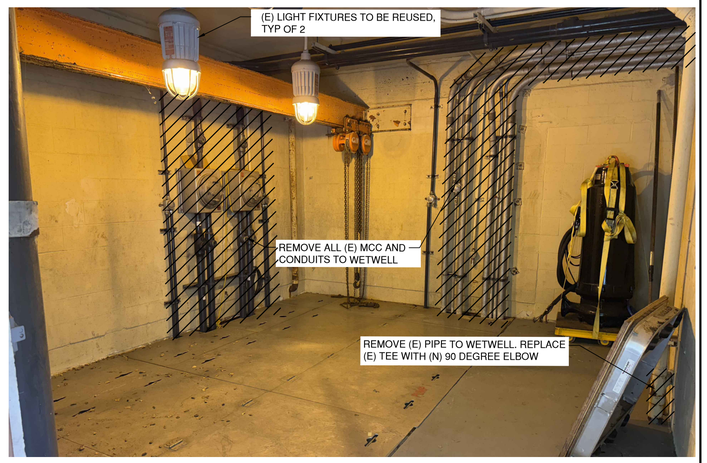
SHEET: 16 OF 55



EXISTING WETWELL DEMO SECTION A C14
SCALE: 1/2"=1'-0"



EXISTING WETWELL DEMO SECTION B C14
SCALE: 1/2"=1'-0"



WET WELL OVERFLOW ROOM

NOTES

1. SEE ELECTRICAL AND STRUCTURAL SHEETS FOR ADDITIONAL REQUIREMENTS
2. TRIM EXISTING PIPES FLUSH WITH THE INTERIOR WALL OF THE STRUCTURE, INSTALL TWO BEADS OF ADEKA P201 WATERSTOP WITHIN INTERIOR CIRCUMFERENCE OF PIPE AND PLUG END OF PIPE WITH 2' OF CONCRETE.

NO	REVISIONS	DATE	APPR
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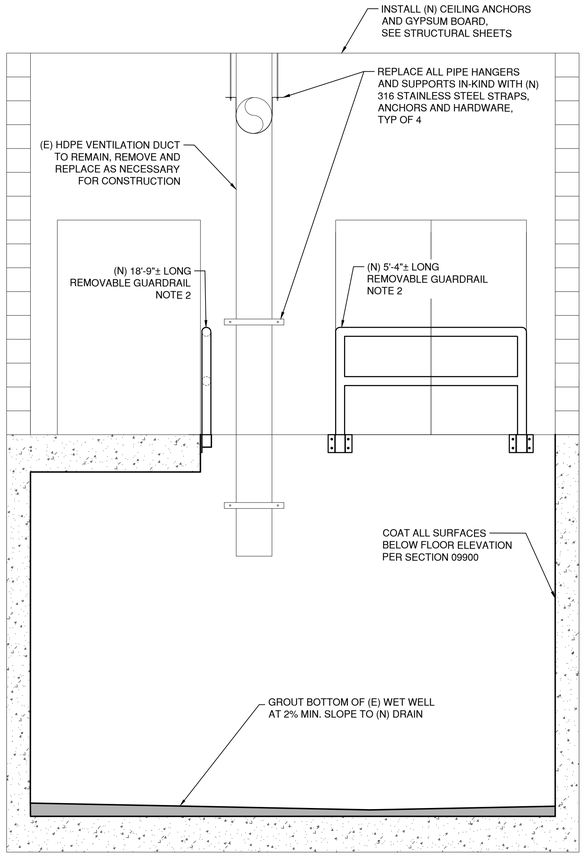
REGISTERED PROFESSIONAL ENGINEER — MORGAN L. PRITCHETT — NO. 74913 — CIVIL — STATE OF CALIFORNIA
04/10/26

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SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
BUILDING DEMOLITION SECTIONS

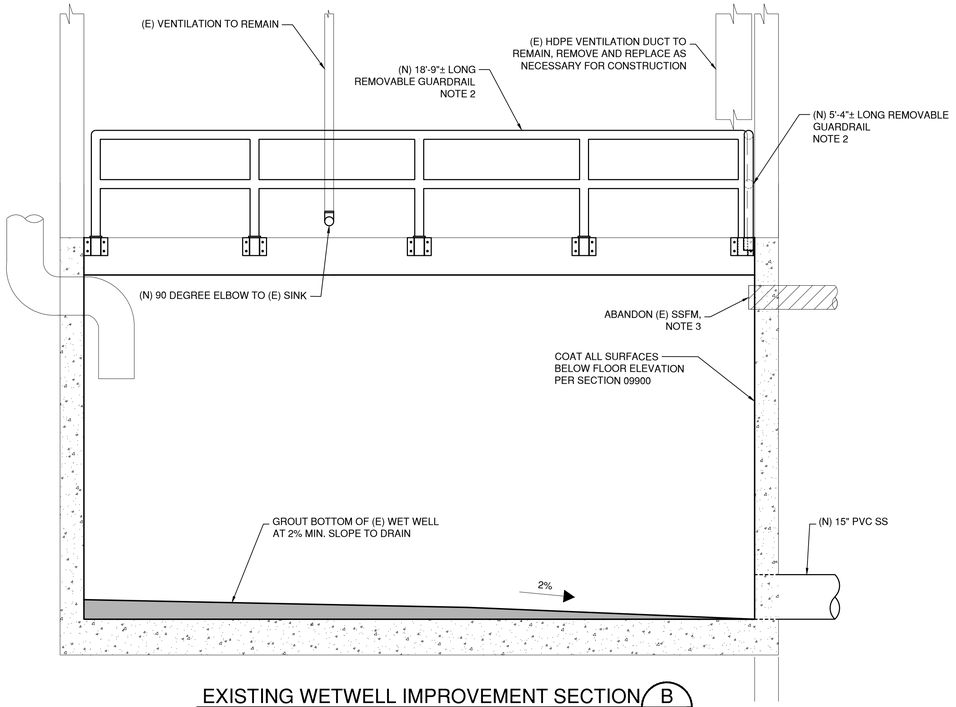
DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C14

SHEET: 17 OF 55



EXISTING WETWELL IMPROVEMENT SECTION A C15
SCALE: 1/2"=1'-0"



EXISTING WETWELL IMPROVEMENT SECTION B C15
SCALE: 1/2"=1'-0"

NOTES

1. SEE ELECTRICAL AND STRUCTURAL SHEETS FOR ADDITIONAL IMPROVEMENTS AND REQUIREMENTS
2. (N) REMOVABLE FACE MOUNTED FIBERGLASS GUARD RAIL PER 7/D4.
3. TRIM EXISTING PIPES FLUSH WITH THE INTERIOR WALL OF THE STRUCTURE, INSTALL TWO BEADS OF ADEKA P201WATERSTOP WITHIN INTERIOR CIRCUMFERENCE OF PIPE AND PLUG END OF PIPE WITH 2' OF CONCRETE.

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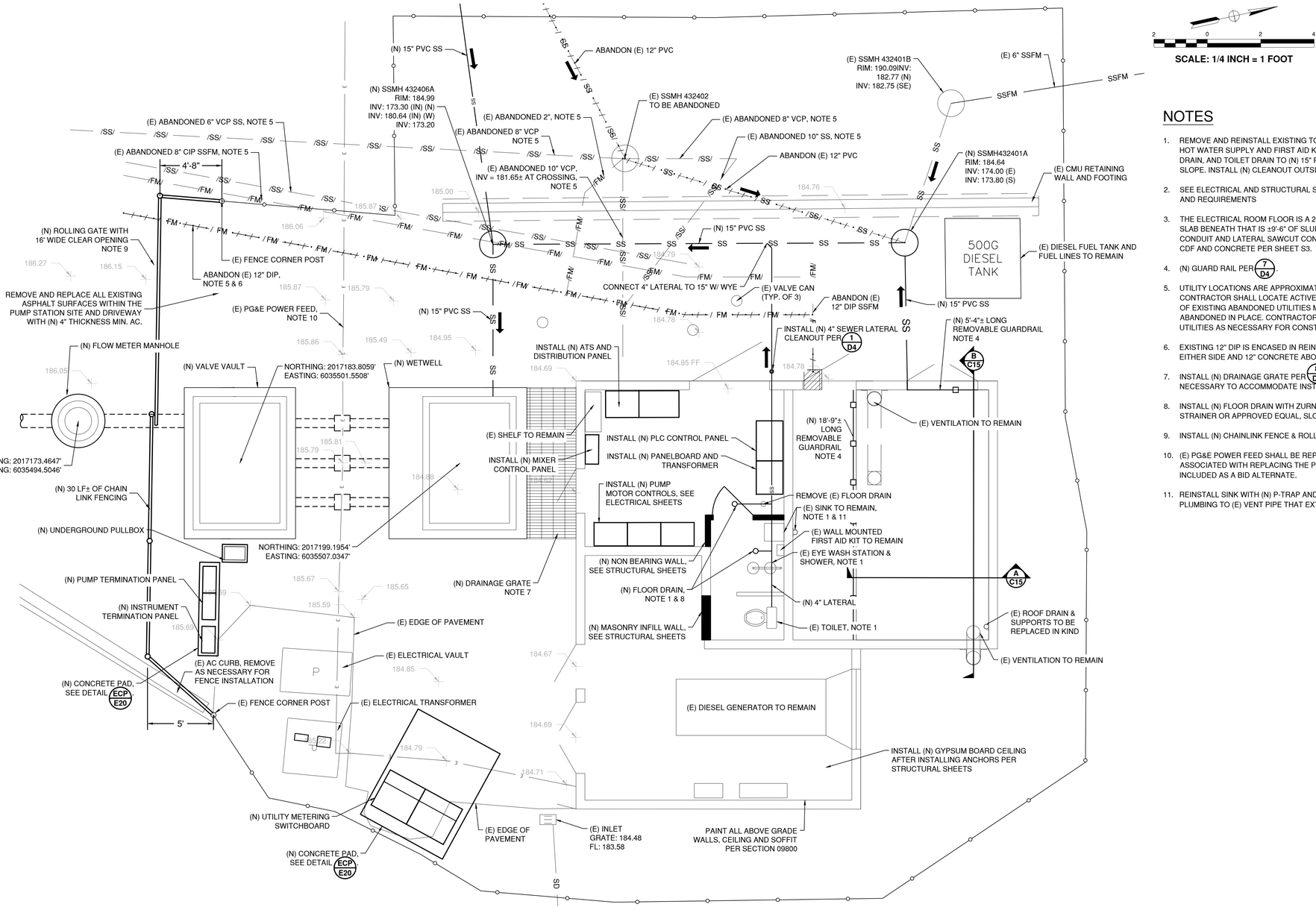
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04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
BUILDING IMPROVEMENT SECTIONS

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C15



2 0 2 4

SCALE: 1/4 INCH = 1 FOOT

NOTES

1. REMOVE AND REINSTALL EXISTING TOILET, EYE WASH STATION, SINK, FAUCET, HOT WATER SUPPLY AND FIRST AID KIT. RE-ROUTE (E) EYE WASH. SHOWER DRAIN, AND TOILET DRAIN TO (N) 15" PVC SS. INSTALL USING 4" PVC SDR 26 AT 2% SLOPE. INSTALL (N) CLEANOUT OUTSIDE OF BUILDING. SEE DETAIL 1/D4 & 2/D4.
2. SEE ELECTRICAL AND STRUCTURAL SHEETS FOR ADDITIONAL IMPROVEMENTS AND REQUIREMENTS
3. THE ELECTRICAL ROOM FLOOR IS A 2,000 PSI 3" NON-REINFORCED CONCRETE SLAB BENEATH THAT IS ±9'-6" OF SLURRY CONCRETE. FOR THE INSTALLATION OF CONDUIT AND LATERAL SAWCUT CONCRETE SLAB AND SLURRY AND REPLACE W/ CDF AND CONCRETE PER SHEET S3.
4. (N) GUARD RAIL PER 7/D4.
5. UTILITY LOCATIONS ARE APPROXIMATE BASED ON HISTORICAL DRAWINGS. CONTRACTOR SHALL LOCATE ACTIVE SSFM PRIOR TO CONSTRUCTION. PORTIONS OF EXISTING ABANDONED UTILITIES MAY HAVE PREVIOUSLY BEEN REMOVED OR ABANDONED IN PLACE. CONTRACTOR MAY REMOVE PREVIOUSLY ABANDONED UTILITIES AS NECESSARY FOR CONSTRUCTION.
6. EXISTING 12" DIP IS ENCASED IN REINFORCED CONCRETE W/ 8" CONCRETE ON EITHER SIDE AND 12" CONCRETE ABOVE AND BELOW PIPE.
7. INSTALL (N) DRAINAGE GRATE PER 8/D4. TRIM GRATE OR DOWNSPOUT AS NECESSARY TO ACCOMMODATE INSTALLATION.
8. INSTALL (N) FLOOR DRAIN WITH ZURN Z450B DRUM TRAP DRAIN W/ 6" TYPE B STRAINER OR APPROVED EQUAL, SLOPE FLOOR TO DRAIN.
9. INSTALL (N) CHAINLINK FENCE & ROLLING GATE PER 1/D5 & 3/D5
10. (E) PG&E POWER FEED SHALL BE REPLACED IF REQUIRED BY PG&E. THE WORK ASSOCIATED WITH REPLACING THE POWER FEED TO THE TRANSFORMER IS INCLUDED AS A BID ALTERNATE.
11. REINSTALL SINK WITH (N) P-TRAP AND DRAIN TO (N) LATERAL. CONNECT (N) PLUMBING TO (E) VENT PIPE THAT EXTENDS THROUGH THE WALL.

BUILDING AND SITE IMPROVEMENT PLAN

SCALE: 1/4"=1'-0"

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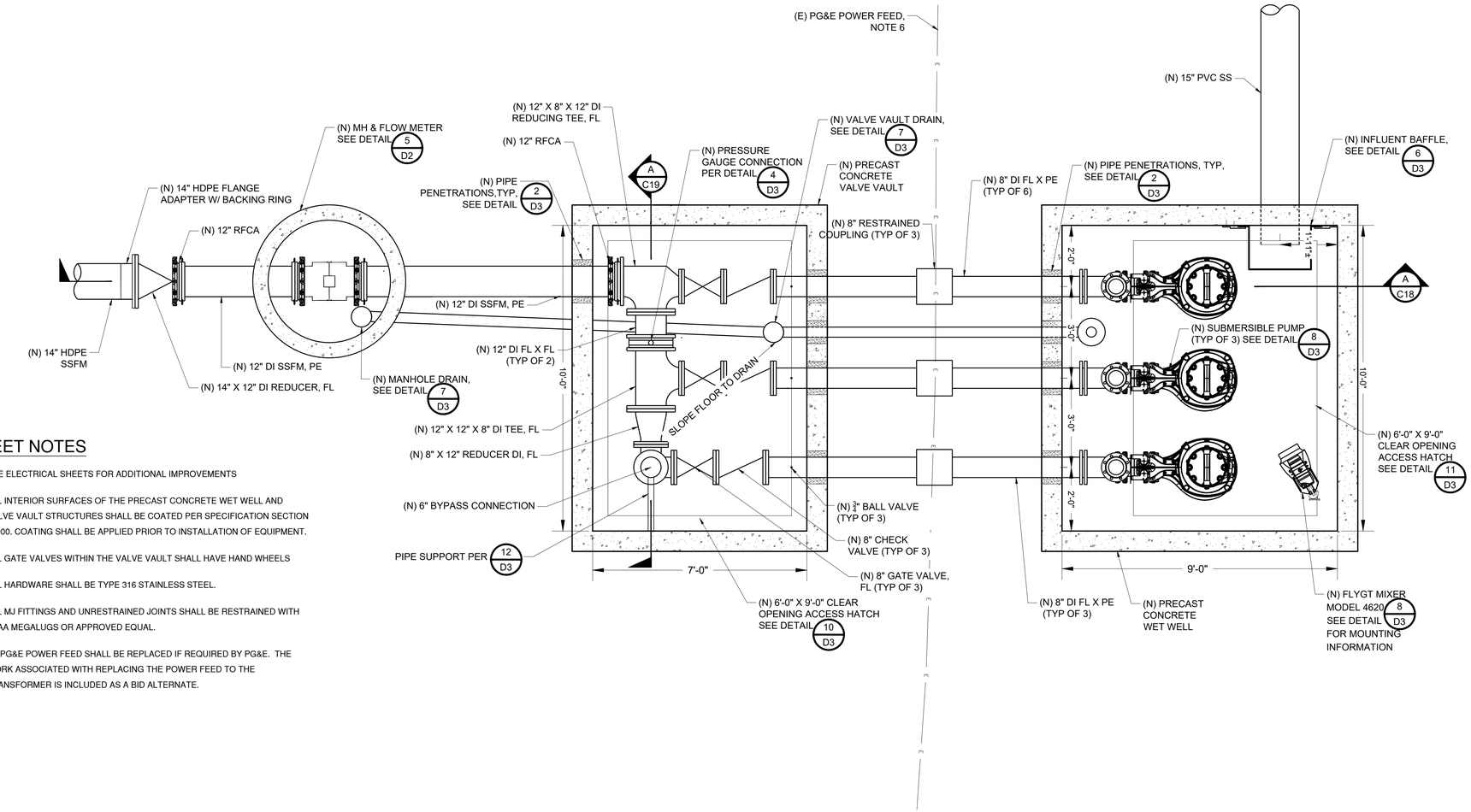
REGISTERED PROFESSIONAL ENGINEER
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No. 74893
CIVIL
STATE OF CALIFORNIA
04/10/26

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SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
BUILDING IMPROVEMENT PLAN

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C16

SHEET: 19 OF 55



SHEET NOTES

1. SEE ELECTRICAL SHEETS FOR ADDITIONAL IMPROVEMENTS
2. ALL INTERIOR SURFACES OF THE PRECAST CONCRETE WET WELL AND VALVE VAULT STRUCTURES SHALL BE COATED PER SPECIFICATION SECTION 09900. COATING SHALL BE APPLIED PRIOR TO INSTALLATION OF EQUIPMENT.
3. ALL GATE VALVES WITHIN THE VALVE VAULT SHALL HAVE HAND WHEELS
4. ALL HARDWARE SHALL BE TYPE 316 STAINLESS STEEL.
5. ALL MJ FITTINGS AND UNRESTRAINED JOINTS SHALL BE RESTRAINED WITH EBAA MEGALUGS OR APPROVED EQUAL.
6. (E) PG&E POWER FEED SHALL BE REPLACED IF REQUIRED BY PG&E. THE WORK ASSOCIATED WITH REPLACING THE POWER FEED TO THE TRANSFORMER IS INCLUDED AS A BID ALTERNATE.

PUMP STATION PLAN

SCALE: 1/2" = 1'

2 0 2 4

SCALE: 1/2 INCH = 1 FEET

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CITY OF BELMONT PUBLIC WORKS

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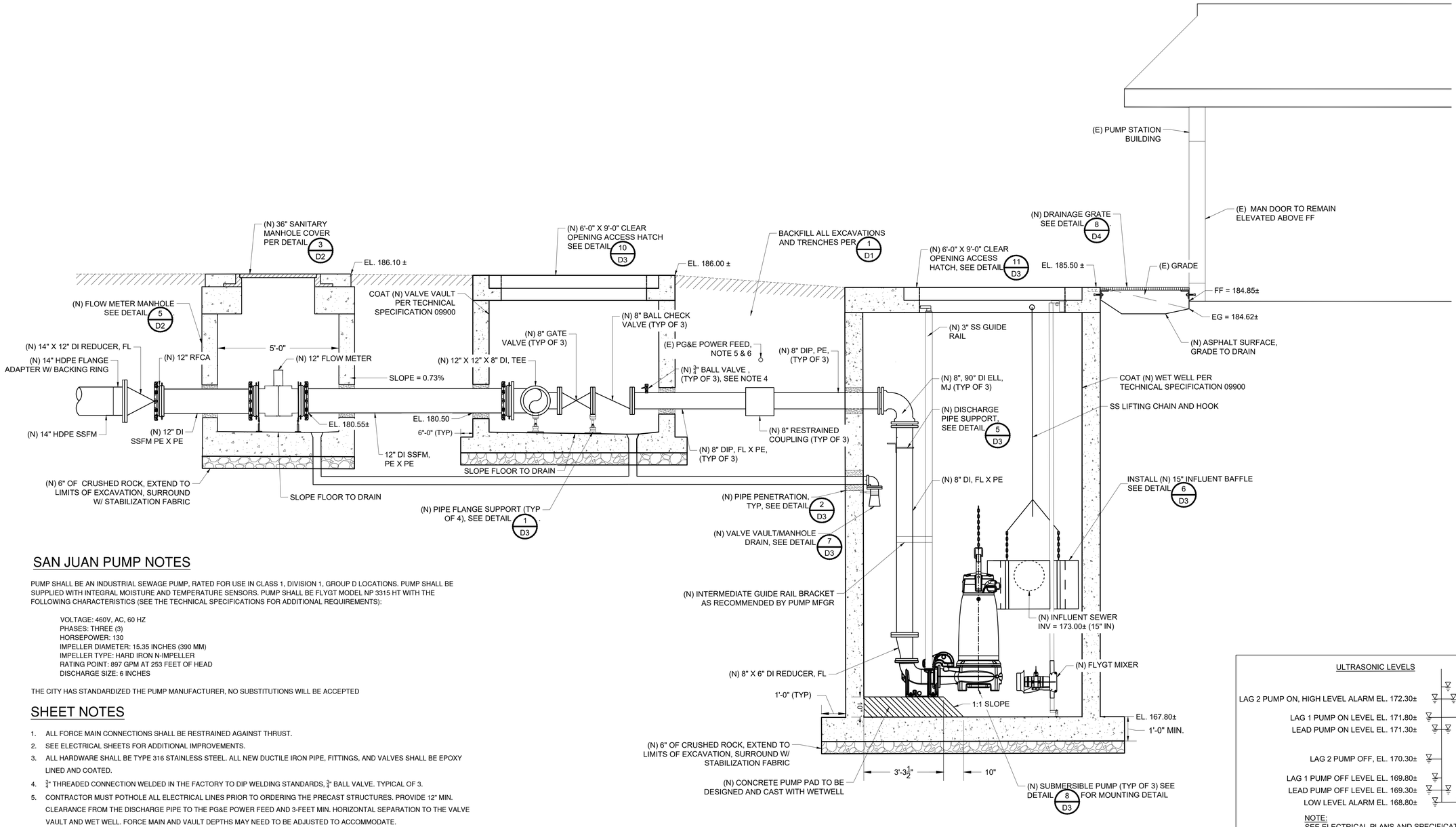
REGISTERED PROFESSIONAL ENGINEER — BRIAN L. PRICE — No. 74813 — CIVIL — STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
PUMP STATION PLAN

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C17

SHEET: 20 OF 55



PUMP STATION SECTION A/C18
SCALE: 1/2" = 1'

SAN JUAN PUMP NOTES

PUMP SHALL BE AN INDUSTRIAL SEWAGE PUMP, RATED FOR USE IN CLASS 1, DIVISION 1, GROUP D LOCATIONS. PUMP SHALL BE SUPPLIED WITH INTEGRAL MOISTURE AND TEMPERATURE SENSORS. PUMP SHALL BE FLYGT MODEL NP 3315 HT WITH THE FOLLOWING CHARACTERISTICS (SEE THE TECHNICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS):

VOLTAGE: 460V, AC, 60 HZ
PHASES: THREE (3)
HORSEPOWER: 130
IMPELLER DIAMETER: 15.35 INCHES (390 MM)
IMPELLER TYPE: HARD IRON N-IMPELLER
RATING POINT: 897 GPM AT 253 FEET OF HEAD
DISCHARGE SIZE: 6 INCHES

THE CITY HAS STANDARDIZED THE PUMP MANUFACTURER, NO SUBSTITUTIONS WILL BE ACCEPTED

SHEET NOTES

1. ALL FORCE MAIN CONNECTIONS SHALL BE RESTRAINED AGAINST THRUST.
2. SEE ELECTRICAL SHEETS FOR ADDITIONAL IMPROVEMENTS.
3. ALL HARDWARE SHALL BE TYPE 316 STAINLESS STEEL. ALL NEW DUCTILE IRON PIPE, FITTINGS, AND VALVES SHALL BE EPOXY LINED AND COATED.
4. 3/4" THREADED CONNECTION WELDED IN THE FACTORY TO DIP WELDING STANDARDS, 3/4" BALL VALVE. TYPICAL OF 3.
5. CONTRACTOR MUST POTHOLE ALL ELECTRICAL LINES PRIOR TO ORDERING THE PRECAST STRUCTURES. PROVIDE 12" MIN. CLEARANCE FROM THE DISCHARGE PIPE TO THE PG&E POWER FEED AND 3-FEET MIN. HORIZONTAL SEPARATION TO THE VALVE VAULT AND WET WELL. FORCE MAIN AND VAULT DEPTHS MAY NEED TO BE ADJUSTED TO ACCOMMODATE.
6. (E) PG&E POWER FEED SHALL BE REPLACED IF REQUIRED BY PG&E. THE WORK ASSOCIATED WITH REPLACING THE POWER FEED TO THE TRANSFORMER IS INCLUDED AS A BID ALTERNATE.

WET WELL & VALVE VAULT COATING:

1. ALL INTERIOR SURFACES OF THE PRECAST CONCRETE WET WELL & VALVE VAULT SHALL BE COATED PER TECHNICAL SPECIFICATION SECTION 09900. COATING SHALL BE APPLIED PRIOR TO INSTALLATION OF EQUIPMENT

ULTRASONIC LEVELS	FLOAT SWITCH LEVELS
	HIGH LEVEL ALARM, ALL PUMPS ON EL. 172.80±
LAG 2 PUMP ON, HIGH LEVEL ALARM EL. 172.30±	LAG 2 PUMP ON LEVEL EL. 172.30±
LAG 1 PUMP ON LEVEL EL. 171.80±	LAG 1 PUMP ON LEVEL EL. 171.80±
LEAD PUMP ON LEVEL EL. 171.30±	LEAD PUMP ON LEVEL EL. 171.30±
LAG 2 PUMP OFF, EL. 170.30±	
LAG 1 PUMP OFF LEVEL EL. 169.80±	
LEAD PUMP OFF LEVEL EL. 169.30±	ALL PUMPS OFF LEVEL EL. 169.30±
LOW LEVEL ALARM EL. 168.80±	LOW LEVEL ALARM EL 168.80±

NOTE:
SEE ELECTRICAL PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION

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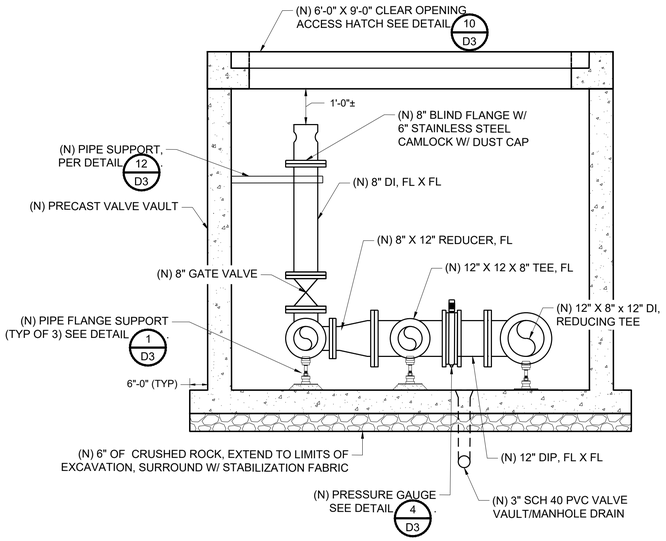
SCHAAF & WHEELER
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REGISTERED PROFESSIONAL ENGINEER BRIAN L. PRICE No. 74813 CIVIL STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
PUMP STATION SECTION

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C18
SHEET: 21 OF 55



VALVE VAULT SECTION A C19
SCALE: 1/2" = 1'

SHEET NOTES

1. SEE ELECTRICAL SHEETS FOR ADDITIONAL IMPROVEMENTS
2. ALL INTERIOR SURFACES OF THE PRECAST CONCRETE WET WELL AND VALVE VAULT STRUCTURES SHALL BE COATED PER SPECIFICATION SECTION 09900. COATING SHALL BE APPLIED PRIOR TO INSTALLATION OF EQUIPMENT.
3. ALL GATE VALVES WITHIN THE VALVE VAULT SHALL HAVE HAND WHEELS.

NO	REVISIONS	DATE	APPR
1			
2			
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CITY OF BELMONT PUBLIC WORKS

SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
(707) 528-4848

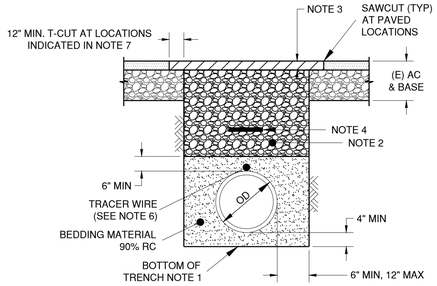
REGISTERED PROFESSIONAL ENGINEER — BRIAN L. PRICE — NO. 74913 — CIVIL — STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
VALVE VAULT SECTION

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

C19

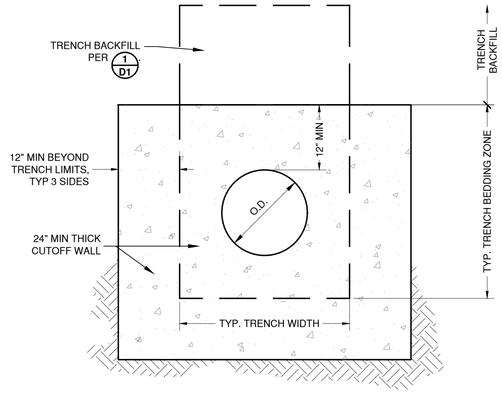
SHEET: 22 OF 55



NOTES:

1. IF SOFT SOILS ARE ENCOUNTERED EXCAVATE 12" BELOW PIPE AND INSTALL GEOTEXTILE FABRIC PER SPECIFICATION SECTION 02200.
2. CL 2 AB 95% RC.
3. IN PAVED AREAS: 4" AC OR MATCH EXISTING PAVEMENT THICKNESS WHICHEVER IS GREATER. UNIMPROVED AREAS: 12" NATIVE MATERIAL.
4. DETECTABLE WARNING TAPE 14" ABOVE PIPE.
5. INSTALL TRENCH CUTOFF WALL EVERY 200' PER (2/D1) AT ALL OPEN TRENCH LOCATIONS, UNLESS INDICATED OTHERWISE.
6. TRACER WIRE SHALL BE TAPED TO THE TOP OF THE (N) FORCE MAIN. A TRACER WIRE CONNECTION BOX SHALL BE INSTALLED PER DETAIL (3/D4)
7. T-CUT ASPHALT REPLACEMENT IS REQUIRED ON CIPRIANI BLVD, E LAUREL CREEK RD, LYALL WAY, AND AT THE PUMP STATION. ON SAN JUAN BLVD, 12" T-CUT IS NOT REQUIRED, CONTRACTOR SHALL RESTORE ASPHALT SURFACE WITHIN TRENCH LIMITS.

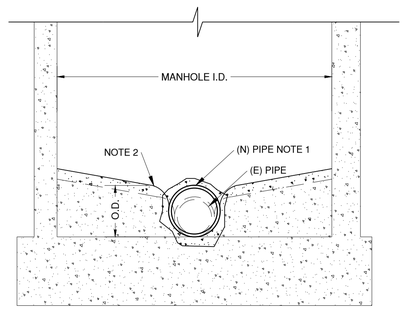
STANDARD TRENCH 1/D1
SCALE: NTS



CUTOFF WALL NOTES:

1. PLACE CUTOFF WALL EVERY 200' AT OPEN TRENCH LOCATIONS.
2. CUTOFF WALL TO EXTEND 12" PAST TRENCH LIMITS AND BE AT LEAST 24" THICK.
3. CUTOFF WALL SHALL BE A BLENDED MIXTURE OF 1-PART FREE DRAINING SAND AND 1-PART DRY MIX CEMENT MIXED WITH WATER. WATER TO CEMENT RATIO SHALL BE LESS THAN 0.3, RESULTING IN A "DRY" MIX THAT IS HAND COMPACTED AROUND THE PIPE.

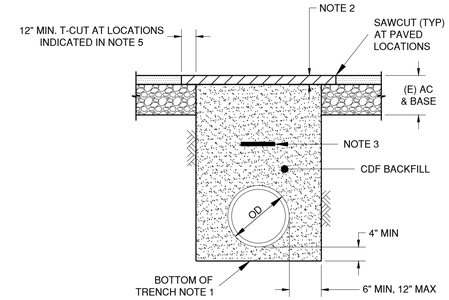
TRENCH CUTOFF WALL 2/D1
SCALE: NTS



NOTES:

1. REMOVE PORTION OF (E) MH WALL TO ALLOW INSERTION OF (N) PIPE. INSTALL WATERSTOP AROUND NEW CONNECTION. FILL VOIDS W/ NON-SHRINK GROUT.
2. REMOVE PORTION OF (E) TROUGH & BENCH TO ALLOW FOR (N) PIPE. BUILD UP BENCH & REFORM TROUGH FOR (N) PIPE W/ GROUT. SLOPE BENCH AT 1/2" PER FOOT TOWARDS CHANNEL.

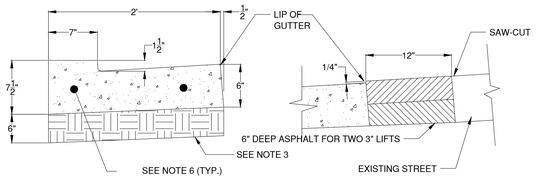
MANHOLE MODIFICATION 3/D1
SCALE: NTS



NOTES:

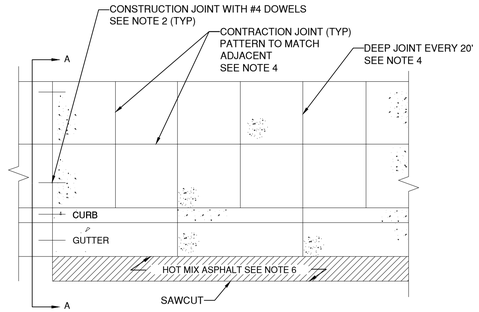
1. IF SOFT SOILS ARE ENCOUNTERED EXCAVATE 12" BELOW PIPE AND INSTALL GEOTEXTILE FABRIC PER SPECIFICATION SECTION 02200.
2. IN PAVED AREAS: 4" AC OR MATCH EXISTING PAVEMENT THICKNESS WHICHEVER IS GREATER. UNIMPROVED AREAS: 12" NATIVE MATERIAL.
3. DETECTABLE WARNING TAPE 14" ABOVE PIPE.
4. TRACER WIRE SHALL BE TAPED TO THE TOP OF THE (N) FORCE MAIN. A TRACER WIRE CONNECTION BOX SHALL BE INSTALLED PER DETAIL (3/D4)
5. T-CUT ASPHALT REPLACEMENT IS REQUIRED ON CIPRIANI BLVD, E LAUREL CREEK RD, LYALL WAY, AND AT THE PUMP STATION. ON SAN JUAN BLVD, 12" T-CUT IS NOT REQUIRED, CONTRACTOR SHALL RESTORE ASPHALT SURFACE WITHIN TRENCH LIMITS.

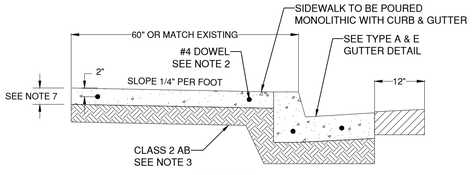
CDF TRENCH 4/D1
SCALE: NTS



SECTION A-A

ASPHALT REPAIR AT GUTTER (TYP)



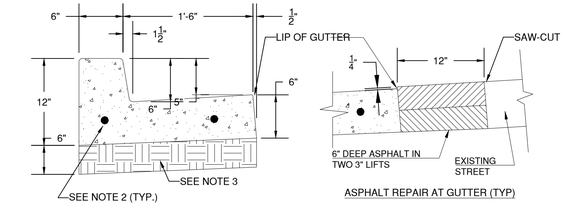


SECTION A-A

NOTES:

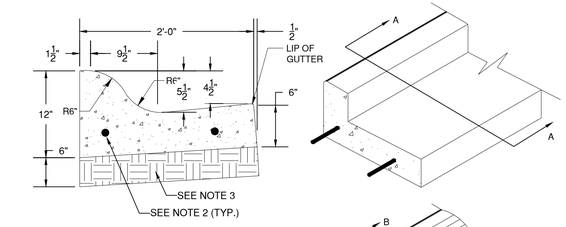
1. PRIOR TO BEGINNING ANY WORK, AN ENCROACHMENT PERMIT SHALL BE OBTAINED.
2. 12" #4 REBAR DOWELS, 6" MINIMUM DEPTH INTO EXISTING OR NEW SIDEWALK. DO NOT DOWEL PRIVATE IMPROVEMENTS INTO PUBLIC IMPROVEMENTS.
3. 6" MINIMUM CLASS 2 A.B. COMPACTED TO 90%.
4. 1/2" DEEP CONTRACTION JOINTS AT 20', 1/4" DEEP CONTRACTION JOINTS AT 10' SIDEWALK SHALL BE SCORED TO MATCH CONTIGUOUS EXISTING SIDEWALK.
5. ALL CONCRETE SHALL BE 6 SACK 3/4" WITH ONE POUND OF LAMP BLACK PER CUBIC YARD.
6. ASPHALT TO BE HOT MIX ASPHALT 1/2" FINE.
7. 4" THICK SIDEWALK FOR VERTICAL CURB, 6" THICK SIDEWALK FOR ROLLED CURB.

CURB, GUTTER, & SIDEWALK 7/D1
SCALE: NTS

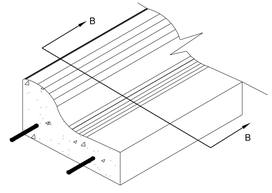


ASPHALT REPAIR AT GUTTER (TYP)

TYPE A CURB
SECTION A-A



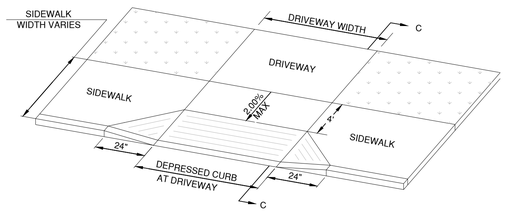
TYPE E CURB
SECTION B-B

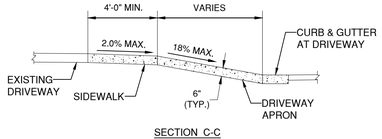


NOTES:

1. PRIOR TO BEGINNING ANY WORK, AN ENCROACHMENT PERMIT SHALL BE OBTAINED.
2. 12" #4 REBAR DOWELS, 6" MINIMUM DEPTH INTO EXISTING SIDEWALK, CURB & GUTTER. DO NOT DOWEL PRIVATE IMPROVEMENTS INTO PUBLIC IMPROVEMENTS.
3. 6" MINIMUM CLASS 2 A.B. COMPACTED TO 90%.
4. 1/2" DEEP CONTRACTION JOINTS AT 20', 1/4" DEEP CONTRACTION JOINS AT 10'.
5. ALL CONCRETE SHALL BE 6 SACK 3/4" WITH ONE POUND LAMP BLACK PER CUBIC YARD. FINISH TO BE UNIFORM FINE BROOMED TEXTURE.
6. ASPHALT TO BE HOT MIX ASPHALT 1/2" FINE.
7. UNLESS OTHERWISE NOTED, ALL RADII TO BE 1/2".

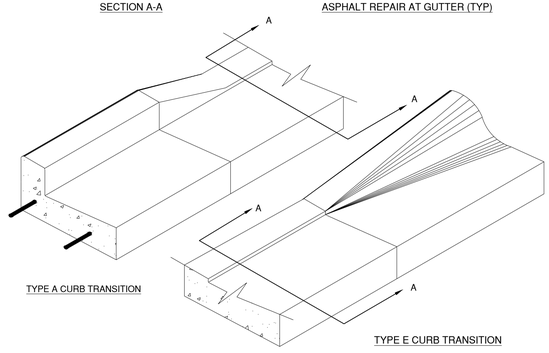
CURB & GUTTER 8/D1
SCALE: NTS





SECTION C-C

DRIVEWAY APPROACH 5/D1
SCALE: NTS



TYPE A CURB TRANSITION

TYPE E CURB TRANSITION

NOTES:

1. PRIOR TO BEGINNING ANY WORK, AN ENCROACHMENT PERMIT SHALL BE OBTAINED.
2. 6" MINIMUM CLASS 2 A.B. COMPACTED TO 90%.
3. 1/2" DEEP CONTRACTION JOINTS AT 20', 1/4"DEEP CONTRACTION JOINTS AT 10'.
4. ALL CONCRETE SHALL BE 6 SACK 3/4"WITH ONE POUND OF LAMP BLACK PER CUBIC YARD. FINISH TO BE UNIFORM FINE BROOMED TEXTURE.
5. ASPHALT TO BE HOT MIX ASPHALT 1/2" FINE.
6. 12" #4 REBAR DOWLS, 6" MINIMUM DEPTH INTO EXISTING SIDEWALK, CURB & GUTTER. DO NOT DOWEL PRIVATE IMPROVEMENTS INTO PUBLIC IMPROVEMENTS.

DRIVEWAY APPROACH CURB 6/D1
SCALE: NTS

NO	REVISIONS	DATE	APPR
1			
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CITY OF BELMONT PUBLIC WORKS

SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
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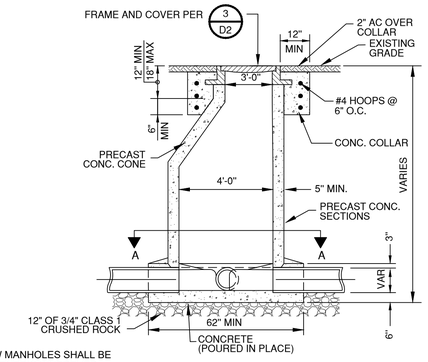
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
No. 74393
CIVIL
STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
DETAILS

DATE:	4/10/2026
SCALE:	AS SHOWN
DESIGN:	CLP
DRAWN:	BDL
CHECKED:	BLS

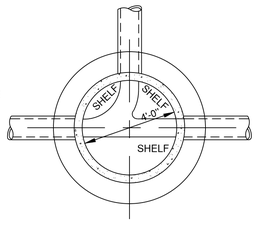
D1

SHEET: 23 OF 55



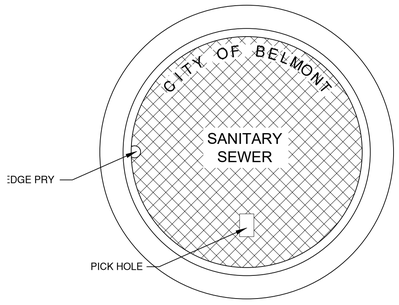
NOTES:
1. NEW MANHOLES SHALL BE ECCENTRIC WHEREVER POSSIBLE. EXISTING MANHOLES ARE CONCENTRIC UNLESS OTHERWISE NOTED ON THE PLANS.
2. TAPER "SHELF" 1" PER FOOT TOWARDS CHANNEL.
3. REFER TO SPECIFICATIONS FOR MANHOLE PIPE CONNECTION.
4. IN UNPAVED AREAS, MANHOLE RIM SHALL BE PLACED APPROXIMATELY 6" ABOVE GRADE W/ A 6" CONCRETE RING TAPERED AT 3:1 SLOPE FROM THE TOP TO THE OUTSIDE EDGE OF THE COLLAR TO THE GROUND SURFACE.

SECTIONAL ELEVATION

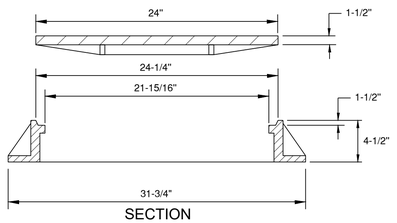


SECTION A-A

PRE-CAST MANHOLE 1 D2
SCALE: NTS

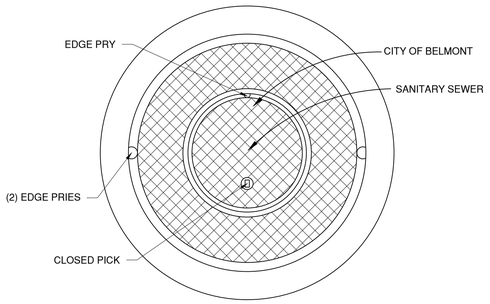


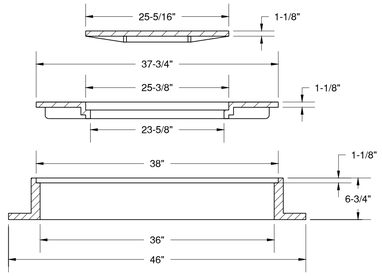
NOTE: D& L FOUNDRY MODEL A-1024 OR APPROVED EQUAL. 36-INCH FRAME AND COVER SHALL BE USED ON ALL NEW MANHOLES. 24-INCH FRAME AND COVER SHALL BE USED TO REPLACE EXISTING MANHOLE FRAME AND COVERS.



SECTION

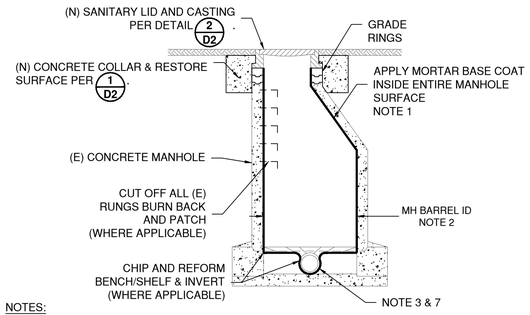
24" MANHOLE FRAME & COVER 2 D2
SCALE: NTS





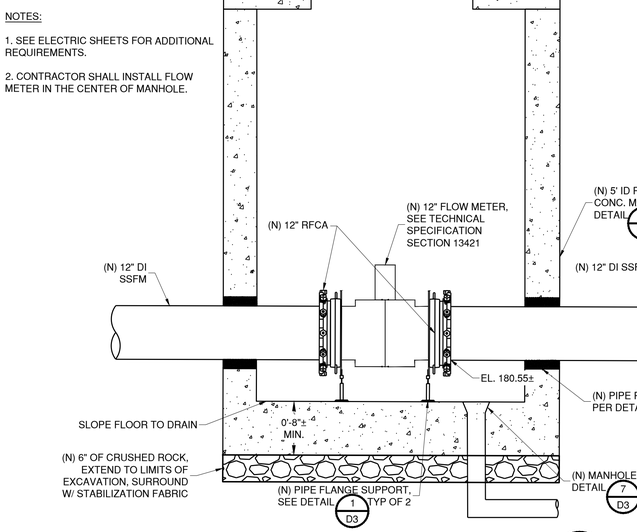
FRAME: D&L A-1462 OR APPROVED EQUAL
OUTER COVER: D&L A-1462-R5 OR APPROVED EQUAL
INNER COVER: D&L A-1024 OR APPROVED EQUAL

36" MANHOLE FRAME & COVER 3 D2
SCALE: NTS



NOTES:
1. CONTRACTOR SHALL COAT ALL INTERIOR CONCRETE, BRICK, OR MORTAR SURFACES INSIDE OF MANHOLE INCLUDING WALLS, CONES, BASE, AND CHANNEL WITH A 1-INCH MINIMUM COATING THICKNESS, UNLESS OTHERWISE NOTED. MINIMUM COATING THICKNESS SHALL BE MEASURED FROM THE FLAT SURFACE OF THE EXISTING MANHOLE. CONTRACTOR SHALL CLEAN AND PREPARE ALL SURFACES IN ACCORDANCE WITH COATING MANUFACTURER'S RECOMMENDATIONS AND PER SPECIFICATION SECTION 09900. PERFORM TESTING IN ACCORDANCE WITH SPECIFICATIONS SECTION 099000.
2. REPAIR DETERIORATED SURFACES INSIDE OF MANHOLE WITH HYDRAULIC CEMENT MORTAR IN CONFORMANCE WITH COATING MANUFACTURER RECOMMENDATIONS. THE REPAIR MATERIAL THICKNESS SHALL BE SUCH THAT THE NEW MATERIAL SURFACE MATCHES THE MANHOLE'S ORIGINAL INSIDE DIAMETER, OR AS DIRECT BY THE CITY OR ITS REPRESENTATIVES.
3. PERFORM TESTING OF EXISTING SURFACE PRIOR TO PLACING HYDRAULIC CEMENT IN ACCORDANCE WITH HYDRAULIC CEMENT MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION SECTION 09900.
4. CONTRACTOR SHALL COMPLY WITH ALL CAL-OSHA CONFINED SPACE ENTRY REQUIREMENTS.
5. PERFORM BYPASS PUMPING AS REQUIRED AND IN ACCORDANCE WITH SPECIFICATION SECTION 01120.
6. WHERE REQUIRED, CONTRACTOR SHALL REPAIR EXISTING CHANNEL AND BASE PRIOR TO INSTALLING COATING MATERIAL. FORM A SMOOTH CHANNEL AND MINIMIZE DISTURBANCE TO FLOW.
7. CONTRACTOR SHALL CHIP OUT AND REPAIR EXISTING INVERT PRIOR TO INSTALLING COATING MATERIAL, SO THAT FINISHED INVERT SURFACES MATCH EXISTING INVERT. CHANNEL SHALL BE SMOOTH AND MINIMIZE DISTURBANCE TO FLOW.
8. MANHOLE REHABILITATION SHALL BE DONE IN ACCORDANCE TO THESE NOTES AND SPECIFICATION SECTION 09900.

MANHOLE REHABILITATION DETAIL 4 D2
SCALE: NTS

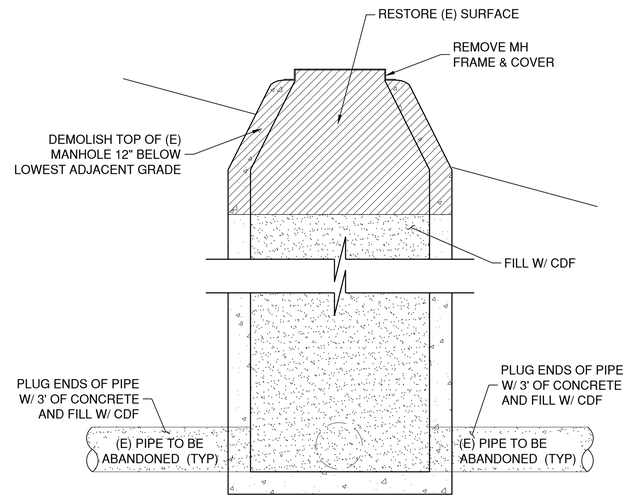


NOTES:

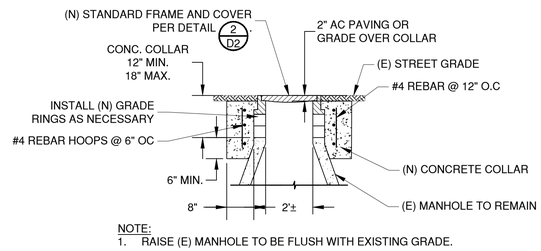
1. SEE ELECTRIC SHEETS FOR ADDITIONAL REQUIREMENTS.

2. CONTRACTOR SHALL INSTALL FLOW METER IN THE CENTER OF MANHOLE.

FLOW METER MANHOLE DETAIL 5 D2
SCALE: NTS



SEWER ABANDONMENT 6 D2
SCALE: NTS



NOTE:
1. RAISE (E) MANHOLE TO BE FLUSH WITH EXISTING GRADE.

RAISE MANHOLE 7 D2
SCALE: NTS

NO	REVISIONS	DATE	APPR
1			
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CITY OF BELMONT PUBLIC WORKS

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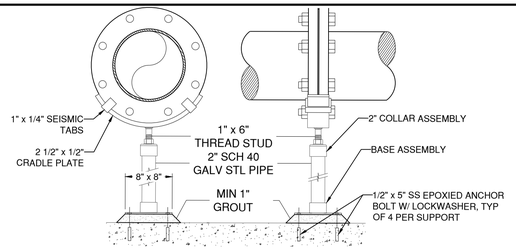
REGISTERED PROFESSIONAL ENGINEER — BRIAN L. PRICE — No. 74913 — CIVIL — STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
DETAILS

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

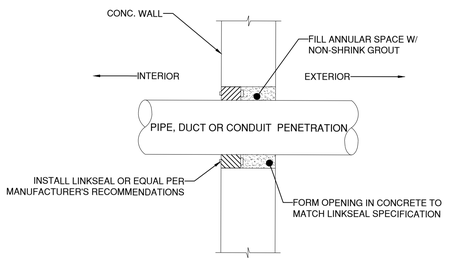
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SHEET: 24 OF 55

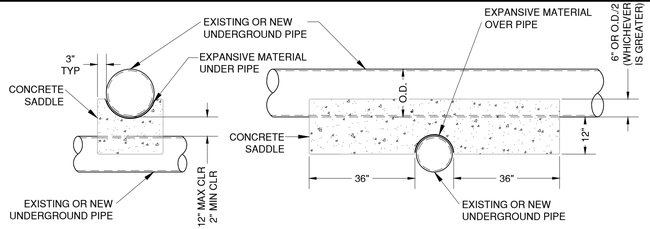


NOTE: EXPOSED PIPE FLANGE SUPPORT METAL SHALL BE HOT DIPPED GALVANIZED STEEL PER ASTM SPECIFICATION A-123.

FLANGE PIPE SUPPORT DETAIL 1 D3
NTS

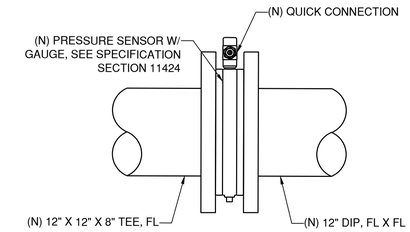


PIPE PENETRATION DETAIL 2 D3
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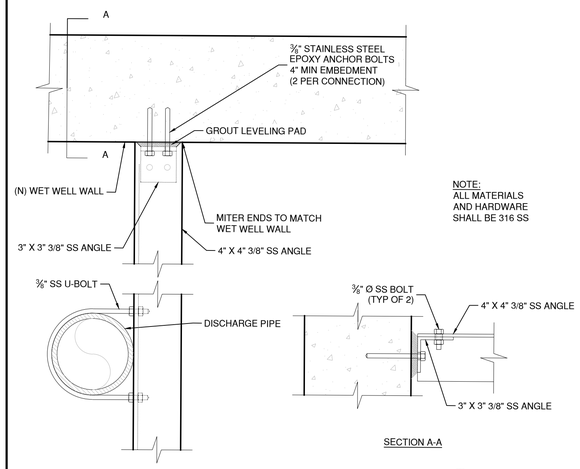


NOTES:
1. INSTALL CONCRETE SADDLE AT EACH LOCATION WHERE A NEW UNDERGROUND UTILITY CROSSES IN EXISTING UNDERGROUND UTILITY WITH LESS THAN 12" CLEARANCE. MINIMUM ALLOWABLE CLEARANCE IS 2".
2. INSTALL V-BIO POLYETHYLENE WRAP AROUND ALL EXPOSED WATER MAINS.

CONCRETE SADDLE 3 D3
SCALE: NTS

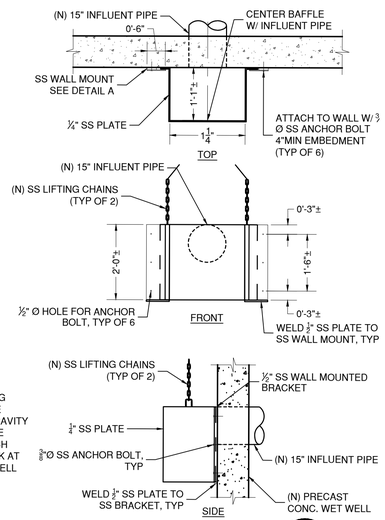


PRESSURE GAUGE DETAIL 4 D3
NTS



NOTE:
ALL MATERIALS AND HARDWARE SHALL BE 316 SS

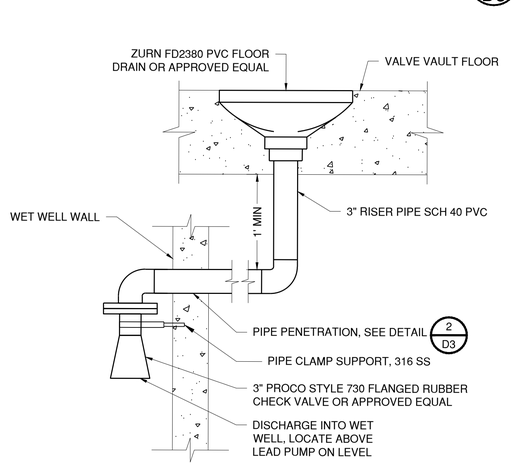
DISCHARGE PIPE SUPPORT DETAIL 5 D3
NTS



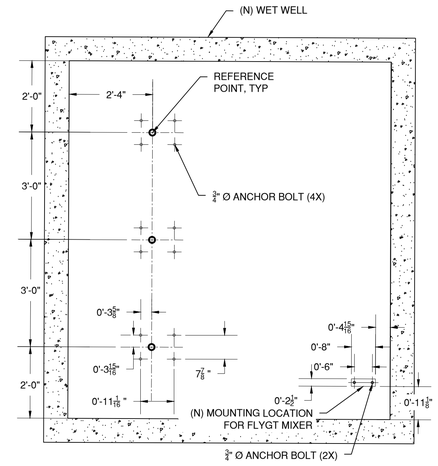
NOTE:

LOCATE LIFTING CHAINS AT THE CENTER OF GRAVITY OF REMOVABLE BAFFLE. ATTACH CHAIN TO HOOK AT TOP OF WET WELL

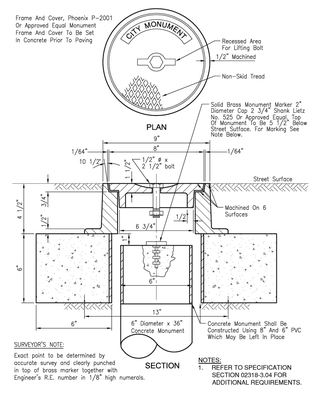
INFLUENT BAFFLE DETAIL 6 D3
NTS



VALVE VAULT/MANHOLE DRAIN DETAIL 7 D3
NTS



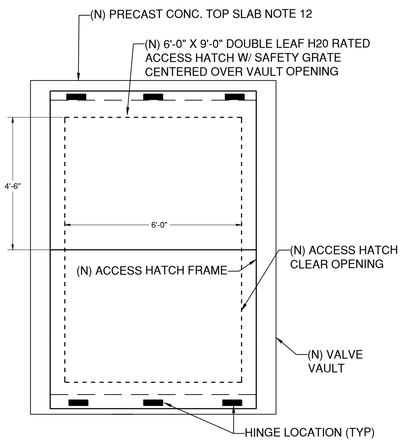
PUMP AND MIXER MOUNTING DETAIL 8 D3
NTS



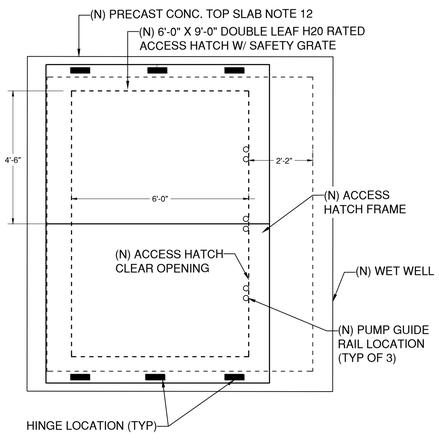
STANDARD MONUMENT 9 D3
SCALE: NTS

VALVE VAULT HATCH NOTES:

1. ACCESS HATCH DIMENSIONS SHOWN ARE CLEAR OPENINGS.
2. HINGES SHALL BE POSITIONED AS SHOWN.
3. ACCESS HATCH SHALL BE EQUIPPED WITH INTEGRAL FALL PROTECTION.
4. ACCESS HATCH SHALL BE RATED FOR H20 LOADING.
5. ACCESS HATCH SHALL BE DOUBLE LEAF, MANUFACTURED BY USF, EJ, OR APPROVED EQUAL.
6. ACCESS HATCH SHALL HAVE A CHANNEL FRAME WITH A 1½" DRAIN COUPLER THAT DRAINS TO WET WELL.
7. ACCESS HATCH TOP SHALL BE ¼" DIAMOND PLATE.
8. ACCESS HATCH SHALL BE EQUIPPED WITH HYDRAULIC LIFT SPRINGS TO ASSIST WITH OPENING.
9. ACCESS HATCH SHALL HAVE A RECESSED PADLOCK CLIP FOR LOCKING.
10. ALL HARDWARE AND HINGES SHALL BE STAINLESS STEEL.
11. SEE SPECIFICATION SECTION 08310 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
12. OVERSIZE TOP SLAB AS NECESSARY TO PROVIDE SUFFICIENT CLEARANCE TO HATCH FRAME.



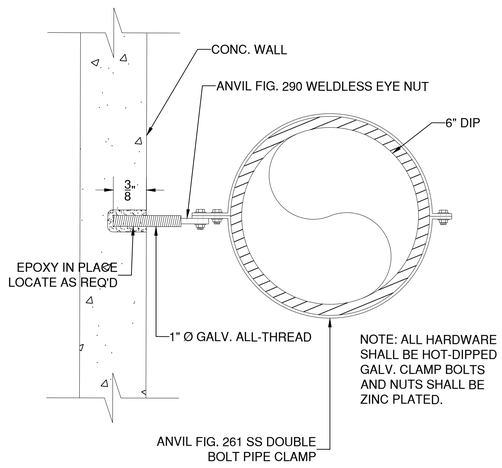
VALVE VAULT ACCESS HATCH 10 D3
NTS



WET WELL ACCESS HATCH 11 D3
NTS

WET WELL HATCH NOTES:

1. ACCESS HATCH DIMENSIONS SHOWN ARE CLEAR OPENINGS.
2. HINGES SHALL BE POSITIONED AS SHOWN.
3. ACCESS HATCH SHALL BE EQUIPPED WITH INTEGRAL FALL PROTECTION.
4. ACCESS HATCH SHALL BE RATED FOR H20 LOADING.
5. ACCESS HATCH SHALL BE DOUBLE LEAF, MANUFACTURED BY USF, EJ, OR APPROVED EQUAL.
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10. ALL HARDWARE AND HINGES SHALL BE STAINLESS STEEL.
11. SEE SPECIFICATION SECTION 08310 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
12. OVERSIZE TOP SLAB AS NECESSARY TO PROVIDE SUFFICIENT CLEARANCE TO HATCH FRAME.



PIPE RISER SUPPORT DETAIL 12 D3
NTS

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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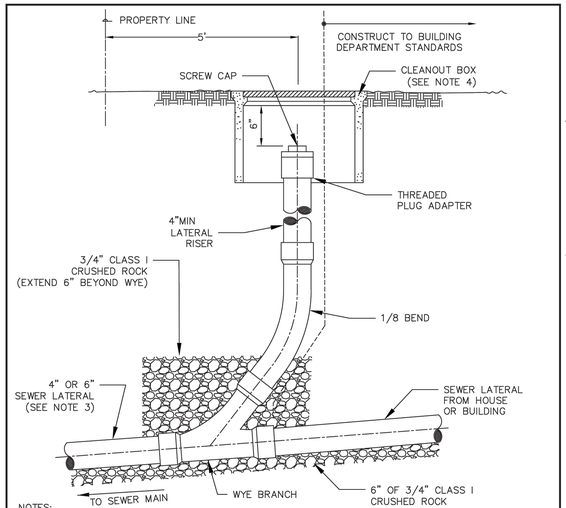
REGISTERED PROFESSIONAL ENGINEER BRIAN L. PRICE NO. 74913 CIVIL STATE OF CALIFORNIA
04/10/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
DETAILS

DATE:	4/10/2026
SCALE:	AS SHOWN
DESIGN:	CLP
DRAWN:	BDL
CHECKED:	BLS

D3

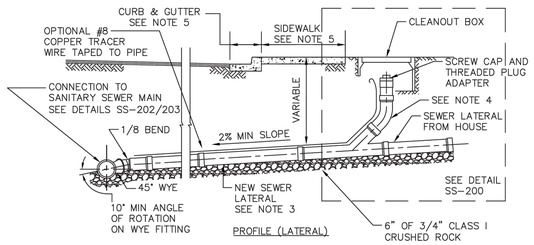
SHEET: 25 OF 55



NOTES:
1. PRIOR TO BEGINNING ANY WORK, AN ENCROACHMENT PERMIT SHALL BE OBTAINED.
2. THE CITY SHALL NOT BE RESPONSIBLE FOR FLUSHING PRIVATE LATERALS. OWNER IS RESPONSIBLE FOR LATERAL TO THE MAIN, INCLUDING THE CONNECTION TO THE MAIN.
3. SEWER LATERAL FROM THE CLEANOUT TO MAIN SHALL BE MADE OF FUSIBLE HDPE OR PVC SDR 26/35 WITH A MINIMUM 4" DIAMETER FOR A SINGLE FAMILY HOME AND A MINIMUM OF 6" DIAMETER FOR COMMERCIAL AND MULTI-FAMILY PROPERTIES.
4. IN DRIVEWAY AREA, USE B03 BOX, OR G05 BOX. LID SHALL CONTAIN THE LETTERS "SEWER".
5. WHEN INSTALLED IN PLANTED AREAS, CLEANOUT BOX SHALL BE SET A MINIMUM OF 4" ABOVE GRADE. IN LAWNS, THE BOX MAY BE LOWER TO ALLOW MOWING.
6. STAINLESS STEEL SHIELDED ADJUSTABLE REPAIR COUPLINGS TO BE USED WHEN CONNECTION FROM EXISTING TO NEW CONSTRUCTION.
7. SEWER CLEANOUT SHALL HAVE NO MORE THAN TWO BENDS.

CITY OF BELMONT	4" AND 6" SEWER LATERAL CLEANOUT	SS-200
	APPROVED BY: JARED BARRILLEAUX DATE: MARCH 2022	N.T.S. SHEET: 1 OF 1

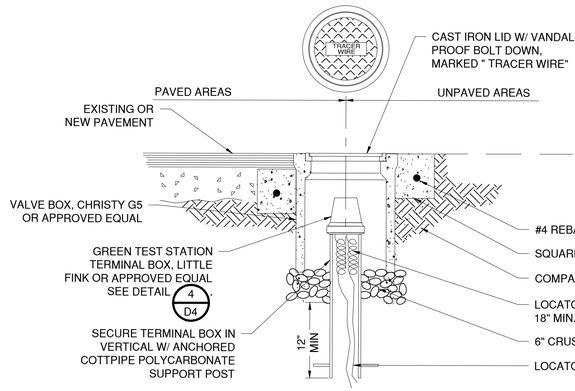
4" & 6" SEWER LATERAL CLEANOUT 1/D4
SCALE: NTS



NOTES:
1. PRIOR TO BEGINNING ANY WORK, AN ENCROACHMENT PERMIT SHALL BE OBTAINED.
2. TO CONNECT NEW LATERAL TO EXISTING LATERAL, USE ARC COUPLING OR APPROVED EQUAL.
3. SEWER LATERAL FROM THE CLEANOUT SHALL BE MADE OF FUSIBLE HDPE OR PVC SDR 35/26, WITH NO GLUED ON FITTINGS.
4. SEWER CLEANOUTS AND LATERAL SHALL HAVE NO MORE THAN 2 BENDS.
5. REPLACE EXISTING CURB, GUTTER, SIDEWALK, OR OTHER IMPROVEMENTS DAMAGED DURING CONSTRUCTION TO PRE-CONSTRUCTION CONDITIONS PER CITY STANDARDS.
6. IF LATERAL IS REPLACED WITH HDPE, USE FUSIBLE PIPE TO CONNECT TO MAIN. FOR PVC PIPE, USE SDR 35/26 FROM THE SEWER CLEANOUT TO CONNECT TO MAIN.
7. CIPP WILL NOT BE ALLOWED.
8. NEW SEWER LATERAL CONNECTIONS SHALL OCCUR AT SEWER MAIN IMMEDIATELY IN FRONT OF PRIVATE PARCEL, UNLESS DIRECTED OTHERWISE BY ENGINEER.

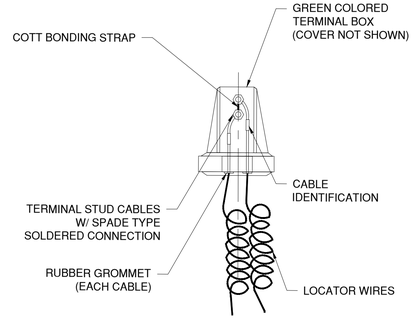
CITY OF BELMONT	SANITARY SEWER LATERAL (NEW PIPE)	SS-201
	APPROVED BY: JARED BARRILLEAUX DATE: MARCH 2022	N.T.S. SHEET: 1 OF 1

SEWER LATERAL CONNECTION 2/D4
SCALE: NTS

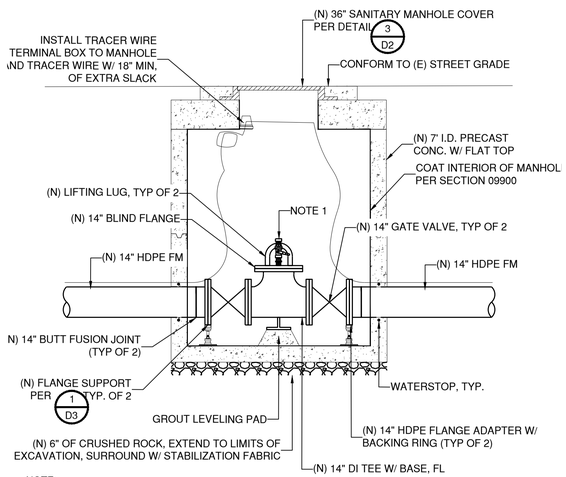


NOTES:
1. LOCATION OF TRACER WIRE TERMINAL BOXES ARE NOT SHOWN ON PLANS.
2. TRACER WIRE MAY TERMINATE IN PUMP STATION VALVE VAULT, ACCESS STRUCTURES, AND DISCHARGE MANHOLE W/ TERMINAL BOX PER 4/D4.
3. TRACER WIRE TERMINAL BOXES SHALL BE INSTALLED AT MAXIMUM 500 FEET INTERVALS ALONG THE FORCE MAIN. CONTRACTOR SHALL MARK OUT PROPOSED LOCATIONS FOR TERMINAL BOXES IN THE FIELD AND REVIEW W/ CITY PRIOR TO INSTALLATION.

TRACER WIRE BOX 3/D4
SCALE: NTS

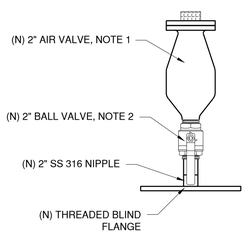


TERMINAL BOX 4/D4
SCALE: NTS



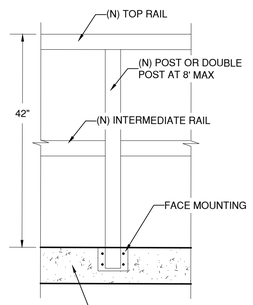
NOTE:
1. (N) INSTALL 2" THREADED CONNECTION AND AIR VALVE PER DETAIL 6/D4 IN LOCATIONS NOTED ON THE PLANS (FM ACCESS STRUCTURE #3 & #6). ALL OTHER LOCATIONS INSTALL 1" THREADED CONNECTION IN MIDDLE OF BLIND FLANGE, INSTALL TWO (2) 1" SCH 40 SS NIPPLES, 1" BALL VALVE, AND SS CAP

FORCE MAIN ACCESS STRUCTURE 5/D4
SCALE: 1/2" = 1'-0"



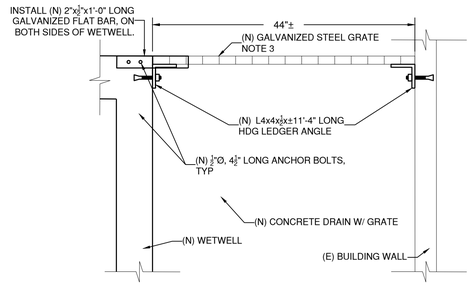
NOTES:
1. AIR VALVE SHALL BE VENT-O-MAT RGX II, 2", THREADED W/ 2" THREADED DICHARGE OUTLET FOR USE IN SEWAGE APPLICATIONS.
2. BALL VALVE SHALL BE 316 STAINLESS STEEL, 2 PIECE FULL PORT, FNW FIGURE 200A OR EQUAL.

AIR VALVE 6/D4
SCALE: NTS



NOTES:
1. RAILING AND POSTS SHALL BE YELLOW FIBERGLASS.
2. HARDWARE ANCHORAGE SHALL BE STAINLESS STEEL 316.
3. RAILING SYSTEM SHALL BE EASILY REMOVABLE FROM THE POST BASE.
4. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL.

SAFETY RAILING 7/D4
SCALE: NTS



NOTE:
1. INSTALL AN EXPANSION JOINT BETWEEN THE (N) CONCRETE DRAIN AND THE CONCRETE OF THE (E) BUILDING AND (N) WETWELL.

2. RE-GRADE ASPHALT AROUND THE ENDS OF THE DRAIN TO PREVENT A VERTICAL DROP.

3. GRATE SHALL BE ABLE TO SUPPORT A 18 KIP WHEEL LOAD (HS-20 LOADING) AND 200 PSF UNIFORM PEDESTRIAN LOADING CONDITION.

DRAINAGE GRATE 8/D4
SCALE: NTS

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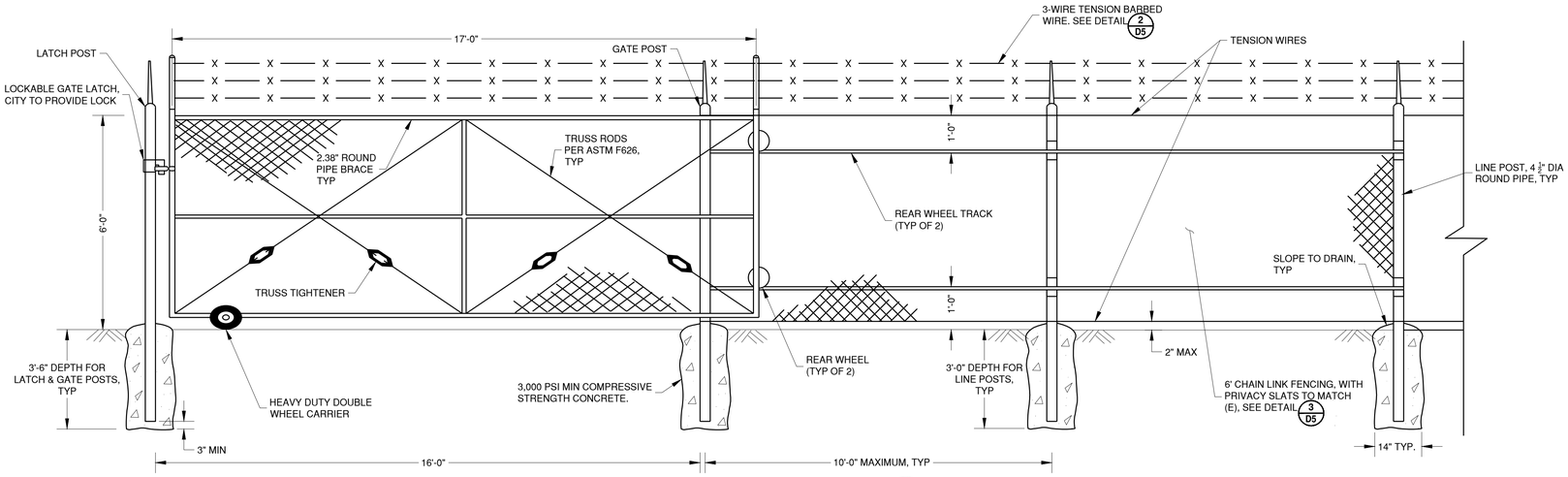
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DETAILS

DATE: 4/10/2026
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

D4

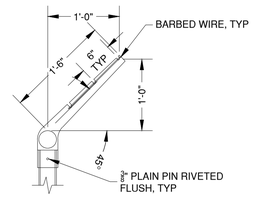
SHEET: 26 OF 55



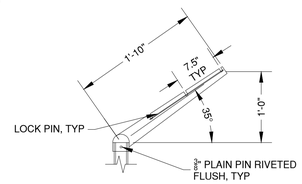
16' ROLLING GATE 1 D5
SCALE: NTS

FENCE AND GATE NOTES:

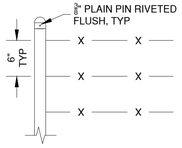
1. ALL FENCING SHALL FOLLOW CALTRANS STANDARD DRAWINGS A85.
2. ROLLING GATES SHALL COMPLY WITH CALTRANS STANDARD DRAWINGS A85 CHAIN LINK GATE INSTALLATION, WITH EXCEPTION TO THE MAXIMUM GATE WIDTH.
3. ALL FENCING AND GATES SHALL HAVE BROWN POLYETHYLENE SLATS MATCHING TO MATCH EXISTING.



LINE POST

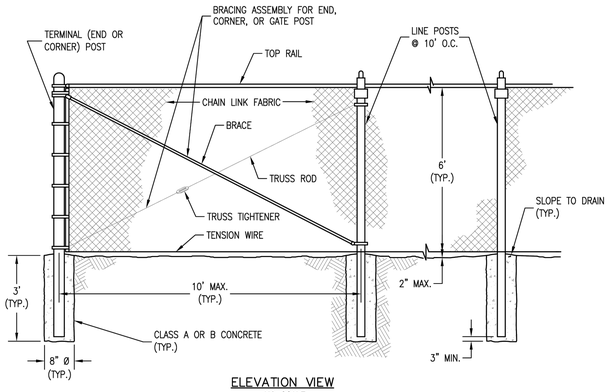


CORNER POST



ROLLING GATE POST

BARBED WIRE 2 D5
SCALE: NTS



ELEVATION VIEW
NO SCALE

NOTES:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO CALTRANS REQUIREMENTS FOR CHAIN LINK FENCE AS SPECIFIED IN SECTION 80-4 OF THE STANDARD SPECIFICATION EXCEPT THAT IN LIEU OF TOP TENSION WIRE, TOP RAIL SHALL BE USED. TOP RAIL SHALL BE GALVANIZED STEEL PIPE NOT LESS THAN 1.63" OUTSIDE DIA. AND WEIGHING NOT LESS THAN 1.93 LBS. PER LINEAL FOOT.
2. CHAIN LINK FABRIC WIRE SHALL BE 11-GAGE MINIMUM. IF SPECIFIED, THE PLASTIC COATED STEEL MESH AND STAINED REDWOOD SLATS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   A) PLASTIC COATED CHAIN LINK FABRIC SHALL BE 11-GAGE PLASTIC COATED COMMERCIAL QUALITY STEEL WIRE WOVEN INTO A 2" MESH CHAIN LINK FABRIC. PLASTIC COATING SHALL BE FIRMLY BONDED TO THE STEEL CORE WIRE AND PROVIDE A DENSE IMPERVIOUS COVERING AT LEAST 0.005" THICK. THE COATING SHALL BE OF A HIGH QUALITY AND SHOW NO DELETERIOUS EFFECTS FROM CHEMICALS SUCH AS AMMONIUM HYDROXIDE, SODIUM CHLORIDE, GASOLINE, PETROLIUM OILS, OR HYDROCHLORIC ACID, NOR SHALL IT SUPPORT COMBUSTION. THE COATING SHALL ALSO HAVE AN ESTHETICALLY PLEASING COLOR THAT WILL NOT FADE, CRACK, OR SPLIT FROM NORMAL AGE AND EXPOSURE.
   B) REDWOOD PICKET CHAIN LINK FABRIC SHALL HAVE 9-GAGE HEAVILY ZINC COATED CHAIN LINK WIRE WOVEN IN A 3 1/2" X 5 1/2" MESH AND STANDARD GRADE "A" 3/8" X 2 1/2" STAINED REDWOOD PICKETS INSERTED VERTICALLY IN EACH MESH OF THE CHAIN LINK FABRIC FOR THE FULL HEIGHT OF THE FABRIC.

CHAIN LINK FENCE 3 D5
SCALE: NTS

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DESIGN: CLP
DRAWN: BDL
CHECKED: BLS

D5

SHEET: 27 OF 55

COMPONENTS

SYMBOL	DESCRIPTION
RES	RESISTOR
SV	SOLENOID COIL
HTR	HEATER
	CAPACITOR
	DIODE
	DIODE, ZENER
	METAL OXIDE VARISTOR
	AUDIBLE ALARM
1	MOTOR STARTER NEMA SIZE SHOWN
?	MOTOR LOAD ? = MOTOR HP
M	3 PHASE MOTOR
M	SINGLE PHASE MOTOR
	TRANSFORMER SIZE AND VOLTAGE AS SHOWN
M	UTILITY POWER METER
N N G G	NEUTRAL AND GROUND WITH DISCONNECT LINK
	GROUND ROD OR SYSTEM UFER GROUND
	CURRENT TRANSFORMER RATIO AS NOTED
	DISCONNECT SWITCH SIZED AS NOTED OR PER FEEDER BREAKER AMPERAGE
PDB	POWER DISTRIBUTION BLOCK

SWITCHES – OPERATOR

SYMBOL	DESCRIPTION
SW	TOGGLE OR DISCONNECT SWITCH
PB	PUSHBUTTON – NORMALLY OPEN, MOMENTARY ACTION
PB	PUSHBUTTON – NORMALLY CLOSED, MOMENTARY UNLESS LOS (LOCK OUT STOP) WHERE MECHANICALLY HELD
PB	PUSHBUTTON, MECHANICALLY CONNECTED, DOUBLE CIRCUIT – NORMALLY CLOSED AND NORMALLY OPEN
HAND OFF AUTO	SELECTOR SWITCH, 3 POSITION – CONTACT STATUS SHOWN EXISTS I.E. AT POSITION OF HAND, OFF, OR AUTO
	SELECTOR SWITCH, 2 POSITION – MIDDLE POSITION IS DELETED
	ALTERNATE METHOD: X00 = HAND 00X = AUTO, 0X0 = OFF
	POTENTIOMETER

SWITCHES – PROCESS

SYMBOL	DESCRIPTION
FS	FLOW SWITCH – CLOSES UPON INCREASING FLOW
FS	FLOW SWITCH – OPENS UPON INCREASING FLOW
LS	LEVEL SWITCH – CLOSES UPON INCREASING LEVEL
LS	LEVEL SWITCH – OPENS UPON INCREASING LEVEL
PS	PRESSURE SWITCH – CLOSES UPON INCREASING PRESSURE (DECREASING VACUUM)
PS	PRESSURE SWITCH – OPENS UPON INCREASING PRESSURE (DECREASING VACUUM)
TS	TEMPERATURE SWITCH – CLOSES UPON INCREASING TEMPERATURE
TS	TEMPERATURE SWITCH – OPENS UPON INCREASING TEMPERATURE
ZS	LIMIT SWITCH – CLOSES AT SET LIMIT
ZS	LIMIT SWITCH – OPENS AT SET LIMIT
WS	TORQUE SWITCH – CLOSES UPON INCREASING TORQUE
WS	TORQUE SWITCH – OPENS UPON INCREASING TORQUE

DEVICES – FRONT PANEL

SYMBOL	DESCRIPTION
X	INDICATING LIGHT, LETTER "X" INDICATES COLOR: R=RED G=GREEN, A=AMBER, W=WHITE Y=YELLOW, B=BLUE
PTT X	INDICATING LIGHT, PUSH TO TEST

DEVICES – PROTECTIVE

SYMBOL	DESCRIPTION
S	CT SHORTING TERMINAL BLOCK
PTS	FUSED POTENTIAL TRANSFORMER, 208 / 120 V SECONDARY OR AS SHOWN
PM	POWER MONITOR
SPD	SURGE PROTECTION DEVICE
VMR	VOLTAGE MONITORING RELAY
OL	THERMAL OVERLOAD CONTACT
	THERMAL OVERLOAD ELEMENT
	FUSE
2	CONTACTOR, (NEMA) SIZE SHOWN

DEVICES – RELAY

SYMBOL	DESCRIPTION
M1	CONTACTOR OR STARTER M1
CR 1	CONTROL RELAY CR1
TR 2	TIME DELAY RELAY TR2 – ADJUSTABLE TIME DELAY RANGE & SETTING AS SHOWN
TDOE TDOD	TIME DELAY ON ENERGIZATION TIME DELAY ON DE–ENERGIZATION
107, 121	REFERENCED RELAY WITH N.O. CONTACT ON LINE 107 N.C. CONTACT ON LINE 121
CR1 (105)	NORMALLY OPEN, RELAY CONTACT – ACTUATED BY RELAY CR1 COIL LOCATED ON LINE 105
CR1	NORMALLY CLOSED, RELAY CONTACT – ACTUATED BY RELAY CR1
TR2	NORMALLY OPEN, TIME DELAY RELAY CONTACT – CONTACT CLOSES AFTER TR2 IS ENERGIZED
TR2	NORMALLY CLOSED, TIME DELAY RELAY CONTACT – CONTACT OPENS AFTER TR2 IS ENERGIZED
TR2	NORMALLY OPEN, TIME DELAY RELAY CONTACT – CONTACT OPENS AFTER TR2 IS DE–ENERGIZED
TR2	NORMALLY CLOSED, TIME DELAY RELAY CONTACT – CONTACT CLOSES AFTER TR2 IS DE–ENERGIZED
TR2	CONTACT OPENS AND CLOSES IN A TIMED REPEAT CYCLE

DEVICES – PROTECTIVE

SYMBOL	DESCRIPTION
Y xA xP xT	LOW VOLTAGE MOLDED CASE, INSULATED CASE OR POWER CIRCUIT BREAKER. RATINGS AS SHOWN IN DRAWINGS AND AS DEFINED BELOW: xA: CIRCUIT BREAKER AMERAGE xAT: AMPERAGE TRIP xAF: AMPERAGE FRAME xP: NUMBER OF POLES xT: TRIP PROTECTION MCP: MOTOR CIRCUIT PROTECTION TM: THERMAL MAGNETIC L: LONG TIME DELAY S: SHORT TIME DELAY I: INSTANTANEOUS TRIP G: GROUND FAULT A: ARC FLASH PROTECTION 100% DUTY RATED
100% NO MARKINGS	PER SPECIFICATIONS
S K M E	y: BREAKER FEATURES / OPTIONS – SHUNT TRIP – KIRK–KEY INTERLOCK – MANUALLY CHARGED PUSHBUTTON OPERATION – ELECTRICALLY CHARGED PUSHBUTTON OPERATION
52	MEDIUM VOLTAGE CIRCUIT BREAKER TRIP FUNCTIONS PER DRAWINGS AND SPECIFICATIONS
MFR	MULTIFUNCTION RELAY PER SPECIFICATIONS

WIRING – CONNECTIONS

SYMBOL	DESCRIPTION
	PANEL OR EQUIPMENT WIRING
	FIELD WIRING
	CONDUCTORS – NOT CONNECTED
	CONDUCTORS – CONNECTED
	GROUND CONNECTION
	PLUG AND RECEPTACLE
	INCOMING LINE
123 123	TERMINAL BLOCKS WITH TERMINAL NUMBER AS SHOWN OR AS DETERMINED BY SUBMITTAL
123	DISCONNECTING TERMINAL BLOCK
	FUSE
SHIELD CONDUCTOR	SHIELDED CABLE

PLAN – SYMBOLS

SYMBOL	DESCRIPTION
	CONDUIT, EXPOSED
	CONDUIT, IN SLAB OR BELOW GRADE
	CONDUIT, CONCEALED IN WALL OR CEILING
	CONDUIT STUBBED OUT & CAPPED
	CONDUIT BENDS TOWARD OBSERVER
	CONDUIT BENDS AWAY FROM OBSERVER
	CONDUIT ENDS
J	FLEXIBLE CONDUIT CONNECTION FROM J–BOX TO EQUIPMENT
	CONDUIT CHANGE IN ELEVATION
G	BARE COPPER GROUND WIRE
G	GROUND CONNECTION BOLTED TYPE
G	GROUND CONNECTION EXOTHERMIC WELD TYPE
	DISCONNECT SWITCH
	FIELD MOUNTED DEVICE
	TELEPHONE/DATA RECEPTACLE 2 PORT TA568A, 2 CAT 6 CABLES
#	CONDUIT REFERENCE TO SCHEDULE
T	THERMOSTAT
E	EYS SEAL
J	JUNCTION BOX
B	CONDUIT SEALING BUSHING
	PULL BOX OF SIZE SHOWN (CHRISTY BOX SIZE MINIMUM)
A a/#	LIGHTING FIXTURE # – CIRCUIT BREAKER NUMBER A – FIXTURE SCHEDULE REF. a – CONTROL SWITCH REFERENCE
WP #7 WP	DUPLEX RECEPTACLE # – CIRCUIT BREAKER NUMBER WP – WEATHERPROOF (IF SHOWN) GFI – GROUND FAULT TYPE
aM	TOGGLE SWITCH a – FIXTURES CONTROLLED 3 – 3 WAY M = MOTION DETECTOR T = TIMER SWITCH
	SPECIAL RECEPTACLE AS REQUIRED FOR EQUIPMENT TO BE CONNECTED

MISCELLANEOUS ABBREVIATIONS

&	AND	NTS	NOT TO SCALE
@	AT	(N)	NEW, PROVIDE
A	AMBER, AMPERES	OC	ON CENTER
AC	ALTERNATING CURRENT	OI, OIT	OPERATOR INTERFACE
ACK	ACKNOWLEDGE	OL	OVERLOAD
AFF	ABOVE FINISHED FLOOR	ORP	OXIDATION REDUCTION POTENTIAL
AH	AMP HOUR	P	POLE
AI	ANALOG INPUT	PB	PUSHBUTTON
AIC	AMP INTERRUPTING CAPACITY SYMMETRICAL	PBX	PULL BOX
ATS	AUTOMATIC TRANSFER SWITCH	PDB	POWER DISTRIBUTION BLOCK
AO	ANALOG OUTPUT	PE	POLYETHLENE
AWG	AMERICAN WIRE GUAGE	PF	POWER FACTOR
BATT	BATTERY	PFR	POWER FAIL RELAY
BOD	BOCHEMICAL OXYGEN DEMAND	PH	HYDROGEN ION CONCENTRATION
BYP	BYPASS	PLC	PROGRAMMABLE LOGIC CONTROLLER
C	CONDUIT	PM	POWER MONITOR
CAP	CAPACITOR	PMP	PUMP
CB	CIRCUIT BREAKER	PNL	PANEL
CKT	CIRCUIT	POT	POTENTIOMETER
COMM	COMMUNICATION	PR	PAIR, TWISTED AND SHIELDED
CR	CONTROL RELAY	PRESS	PRESSURE
CT	CURRENT TRANSFORMER	PRI	PRIMARY
CS	CONSTANT SPEED	PROVIDE	FURNISH, INSTALL, AND CONNECT
CU	COPPER	PS	PRESSURE SWITCH
DC	DIRECT CURRENT	PT	POTENTIAL TRANSFORMER
DET	DETAIL	PTT	PUSH TO TEST
DI	DIGITAL INPUT	PV	PROCESS VARIABLE
DIAG	DIAGONAL	PVC	POLYVINYLCHLORIDE
DISC	DISCONNECT	PWR	POWER
DO	DIGITAL OUTPUT	REF	REFERENCE
DPDT	DOUBLE THROW DOUBLE THROW	RFI	RADIO FREQUENCY INTERFERENCE
DWG	DRAWING	REV	REVERSE
ELEV	ELEVATION	RMS	ROOT MEAN SQUARE
ENET	ETHERNET	RTD	RESISTANCE TEMPERATURE DETECTOR
ETM	ELAPSED TIME METER	RST	RESET
ESW	ETHERNET SWITCH	RVAT	REDUCE VOLTAGE AUTO TRANSFORMER
(E)	EXISTING	RTU	REMOTE TERMINAL UNIT
FCS	FIELD CONTROL STATION	RTM	RUN TIME METER
FLA	FULL LOAD AMPS	(R)	REWIRE, RELOCATE, REVISE, REUSE
FLEX	FLEXIBLE, LIQUID TIGHT CONDUIT	SCH	SCHEDULE
FVNR	FULL VOLTAGE NON–REVERSING	SEC	SECONDARY, SECOND
FVR	FULL VOLTAGE REVERSING	SECS	SECONDS
FWD	FORWARD	SEL	SELECTOR
(F)	FUTURE	SFA	SERVICE FACTOR AMPS
GFI	GROUND FAULT INTERRUPTER	SP	SETPOINT
GND	GROUND	SPDT	SINGLE POLE DOUBLE THROW
GRS	GALVANIZED RIGID STEEL CONDUIT	SPEC	SPECIFICATION
GRS–PVC	PVC COATED GRS CONDUIT	SE	SERVICE ENTRANCE
HI	HIGH	SS	STAINLESS STEEL
HIM	HUMAN INTERFACE MODULE	SSRC	STAINLESS STEEL RIGID CONDUIT
HOA	HAND OFF AUTO	SSS	SOLID STATE STARTER
HP	HORSE POWER	STT	START
HTR	HEATER	STP	STOP
HZ	HERTZ	SV	SOLENOID VALVE
I	INTERLOCK	SW	SWITCH
I/O	INPUT/OUTPUT	SWBD	SWITCHBOARD
INST	INSTANTANEOUS	SYM	SYMMETRICAL
ISR	INTRINSICALLY SAFE RELAY	TB	TERMINAL BLOCK
J	JUNCTION BOX	TC	TIME CLOCK
K	KILO, PREFIX	TDOD	TIME DELAY ON DE–ENERGIZATION
LA	LIGHTNING ARRESTOR	TDOE	TIME DELAY ON ENERGIZATION
LC	LIGHTING CONTACTOR	TELCO	TELEPHONE COMPANY
LEL	LOWER EXPLOSION LIMIT	TM	THERMAL MAGNETIC
LOS	LOCK OUT STOP	TEMP	TEMPERATURE
LR	LIGHTING RELAY	TR	TIME DELAY RELAY
LP	LIGHTING PANELBOARD	TRIAD	TWISTED AND SHIELDED 3 CONDUCTOR
LS	LIMIT SWITCH	TS	TEMPERATURE SWITCH
M	MOTOR, MOTOR CONTACTOR	TSPR	TWISTED AND SHIELDED PAIR
MAG	MAGNETIC FLOWMETER	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
MAX	MAXIMUM	TYP	TYPICAL
MCM	THOUSAND CIRCULAR MILS	UG	UNDERGROUND
MCP	MOTOR CIRCUIT PROTECTOR	UON	UNLESS OTHERWISE NOTED
MCS	MOLDED CASE SWITCH	UPS	UNINTERRUPTIBLE POWER SUPPLY
MH	MANHOLE	V	VOLTAGE
MIN	MINIMUM, MINUTE	VA	VOLT AMPS
MOV	MOTOR OPERATED VALVE	VAR	VOLT AMPS REACTIVE
MTR	MOTOR	VFD	VARIABLE FREQUENCY DRIVE
MUX	MULTIPLEXER	VMR	VOLTAGE MONITOR RELAY
MV	MEDIUM VOLTAGE	W	WATTS
N	NEUTRAL	VR	VOLTAGE RELAY
NC	NORMALLY CLOSED	WHM	WATT HOUR METER
NDL	NEUTRAL DISCONNECT LINK	WP	WEATHER PROOF, NEMA 3R
NHC	NORMALLY HELD CLOSED	WS	TORQUE SWITCH
NHO	NORMALLY HELD OPEN	XFMR	TRANSFORMER
NIC	NOT IN CONTRACT	XS	MISCELLANEOUS SWITCH
NO	NORMALLY OPEN	Z	IMPEDANCE
NP	NAMEPLATE	ZS	LIMIT SWITCH

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CITY OF BELMONT PUBLIC WORKS

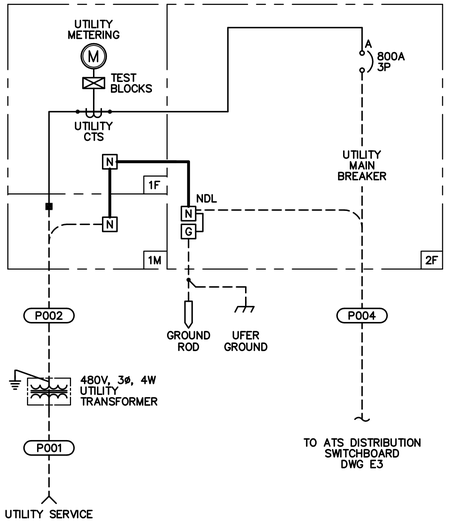
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THOMAS P. FRISCH No. E15761 ELECTRICAL STATE OF CALIFORNIA

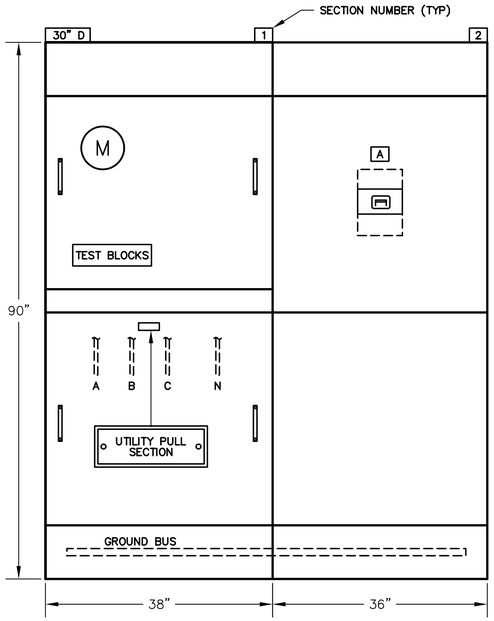
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
ELECTRICAL SYMBOLS AND ABBREVIATIONS

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E01



METER/MAIN SWITCHBOARD ONE-LINE DIAGRAM



METER/MAIN ELEVATION

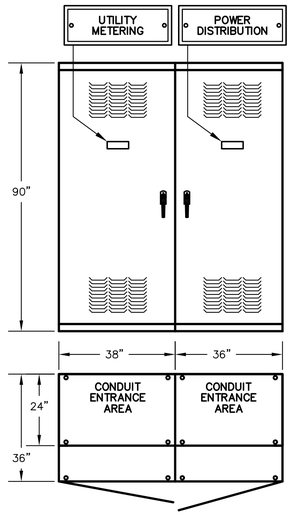
NEMA 3R, OUTDOOR

LOAD CALCULATIONS

LOAD DESCRIPTION		CONNECTED LOAD LOAD	QTY	TOTAL	DEMAND LOAD LOAD	QTY	TOTAL	GENERATOR LOAD LOAD	QTY	TOTAL
130HP SUBMERSIBLE PUMP		156.00 A	3	389087.9 VA	156.00 A	2	259391.9 VA	156.00 A	3	389087.9 VA
2.3HP MIXER		3.70 A	1	3076.1 VA	3.70 A	1	3076.1 VA	3.70 A	1	3076.1 VA
PANELBOARD LP	120/240	20.35 A	1	16920.0 VA	16.28 A	1	13536.0 VA	16.28 A	1	13536.0 VA
	TOTAL LOAD =	492.05 A	<	409084.0 VA	331.98 A	<	276004.1 VA	487.98 A	<	405700.0 VA
LOAD CORRECTION FACTORS								GENERATOR SIZE		
CONTINUOUS DEMAND LOAD x 25%:								NAMEPLATE = 400 KW 500 KVA		
DEMAND => 0.25 x 276004.1 VA	=	83.00 A		69001.0 VA	83.00 A		69001.0 VA	@ TEMP OF 100 deg F		
80% BREAKER DERATING =	TOTAL x 0.25 =	143.76 A		119521.3 VA	103.74 A		86251.3 VA	ELEVATION OF 200 FT ASL		
								DERATED SIZE = 390.8 KW 488.5 KVA		
	SERVICE SIZE (MIN) =	718.81 AMP		597606.3VA	518.72 A		431256.3VA	AMPERAGE = 588 A @ 0.8 PF		
	UTILITY SERVICE =	800 AMP						UTILIZATION % = 93 % @ 0.90 PF		
	480V, 3 PHASE, 4 WIRE									

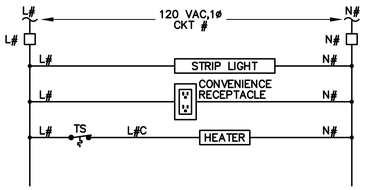
GENERAL NOTES:

1. EACH BREAKER SHALL HAVE A PADLOCKABLE HASP TO LOCK BREAKER IN THE OFF POSITION.
2. ALL DIMENSIONS ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE PER MANUFACTURER APPROVED IN SUBMITTAL.
3. FURNISH AND APPLY ENGRAVED WHITE LETTERING ON BLACK PLASTIC NAMEPLATES FOR DEVICES AND BREAKERS WHERE NOTED, ON EXTERIOR DOORS AT MINIMUM, WITH A LETTERED BOX. TEXT HEIGHT SHALL BE 1/4 INCH MINIMUM. REFRENCE ONE-LINE DIAGRAM FOR LABEL.
4. FURNISH CODE REQUIRED WARNING LABELS AND EQUIPMENT RATINGS LABELS.



METER/MAIN WEATHERWRAP

ALL DIMENSIONS ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE PER MANUFACTURER APPROVED IN SUBMITTAL.



PANEL AUXILIARY CIRCUIT

CIRCUIT NUMBERS PER PANELBOARD SCHEDULE. REPLACE # WITH CIRCUIT NUMBER TO COMPLETE WIRE AND TERMINAL BLOCK LABELS. INSTALL DEVICES AS SHOWN ON WEATHER WRAP AND ELEVATION PLANS.

WEATHERWRAP FABRICATION METHODS

1. NEMA 3R WEATHER-PROOF FOR OUTDOOR INSTALLATION.
2. OUTER DOORS SHALL BE SEALED WITH RUBBERIZED FOAM GASKET.
3. EXTERIOR FABRICATED FROM GALVANEAL (PAINT BOND) SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. ALL SEAMS SHALL HAVE CONTINUOUS WELD, GROUND SMOOTH.
6. OUTER DOORS TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCHES.
7. DOOR HINGES AND PINS SHALL BE 316 STAINLESS STEEL.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE STAINLESS STEEL.
10. PAINT APPLICATION SHALL BE AS FOLLOWS:
    A. TWO STAGE CHEMICAL BATH CLEANING.
    B. ELECTROSTATICALLY APPLIED POWDER COAT PAINT FINISH.
    C. OVEN CURED FOR TWO HOURS.
    D. EXTERIOR COLOR SHALL BE: HOSPITAL WHITE
11. PHENOLIC SCREW MOUNTED NAMEPLATES SHALL BE PROVIDED FOR ALL OUTER DOOR SECTIONS.
12. FABRICATION, COMPONENTS, AND WIRING SHALL CONFORM TO UL, NEC AND NEMA STANDARDS. PANEL SHALL BE APPROPRIATELY LABELLED.
13. ALL WIRING SHALL BE LABELLED ON BOTH ENDS OF WIRE.
14. AS-BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH PANEL.
15. PROVIDE DRAWING POCKET ON INSIDE OF CONTROL PANEL DOOR.

NO	REVISIONS	DATE	APPR
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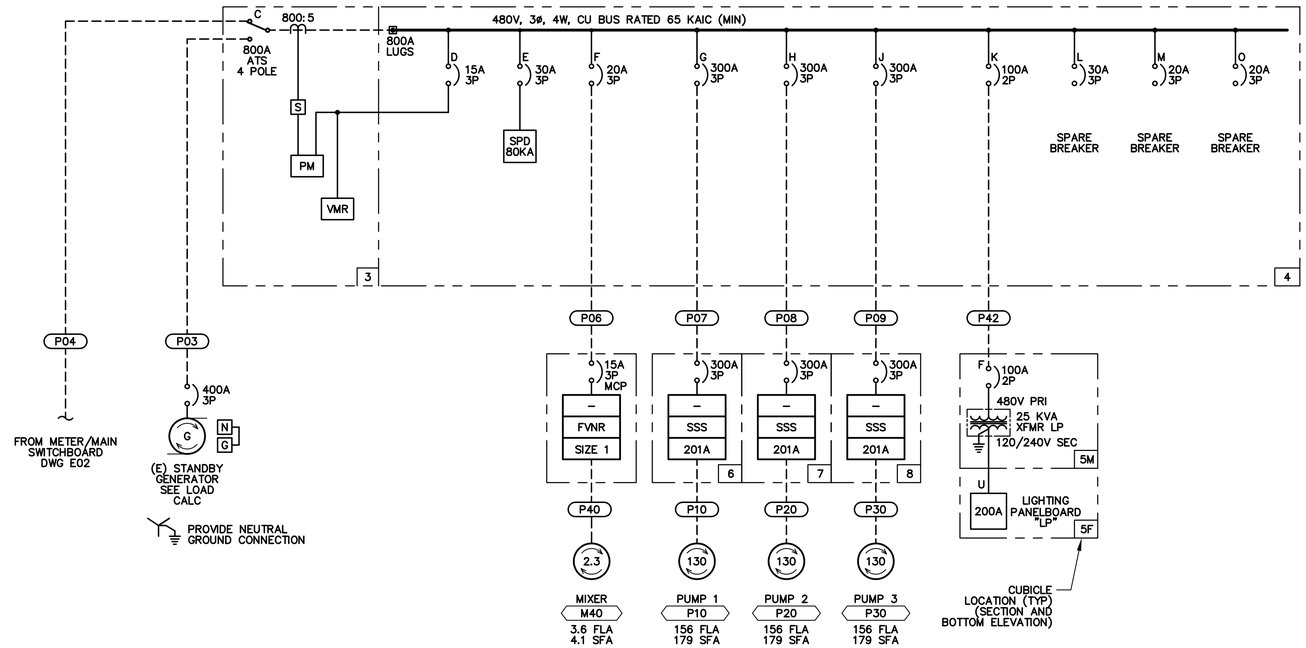
THOMAS P. FRISCH No. E13761 ELECTRICAL STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
SWITCHBOARD ONE-LINE AND ELEVATION

DATE: 04/10/26
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E02

SHEET: 29 OF 55



ATS AND DISTRIBUTION ONE-LINE DIAGRAM

PANEL "LP"

LOCATION:ELECTRICAL ROOM
ENCLOSURE:NEMA 1
AIC RATING:10 KAIC

120/ 240 VOLTS, 1 PHASE, 3 WIRE
200 AMP BUS
125 AMP MAIN BREAKER

BKR NO.	DESCRIPTION	LOAD VA	LINE AMPS		AMPS/ POLE	BKR NO.
1	LIGHTING ELECTRICAL ROOM	252	2.1		20/1	1
3	LIGHTING OUTDOORS	380		3.2	20/1	3
5	RECEPTACLE INDOORS	1800	15.0		20/1*	5
7	RECEPTACLE OUTDOORS	1800		15.0	20/1*	7
9	LIGHTING OVERFLOW ROOM	252	2.1		20/1*	9
11	LIGHTING GENERATOR ROOM	336		2.8	20/1	11
13	EXHAUST FAN OVERFLOW ROOM	300	2.5		20/1	13
15	SPARE	0		0.0	20/1	15
17	SPARE	0	0.0		20/1	17
19	SPARE	0		0.0	20/1	19
21	SPARE	0	0.0		20/1	21
23	SPARE	0		0.0	20/1	23
25	SPARE	0	0.0		20/1	25
27	SPACE	0		0.0		27
29	SPACE	0	0.0			29
31	SPACE	0		0.0		31
33	SPACE	0	0.0			33
35	SPACE	0		0.0		35
37	SPACE	0	0.0			37
39	SPACE	0		0.0		39
41	SPACE	0	0.0			41

BKR NO.	AMPS/ POLE	LINE AMPS		LOAD VA	DESCRIPTION	BKR NO.
2	20/1	4.2		500	CONTROL PANEL	2
4	20/1		6.7	800	CONTROL PANEL AUXILLIARY	4
6	20/1	2.5		300	UTILITY SWITCHBOARD	6
8	20/1		2.5	300	ATS DISTRIBUTION SWITCHBOARD	8
10	20/1	0.0		0	SPARE	10
12	20/1		1.3	150	GENERATOR BATTERY CHARGER	12
14	50/2	16.7		2000	GENERATOR HEATER	14
16			16.7	2000		16
18	20/1	6.3		750	GENENERATOR DAY TANK	18
20	20/1		0.0	0	PUMP TERMINATION PANEL	20
22	20/1	0.0		0	INSTRUMENT TERMINATION PANEL	22
24	40/2		20.8	2500	WATER HEATER	24
26		20.8		2500		26
28			0.0	0	SPACE	28
30		0.0		0	SPACE	30
32			0.0	0	SPARE	32
34		0.0		0	SPACE	34
36			0.0	0	SPACE	36
38		0.0		0	SPACE	38
40			0.0	0	SPACE	40
42		0.0		0	SPACE	42

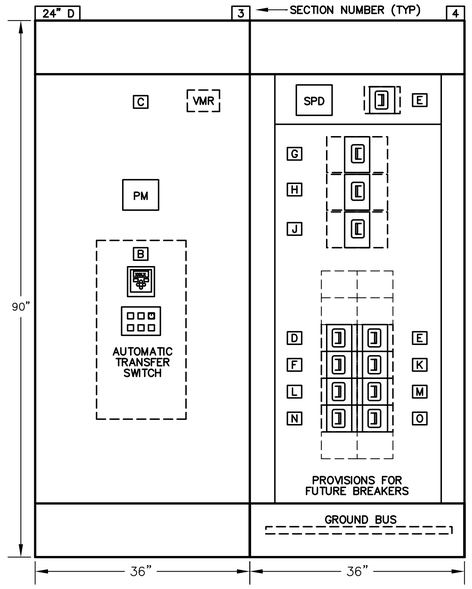
PHASE	A	B
LEFT SIDE AMPS	21.70	20.97
LEFT SIDE KVA	2.60	2.52
TOTAL PHASE KVA	8.65	8.27
TOTAL PHASE AMPS	72	69
% OF AVERAGE	102	98

NEUTRAL

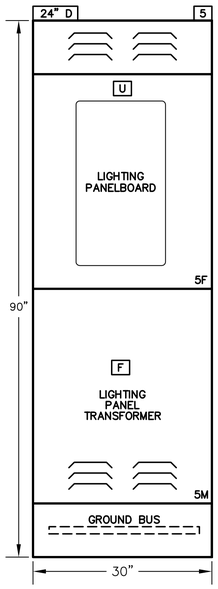
GROUND

A	B	PHASE
50.42	47.92	RIGHT SIDE AMPS
6.05	5.75	RIGHT SIDE KVA
16.92		TOTAL KVA
70.50		TOTAL AMPS @ 240V, 1P
0.80		DIVERSITY FACTOR
13.54		LOAD KVA

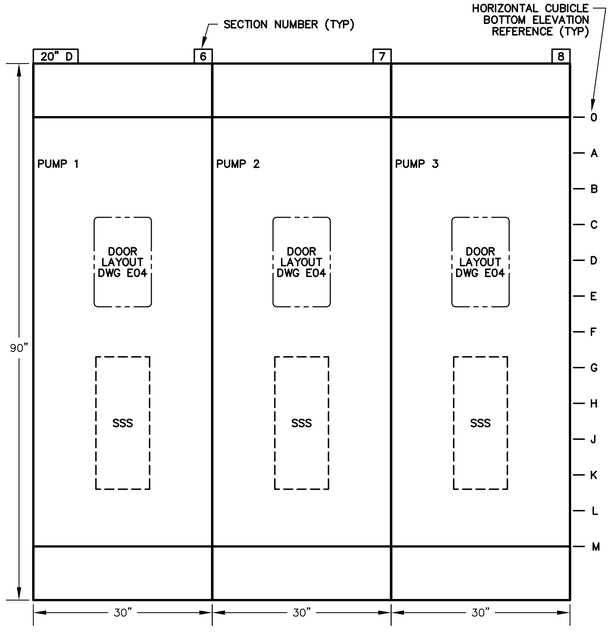
NOTES:
1 MEANS OF WIRE COLOR CODING SHALL BE POSTED ON PANELBOARD PER NEC 210 (4)
2 ASTERISK (*) DENOTES GFI BREAKER REQUIRED WITH 5 MA SENSITIVITY
3 TILDA (~) DENOTES GFI BREAKER REQUIRED WITH 30 MA SENSITIVITY



ATS AND DISTRIBUTION ELEVATION
NEMA 1, INDOOR



PANELBOARD ELEVATION
NEMA 1, INDOOR



MOTOR CONTROL ELEVATION
NEMA 1, INDOOR

GENERAL NOTES:

1. EACH BREAKER SHALL HAVE A PADLOCK PROVISIONS TO LOCK BREAKER IN THE OFF POSITION.
2. ALL DIMENSIONS ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE PER MANUFACTURER APPROVED IN SUBMITTAL.
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4. FURNISH CODE REQUIRED WARNING LABELS AND EQUIPMENT RATINGS LABELS.

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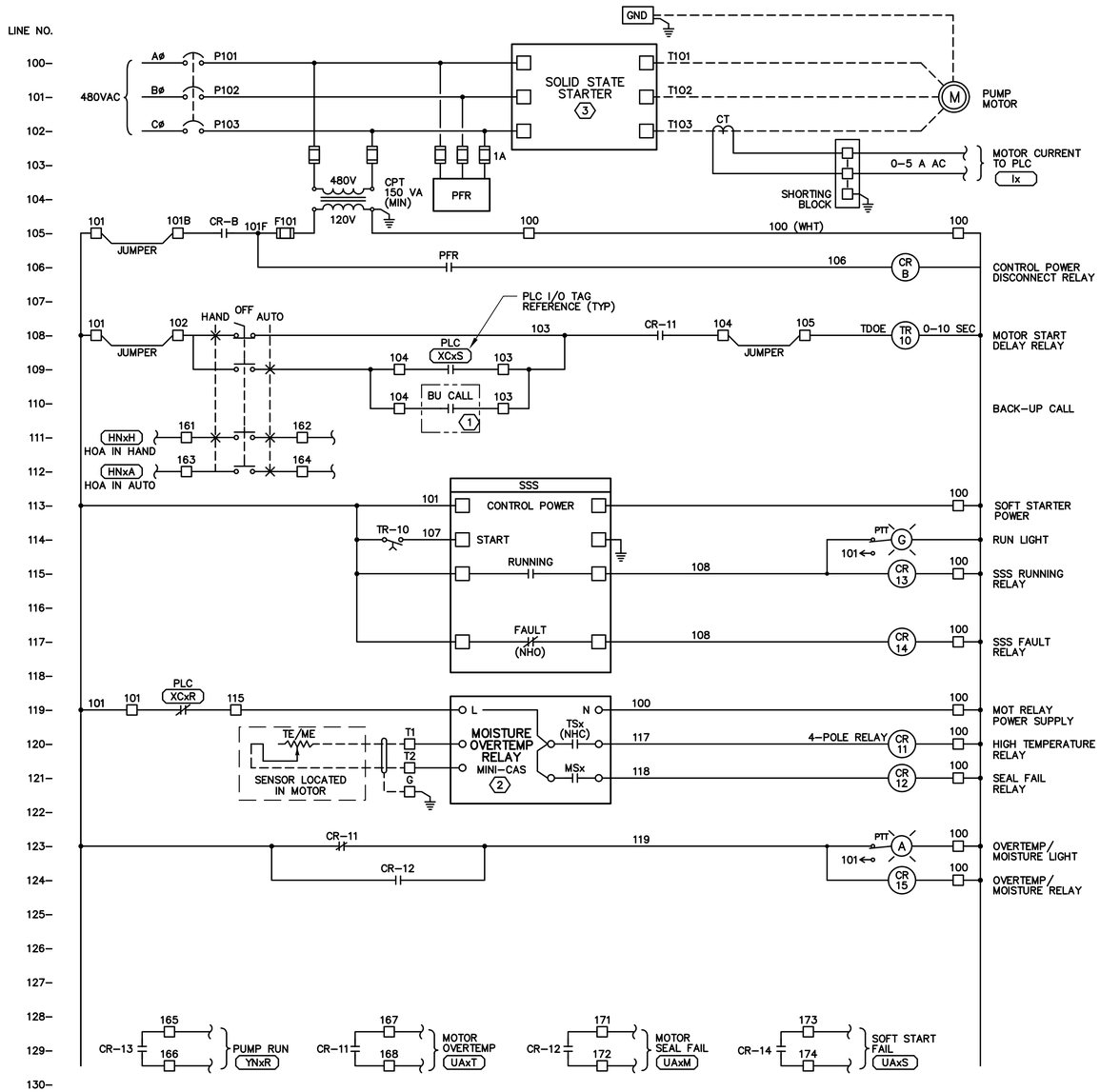
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SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
ONE-LINE AND ELEVATIONS

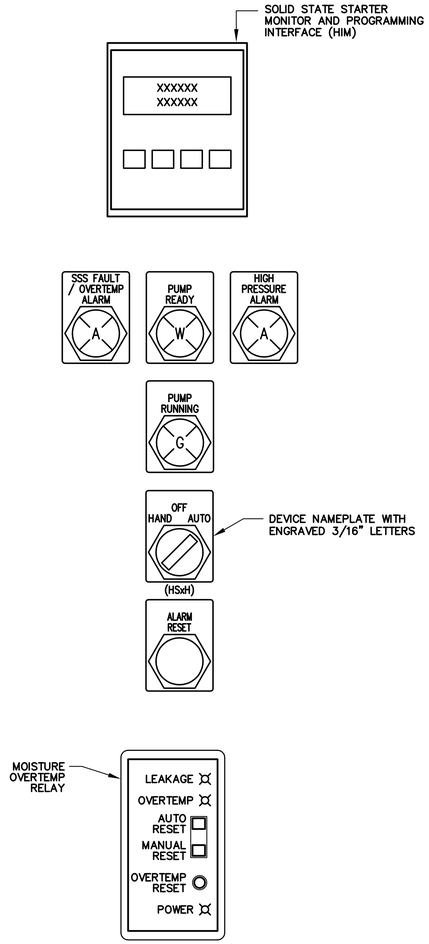
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E03

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PUMP ELEMENTARY DIAGRAM P10 P20 P30



DOOR LAYOUT

(NOT TO SCALE)

NOTES REFERENCED IN DRAWING:

1. SOLID STATE STARTER SHALL PROVIDE THE FOLLOWING USER CONFIGURABLE MOTOR PROTECTION PARAMETERS:

VOLTAGE	CURRENT
UNDERVOLTAGE	OVERLOAD
OVERVOLTAGE	UNBALANCE
PHASE REVERSAL	

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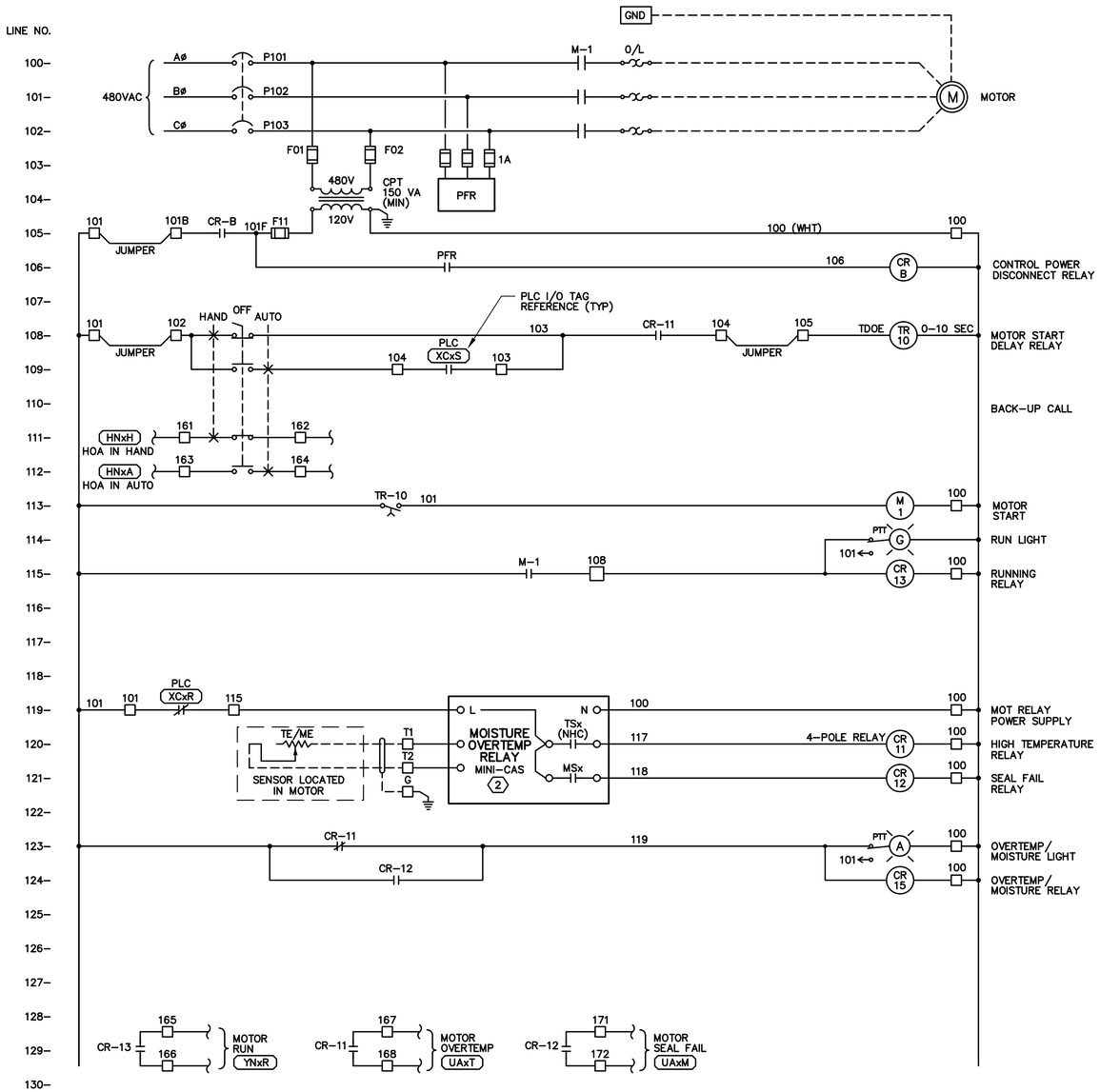
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ELEMENTARY DIAGRAM

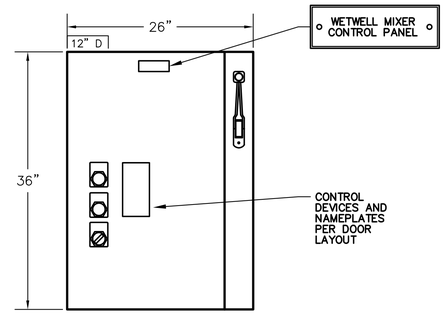
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E04

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ELEMENTARY DIAGRAM M40

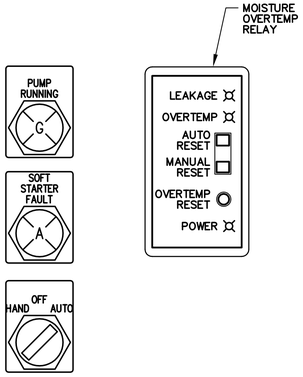


FRONT ELEVATION

MOTOR CONTROL PANEL

NEMA 1, INDOOR

NOTE: NEMA 12, GRAY PAINTED STEEL, 14GA (MIN)
SAGINAW XEL LP ENCLOSURE, OR EQUAL.
DIMENSIONS ARE APPROXIMATE.
PROVIDE NAMEPLATES FOR SWITCHES AND PANEL



DOOR LAYOUT

(NOT TO SCALE)

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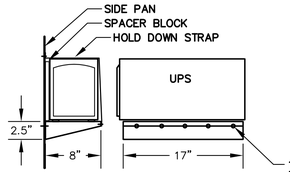
REGISTERED PROFESSIONAL ENGINEER — THOMAS P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
MIXER PANEL ELEMENTARY AND ELEVATION

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
DRAWN: ATF
CHECKED: TPF

E05

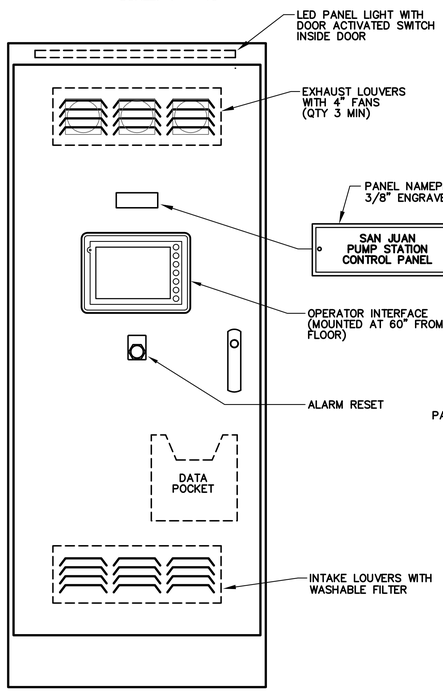
SHEET: 32 OF 55



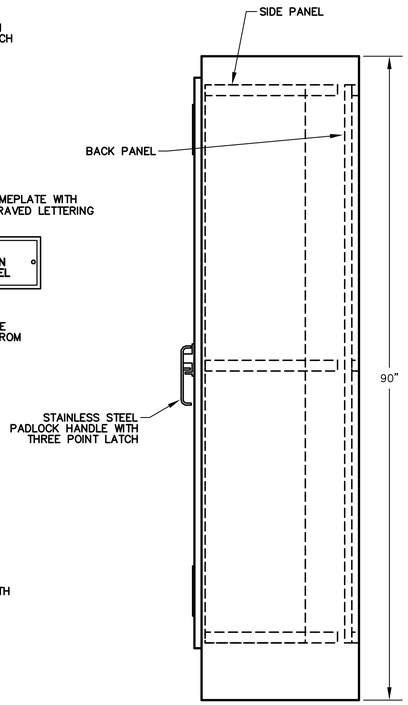
UPS SHELF DETAIL
SCALE: 1" = 10"

DETAIL NOTES:

1. DO NOT BLOCK VENTS WITH SPACER BLOCK. USE TWO.
2. FABRICATED FROM 14 GA (MIN) PAINTED GALVANEAL OR STAINLESS STEEL SOLID SIDES, TOP, BACK AND FRONT WITH CONTINUOUS WELDED SEAMS.

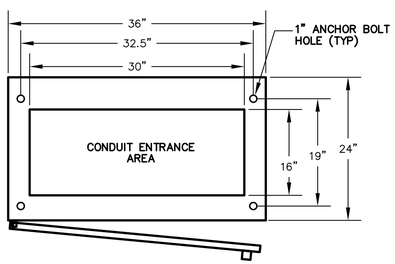


FRONT ELEVATION



SIDE ELEVATION

ELEVATION



BASE PLAN

PANEL FABRICATION METHODS

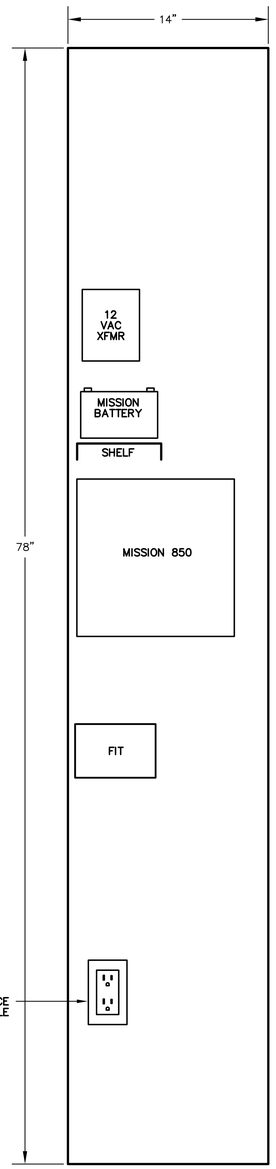
1. FREESTANDING, OPEN BOTTOM.
2. OUTER DOOR SEALED WITH RUBBERIZED FOAM GASKET.
3. PANEL SHALL BE FABRICATED FROM PAINT BOND GALVANEAL SHEET STEEL.
4. 12 GAUGE EXTERIOR AND 14 GAUGE INTERIOR.
5. ALL SEAMS SHALL HAVE CONTINUOUS WELD GROUND SMOOTH.
6. DOOR TO BE PADLOCKABLE WITH HEAVY DUTY 3 POINT LATCH.
7. DOOR HINGES AND PINS SHALL BE CONTINUOUS, HEAVY DUTY.
8. NO SCREWS, RIVETS, OR BOLTS SHALL PROTRUDE EXTERNALLY.
9. INTERNAL SCREWS, RIVETS, BOLTS, AND NUTS SHALL BE MACHINE THREAD INTO TAPPED BACKPAN.
10. EXTERIOR PANEL COLOR: ANSI 61 GRAY.
11. MOUNTING PAN AND INTERIOR DOOR COLOR: WHITE.
12. FABRICATION AND WIRING SHALL CONFORM TO U.L. AND NEMA STANDARDS.
13. ALL WIRING SHALL BE PERMANENTLY LABELED WITH WIRE MARKERS ON BOTH ENDS.
14. WIRING DIAGRAMS SHALL BE PLACED IN A PLASTIC DRAWING HOLDER PERMANENTLY ATTACHED TO THE INSIDE OF THE FRONT DOOR.
15. AS – BUILT WIRING DIAGRAMS SHALL BE SHIPPED WITH EQUIPMENT.
16. HOFFMAN TYPE 12 FREE–STANDING, OR EQUAL.

GENERAL NOTES:

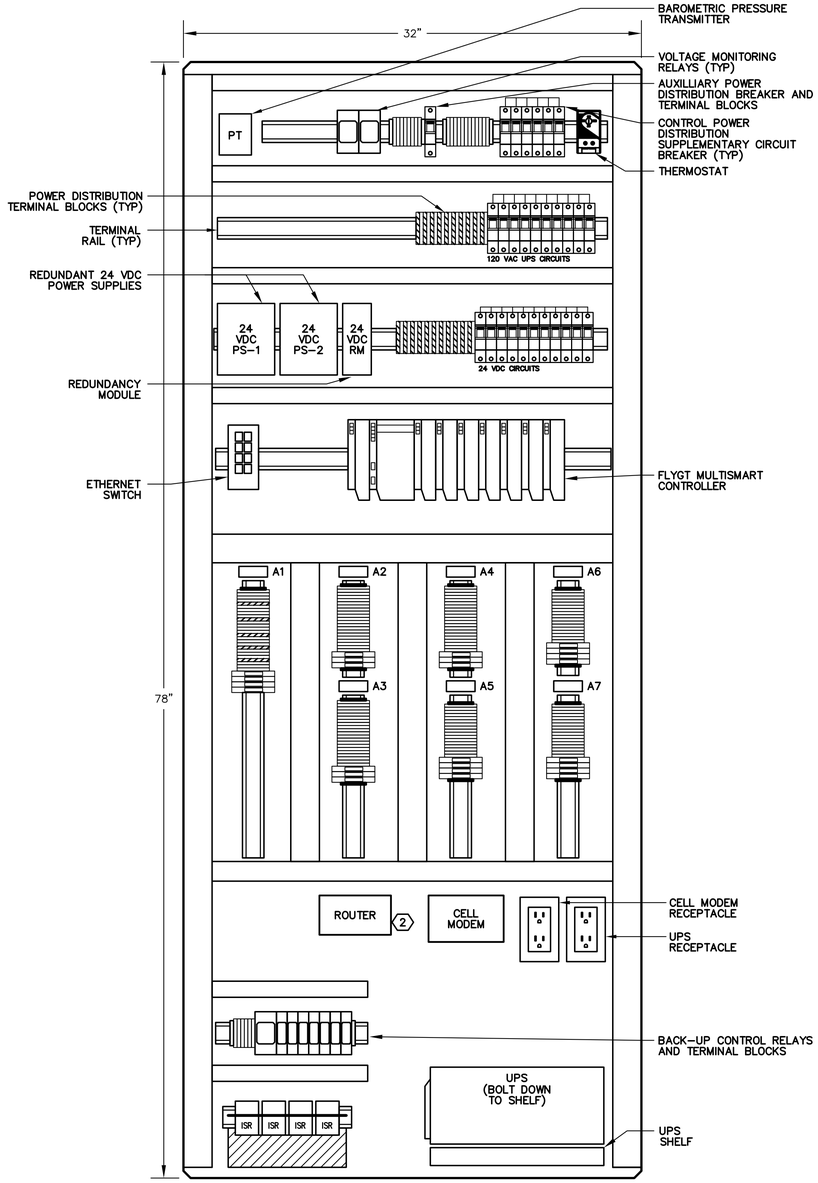
1. REPRESENTATIVE OF MAJOR COMPONENTS ONLY. ACTUAL BACKPAN LAYOUT SHALL BE SIMILAR TO LAYOUT SHOWN. SUBMIT SCALED BACKPAN LAYOUT FOR REVIEW BY ENGINEER.
2. QUANTITY OF TERMINAL BLOCKS AND RELAYS SHALL BE AS DETERMINED BY P&IDS AND I/O WIRING DIAGRAMS.

REFERENCED NOTES:

1. WIRE I/O TO TERMINAL BLOCK PER I/O WIRING DIAGRAMS.
2. MOUNT ROUTER TO 90 DEGREE L–BRACKETS, SHELF, OR DIN RAIL FOR VISIBILITY OF INDICATOR LIGHTS FROM FRONT.



LEFT
SIDEPAN LAYOUT



BACKPAN LAYOUT 1
NOT TO SCALE

NO	REVISIONS	DATE	APPR
1			
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CITY OF BELMONT PUBLIC WORKS

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM
FILE: 25018-E06.DWG
DATE: APR 06, 2026 TIME: 5:29:46PM

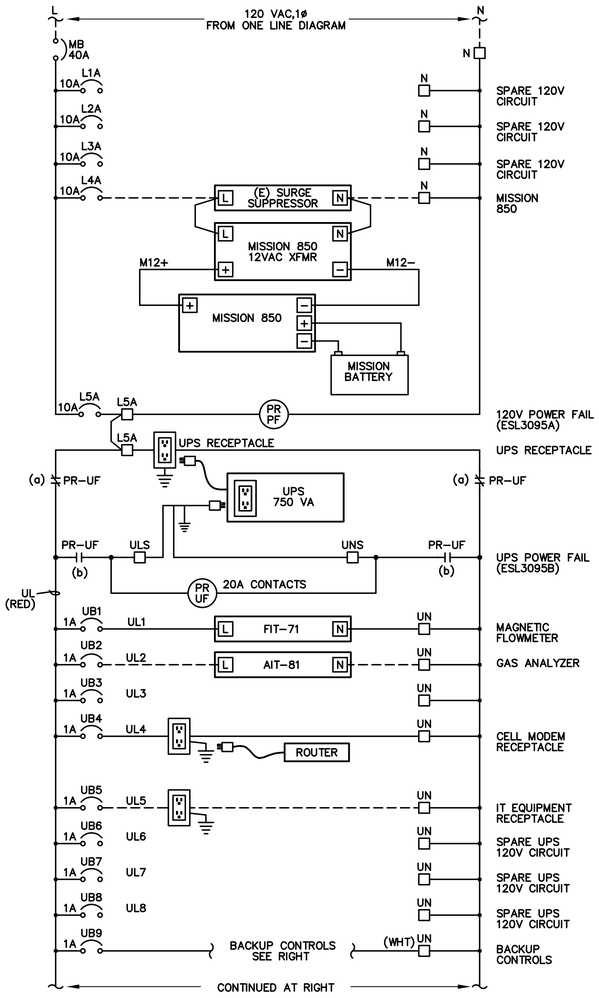
REGISTERED PROFESSIONAL ENGINEER — THOMAS P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
CONTROL PANEL ELEVATION AND LAYOUT

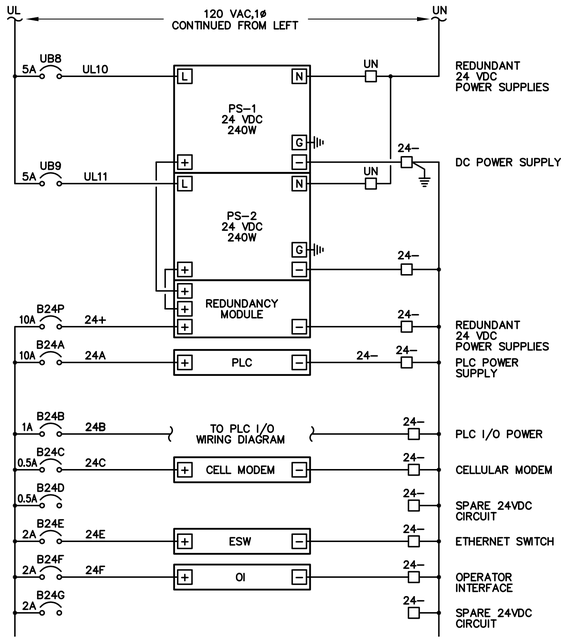
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DRAWN:	ATF
CHECKED:	TPF

E06

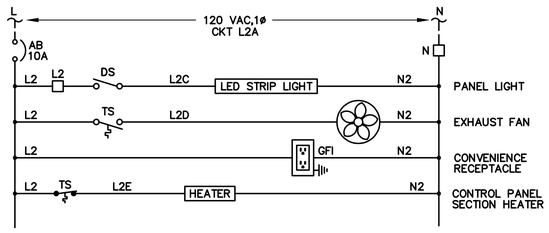
SHEET: 33 OF 55



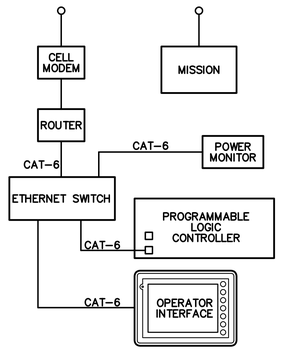
CONTROL PANEL DISTRIBUTION



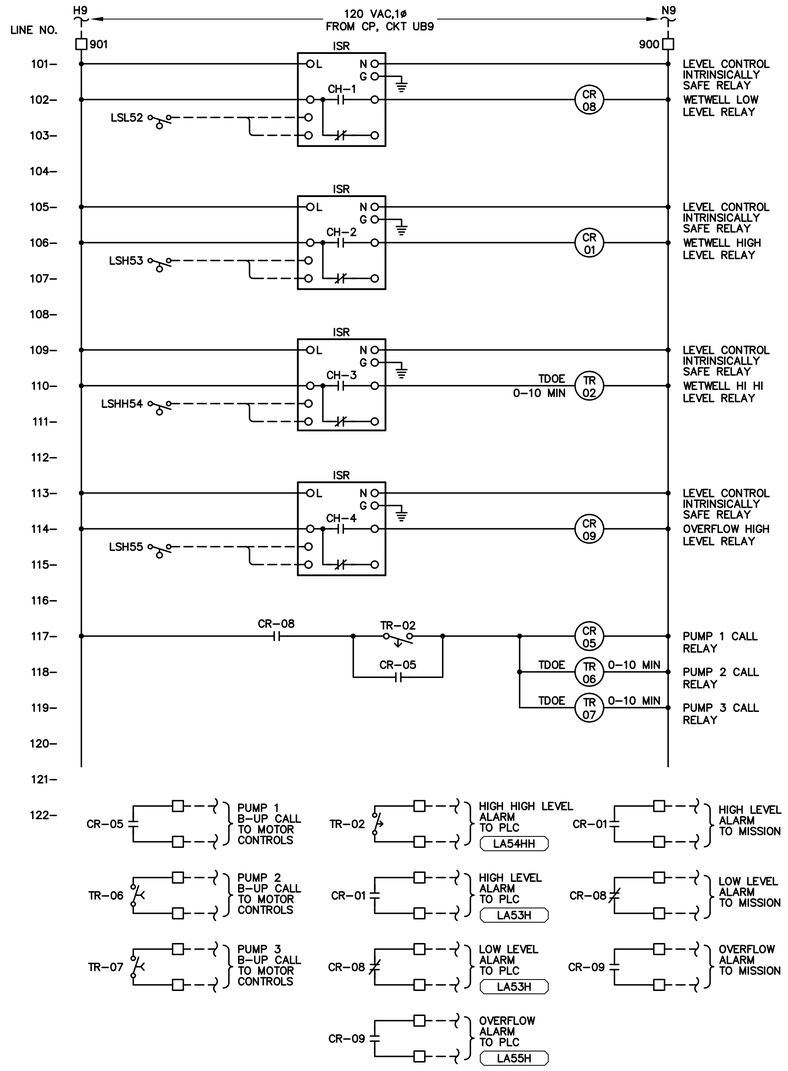
CONTROL PANEL DISTRIBUTION CONTINUED



AUXILLIARY POWER DIAGRAM



COMMUNICATION BLOCK DIAGRAM



PUMP BACK–UP CONTROLS

NO	REVISIONS	DATE	APPR
1			
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WWW.FRISCHENGINEERING.COM
FILE: 25018-E07.DWG
DATE: APR 06, 2026 TIME: 5:29:58PM

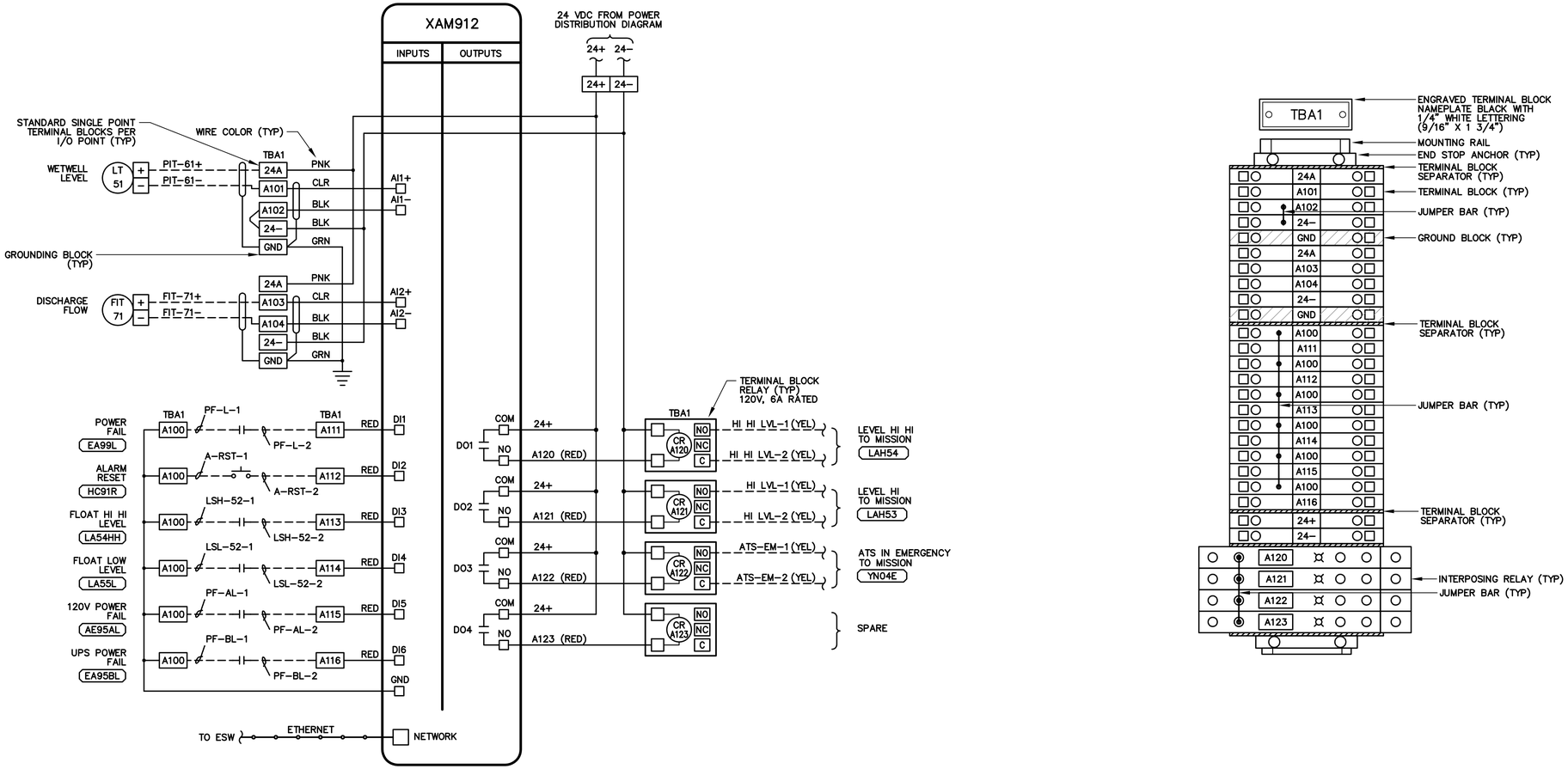
JAMES P. FRISCH
No. E15781
ELECTRICAL
STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
CONTROL PANEL POWER DISTRIBUTION DIAGRAM

DATE:	04/10/26
SCALE:	AS SHOWN
DESIGN:	TPF
DRAWN:	ATF
CHECKED:	TPF

E07

SHEET: 34 OF 55



APPLICATION MANAGER I/O WIRING DIAGRAM

NO	REVISIONS	DATE	APPR
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FILE: 25018-E08.DWG
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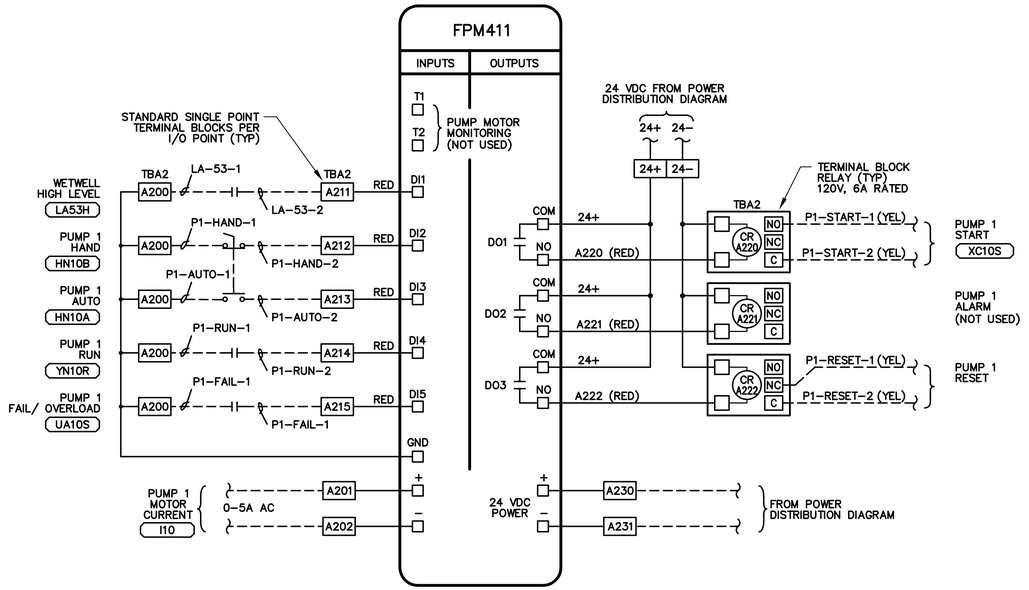
THOMAS P. FRISCH No. E15761 REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA

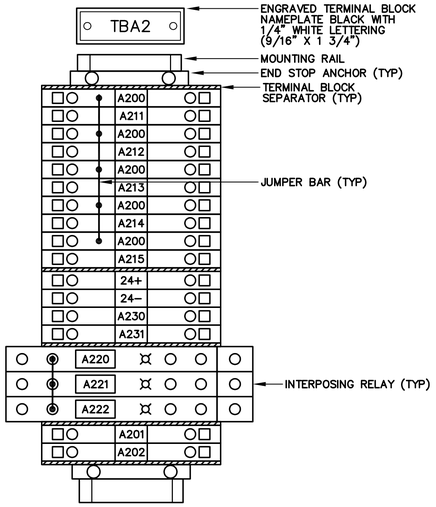
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
APPLICATION MANAGER WIRING DIAGRAM

DATE: 04/10/26
SCALE: AS SHOWN
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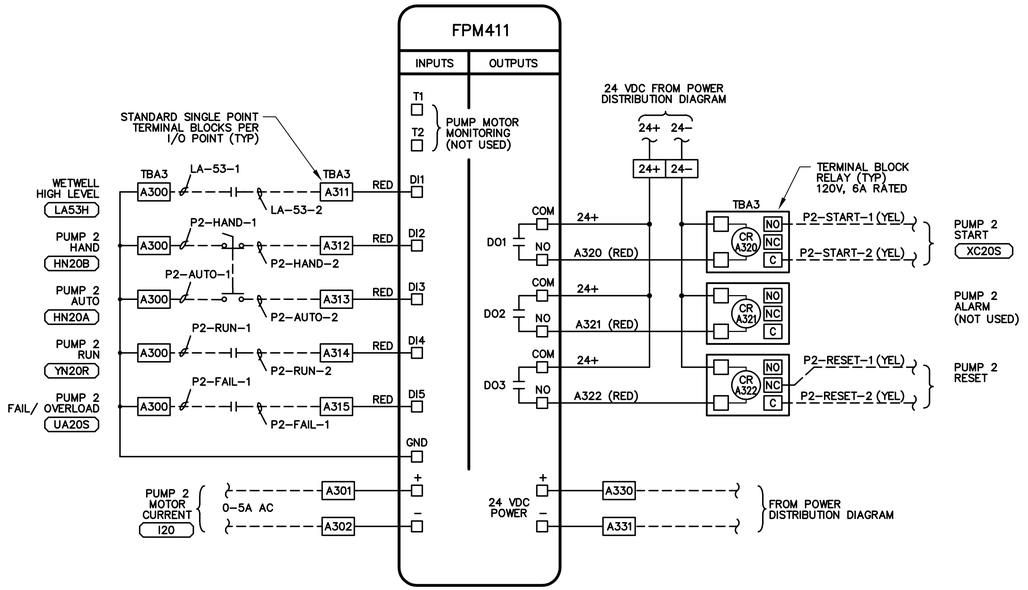
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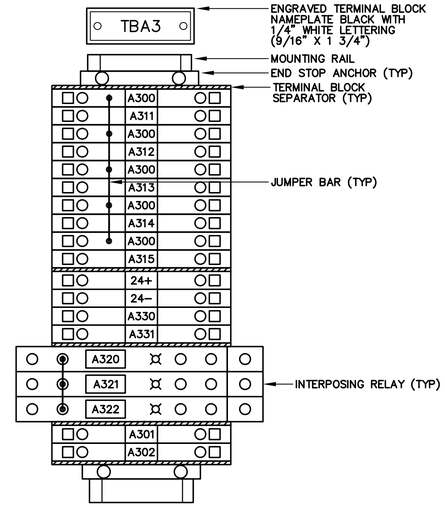
SHEET: 35 OF 55





PUMP MODULE 1





PUMP MODULE 2

NO	REVISIONS	DATE	APPR
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FILE: 25018-E09.DWG
DATE: APR 06, 2026 TIME: 5:30:26PM

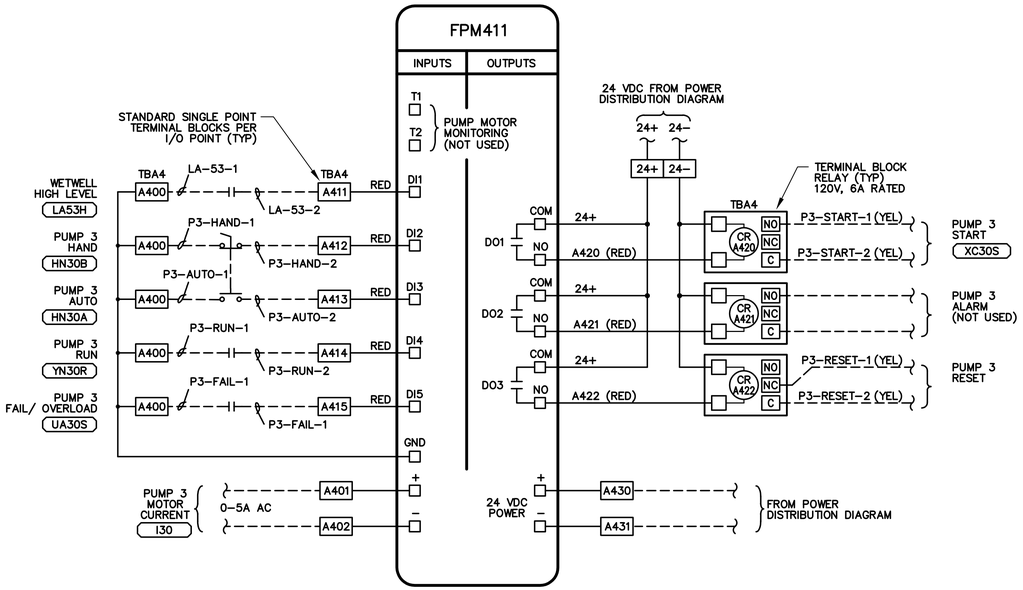
THOMAS P. FRISCH No. E15781 ELECTRICAL STATE OF CALIFORNIA

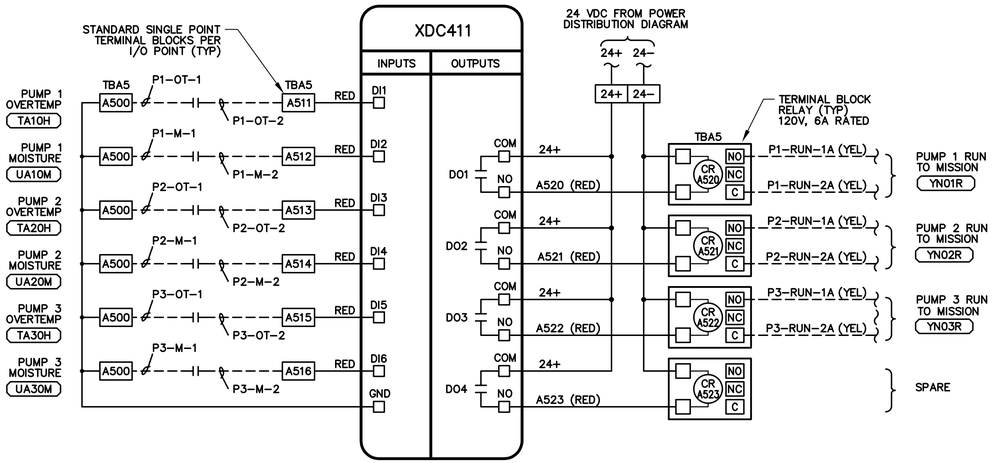
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
PLC I/O WIRING DIAGRAMS

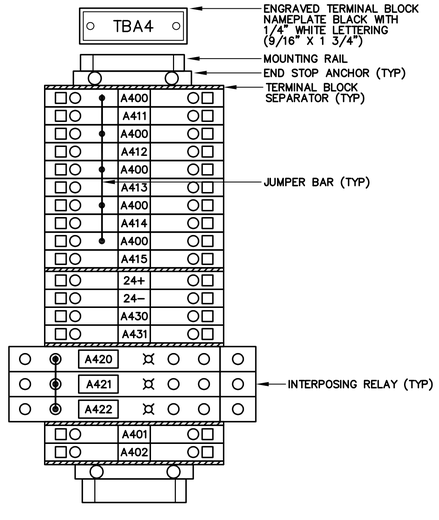
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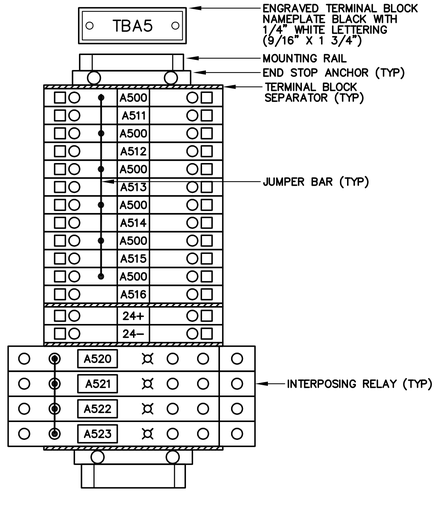
E09

SHEET: 36 OF 55









PUMP MODULE 3

DIGITAL I/O MODULE 1

NO	REVISIONS	DATE	APPR
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2			
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PH 916 353 1025
WWW.FRISCHENGINEERING.COM
FILE: 25018-E10.DWG
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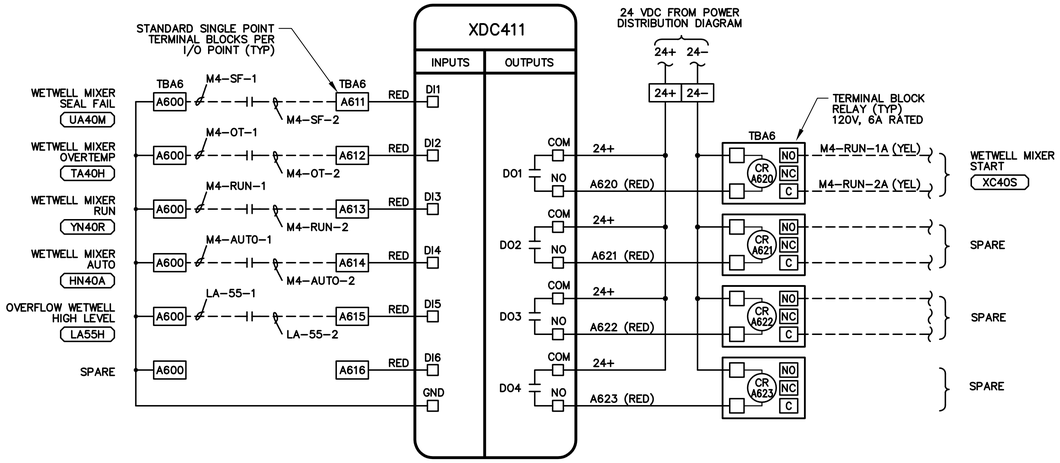
REGISTERED PROFESSIONAL ENGINEER — JAMES P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

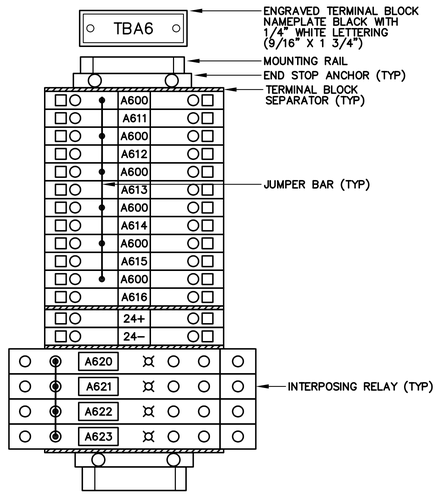
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
PLC I/O WIRING DIAGRAMS

DATE: 04/10/26
SCALE: AS SHOWN
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DRAWN: ATF
CHECKED: TPF

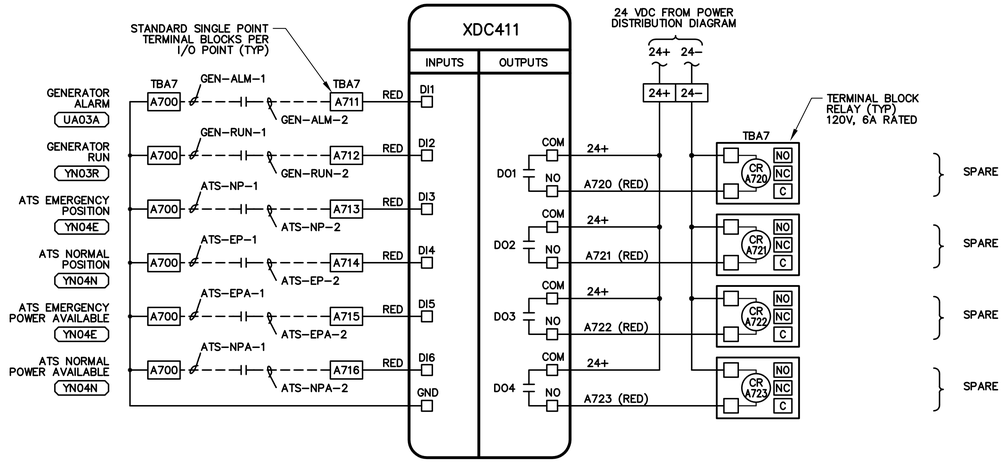
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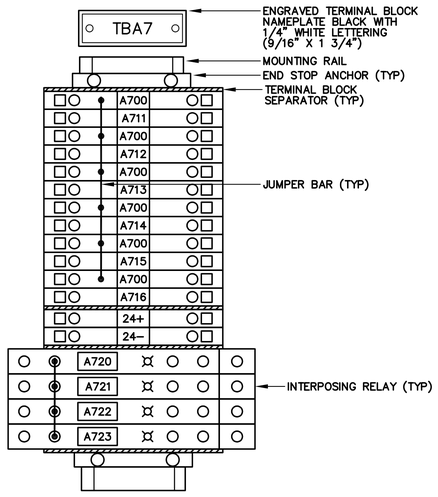
SHEET: 37 OF 55





DIGITAL I/O MODULE 2





DIGITAL I/O MODULE 3

NO	REVISIONS	DATE	APPR
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FILE: 25018-E11.DWG
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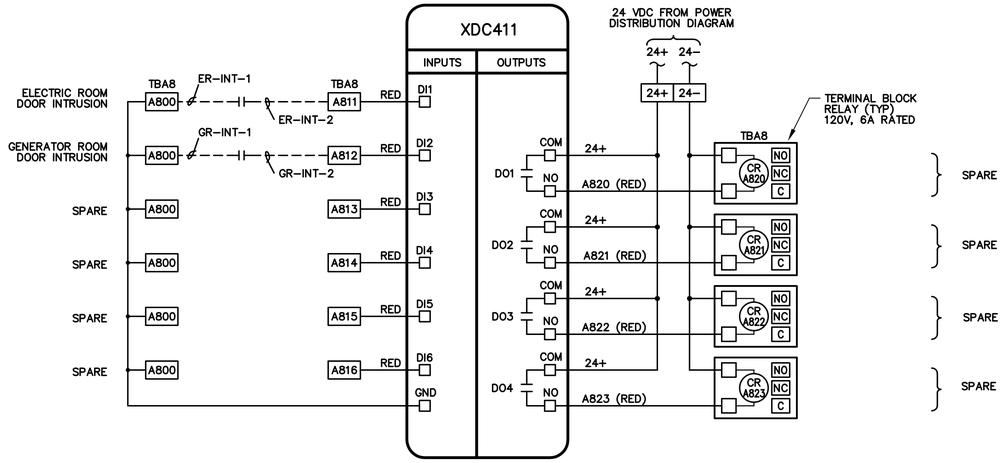
THOMAS P. FRISCH No. E15761 ELECTRICAL STATE OF CALIFORNIA REGISTERED PROFESSIONAL ENGINEER

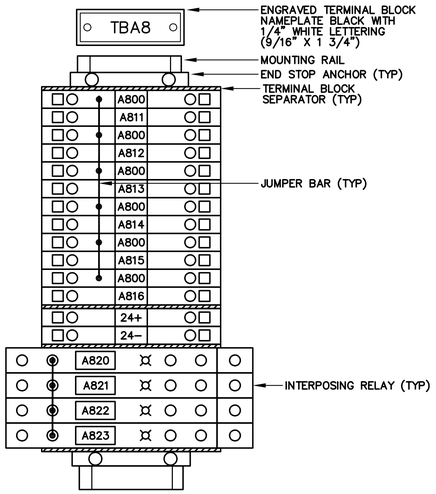
DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
PLC I/O WIRING DIAGRAMS

DATE: 04/10/26
SCALE: AS SHOWN
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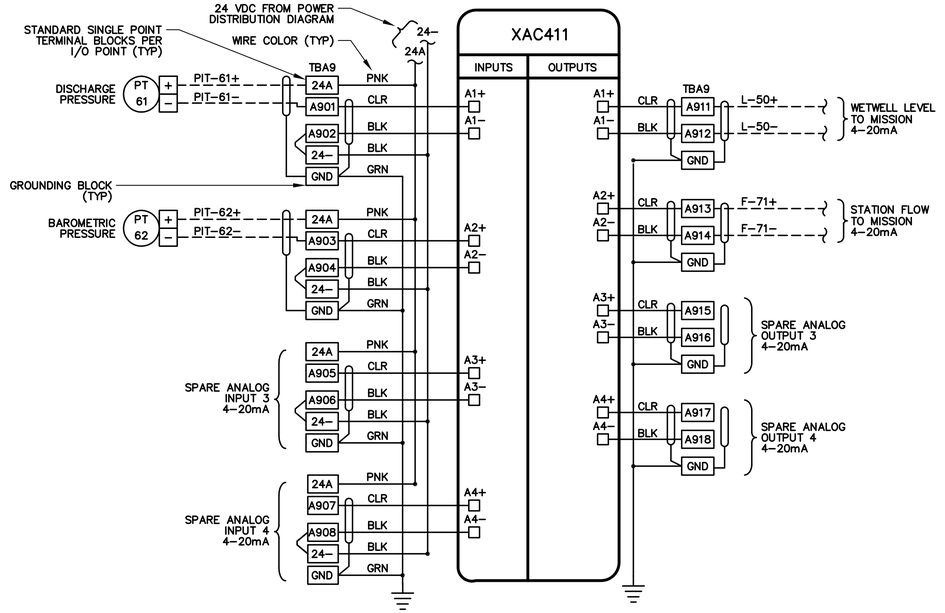
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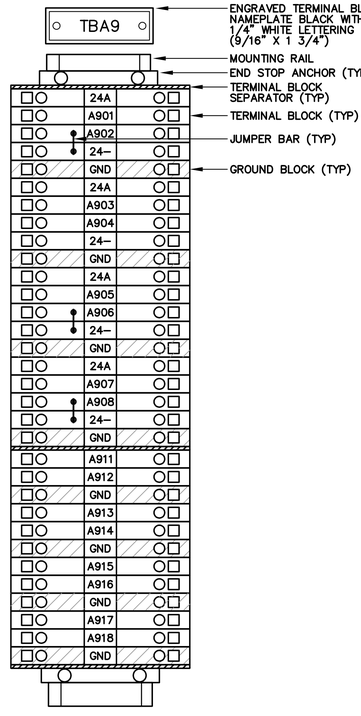
SHEET: 38 OF 55





DIGITAL I/O MODULE 4





ANALOG I/O MODULE 1

NO	REVISIONS	DATE	APPR
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FILE: 25018-E12.DWG
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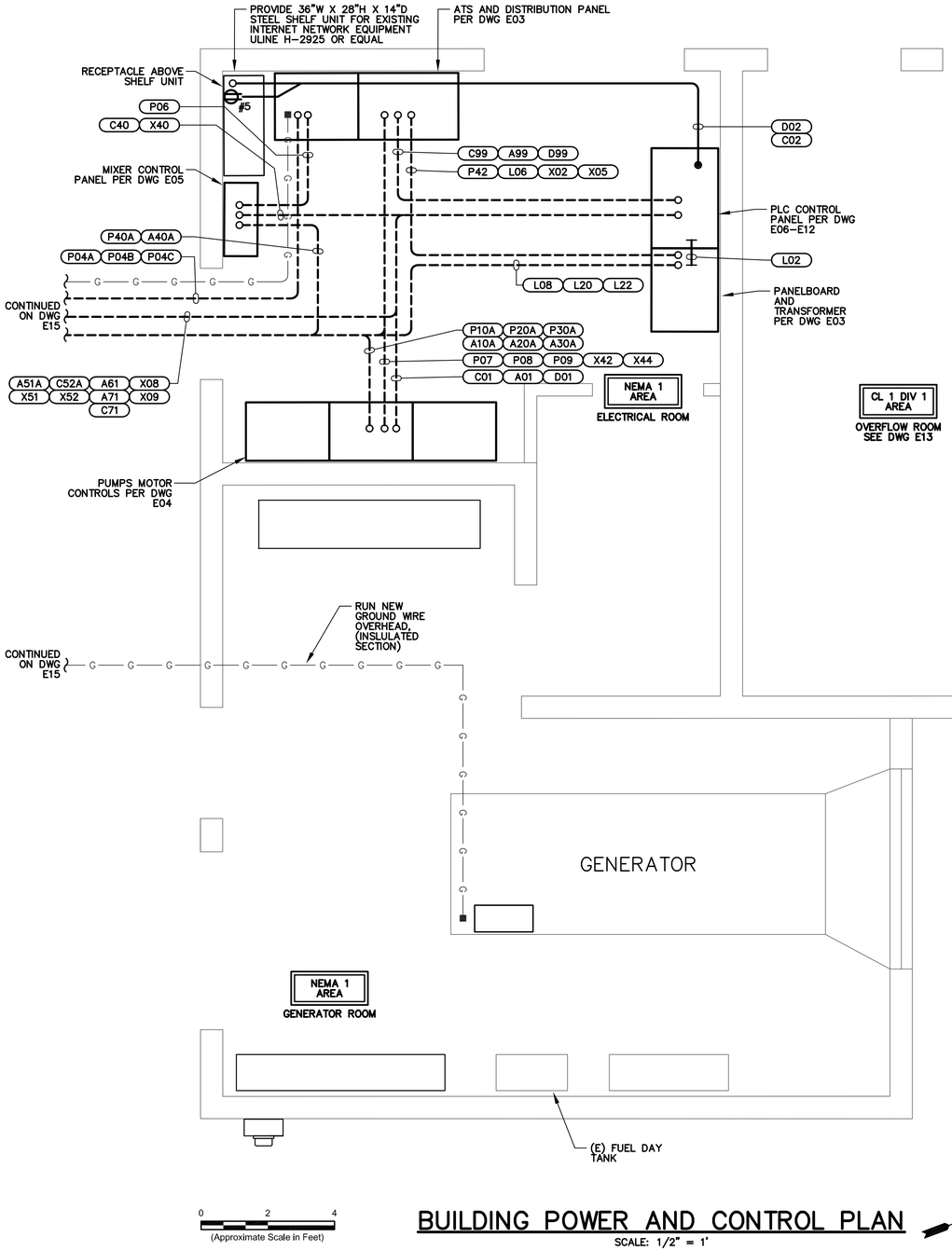
THOMAS P. FRISCH No. E15781 REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
PLC I/O WIRING DIAGRAMS

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
DRAWN: ATF
CHECKED: TPF

E12

SHEET: 39 OF 55



BUILDING POWER AND CONTROL PLAN

SCALE: 1/2" = 1'

	CONDUIT & WIRE ROUTING SCHEDULE									
	CONDUIT DETAILS					POWER WIRE	CONTROL WIRE	GROUND	NOTES
REV	TAG NO.	FROM	TO	QTY	SIZE TYPE	QTY SIZE	QTY SIZE	SIZE	
	A01	PLC CONTROL PANEL	MOTOR CONTROL PANELS	1	1-1/2" SPEC	– –	– –	–	
	A10A	PUMP 1 CONTROL PANEL	PUMP 1 (TERMINATION PANEL)	1	1" SPEC	– –	1 #18 TSPR	–	
	A20A	PUMP 2 CONTROL PANEL	PUMP 2 (TERMINATION PANEL)	1	1" SPEC	– –	1 #18 TSPR	–	
	A30A	PUMP 3 CONTROL PANEL	PUMP 3 (TERMINATION PANEL)	1	1" SPEC	– –	1 #18 TSPR	–	
	A40A	MIXER CONTROL PANEL	MIXER (TERMINATION PANEL)	1	1" SPEC	– –	1 #18 TSPR	–	
	A51A	PLC CONTROL PANEL	INSTRUMENT TERMINATION PANEL	1	1" SPEC	– –	1 #18 TSPR	#12	
	A51B	INSTRUMENT TERMINATION PANEL	WETWELL LEVEL LT-51	1	1" SPEC	– –	1 MFG CABLE	–	LT
	A61	PLC CONTROL PANEL	DISCHARGE PRESSURE PT-61	1	3/4" SPEC	– –	1 #18 TSPR	–	
	A71	PLC CONTROL PANEL	DISCHARGE PRESSURE FE-71	1	1" SPEC	– –	1 MFG CABLE	#10	
	A99	PLC CONTROL PANEL	ATS POWER DISTRIBUTION SWBD	1	3/4" SPEC	– –	1 #18 TSPR	–	
	C01	PLC CONTROL PANEL	MOTOR CONTROL PANELS	1	1-1/2" SPEC	– –	36 #14	#14	
	C40	PLC CONTROL PANEL	MIXER CONTROL PANEL	1	1" SPEC	– –	16 #14	#14	
	C52A	PLC CONTROL PANEL	INSTRUMENT TERMINATION PANEL	1	1" SPEC	– –	10 #14	#14	
	C52B	INSTRUMENT TERMINATION PANEL	WETWELL LEVEL SWITCHES	1	2" SPEC	– –	3 MFG CABLE	–	LSH, LSHH, LSL
	C71	PLC CONTROL PANEL	DISCHARGE FLOWMETER	1	3/4" SPEC	– –	– –	–	
	C99	PLC CONTROL PANEL	ATS POWER DISTRIBUTION SWBD	1	3/4" SPEC	– –	16 #14	#14	
	D01	PLC CONTROL PANEL	MOTOR CONTROL PANELS	1	1" SPEC	– –	3 CAT 6	–	
	D99	PLC CONTROL PANEL	ATS POWER DISTRIBUTION SWBD	1	3/4" SPEC	– –	1 CAT 6	–	
	P01	UTILITY SERVICE	E	1	4" EXISTING	– –	– –	–	NO REVISIONS
	P02A,B	TRANSFORMER	METER/MAIN SWITCHBOARD	2	5" SPEC	– –	– –	–	PER UTILITY REQUIREMENTS
	P04A,B,C	METER/MAIN SWITCHBOARD	ATS POWER DISTRIBUTION SWBD	3	4" SPEC	3 #350	– –	#1/0	
	P06	ATS POWER DISTRIBUTION SWBD	MIXER CONTROL PANEL	1	1" SPEC	3 #10	– –	#10	
	P07	ATS POWER DISTRIBUTION SWBD	PUMP 1 CONTROL PANEL	1	3" SPEC	3 #350	– –	#2	
	P08	ATS POWER DISTRIBUTION SWBD	PUMP 2 CONTROL PANEL	1	3" SPEC	3 #350	– –	#2	
	P09	ATS POWER DISTRIBUTION SWBD	PUMP 3 CONTROL PANEL	1	3" SPEC	3 #350	– –	#2	
	P10A	PUMP 1 CONTROL PANEL	PUMP 1 (TERMINATION PANEL)	1	3" SPEC	3 #250	– –	#2	
	P10B	PUMP 1 (TERMINATION PANEL)	PUMP 1 (WETWELL)	1	4" SPEC	1 MFG CABLE	– –	–	
	P20A	PUMP 2 CONTROL PANEL	PUMP 2 (TERMINATION PANEL)	1	3" SPEC	3 #250	– –	#2	
	P20B	PUMP 2 (TERMINATION PANEL)	PUMP 2 (WETWELL)	1	4" SPEC	1 MFG CABLE	– –	–	
	P30A	PUMP 3 CONTROL PANEL	PUMP 3 (TERMINATION PANEL)	1	3" SPEC	3 #250	– –	#2	
	P30B	PUMP 3 (TERMINATION PANEL)	PUMP 3 (WETWELL)	1	4" SPEC	1 MFG CABLE	– –	–	
	P40A	MIXER CONTROL PANEL	MIXER (TERMINATION PANEL)	1	1" SPEC	3 #12	– –	#12	
	P40B	MIXER (TERMINATION PANEL)	MIXER (WETWELL)	1	2" SPEC	1 MFG CABLE	– –	–	
	P42	ATS POWER DISTRIBUTION SWBD	PANEL LP TRANSFORMER	1	1" SPEC	2 #2	– –	#6	
	L02	PANELBOARD LP	CONTROL PANEL	1	1-1/2" SPEC	4 #12	– –	#12	CKT 2,4
	L06	PANELBOARD LP	ATS POWER DISTRIBUTION SWBD	1	3/4" SPEC	2 #12	– –	#12	CKT 6
	L08	PANELBOARD LP	METER/MAIN SWITCHBOARD	1	3/4" SPEC	2 #12	– –	#12	CKT 8
	L20	PANELBOARD LP	PUMP TERMINATION PANEL	1	3/4" SPEC	2 #12	– –	#12	CKT 20
	L22	PANELBOARD LP	INSTRUMENT TERMINATION PANEL	1	3/4" SPEC	2 #12	– –	#12	CKT 22
	X02	PANELBOARD LP	ATS POWER DISTRIBUTION SWBD	1	1" SPEC	– –	– –	–	
	X05	PANELBOARD LP	ATS POWER DISTRIBUTION SWBD	1	1" SPEC	– –	– –	–	
	X08	PLC CONTROL PANEL	METER/MAIN SWITCHBOARD	1	3/4" SPEC	– –	– –	–	
	X09	PLC CONTROL PANEL	METER/MAIN SWITCHBOARD	1	3/4" SPEC	– –	– –	–	
	X40	PLC CONTROL PANEL	MIXER CONTROL PANEL	1	3/4" SPEC	– –	– –	–	
	X42	ATS POWER DISTRIBUTION SWBD	PUMP CONTROL PANELS	1	1" SPEC	– –	– –	–	
	X44	ATS POWER DISTRIBUTION SWBD	PUMP CONTROL PANELS	1	1" SPEC	– –	– –	–	
	X51	PLC CONTROL PANEL	INSTRUMENT TERMINATION PANEL	1	1" SPEC	– –	– –	–	
	X52	PLC CONTROL PANEL	INSTRUMENT TERMINATION PANEL	1	1" SPEC	– –	– –	–	
	X53	INSTRUMENT TERMINATION PANEL	WETWELL	1	1" SPEC	– –	– –	–	
	X54	INSTRUMENT TERMINATION PANEL	WETWELL	1	1" SPEC	– –	– –	–	

ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL SYMBOLS AND ABBREVIATIONS DRAWING FOR SYMBOL DEFINITION.
2. ALL WORK SHALL CONFORM TO LOCAL CODES AND NATIONAL ELECTRIC CODE.
3. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE WITH OTHER DISCIPLINES.
4. CONFIRM HOOKUP REQUIREMENTS FOR ELECTRICAL AND MECHANICAL EQUIPMENT PRIOR TO INSTALLING UNDERGROUND CONDUIT AND STUB-UPS. MISSING CONDUITS, INCORRECT SIZING, OR OTHER ISSUES MUST BE BROUGHT TO THE ATTENTION OF ENGINEER PRIOR TO BACKFILL.
5. CONDUIT ROUTING IS SHOWN GENERALLY DIAGRAMMATIC AND DOES NOT INDICATE TRENCH WIDTH OR TRENCH LAYOUT. FOR CONDUITS OUTSIDE BUILDINGS, IF CONTRACTOR WANTS TO RUN CONDUITS IN ROUTES OTHER THAN THOSE SHOWN FOR ANY REASON, THEN HE SHALL SUBMIT THE PLAN FOR APPROVAL PRIOR TO INSTALLATION. SPECIFY REASON FOR CHANGE.
6. INSTALL NON-UTILITY CONDUITS PER DRAWING DETAILS AND SPECIFICATIONS SECTION 16110.
7. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT AND WIRE ROUTING SCHEDULE.
8. INSTALL UNDERGROUND NON-DUCTBANK CONDUITS PER ELECTRICAL DETAIL LVC.
9. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL ECT.
10. EXPOSED CONDUIT TYPE AND FITTINGS TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
11. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES. GROUT, CAULK, AND PAINT ANY PENETRATIONS INTO STRUCTURES FOR WATERTIGHT SEAL.
12. USE SS EXPANSION WEDGE ANCHORS OR EPOXY ANCHORS AS NECESSARY FOR EQUIPMENT MOUNTING.

NOTES PERTAINING TO CONDUIT SCHEDULE:

1. CONDUIT TYPE "SPEC" IS AS DEFINED IN SPECIFICATIONS SECTION [CONDUIT AND BOXES] FOR NON-EXPOSED AND EXPOSED PORTIONS OF CONDUIT RUN.
2. SEE SPECIFICATIONS AND EXPOSED TRANSITION DETAIL OR EQUIPMENT SPECIFIC DETAIL FOR CONDUIT TRANSITION MATERIALS AND METHODS FROM BELOW GROUND TO EXPOSED PORTIONS OF RUN.
3. CONDUITS OVER 15 FT LENGTH (EITHER EMPTY OR WITH CONDUCTORS SIZED LESS THAN #8 AWG), SHALL INCLUDE A POLY PULL STRING. STRING SHALL BE TIED OFF AT EACH END.
4. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE SPECIFICATIONS [CONDUIT AND BOXES.]
5. WIRE SIZING IN TABLE IS BASED ON COPPER CONDUCTORS, THHN INSULATION, WITH TYPE C STRANDING. OTHER CONDUCTOR TYPES, IF ALLOWED OR REQUIRED PER SPECIFICATION, MAY REQUIRE CONDUITS TO BE UPSIZED BY CONTRACTOR AND SUBMITTED FOR APPROVAL.
6. SEE GENERAL NOTES ON LIGHTING AND RECEPTACLE PLAN FOR CONDUIT REQUIREMENTS FOR ELECTRICAL DEVICES WITHOUT CONDUITS SHOWN, CONDUIT NUMBERS, OR NOT LISTED IN SCHEDULE.
7. CONDUIT LABELING CONVENTION IS AS FOLLOWS: A- ANALOG, C- CONTROL, D- COMM, L- PANELBOARD, P- POWER, S- SECURITY, T- MEDIUM VOLTAGE, V- VIDEO, X- SPARE.

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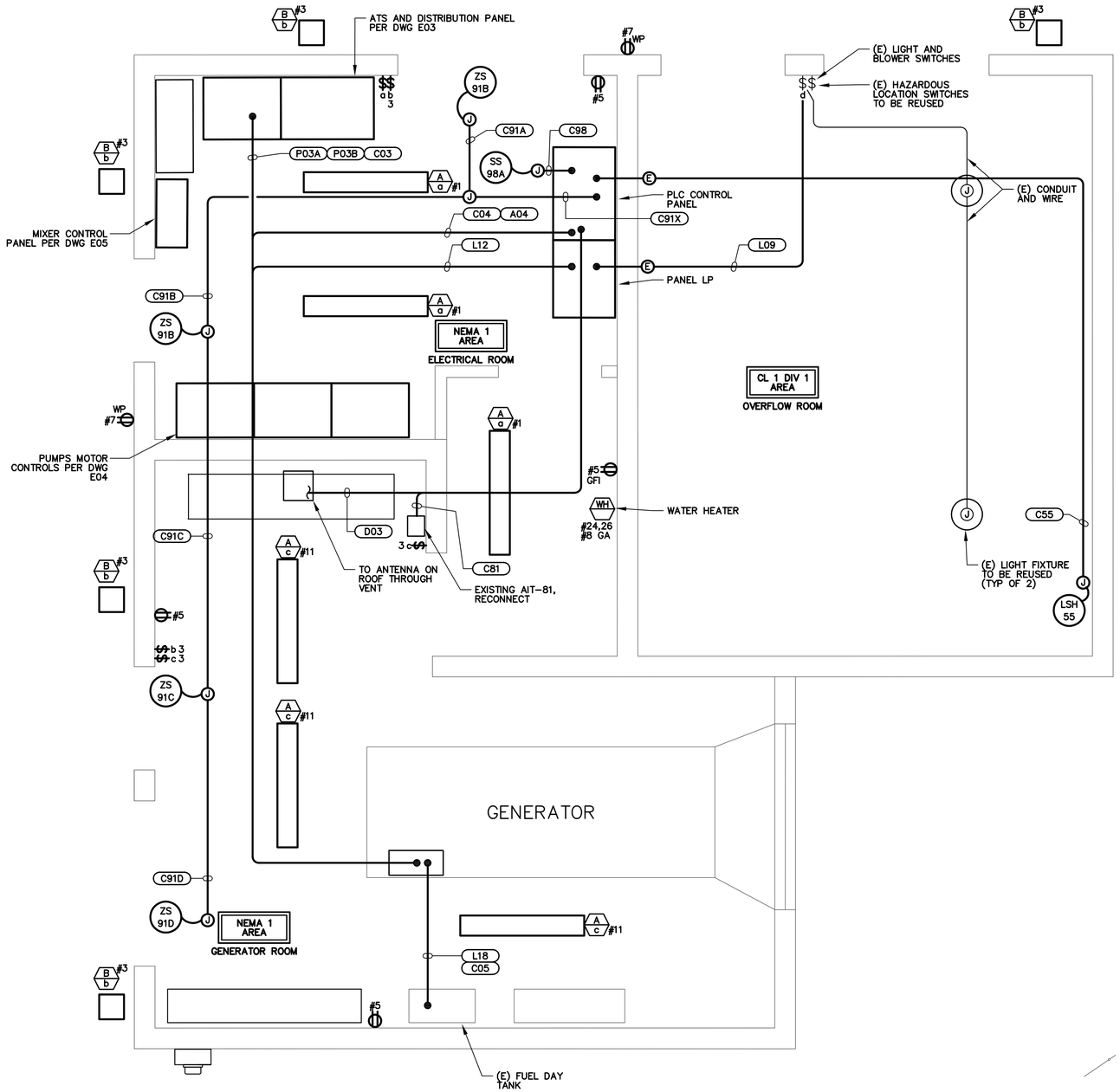
THOMAS P. FRISCH No. E15781 PROFESSIONAL ENGINEER ELECTRICAL STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
BUILDING POWER AND CONTROL PLAN

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
DRAWN: ATF
CHECKED: TPF

E13

SHEET: 40 OF 55



0 2 4
(Approximate Scale in Feet)

BUILDING LIGHTING AND RECEPTACLE PLAN

SCALE: 1/2" = 1'

CONDUIT & WIRE ROUTING SCHEDULE

REV	CONDUIT DETAILS TAG NO.	FROM	TO	QTY	SIZE	TYPE	POWER WIRE QTY	POWER WIRE SIZE	CONTROL WIRE QTY	CONTROL WIRE SIZE	GROUND SIZE	NOTES
	A04	PLC CONTROL PANEL	GENERATOR/DAY TANK	1	3/4"	SPEC	–	–	–	–	–	
	C02	PLC CONTROL PANEL	GENERATOR	1	3/4"	SPEC	–	–	6	#14	#14	
	C03	ATS POWER DISTRIBUTION SWBD	GENERATOR	1	3/4"	SPEC	–	–	6	#14	#14	
	C04	PLC CONTROL PANEL	GENERATOR/DAY TANK	1	3/4"	SPEC	–	–	16	#14	#14	
	C05	GENERATOR	DAY TANK	1	3/4"	SPEC	–	–	10	#14	#14	
	C55	CONTROL PANEL	OVERFLOW WETWELL	1	3/4"	SPEC	–	–	2	#14	#14	
	C81	CONTROL PANEL	GAS ANALYZER	1	3/4"	SPEC	–	–	6	#14	#14	
	C91A	ZS-91A J-BOX	ZS-91A	1	3/4"	SPEC	–	–	2	#14	#14	
	C91B	ZS-91A J-BOX	ZS-91B J-BOX	1	3/4"	SPEC	–	–	6	#14	#14	
	C91C	ZS-91B J-BOX	ZS-91C J-BOX	1	3/4"	SPEC	–	–	4	#14	#14	
	C91D	ZS-91C J-BOX	ZS-91D	1	3/4"	SPEC	–	–	2	#14	#14	
	C91X	CONTROL PANEL	ZS-91A J-BOX	1	3/4"	SPEC	–	–	8	#14	#14	
	C98	CONTROL PANEL	SMOKE ALARM SS-98A	1	3/4"	SPEC	–	–	4	#14	#14	
	D01	PLC CONTROL PANEL	MOTOR CONTROL PANELS	1	1"	SPEC	–	–	3	CAT 6	–	
	D02	PLC CONTROL PANEL	INTERNET EQUIPMENT	1	3/4"	SPEC	–	–	2	CAT 6	–	
	D03	PLC CONTROL PANEL	ANTENNA	1	–	–	–	–	1	ANTENNA CABLE	–	
	P03A,B	GENERATOR	ATS POWER DISTRIBUTION SWBD	2	4"	SPEC	3	#500	–	–	#1/0	
	L09	PANELBOARD LP	OVERFLOW WETWELL ROOM	1	3/4"	SPEC	4	#12	–	–	#12	CKT 9, 13
	L12	PANELBOARD LP	GENERATOR	1	1-1/2"	SPEC	3	#8	4	#10	#12	CKT 12, 14/16, 18
	L18	GENERATOR	DAY TANK CONTROLS	1	3/4"	SPEC	2	#10	–	–	#12	CKT 18

NOTES PERTAINING TO CONDUIT SCHEDULE:

1. CONDUIT TYPE "SPEC" IS AS DEFINED IN SPECIFICATIONS SECTION [CONDUIT AND BOXES] FOR NON-EXPOSED AND EXPOSED PORTIONS OF CONDUIT RUN.
2. SEE SPECIFICATIONS AND EXPOSED TRANSITION DETAIL OR EQUIPMENT SPECIFIC DETAIL FOR CONDUIT TRANSITION MATERIALS AND METHODS FROM BELOW GROUND TO EXPOSED PORTIONS OF RUN.
3. CONDUITS OVER 15 FT LENGTH (EITHER EMPTY OR WITH CONDUCTORS SIZED LESS THAN #8 AWG), SHALL INCLUDE A POLY PULL STRING. STRING SHALL BE TIED OFF AT EACH END.
4. FITTINGS, CONDULETS, BOXES AND COVERS SHALL MATCH DUTY OF ADJACENT PIPE, SEE SPECIFICATIONS [CONDUIT AND BOXES.]
5. WIRE SIZING IN TABLE IS BASED ON COPPER CONDUCTORS, THHN INSULATION, WITH TYPE C STRANDING. OTHER CONDUCTOR TYPES, IF ALLOWED OR REQUIRED PER SPECIFICATION, MAY REQUIRE CONDUITS TO BE UPSIZED BY CONTRACTOR AND SUBMITTED FOR APPROVAL.
6. SEE GENERAL NOTES ON LIGHTING AND RECEPTACLE PLAN FOR CONDUIT REQUIREMENTS FOR ELECTRICAL DEVICES WITHOUT CONDUITS SHOWN, CONDUIT NUMBERS, OR NOT LISTED IN SCHEDULE.
7. CONDUIT LABELING CONVENTION IS AS FOLLOWS: A- ANALOG, C- CONTROL, D- COMM, L- PANELBOARD, P- POWER, S- SECURITY, T- MEDIUM VOLTAGE, V- VIDEO, X- SPARE.

GENERAL NOTES THAT APPLY TO LIGHTING AND RECEPTACLE PLAN.

1. THESE NOTES SHALL APPLY TO ALL EQUIPMENT OR FIXTURES WITH ELECTRICAL CONNECTIONS BUT WITHOUT CONDUITS SHOWN, CONDUIT NUMBERS, OR NOT LISTED IN SCHEDULE.
2. PROVIDE AND INSTALL NECESSARY WIRES IN SURFACE MOUNT 3/4" (MINIMUM) CONDUIT FOR FOR ELECTRICAL FIXTURE ARRANGEMENT AS SHOWN. MAXIMUM 3 CIRCUITS PER CONDUIT SECTION OVER 24" IN LENGTH. CONDUITS SHALL NOT EXCEED 40% FILL.
3. CONDUITS UNDER SLAB SHALL BE PVC-40 WITH STUB-OUTS PER EXPOSED CONDUIT TRANSITION DETAIL.
4. CONDUITS ABOVE CEILING SHALL BE EMT WITH COMPRESSION STYLE FITTINGS. CONDUITS BELOW CEILING SHALL BE GRS. ACCESS TO ATTIC AREA SHALL NOT BE REQUIRED TO INSTALL CONDUCTORS.
5. DEVICE BOXES AND CONDUIT BODIES SHALL BE CAST IRON OR ALUMINUM WITH THREADED HUB.
6. CONDUCTORS SHALL BE COPPER TYPE THHN, CLASS C STRANDING, #12 AWG (MINIMUM).
7. MOUNT CONDUITS USING SINGLE BOLT GALVANIZED PIPE STRAPS AND CLAMP BACK SPACERS.
8. USE SS EXPANSION WEDGE ANCHORS OR EPOXY ANCHORS AS NECESSARY FOR EQUIPMENT MOUNTING.
9. EXPOSED CONDUIT SHALL BE PAINTED WITH WALL AND/OR CEILING AS SPECIFIED.
10. PROVIDE AND INSTALL FIXTURES PER SCHEDULE THIS PAGE, QUANTITY AS SHOWN IN DRAWINGS.
11. PROVIDE AND INSTALL ALL DEVICE BOXES, JUNCTION BOXES, RECEPTACLES, SWITCHES, AND COVERS MOUNT ALL RECEPTACLES AT 48" AFF UNLESS OTHERWISE NOTED.
12. RECEPTACLES TO BE GROUND FAULT INTERRUPTER (GFI) TYPE AND WEATHERPROOF (WP) WHERE SHOWN.
13. SEE ELECTRICAL SYMBOLS AND ABBREVIATIONS DRAWING FOR SYMBOL DEFINITION.
14. ALL WORK SHALL CONFORM TO LOCAL CODES AND NATIONAL ELECTRIC CODE.
15. SWITCH TYPE: T= TIME SWITCH, M= MOTION DETECTOR, 3= 3-WAY.

FIXTURE SCHEDULE

CODE LETTER	FIXTURE TYPE	FIXTURE LAMPS	WATTS/ FIXTURE	MANUFACTURER OR APPROVED EQUAL	MOUNTING ARRANGEMENT	NOTES
A	STRIP LUMINAIRE, 4 FT, VAPORTIGHT MOLDED POLYCARBONATE HOUSING FROSTED LENS, MEDIUM DISTRIBUTION	6000 LUMEN 4000K	120V 50W	ATLAS ILW48LED4D RAB SEAL4-50/D10 METALUX 4VT2	CEILING MOUNT	U.L. LISTED FOR WET LOCATIONS -20F TO 140F
B	CANOPY LIGHT 10" SQUARE, LED DARK BRONZE COLOR ALUMINUM CASE	4000 LUMEN 4000K	120V 75W	LITHONIA CNY LED ALO	CEILING MOUNT UNDER EAVE	U.L. LISTED FOR WET LOCATIONS PHOTOCELL AND MOTION CONTROL FULL CUTOFF

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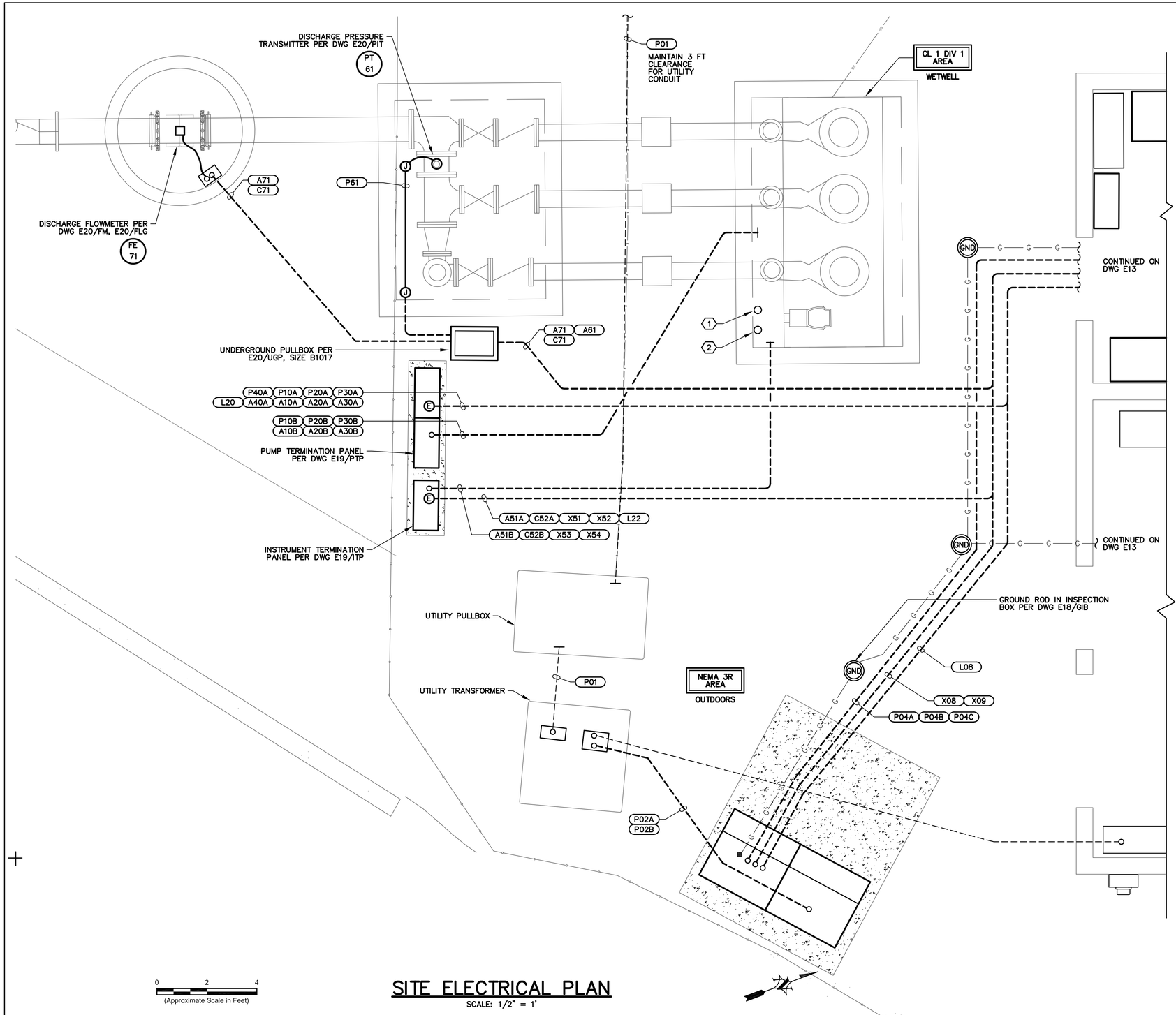
REGISTERED PROFESSIONAL ENGINEER — THOMAS P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
LIGHTING AND RECEPTACLE PLAN

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
DRAWN: ATF
CHECKED: TPF

E14

SHEET: 41 OF 55



SITE ELECTRICAL PLAN
SCALE: 1/2" = 1'

ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL SYMBOLS AND ABBREVIATIONS DRAWING FOR SYMBOL DEFINITION.
2. ALL WORK SHALL CONFORM TO LOCAL CODES AND NATIONAL ELECTRIC CODE.
3. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE WITH OTHER DISCIPLINES.
4. CONFIRM HOOKUP REQUIREMENTS FOR ELECTRICAL AND MECHANICAL EQUIPMENT PRIOR TO INSTALLING UNDERGROUND CONDUIT AND STUB-UPS. MISSING CONDUITS, INCORRECT SIZING, OR OTHER ISSUES MUST BE BROUGHT TO THE ATTENTION OF ENGINEER PRIOR TO BACKFILL.
5. CONDUIT ROUTING IS SHOWN GENERALLY DIAGRAMMATIC AND DOES NOT INDICATE TRENCH WIDTH OR TRENCH LAYOUT. FOR CONDUITS OUTSIDE BUILDINGS, IF CONTRACTOR WANTS TO RUN CONDUITS IN ROUTES OTHER THAN THOSE SHOWN FOR ANY REASON, THEN HE SHALL SUBMIT THE PLAN FOR APPROVAL PRIOR TO INSTALLATION. SPECIFY REASON FOR CHANGE.
6. INSTALL NON-UTILITY CONDUITS PER DRAWING DETAILS AND SPECIFICATIONS SECTION 16110.
7. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT AND WIRE ROUTING SCHEDULE.
8. INSTALL UNDERGROUND NON-DUCTBANK CONDUITS PER ELECTRICAL DETAIL LVC.
9. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL ECT.
10. EXPOSED CONDUIT TYPE AND FITTINGS TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
11. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES. GROUT, CAULK, AND PAINT ANY PENETRATIONS INTO STRUCTURES FOR WATERTIGHT SEAL.
12. USE SS EXPANSION WEDGE ANCHORS OR EPOXY ANCHORS AS NECESSARY FOR EQUIPMENT MOUNTING.
13. RECEPTACLES TO BE GROUND FAULT INTERRUPTER (GFI) TYPE AND WEATHERPROOF (WP) OUTDOORS AND WHERE SHOWN.
14. STUB UP CONDUITS BENEATH GENERATOR FRAME PER MANUFACTURER RECOMMENDATIONS. USE FLEXIBLE CONDUIT FOR TRANSITION BETWEEN EXPOSED CONDUIT TRANSTION AND ELECTRICAL CONNECTION BOX AND GENERATOR CONTROL PANEL.
15. UTILITY PRIMARY AND SECONDARY CONDUITS, TRANSFORMER PAD, PULL BOXES AND REMOVABLE BOLLARDS SHALL BE INSTALLED PER POWER UTILITY ENGINEERED DRAWINGS AND STANDARDS.
16. ASSUME 100 FT OF UNDERGROUND RUN BEYOND DRAWING FOR UTILITY CONNECTIONS. CONNECTION POINT SHALL BE AS DETERMINED BY UTILITY.

DRAWING REFERENCED NOTES:

1. INSTALL LEVEL SWITCHES PER E20/FLS — LSL 53, LSH 54, LSHH 55
2. INSTALL LEVEL TRANSMITTER PER E20/SUB — LT 51

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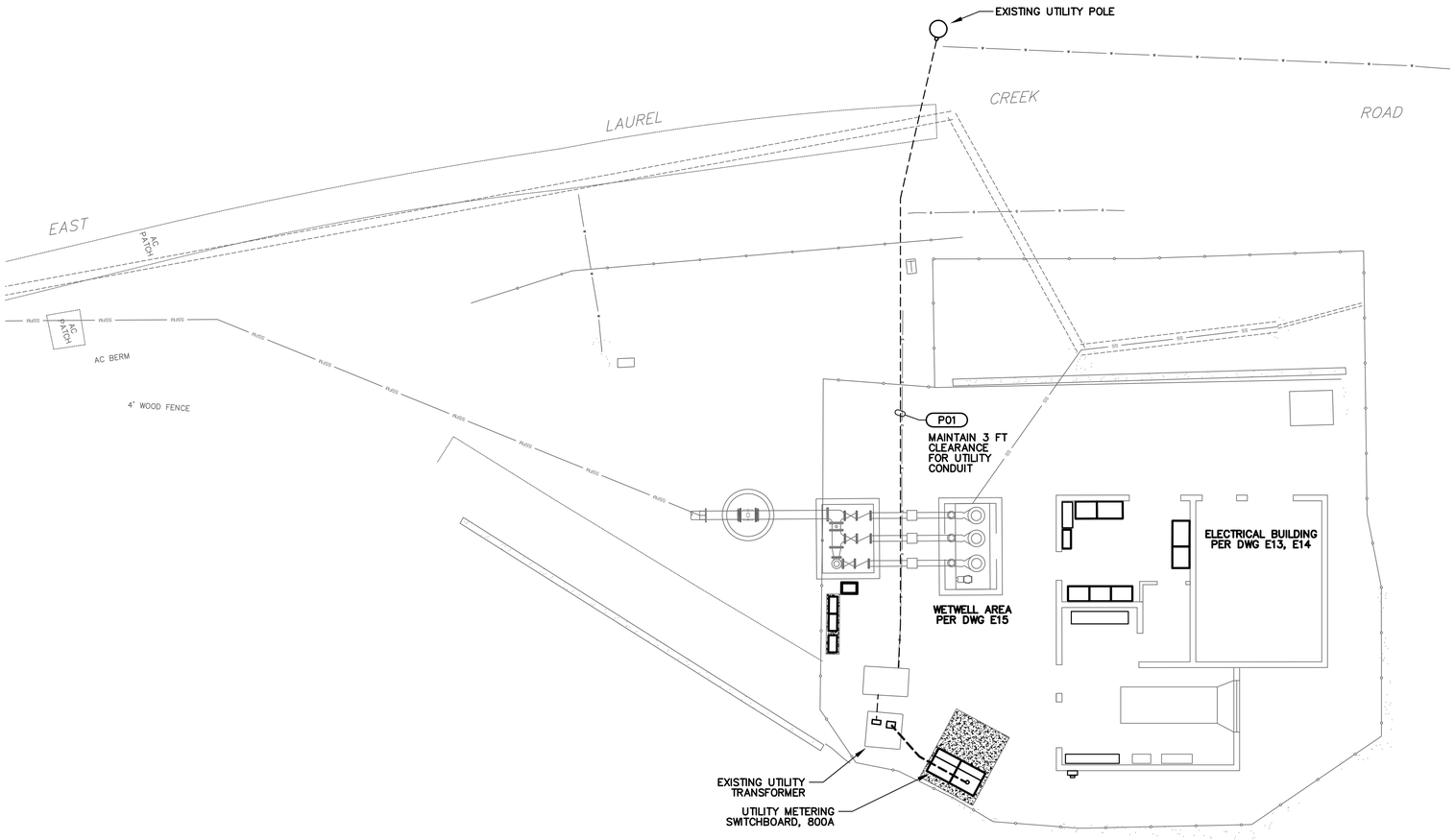
THOMAS P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
WETWELL AREA ELECTRICAL PLAN

DATE: 04/10/26
SCALE: AS SHOWN
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E15

SHEET: 42 OF 55



ELECTRICAL PLAN NOTES:

1. SEE ELECTRICAL SYMBOLS AND ABBREVIATIONS DRAWING FOR SYMBOL DEFINITION.
2. ALL WORK SHALL CONFORM TO LOCAL CODES AND NATIONAL ELECTRIC CODE.
3. SITEPLAN ACCURATE FOR ELECTRICAL WORK ONLY. COORDINATE WITH OTHER DISCIPLINES.
4. CONFIRM HOOKUP REQUIREMENTS FOR ELECTRICAL AND MECHANICAL EQUIPMENT PRIOR TO INSTALLING UNDERGROUND CONDUIT AND STUB-UPS. MISSING CONDUITS, INCORRECT SIZING, OR OTHER ISSUES MUST BE BROUGHT TO THE ATTENTION OF ENGINEER PRIOR TO BACKFILL.
5. CONDUIT ROUTING IS SHOWN GENERALLY DIAGRAMMATIC AND DOES NOT INDICATE TRENCH WIDTH OR TRENCH LAYOUT. FOR CONDUITS OUTSIDE BUILDINGS, IF CONTRACTOR WANTS TO RUN CONDUITS IN ROUTES OTHER THAN THOSE SHOWN FOR ANY REASON, THEN HE SHALL SUBMIT THE PLAN FOR APPROVAL PRIOR TO INSTALLATION. SPECIFY REASON FOR CHANGE.
6. INSTALL NON-UTILITY CONDUITS PER DRAWING DETAILS AND SPECIFICATIONS SECTION 16110.
7. CONDUITS SIZE, TYPE AND FILL DEFINED BY TAG NAME IN CONDUIT AND WIRE ROUTING SCHEDULE.
8. INSTALL UNDERGROUND NON-DUCTBANK CONDUITS PER ELECTRICAL DETAIL LVC.
9. CONDUIT TRANSITIONS SHALL BE PER EXPOSED CONDUIT TRANSITION DETAIL ECT.
10. EXPOSED CONDUIT TYPE AND FITTINGS TO BE USED ABOVE TRANSITION SHALL BE PER AREA CLASSIFICATION DEFINED IN CONDUIT SPECIFICATIONS AND EQUIPMENT SPECIFIC DETAIL.
11. REPAIR SURFACE TO PREVIOUS CONDITION FOR ALL UNDERGROUND CONDUIT ROUTES. GROUT, CAULK, AND PAINT ANY PENETRATIONS INTO STRUCTURES FOR WATERTIGHT SEAL.
12. USE SS EXPANSION WEDGE ANCHORS OR EPOXY ANCHORS AS NECESSARY FOR EQUIPMENT MOUNTING.
13. RECEPTACLES TO BE GROUND FAULT INTERRUPTER (GFI) TYPE AND WEATHERPROOF (WP) OUTDOORS AND WHERE SHOWN.
14. STUB UP CONDUITS BENEATH GENERATOR FRAME PER MANUFACTURER RECOMMENDATIONS. USE FLEXIBLE CONDUIT FOR TRANSITION BETWEEN EXPOSED CONDUIT TRANSTION AND ELECTRICAL CONNECTION BOX AND GENERATOR CONTROL PANEL.
15. UTILITY PRIMARY AND SECONDARY CONDUITS, TRANSFORMER PAD, PULL BOXES AND REMOVABLE BOLLARDS SHALL BE INSTALLED PER POWER UTILITY ENGINEERED DRAWINGS AND STANDARDS.

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(Approximate Scale in Feet)

SAN JUAN PUMP STATION UTILITY PLAN

SCALE: 1/8" = 1'

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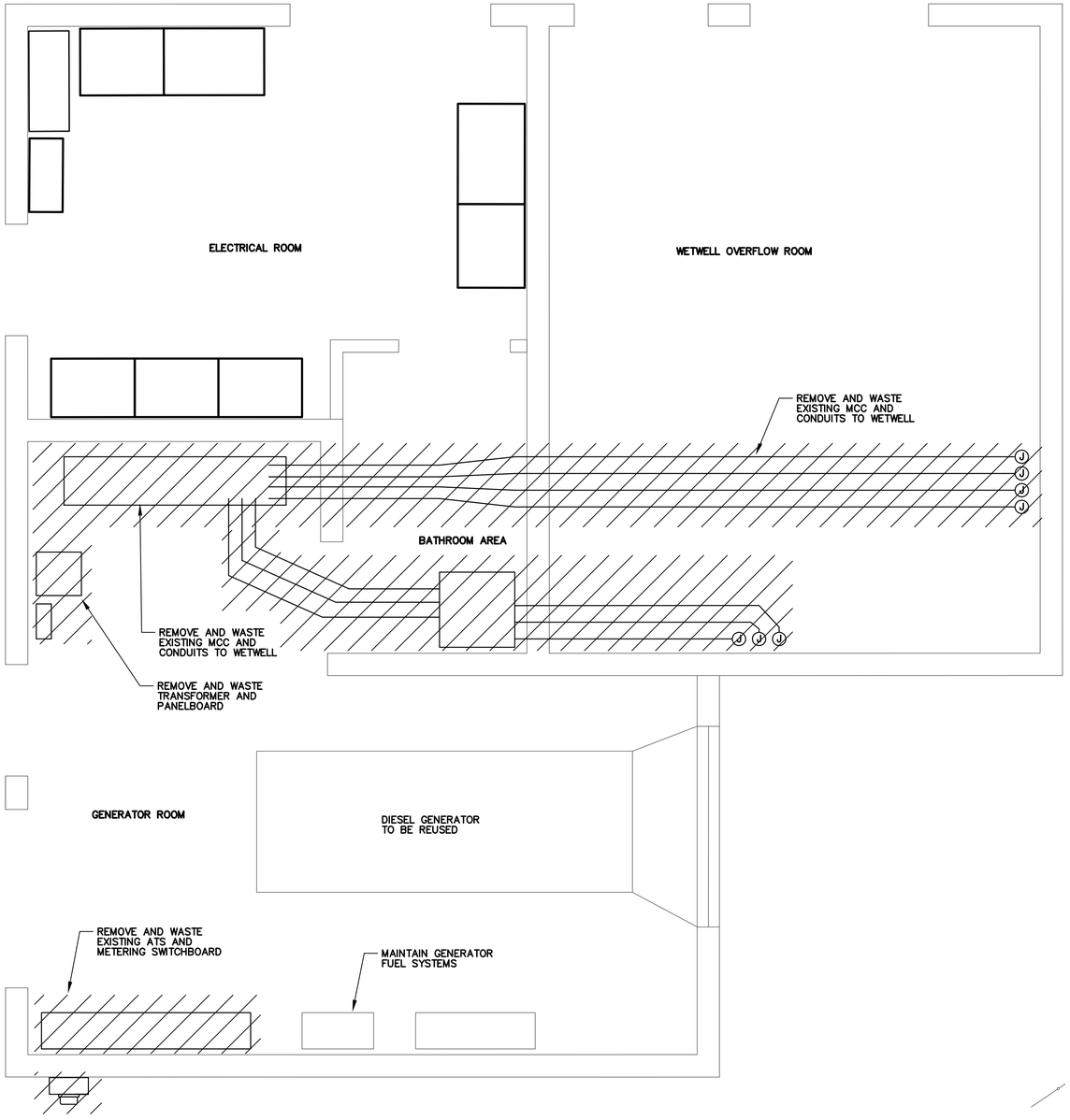
THOMAS P. FRISCH No. E15761 ELECTRICAL STATE OF CALIFORNIA PROFESSIONAL ENGINEER

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
UTILITY PLAN

DATE: 04/10/26
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E16

SHEET: 43 OF 55



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(Approximate Scale in Feet)

ELECTRICAL DEMOLITION PLAN

SCALE: 1/2" = 1'



GENERATOR AREA



CEILING IN GENERATOR ROOM



CONDUITS ABOVE MCC



PANELBOARD AND TRANSFORMER



MAIN SWITCHBOARD AND ATS



CONDUITS ABOVE MCC

DEOMOLITION PLAN NOTES

1. REMOVE ALL EXISTING EXPOSED ELECTRICAL AND LIGHTING WITHIN BUILDING AND ON EXTERIOR. EXCEPTION IS OVERFLOW WETWELL ROOM EXCEPT WHERE SPECIFICALLY CALLED OUT.
2. MAINTAIN GENERATOR FUEL TANK AND DAY TANK CONTROLS.
3. MAINTAIN BATHROOM AREA WATER HEATER.
4. MAINTAIN GAS ANALYZER AND CONDUITS.
5. MAINTAIN LIGHTING AND BLOWER IN WETWELL OVERFLOW ROOM.

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THOMAS P. FRISCH — No. E15761 — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — ELECTRICAL

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
ELECTRICAL DEMOLITION PLAN

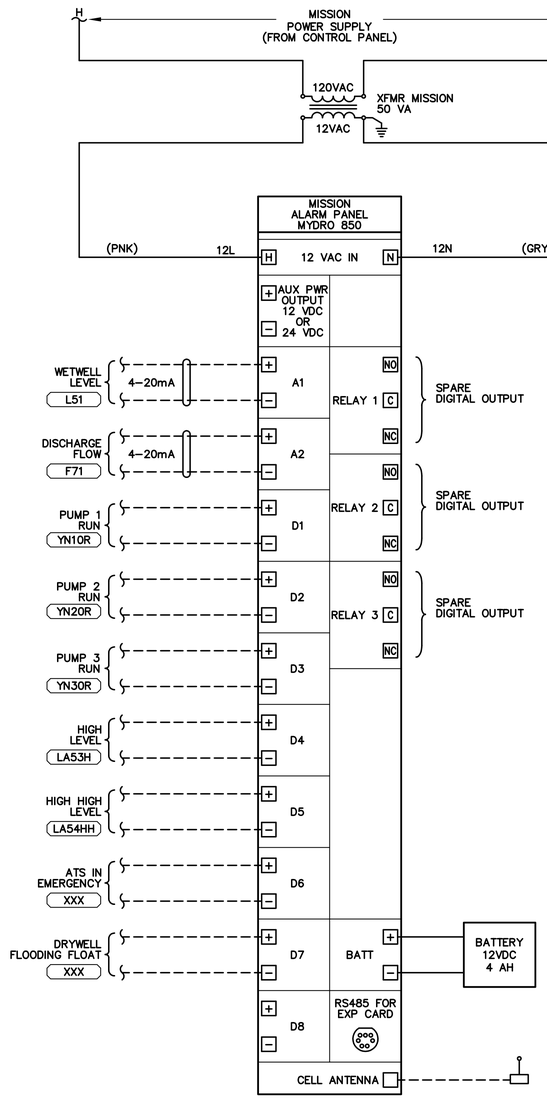
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DESIGN:	TPF
DRAWN:	ATF
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E17

SHEET: 44 OF 55

LINE NO.

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MISSION WIRING DIAGRAM

DRAWING REFERENCED NOTES:

1. FROM PLC I/O SEE P&IDS
2. FROM BACKUP CONTROLS PER DWG E07

GENERAL NOTES:

1. EQUIPMENT FURNISHED BY OWNER, INSTALLED BY CONTRACTOR.

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

FRISCH ENGINEERING, INC.
CONSULTING ELECTRICAL ENGINEERS
13405 FOLSOM BLVD, UNIT 600
FOLSOM, CA 95630
PH 916 353 1025
WWW.FRISCHENGINEERING.COM
FILE: 25018-E18.DWG
DATE: APR 06, 2026 TIME: 5:44:25PM

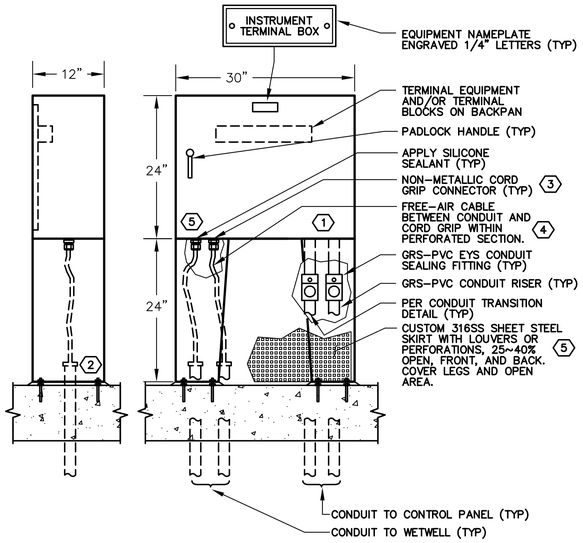
THOMAS P. FRISCH No. E15781 REGISTERED PROFESSIONAL ENGINEER STATE OF CALIFORNIA ELECTRICAL

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
MISSION WIRING DIAGRAM

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
DRAWN: ATF
CHECKED: TPF

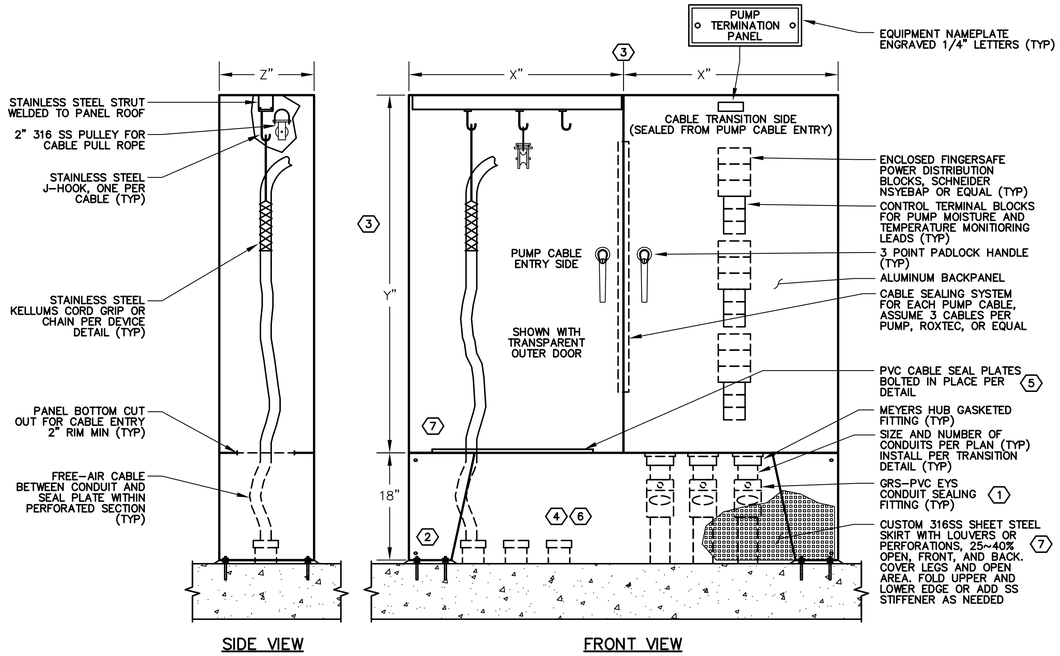
E18

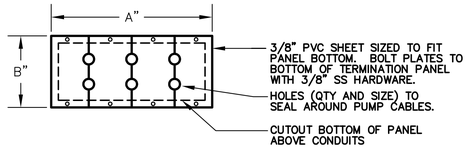
SHEET: 45 OF 55



NOTES:
1. USE ALL STAINLESS STEEL HARDWARE. SEAL BOX PENETRATIONS WITH SILICONE GLUE.
2. MOUNT PANEL ON 3/8" SS EPOXY ANCHORS WITH DOUBLE NUT LEVELING. GROUT SPACE BELOW PANEL LEGS.
3. WIRE ENTRY IS ONLY THROUGH BOTTOM OF PANEL. NO ADDITIONAL PANEL PENETRATIONS.
4. CONDUIT ENTRY TO PANEL SKIRT AREA ONLY. FREE AIR WIRE TO PANEL.
5. NO PENETRATIONS OF PANEL OR SKIRT, ALL CONDUITS SHALL BE UNDERGROUND ENTRY, UNLESS SPECIFICALLY SHOWN ON PLAN.

ITP — INSTRUMENT TERMINATION PANEL
NEMA 4X, 316SS, NOT TO SCALE





PVC CABLE SEAL PLATES

NOTES:
1. FILL EYS WITH "CHICO" OR EQUAL CONDUIT SEALING COMPOUND AFTER INSPECTION AND TESTING IS COMPLETED.
2. MOUNT PANEL ON 3/8" SS EPOXY ANCHORS WITH DOUBLE NUT LEVELING. GROUT SPACE BELOW PANEL LEGS.
3. EACH OF TWO PANEL SIZES (SIDE BY SIDE) SHALL BE: A=8", B=20", X=30", Y=42", Z=12"
   EACH OF TWO PANEL SIZES (SIDE BY SIDE) SHALL BE: A=12", B=25", X=36", Y=60", Z=16"
4. SEAL CONDUITS WITH DUCT SEAL, LARGER PUMPS HAVE MULTIPLE CABLES/CONDUITS.
5. WIRE ENTRY IS ONLY THROUGH BOTTOM OF PANEL. NO ADDITIONAL PANEL PENETRATIONS.
6. CONDUIT ENTRY TO PANEL SKIRT AREA ONLY. FREE AIR WIRE TO PANEL.
7. NO PENETRATIONS OF PANEL OR SKIRT, ALL CONDUITS SHALL BE UNDERGROUND ENTRY, UNLESS SPECIFICALLY SHOWN ON PLAN.

PTP — PUMP TERMINATION PANEL
NEMA 4X, 316SS, NOT TO SCALE

NO	REVISIONS	DATE	APPR
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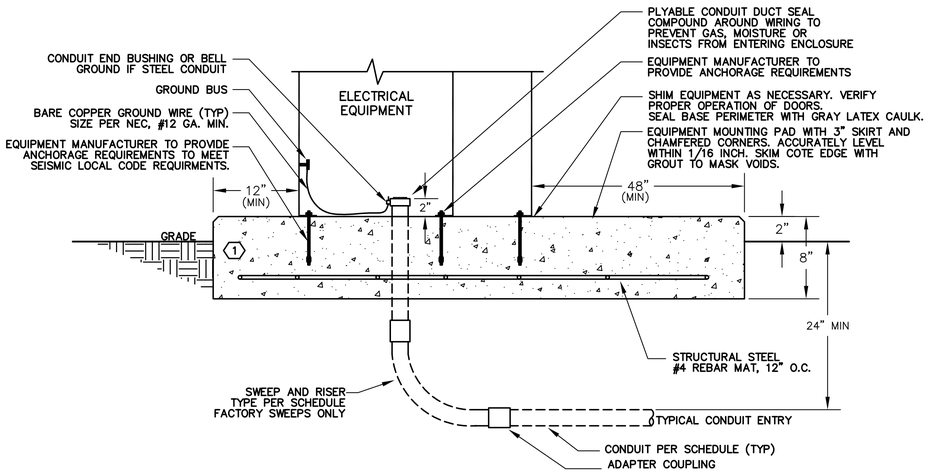
THOMAS P. FRISCH No. E15761 ELECTRICAL STATE OF CALIFORNIA REGISTERED PROFESSIONAL ENGINEER

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
WETWELL TERMINATION PANELS

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
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E19

SHEET: 46 OF 55

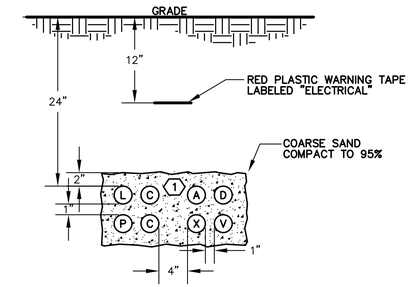


ECP — EQUIPMENT CONCRETE PAD DETAIL

NOT TO SCALE

NOTES: 1 EQUIPMENT PAD SIZE PER SITE PLANS

1 CONTRACTOR SHALL VERIFY EQUIPMENT SIZE AND SIZE PAD ACCORDINGLY. EQUIPMENT MANUFACTURER TO PROVIDE EQUPMENT DIMENSIONS.



LVC — LOW VOLTAGE NON-DUCT BANK SECTION

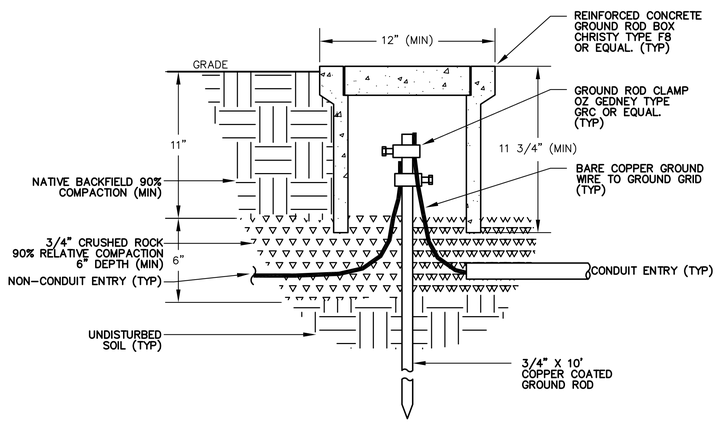
NOT TO SCALE

NOTES: 1 NUMBER OF CONDUITS PER PLANS AND SCHEDULE. MAXIMUM DEPTH OF TRENCH SHALL BE 42". DESIGN TRENCH DESIGN AND INSTALL TRENCH TO MAINTAIN 6" VERTICAL CLEARANCE AND 12" HORIZONTAL CLEARANCE FROM PIPES.

2 P, L, OR C DESIGNATION FOR POWER OR CONTROL CONDUITS.

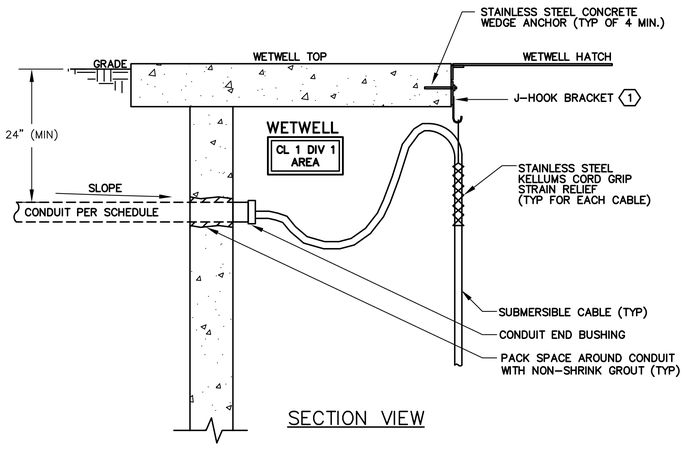
3 A, D, V, OR X DESIGNATION FOR COMMUNICATION (TELEPHONE, DATA, VIDEO, OR INSTRUMENTATION) CONDUITS.

4 USE CONDUIT SPACERS TO SUPPORT CONDUITS AND MAINTAIN SPACING (3' INTERVALS)



GIB — GROUND INSPECTION BOX DETAIL

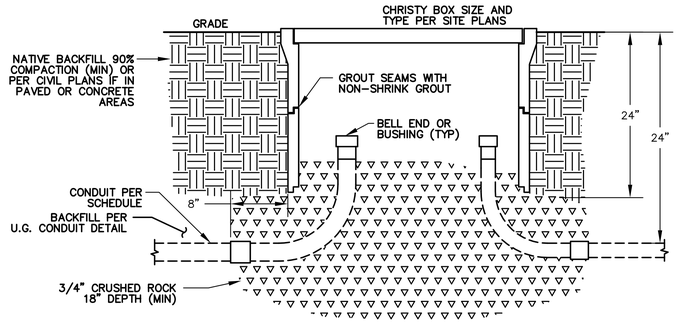
NOT TO SCALE



WWE — WETWELL CONDUIT ENTRANCE DETAIL

NOT TO SCALE

NOTES: 1 CUSTOM MANUFACTURERED J-HOOK ASSEMBLY CONSISTING OF STAINLESS STEEL PLATE WITH STAINLESS STEEL J-HOOKS WELDED TO PLATE. PROVIDE ONE HOOK PER WETWELL CABLE.



UPB — UNDERGROUND PULL BOX DETAIL

NOT TO SCALE

NO	REVISIONS	DATE	APPR
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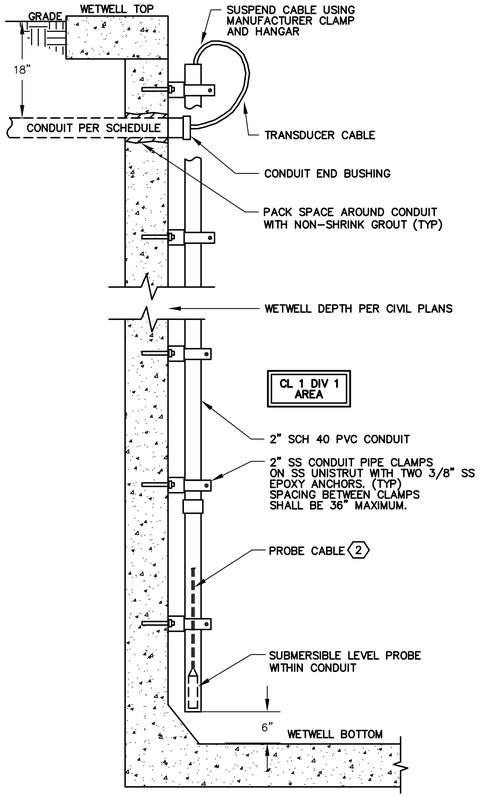
REGISTERED PROFESSIONAL ENGINEER — THOMAS P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
ELECTRICAL DETAILS 1

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E20

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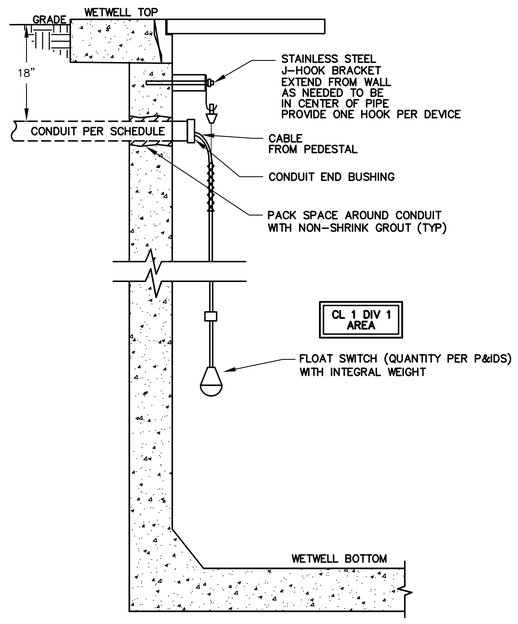


SECTION VIEW

PLT – PRESSURE LEVEL TRANSMITTER

NOT TO SCALE

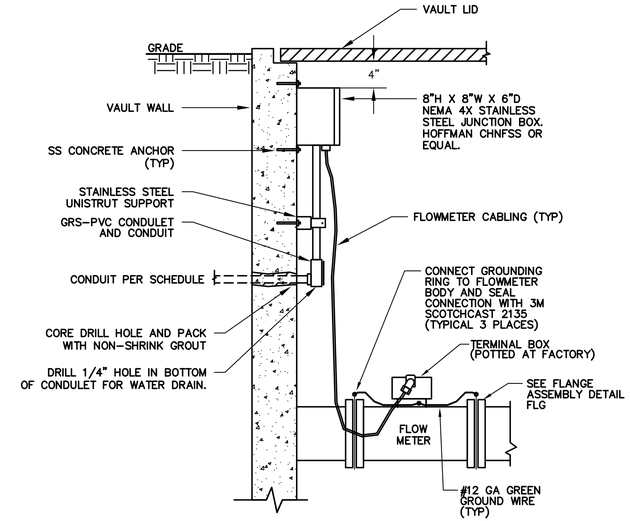
NOTES: 1 SENSOR TERMINATION DESSICANT SHALL BE INSTALLED IN CONTROL TERMINATION BOX. INSTALL PER MANUFACTURER INSTRUCTIONS.



SECTION VIEW

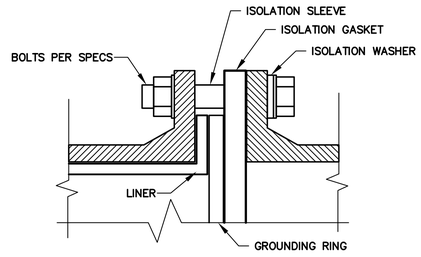
FSD – FLOAT SWITCH DETAIL

NOT TO SCALE



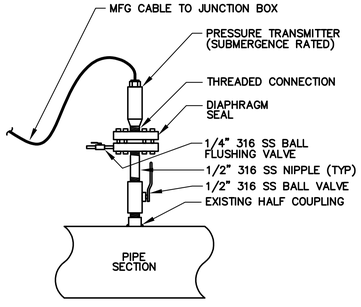
FM – FLOWMETER VAULT DETAIL

NOT TO SCALE



FLG – FLOWMETER FLANGE ASSEMBLY

NOT TO SCALE



PT – PRESSURE TRANSMITTER DETAIL

NOT TO SCALE

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13405 FOLSOM BLVD, UNIT 600
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PH 916 353 1025
WWW.FRISCHENGINEERING.COM
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REGISTERED PROFESSIONAL ENGINEER — JAMES P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
ELECTRICAL DETAILS 1

DATE:	04/10/26
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CHECKED:	TPF

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SHEET: 48 OF 55

P&ID ABBREVIATIONS

INSTRUMENTATION ABBREVIATIONS – ISA MODIFIED

	FIRST LETTER	SECOND LETTER	SUCCEDING LETTERS	
	MEASURED VARIABLE	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS	ALARM	ALARM	
B	BURNER	USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY	CONTROL	CONTROLLER CLOSED	
D	DENSITY		MULTIFUNCTION	
E	VOLTAGE	ELEMENT	ELEMENT	
F	FLOW		FAIL	
G	GENERAL		MULTIFUNCTION	
H	HAND	HIGH	HIGH	HIGH
I	CURRENT	INDICATING, INDICATOR	MULTIFUNCTION	
J	POWER		MULTIFUNCTION	
K	TIME	SPEED	CONTROL STATION	
L	LEVEL	MULTIFUNCTION	LOW	MULTIFUNCTION
M	MOISTURE		MULTIFUNCTION	
N	STATUS	STATUS	USER'S CHOICE	USER'S CHOICE
O	OPERATOR	OPEN	OPEN	
P	PRESSURE, VACUUM		MULTIFUNCTION	
Q	QUANTITY ACCUMULATION	QUANTITY ACCUMULATION	QUANTITY ACCUMULATION	
R	RESET	RECORD	MULTIFUNCTION	
S	SPEED, FREQUENCY	SWITCH	SWITCH	MULTIFUNCTION
T	TEMPERATURE	TRANSMITTER	TRANSMITTER	
U	MULTIVARIABLE	MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION		MULTIFUNCTION	
W	WEIGHT		MULTIFUNCTION	
X	SWITCH	MULTIFUNCTION	MULTIFUNCTION	
Y	STATUS	STATUS	MULTIFUNCTION	
Z	POSITION		MULTIFUNCTION	

SWITCH IDENTIFIER			
F/R	FORWARD/REVERSE	OPN	OPEN
HOA	HAND–OFF–AUTO	CLS	CLOSE
HOR	HAND–OFF–REMOTE	SEL	SELECTOR
LOS	LOCK OUT STOP	S/S	START / STOP
L/R	LOCAL / REMOTE	%	PERCENT ADJUSTMENT
MOA	MANUAL–OFF–AUTO		
OCA	OPEN–CLOSE–AUTO		
O/C	OPEN / CLOSE		
O/O	ON / OFF		

P&ID SYMBOLS

ISA SYMBOLS

- FIELD MOUNTED INSTRUMENT
- INSTRUMENT MOUNTED ON DOOR OF LOCAL PANEL, OPERATOR ACCESSIBLE
- INSTRUMENT MOUNTED ON DOOR OF FIELD PANEL, OPERATOR ACCESSIBLE
- INSTRUMENT MOUNTED WITHIN PANEL, OPERATOR INACCESSIBLE
- INSTRUMENT MOUNTED WITHIN FIELD PANEL, OPERATOR INACCESSIBLE
- OPERATION PERFORMED WITH LOGIC OR HARDWIRED DEVICES
- MCE–XX — ASSOCIATED MOTOR CONTROL ELEMENTARY IF APPLICABLE
- UNIT — VISUAL DISPLAY OF PLC ANALOG REGISTER SCALE TO UNITS AS SHOWN
- VISUAL DISPLAY OF PLC ANALOG ALARM REGISTER
- VISUAL DISPLAY OF PLC DIGITAL REGISTER
- VISUAL DISPLAY OF PLC DIGITAL ALARM REGISTER
- TAG DESCRIPTION
- PLC I/O TAG
- PLC DIGITAL INPUT
- PLC DIGITAL OUTPUT
- ANALOG INPUT
- ANALOG OUTPUT
- AUDIBLE ALARM (BUZZER OR HORN)
- LAMP INDICATION COLOR DENOTED BY "X" RED, BLU, GRN, WHT, AMBER
- CONTINUATION TAG FROM ONE AREA TO ANOTHER AREA OF DIFFERENT DRAWINGS "a" TAG IDENTIFIER TO POINT ON DRAWING NUMBER XXXX.
- CONTINUED ON DWG I–X

LINE TYPES

- PRIMARY PROCESS LINE
- SECONDARY PROCESS LINE
- ELECTRICAL SIGNAL LINE (DIGITAL OR ANALOG)
- SOFTWARE OR DATA LINK
- BOUNDARY OF EQUIPMENT PACKAGE SYSTEM
- COMMUNICATION CONNECTION

VALVES

- GATE VALVE
- CHECK VALVE
- PLUG VALVE
- BALL VALVE
- BALL CHECK VALVE
- BUTTERFLY VALVE
- ANGLE VALVE
- NEEDLE VALVE
- RELIEF VALVE
- DIAPHRAGM VALVE
- 3–WAY VALVE
- FLOW CONTROL VALVE
- PINCH VALVE
- SOLENOID VALVE (2–WAY) (S➔M FOR MOTORIZED VALVE)
- SOLENOID VALVE (3–WAY) (S➔M FOR MOTORIZED VALVE)
- SOLENOID VALVE (4–WAY) (S➔M FOR MOTORIZED VALVE)
- PNEUMATIC DIAPHRAGM CONTROL VALVE
- PRESSURE SUSTAINING VALVE
- PRESSURE REGULATING VALVE
- MULTIFUNCTION VALVE
- SLUICE GATE (SG) OR SLIDE GATE (SLG)
- AIR RELIEF VALVE (ARV)
- FLOAT VALVE
- STRAINER
- BACKFLOW PREVENTER
- CALIBRATION VALVE
- CALIBRATION COLUMN
- ROTAMETER
- UNION

ACTUATORS

- MOTORIZED
- SOLENOID
- PNEUMATIC OPERATOR S– SOLENOID – OPEN/CLOSE A– POSITIONER – MODULATING

PUMPS

- CENTRIFUGAL PUMP OR BLOWER
- SUBMERSIBLE SEWAGE PUMP
- VERTICAL TURBINE PUMP OR WELL PUMP
- SUBMERSIBLE WELL PUMP
- GEAR PUMP
- POSITIVE DISPLACEMENT PUMP OR BLOWER
- DIAPHRAGM PUMP
- PERISTALTIC PUMP
- MOTOR

SENSORS

- ORIFICE PLATE
- ULTRASONIC LEVEL TRANSMITTER (FLOW IF OVER FLUME OR WEIR)
- CONDUCTANCE TYPE LEVEL ELEMENTS
- RADAR TYPE LEVEL TRANSMITTER
- GUIDED OPTION
- CAPACITANCE TYPE LEVEL TRANSMITTER

SENSORS

- MAG — MAGNETIC FLOWMETER
- % — DENSITY METER
- ~ — ULTRASONIC FLOWMETER
- TURBINE OR PROPELLER METER
- VENTURI TUBE
- THERMAL DISPERSION FLOWMETER OR SWITCH
- PADDLE WHEEL FLOWMETER
- C — CORIOLIS FLOWMETER

MISCELLANEOUS MECHANICAL ITEMS

- PIPE REDUCER
- RUPTURE DISC
- PRESSURE OR VACUUM RELIEF VALVE
- DIAPHRAGM SEAL
- ANNUALAR SEAL
- DRAIN TO WASTE
- MIXER
- F OR F — FILTER
- VENT W/CAP OR SCREEN
- FLEXIBLE HOSE OR TUBING
- SPRAY NOZZLE SYSTEM
- EXPANSION JOINT
- STATIC MIXER
- EJECTOR / EDUCTOR
- HOSE COUPLING
- PULSATION DAMPENER
- OMNI ANTENNA NON–DIRECTIONAL
- YAGI ANTENNA DIRECTIONAL

NO	REVISIONS	DATE	APPR
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PH 916 353 1025
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DATE: APR 06, 2026 TIME: 5:45:21PM

THOMAS P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
INSTRUMENTATION SYMBOLS AND ABBREVIATIONS

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
DRAWN: ATF
CHECKED: TPF

I01

SHEET: 49 OF 55

SCADA / OPERATOR INTERFACE | PLC | CONTROL PANEL | FIELD

LAH 51 · LAL 51 · LI 51 (FT) · PAH 62 · PAL 62 · PI 62 (PSI) · LAL 52 · LAH 53 · LAHH 52

UAM 40 · TAH 40 · YNR 40 · HNR 40 · XCS 40 · UAM 10 · TAH 10 · YNR 10 · HNR 10A · HNR 10B · UAS 10 · IAH 10 · IAL 10 · II 10 (A)

PAH 61 · PAL 61 · PI 61 (PSI) · FAH 71 · FAL 71 · FI 71 (GPM) · ZAY 92A · ZAY 92A · EAL 95A · EAL 95B · HCR 91

CONTROLS TYPICAL ALL PUMPS

LEVEL L51 · BAROMETRIC PRESSURE P62 · LOW WETWELL LEVEL LA52L · HIGH WETWELL LEVEL LA53H · HIGH HIGH LEVEL LA52HH

MOTOR SEAL FAIL UA40M · MOTOR OVERTEMP TA40H · RUN YN40R · AUTO HN40A · START XC40S

MOTOR MOISTURE UA10M · MOTOR OVERTEMP TA10H · RUN YN10R · AUTO HN10A · HAND HN10B · START XC10S · SSS FAIL UA10S · RESET HC10R · MOTOR CURRENT I10

DISCHARGE PRESSURE P61 · DISCHARGE FLOW F71 · INTRUSION ELECTRIC ROOM ZA92A · INTRUSION GENERATOR ROOM ZA92C · 120 V POWER FAIL EA95AL · UPS POWER FAIL EA95BL · ALARM RESET HC91R

TAG	DESCRIPTION
L50	WETWELL LEVEL
F71	STATION FLOW
LAH54	LEVEL HI HI
LAH53	LEVEL HIGH
YNxR	PUMP RUNNING (3)
YN04E	ATS IN EMERGENCY

BACKUP CONTROLS · PT 62 · MIXER CONTROL PANEL · SEAL FAIL (A) · HIGH TEMP (A) · RUN (G) · HS 40 HOA · MINICAS RST OT LEAK (A) (A) · FVNR

PUMP CONTROL PANEL · RUN (G) · HS 10 HOA H · MINICAS RST OT LEAK (A) (A) · SSS · HC 10 RST R · 50:5

CONTROL PANEL · FIT 71 · ZS 92A · ZS 92B · ZS 92C · ZS 92D · CR ESL 95A PR-PF · CR ESL 95B PR-UF · HC 91 RESET · LSHH/LSH · MISSION RTU

I/O SIMLAR TO PUMP 1 · I/O SIMLAR TO PUMP 1

PT 61 · FE 71 MAG 12" · TO DISCHARGE FORCE MAIN

8" · 8" · 8"

FROM INCOMING SEWER · LSHH 54 · LSH 53 · LSL 52 · LT 51 · WS · TE 40 · ME 40 · WETWELL MIXER M40 2.3 HP · TE 10 · ME 10 · PUMP 1 P10 130 HP · TE 20 · ME 20 · PUMP 2 P20 130 HP · TE 30 · ME 30 · PUMP 3 P30 130 HP

WETWELL

SAN JUAN PUMP STATION P&ID

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DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
SAN JUAN PUMP STATION P&ID

DATE: 04/10/26
SCALE: AS SHOWN
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CHECKED: TPF

102

SHEET: 50 OF 55

SCADA / OPERATOR INTERFACE

PLC

CONTROL PANEL

FIELD

ZAY 92A

ZAY 92A

EAL 99

UAA 03

YNR 03

ZNE 04

ZNN 04

YNE 04

YNN 04

INTRUSION ELECTRIC ROOM

ZA92A

INTRUSION GENERATOR ROOM

ZA92C

ENET PORT

480V POWER FAIL

EA99L

GEN. ALARM

UA03A

GEN. RUN

YN03R

EMERGENCY POSITION

ZN04E

NORMAL POSITION

ZN04N

EMERGENCY POWER AVAILABLE

YN04E

NORMAL POWER AVAILABLE

YN04N

ETHERNET SWITCH

ATS AND DISTRIBUTION SWITCHBOARD

VMR

ESL 99

TRANSFER SWITCH

START

OPERATOR INTERFACE

CELL MODEM

POWER MONITOR

ZS 92A

ZS 92C

ZS 92B

ZS 92D

EXISTING STANDBY GENERATOR

G03

EXISTING FUEL TANK

SAN JUAN PUMP STATION P&ID

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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FILE: 25018-103.DWG
DATE: APR 06, 2026 TIME: 5:45:37PM

REGISTERED PROFESSIONAL ENGINEER — THOMAS P. FRISCH — No. E15761 — ELECTRICAL — STATE OF CALIFORNIA

DEPT. OF PUBLIC WORKS CCN 2026-645

SAN JUAN PUMP STATION &
FORCE MAIN REHABILITATION PROJECT
SAN JUAN PUMP STATION P&ID

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TPF
DRAWN: ATF
CHECKED: TPF

103

SHEET: 51 OF 55

GENERAL

1. BASIS OF DESIGN: 2025 CALIFORNIA BUILDING CODE.
2. THESE DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE SEPARATELY BOUND PROJECT SPECIFICATIONS.
3. ALL MATERIALS, WORKMANSHIP, TESTING AND INSPECTION SHALL CONFORM TO THE CALIFORNIA BUILDING CODE, 2025 EDITION, AND LOCAL BUILDING CODES.
4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS ON THE JOBSITE WITH A COMPLETE SET OF THE LATEST DRAWINGS. OMISSIONS OR DISCREPANCIES BETWEEN THE VARIOUS ELEMENTS OF THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH WORK.
5. DETAILS SHOWN ARE TYPICAL, AND APPLY TO SIMILAR CONDITIONS, UNLESS NOTED OTHERWISE.
6. REFER TO CIVIL DRAWINGS FOR LAYOUT OF NEW AND/OR EXISTING UTILITIES AND STRUCTURES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR JOBSITE SAFETY, INCLUDING SAFETY OF ALL UTILITIES AND STRUCTURES. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING, AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL ORDINANCES.
8. DRAWINGS SHALL NOT BE SCALED OR MEASURED FOR DIMENSIONS.
9. SPECIAL INSPECTION SHALL BE PROVIDED AS REQUIRED BY THE STATEMENT OF SPECIAL INSPECTIONS ON SHEET S2.

EARTHWORK

1. EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT PREPARED BY COTTON, SHIRES AND ASSOCIATES, INC. DATED MARCH 17, 2025, PROJECT NO. E6025.
2. BACKFILLING OF STRUCTURES SHALL NOT OCCUR UNTIL CONCRETE DESIGN COMPRESSIVE STRENGTH IS ATTAINED. CONTRACTOR SHALL BACKFILL ALL SIDES OF STRUCTURES CONCURRENTLY. THE DIFFERENCE IN BACKFILL ELEVATIONS ON ANY SIDE OF THE STRUCTURE SHALL NOT EXCEED 1'-0" AT ANY TIME.
3. ALL EXCAVATION AND SHORING SHALL BE PERFORMED IN SUBSTANTIAL CONFORMANCE WITH ALL OSHA, STATE AND LOCAL JURISDICTIONAL REQUIREMENTS AND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. WHERE REQUIRED, THE CONTRACTOR SHALL PROVIDE CALCULATIONS AND SHOP DRAWINGS FOR SHORING SIGNED BY A PROFESSIONAL CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA. SHOP DRAWINGS AND CALCULATIONS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO START OF ANY WORK.

FOUNDATION

1. FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL ENGINEERING REPORT PREPARED BY COTTON, SHIRES AND ASSOCIATES, INC. DATED MARCH 17, 2025, PROJECT NO. E6025.
2. OWNER SHALL RETAIN THE GEOTECHNICAL ENGINEER TO OBSERVE CONSTRUCTION, INCLUDING SITE GRADING, EVALUATION OF THE PROPOSED ENGINEERED FILL, COMPACTION OF FILL, ALL FOUNDATION EXCAVATION, AND TO PERFORM APPROPRIATE LABORATORY TESTING.
3. THE GEOTECHNICAL ENGINEER SHALL PROVIDE TO THE OWNER A LETTER FOR FOUNDATION PREPARATION, BACKFILL, COMPACTION, ETC., PRIOR TO THE PLACEMENT OF ANY FOUNDATION CONCRETE. THE GEOTECHNICAL ENGINEER SHALL ALSO PREPARE A FINAL REPORT THAT STATES THAT WORK WAS DONE IN COMPLIANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT, AND THAT INCLUDES CHANGES MADE DURING FOUNDATION CONSTRUCTION THAT WERE DIFFERENT FROM THE REVIEWED GEOTECHNICAL REPORT.
4. SIDES OF FOOTINGS SHOWN STRAIGHT ARE FORMED. IF SITE CONDITION ALLOWS AND GEOTECHNIAL ENGINEER CONCURS, SIDES OF FOOTINGS MAY BE FORMED OR NOT FORMED AT CONTRACTOR'S OPTION. FOOTINGS CAST DIRECTLY AGAINST EARTH REQUIRE THE FOLLOWING PRECAUTIONS;
   A) SLOPE SIDES OF EXCAVATIONS AS APPROVED BY THE GEOTECHNICAL ENGINEER,
   B) CLEAN UP OF SLOUGHING BEFORE, DURING AND AFTER PLACING CONCRETE,
   C) ADEQUATE COVER MUST BE PROVIDED FOR ALL REBAR. ADD 1" TO ALL SIDES OF FOOTING DIMENSIONS WHICH ARE CAST AGAINST EARTH.
5. ALLOWABLE BEARING PRESSURE FOR DEAD + LIVE LOADS = 2,500 PSF.

CONCRETE

1. ALL CONCRETE FOR USE IN THE CONSTRUCTION OF THIS PROJECT SHALL BE MIXED AND PLACED IN ACCORDANCE WITH ACI 318-19. USE MIXES WITH MAXIMUM AGGREGATE SIZE APPROPRIATE FOR FORM REBAR CLEARANCES TO BE ENCOUNTERED (SEE ACI). MAXIMUM WATER/CEMENT RATIO SHALL BE 0.50 FOR REINFORCED CONCRETE AND 0.60 FOR UNREINFORCED CONCRETE FILL. ALL CONCRETE SHALL BE MAINTAINED ABOVE 50 DEGREES FAHRENHEIT AND IN A MOIST CONDITION FOR AT LEAST 7 DAYS AFTER PLACEMENT.
2. THE PROPOSED MATERIALS AND MIX DESIGN SHALL BE FULLY DOCUMENTED AND REVIEWED BY THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE REQUIRED DESIGN STRENGTH. SUBMITTAL DATA FROM 30 PREVIOUS COMPRESSION TESTS ON EACH PROPOSED MIX WILL BE REQUIRED FOR REVIEW BEFORE MIX CAN BE APPROVED.
3. ALL CONCRETE SHALL HAVE THE FOLLOWING MINIMUM 28-DAY STRENGTHS, U.N.O.

REINFORCED CONCRETE	4,000 PSI
UNREINFORCED CONCRETE FILL	2,500 PSI
CONTROLLED LOW-STRENGTH MATERIAL (CLSM)	50-100 PSI

4. SCHEDULING OF WORK MAY REQUIRE DESIGN STRENGTH TO BE ACHIEVED IN LESS THAN 28 DAYS. CONTRACTOR SHALL COORDINATE MIX DESIGN AND CONCRETE CYLINDER BREAKS WITH THE ENGINEER AND SPECIAL INSPECTION & TESTING AGENCY.
5. EPOXY BONDING AGENT SHALL BE "SIKADUR-2 HI-MOD LPL" AS MANUFACTURED BY SIKA CORPORATION OR APPROVED EQUAL. SURFACE PREPARATION, MIX PROPORTIONS, AND APPLICATION SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
6. NON-SHRINK GROUT SHALL BE FLOWABLE, WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 3 DAYS. NON-SHRINK GROUT SHALL BE "SIKAGROUT-928" AS MANUFACTURED BY SIKA CORPORATION OR APPROVED EQUAL.
7. EPOXY ANCHORS & DOWELS IN CONCRETE SHALL BE INSTALLED USING "SET-3G" EPOXY AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INC., "HIT-RE 500 V3" EPOXY AS MANUFACTURED BY HILTI, INC., OR APPROVED EQUAL. PREPARATION OF HOLES AND INSTALLATION OF ANCHORS & DOWELS SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS AND CURRENT ICC-ES REPORT. ANCHORS & DOWELS SHALL NOT BE INSTALLED IN CONCRETE LESS THAN 21 DAYS OLD WITHOUT WRITTEN APPROVAL FROM ENGINEER.
8. CONSTRUCTION JOINTS SHALL BE INTENTIONALLY ROUGHENED BY SAND BLASTING OR MECHANICAL MEANS AND CLEANED BEFORE NEW POUR. LOCATION OF CONSTRUCTION JOINTS SHALL BE AS SHOWN ON THE DRAWINGS. CONSTRUCTION JOINTS AT OTHER LOCATIONS ARE PROHIBITED UNLESS APPROVED IN WRITING BY THE STRUCTURAL ENGINEER.

CONCRETE UNIT MASONRY

1. ALL CONCRETE UNIT MASONRY SHALL BE LIGHTWEIGHT AND SHALL BE GROUTED SOLID.
2. MASONRY UNIT DESIGN STRENGTH f'm = 2,000 PSI.
3. THE PROPOSED MATERIALS AND GROUT AND MORTAR MIX DESIGNS SHALL BE FULLY DOCUMENTED BY THE CONTRACTOR AND REVIEWED BY THE CITY'S TESTING LABORATORY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE REQUIRED STRENGTH.
4. VERIFICATION OF f'm SHALL BE BY MEANS OF THE UNIT STRENGTH METHOD AS OUTLINED IN CBC SECTION 2105.2.2.1.
5. EPOXY ANCHORS & DOWELS IN MASONRY SHALL BE INSTALLED USING "SET-3G" EPOXY AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INC., "HIT-HY 200 V3" EPOXY AS MANUFACTURED BY HILTI, INC., OR APPROVED EQUAL. PREPARATION OF HOLES AND INSTALLATION OF ANCHORS & DOWELS SHALL BE PER THE MANUFACTURER'S RECOMMENDATIONS AND CURRENT ICC-ES REPORT.

REINFORCING STEEL

1. REINFORCING STEEL SHALL BE ASTM A615, GRADE 60 DEFORMED BARS, U.N.O. REINFORCING STEEL TO BE WELDED SHALL BE ASTM A706.
2. ALL REINFORCING STEEL AND EMBEDMENTS TO BE HELD SECURELY IN PLACE PRIOR TO PLACING CONCRETE. PROVIDE SUFFICIENT SUPPORTS TO ALLOW WALKING ON REINFORCEMENT.
3. WELDING OF REINFORCING IS PROHIBITED UNLESS EXPLICITLY SHOWN ON THE DRAWINGS OR APPROVED IN WRITING BY THE STRUCTURAL ENGINEER.
4. PROVIDE CONTINUOUS REINFORCEMENT WHEREVER POSSIBLE, PLACE ONLY AS SHOWN OR APPROVED, STAGGER SPLICES WHERE POSSIBLE.
5. REINFORCING STEEL HOOKS AND LAP SPLICES SHALL BE PER DETAILS 1 AND 2 ON THIS SHEET.

COLD-FORMED STEEL FRAMING

1. COLD-FORMED STEEL FRAMING MEMBERS, BLOCKING AND BRACING SHALL BE SUPPLIED BY A MANUFACTURER WHO IS A MEMBER OF THE STEEL STUD MANUFACTURER'S ASSOCIATION (SSMA). STEEL SHALL BE ASTM A653, GRADE 33 FOR 18 GA. AND THINNER MATERIAL AND GRADE 50 FOR 16 GA. AND THICKER MATERIAL. THE STEEL SHALL HAVE A MINIMUM ZINC COATING (HOT-DIP GALVANIZED) OF G60.
2. SCREWS SHALL BE TEK SCREWS AS MANUFACTURED BY ITW BUILDEX, ITASCA, ILLINOIS OR APPROVED EQUAL. USE LENGTH AND TYPE AS RECOMMENDED BY MANUFACTURER FOR INTENDED USE.
3. POWDER ACTUATED FASTENERS (P.A.F.) SHALL BE 'X-U' FASTENERS AS MANUFACTURED BY HILTI, INC., PLANO, TEXAS OR APPROVED EQUAL. FASTENER TYPE, SHANK DIAMETER AND LENGTH SHALL BE AS SHOWN ON THE DRAWINGS OR AS RECOMMENDED BY MANUFACTURER FOR INTENDED USE. FASTENERS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ICC-ES REPORT NO. ESR-2269.

WOOD

1. ALL PLYWOOD SHALL CONFORM TO VOLUNTARY PRODUCT STANDARD PS 1-09, AMERICAN PLYWOOD ASSOCIATION. EACH SHEET SHALL BE STAMPED WITH THE PS AND/OR APA GRADEMARK.
   ROOF PLYWOOD
   - SHALL BE 5 PLY EXPOSURE 1 TYPE, CDX, GROUP IDENTIFICATION INDEX 32/16, SPECIES GROUP 2 OR BETTER.

   ALL PLYWOOD PERMANENTLY EXPOSED TO WEATHER SHALL BE EXTERIOR TYPE PLYWOOD VS. EXPOSURE 1 TYPE PLYWOOD AS REFERENCED ABOVE

   ALL UNBLOCKED ROOF PLYWOOD EDGES SHALL BE TONGUE-AND-GROOVE OR SUPPORTED WITH PLYWOOD CLEATS OR PLYWOOD CLIPS.

2. WOOD FRAMING SHALL BE DOUGLAS FIR COAST REGION, CONFORMING TO WEST COAST LUMBER INSPECTION BUREAU STANDARD GRADING AND DRESSING RULE NO. 17 AS AMENDED TO DATE.
   1. 2x, 3x, 4x JOISTS AND BEAMS, NO. 1 (1000F-b), PARA. 123-B, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
   2. 2x4, 3x4 STUDS AND BLOCKING, STANDARD GRADE (1400F-c), PARA. 122-C, UNLESS NOTED OTHERWISE. USE NO. 1 (1500F-c), PARA. 124-B WHERE NOTED ON THE DRAWINGS.
   3. 2x6 OR LARGER STUDS AND BLOCKING, NO. 1 (1500F-c), PARA. 123-B.
   4. 2x PLATES, NO. 2 (1350F-c), UNLESS NOTED OTHERWISE ON THE DRAWINGS.
   5. FOUNDATION PLATES: PRESSURE TREATED DOUGLAS FIR.

3. ALL WOOD CONSTRUCTION CONNECTORS & FASTENERS SHALL BE THOSE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY INC., PLEASANTON, CALIFORNIA OR APPROVED EQUAL. INSTALL PER MANUFACTURER'S RECOMMENDATIONS, U.N.O. ON DRAWINGS.

4. ALL NAILS SHALL BE BRIGHT COMMON WIRE NAILS, GALVANIZED FOR EXTERIOR WORK. 16d GREEN VINYL SINKERS MAY BE SUBSTITUTED FOR 10d COMMONS IN ALL APPLICATIONS EXCEPT WOOD CONSTRUCTION CONNECTORS AND PERMANENT EXTERIOR CONDITIONS. 16d GREEN VINYL SINKERS MAY BE SUBSTITUTED FOR 16d COMMONS AT ~r OF THE SPACING REQUIREMENT FOR THE 16d COMMONS. IN NO CASE SHALL GREEN VINYL SINKERS BE USED FOR WOOD CONSTRUCTION CONNECTORS - USE THE MANUFACTURER'S RECOMMENDED NAILS.

STRUCTURAL DESIGN PARAMETERS

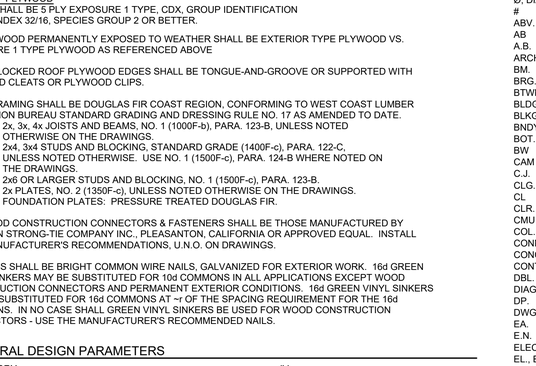
RISK CATEGORY:	IV
DESIGN WIND LOADS:	
BASIC WIND SPEED	105 MPH
EXPOSURE CATEGORY	C
DESIGN EARTHQUAKE LOADS:	
SITE CLASS	CD
SEISMIC IMPORTANCE FACTOR, I_e	1.50
COMPONENT IMPORTANCE FACTOR, I_p	1.50
MAPPED SPECTRAL RESPONSE ACCELERATIONS	
S_s	2.480g
S_1	0.970g
SPECTRAL RESPONSE COEFFICIENTS	
S_{DS}	1.770g
S_{D1}	1.290g
SEISMIC DESIGN CATEGORY, SDC	F

DEFERRED SUBMITTALS/SHOP DRAWINGS

THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW:
1. CONCRETE MIX DESIGNS.
2. MASONRY CERTIFICATES OF COMPLIANCE, GROUT MIX DESIGN, ETC.
3. BAR REINFORCING STEEL SHOP DRAWINGS.
4. ANCHORAGE OF PUMPS, ELECTRICAL EQUIPMENT, ETC.

ABBREVIATIONS

&	AND	I.D.	INSIDE DIAMETER
@	AT	INT.	INTERIOR
Ø, DIA.	DIAMETER	INV.	INVERT
#	NUMBER	JST.	JOIST
ABV.	ABOVE	K-POST	KING POST
AB	AGGREGATE BASE	LOL	LAYOUT LINE
A.B.	ANCHOR BOLT	LDGR.	LEDGER
ARCH.	ARCHITECT	LL	LIVE LOAD
BM.	BEAM	LLH	LONG LEG HORIZONTAL
BRG.	BEARING	LLV	LONG LEG VERTICAL
BTWN.	BETWEEN	LONGIT.	LONGITUDINAL
BLDG.	BUILDING	MANF'R.	MANUFACTURER
BLKG.	BLOCKING	MAX.	MAXIMUM
BNDY.	BOUNDARY	M.B.	MACHINE BOLTS
BOT.	BOTTOM	MECH.	MECHANICAL
BW	BOTTOM OF WALL	MIN.	MINIMUM
CAM	CAMBER UP	(N)	NEW
C.J.	CEILING JOIST, CONSTRUCTION JOINT	N/A	NOT APPLICABLE
CLG.	CEILING	NTS	NOT TO SCALE
CL	CENTERLINE	O.C.	ON CENTER
CLR.	CLEAR	O.D.	OUTSIDE DIAMETER
CMU	CONCRETE MASONRY UNIT	O.H.	OPPOSITE HAND
COL.	COLUMN	OPNG.	OPENING
CONN.	CONNECTION	P.P.	PARTIAL PENETRATION
CONC.	CONCRETE	PL	PLATE
CONT.	CONTINUOUS	PEMB	PRE-ENGINEERED METAL BUILDING
DBL.	DOUBLE	P.E.N.	PLYWOOD EDGE NAILING
DIAG.	DIAGONAL	PT	POST-TENSIONED
DP.	DEEP	P.T.	PRESSURE TREATED
DWG(S).	DRAWING(S)	PTDF	PRESSURE TREATED DOUGLAS FIR
EA.	EACH	REINF.	REINFORCEMENT, REINFORCING
E.N.	EDGE NAILING	REQ'D.	REQUIRED
ELEC.	ELECTRICAL	R.R.	ROOF RAFTER
EL., ELEV.	ELEVATION	S.A.D.	SEE ARCHITECTURAL DRAWINGS
EMBED.	EMBEDMENT	SCHED.	SCHEDULE
EQ.	EQUAL, EQUALLY	SHT.	SHEET
(E)	EXISTING	SHTG.	SHEATHING
EXT.	EXTERIOR	SIM.	SIMILAR
F.O.S.	FACE OF STUD	S.M.S.	SHEET METAL SCREW
F.F.	FINISHED FLOOR	S.O.G.	SLAB-ON-GRADE
F.G.	FINISHED GRADE	SQ.	SQUARE
FLR.	FLOOR	S.S.	STAINLESS STEEL
FL	FLOWLINE	STA.	STATION
FND.	FOUNDATION	STD.	STANDARD
FTG.	FOOTING	STIFF.	STIFFENER
F.H.	FULL HEIGHT	STL.	STEEL
F.J.	FLOOR JOIST	THK.	THICK
F.P.	FULL PENETRATION	THRD.	THREADED
FRMG.	FRAMING	T.N.	TOE NAIL
GA.	GAGE	T.O.C.	TOP OF CONCRETE
GALV.	GALVANIZED	T.O.S.	TOP OF STEEL
G.S.M.	GALVANIZED SHEET METAL	TRANS.	TRANSVERSE
GMU	GLASS MASONRY UNIT	TW	TOP OF WALL
GLB	GLUE LAMINATED BEAM	T&B	TOP & BOTTOM
HDG	HOT-DIP GALVANIZED	TPL.	TRIPLE
HDR.	HEADER	TYP.	TYPICAL
HGR(S).	HANGER(S)	'U210'	SIMPSON 'U210' HGR., ETC.
H.S.B.	HIGH STRENGTH BOLTS	U.N.O.	UNLESS NOTED OTHERWISE
H.M.	HOLLOW METAL	VERT.	VERTICAL
HSS	HOLLOW STRUCTURAL SECTION	W/	WITH
HORIZ.	HORIZONTAL	W/O	WITHOUT

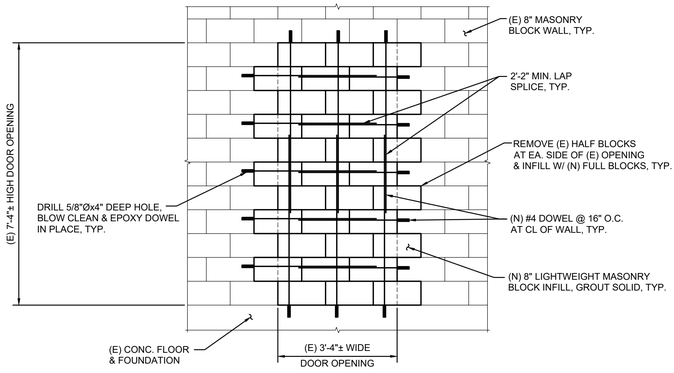


1 S1 REBAR HOOK DETAILS
N.T.S.

CONCRETE REINFORCING LAP SPLICES		
CONCRETE STRENGTH	f'c= 4000 PSI	
BAR SIZE	TOP BARS	OTHER BARS
#3	1'-4"	1'-4"
#4	1'-8"	1'-4"
#5	2'-1"	1'-7"
#6	2'-5"	1'-11"
#7	3'-7"	2'-9"
#8	4'-1"	3'-1"
#9	4'-7"	3'-6"
#10	5'-2"	3'-11"
#11	5'-8"	4'-5"

NOTES:
1. LAP SPLICE LENGTHS SHALL BE INCREASED BY 50% WHERE BAR CLEAR COVER IS LESS THAN 2 BAR DIAMETERS OR WHERE SPACING BETWEEN BARS BEING SPLICED IS LESS THAN 5 BAR DIAMETERS.
2. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.
3. LAP SPLICE LENGTHS FOR EPOXY-COATED BARS SHALL BE INCREASED BY 20%.

2 S1 REBAR LAP SPLICES
N.T.S.



NOTES: ALL (N) MASONRY BLOCK TYPES, PATTERNS, COLORS, SURFACE FINISHES, ETC. SHALL MATCH THE (E) WALL. REMOVE FACE SHELLS ON ONE SIDE OF UPPER COURSE OF (N) BLOCKS AS NECESSARY TO PLACE GROUT. GROUT POUR SHALL CONSIST OF LIFTS NOT EXCEEDING 5'-4" IN HEIGHT.

3 S1 MASONRY WALL OPENING INFILL
1/2"=1'-0"

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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STATE OF CALIFORNIA
04/08/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
TYPICAL NOTES, SPECIFICATIONS & DETAILS

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TEE
DRAWN: LTT
CHECKED: JAF

S1

SHEET: 52 OF 55

STATEMENT OF SPECIAL INSPECTIONS

SPECIAL INSPECTION
- INSPECTION OF THE MATERIALS, INSTALLATION, FABRICATION, ERECTION OR PLACEMENT OF COMPONENTS AND CONNECTIONS REQUIRING SPECIAL EXPERTISE TO ENSURE COMPLIANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS AND THE 2025 CALIFORNIA BUILDING CODE (CBC). THIS IS IN ADDITION TO THOSE REQUIRED BY SECTION 110, CHAPTER 1 OF THE 2025 CBC.

SPECIAL INSPECTOR
- THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE THEIR COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.

DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR
- THE SPECIAL INSPECTOR SHALL INSPECT THE WORK ASSIGNED FOR CONFORMANCE WITH THE APPROVED DESIGN DRAWINGS AND SPECIFICATIONS.
- SPECIAL INSPECTORS SHALL KEEP RECORDS OF ALL INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, THE ENGINEER OR ARCHITECT OF RECORD, AND OTHER DESIGNATED PERSONS. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS DONE IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. THEN IF UNCORRECTED, TO THE ATTENTION OF THE BUILDING OFFICIAL AND ENGINEER OR ARCHITECT OF RECORD.
- THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.

REQUIRED SPECIAL INSPECTIONS
- ITEMS REQUIRING SPECIAL INSPECTION SHALL BE AS FOLLOWS:

REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONTINUOUS SPECIAL INSPECTION [1]	PERIODIC SPECIAL INSPECTION [1]
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	-	X
2. Verify excavations are extended to proper depth and have reached proper material.	-	X
3. Perform classification and testing of compacted fill materials.	-	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	-
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	-	X

NOTE: 1. Refer to CBC Section 202 for definition of continuous and periodic inspections.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION [1]	PERIODIC SPECIAL INSPECTION [1]	REFERENCED STANDARD [2]	CBC SECTION
1. Inspect reinforcement, including prestressing tendons, and verify placement.	-	X	ACI 318: 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. Reinforcing bar welding:				
a. Verify weldability of reinforcing bars other than ASTM A706;	-	X	AWS D1.4 ACI 318: 26.6.4	-
b. Inspect single-pass fillet welds, maximum 5/16"; and	-	X		
c. Inspect all other welds.	X	-		
3. Inspect anchors cast in concrete.	-	X	ACI 318: 17.8.2	-
4. Inspect anchors post-installed in hardened concrete members.[3]				
a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads	X	-	ACI 318: 17.8.2.4	-
b. Mechanical anchors and adhesive anchors not defined in 4.a.	-	X	ACI 318: 17.8.2	
5. Verify use of required design mix.	-	X	ACI 318: 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	-	ASTM C172 ASTM C31 ACI 318: 26.5, 26.12	1908.10
7. Inspect concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8. Verify maintenance of specified curing temperature and techniques.	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9. Inspect prestressed concrete for:				
a. Application of prestressing forces; and	X	-	ACI 318: 26.10	-
b. Grouting of bonded prestressing tendons.	X	-		
10. Inspect erection of precast concrete members.	-	X	ACI 318: 26.9	-
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	-	X	ACI 318: 26.11.2	-
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 26.11.1.2(b)	-

NOTES:
1. Refer to CBC Section 202 for definition of continuous and periodic inspections.
2. Where applicable, see also CBC Section 1705.12, Special inspections for seismic resistance.
3. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with 17.8.2 in ACI 318, or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF POST-INSTALLED CONCRETE ANCHORS

TYPE	CONTINUOUS SPECIAL INSPECTION [1]	PERIODIC SPECIAL INSPECTION [1]	PRODUCT NAME AND EVALUATION REPORT REFERENCE
EXPANSION ANCHORS			
1. During anchor installation, verify the following:			Simpson Strong-Bolt 2 ICC ESR-3037 or Hilti Kwik Bolt TZ2 ICC ESR-4266
a. Anchor type	-	X	
b. Anchor dimensions	-	X	
c. Hole cleanliness/cleaning procedures	-	X	
d. Concrete type/compressive strength/thickness	-	X	
e. Drill bit diameter	-	X	
f. Anchor embedment depth	-	X	
g. Edge/End distance(s)/Anchor spacing(s)	-	X	
h. Tightening Torque	-	X	
i Compliance with the appropriate Evaluation Report and manufacturer's published installation instructions, as well as the approved construction documents.	-	X	
EPOXY ANCHORS			
1. During the initial installation of a series of anchors of the same type and size, installed by the same construction personnel, verify the following[2]:			Simpson SET-3G ICC ESR-4057 or Hilti HIT-RE 500 V3 ICC ESR-3814
a. Adhesive name, expiration date, proper nozzle	-	X	
b. Anchor material, grade, diameter, length and cleanliness	-	X	
c. Hole cleanliness/cleaning procedures	-	X	
d. Concrete type/compressive strength/thickness	-	X	
e. Drill bit diameter	-	X	
f. Anchor embedment depth	-	X	
g. Edge/End distance(s)/Anchor spacing(s)	-	X	
h. Compliance with the appropriate Evaluation Report and manufacturer's published installation instructions, as well as the approved construction documents.	-	X	
SCREW ANCHORS			
1. During anchor installation, verify the following:			Simpson Titen HD ICC ESR-2713 or Hilti KH-EZ ICC ESR-3027
a. Anchor type	-	X	
b. Anchor dimensions	-	X	
c. Hole cleanliness/cleaning procedures	-	X	
d. Concrete type/compressive strength/thickness	-	X	
e. Drill bit diameter	-	X	
f. Anchor embedment depth	-	X	
g. Edge/End distance(s)/Anchor spacing(s)	-	X	
h. Compliance with the appropriate Evaluation Report and manufacturer's published installation instructions, as well as the approved construction documents.	-	X	

NOTES:
1. Refer to CBC Section 202 for definition of continuous and periodic inspections.
2. Any change in anchor product or personnel performing the installation requires an initial reinspection. For ongoing installations over an extended period, the special inspector must make regular inspections to confirm proper handling and installation of the product.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF POST-INSTALLED MASONRY ANCHORS

TYPE	CONTINUOUS SPECIAL INSPECTION[1]	PERIODIC SPECIAL INSPECTION[1]	PRODUCT NAME AND EVALUATION REPORT REFERENCE
EXPANSION ANCHORS			
1. During anchor installation, verify the following:			Simpson Strong-Bolt 2 IAPMO UES ER-240 or Hilti Kwik Bolt TZ2 ICC ESR-4561
a. Anchor type	X	-	
b. Anchor dimensions	X	-	
c. Hole cleanliness/cleaning procedures	X	-	
d. Grout and mortar compressive strengths	X	-	
e. Masonry unit type/compliance with ASTM C90 prism compressive strength (where required)	X	-	
f. Drill bit diameter	X	-	
g. Anchor embedment depth	X	-	
h. Edge/End distance(s)/Anchor spacing(s)	X	-	
i. Tightening Torque	X	-	
j. Compliance with the appropriate Evaluation Report and manufacturer's published installation instructions, as well as the approved construction documents.	X	-	
EPOXY ANCHORS			
1. During anchor installation, verify the following:			Simpson SET-3G ICC ESR-4844 or Hilti HIT-HY 200 V3 ICC ESR-4878
a. Adhesive name, expiration date, proper nozzle	-	X	
b. Anchor material, grade, diameter, length and cleanliness	-	X	
c. Hole cleanliness/cleaning procedures	-	X	
d. Grout and mortar compressive strengths	-	X	
e. Masonry unit type/compliance with ASTM C90 prism compressive strength (where required)	-	X	
f. Drill bit diameter	-	X	
g. Anchor embedment depth	-	X	
h. Edge/End distance(s)/Anchor spacing(s)	-	X	
i Compliance with the appropriate Evaluation Report and manufacturer's published installation instructions, as well as the approved construction documents.	-	X	

1. Refer to CBC Section 202 for definition of continuous and periodic inspections.

REQUIRED VERIFICATION OF STRUCTURAL MASONRY

MINIMUM VERIFICATION	REQUIRED FOR QUALITY ASSURANCE [1]			REFERENCE FOR CRITERIA
	LEVEL 1	LEVEL 2	LEVEL 3	TMS 602 [2]
Prior to construction, verification of compliance of submittals.	R	R	R	Art. 1.5
Prior to construction, verification of f'_m and f'_{AAC}, except where specifically exempted by the Code.	NR	R	R	Art. 1.4B
During construction, verification of Slump flow and Visual Stability Index (VSI) when self-consolidating grout is delivered to the project site.	NR	R	R	Art. 1.5 & 1.6.3
During construction, verification of f'_m and f'_{AAC} for every 5,000 sq. ft. (465 sq. m).	NR	NR	R	Art. 1.4B
During construction, verification of proportions of materials as delivered to the project site for premixed or preblended mortar, prestressing grout, and grout other than self-consolidating grout.	NR	NR	R	Art. 1.4B

1. R=Required, NR=Not Required.
2. The specific standards referenced are those listed in CBC Chapter 35.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF STRUCTURAL MASONRY

INSPECTION TASK	FREQUENCY[1]			REFERENCE FOR CRITERIA	
	LEVEL 1	LEVEL 2	LEVEL 3	TMS 402 [2]	TMS 602 [2]
1. As masonry construction begins, verify that the following are in compliance:					
a. Proportions of site-prepared mortar	NR	P	P	-	Art. 2.1, 2.6A, & 2.6C
b. Grade and size of prestressing tendons and anchorages	NR	P	P	-	Art. 2.4B & 2.4H
c. Grade, type and size of reinforcement, connectors, anchor bolts, and prestressing tendons and anchorages	NR	P	P	-	Art. 3.4 & 3.6A
d. Prestressing technique	NR	P	P	-	Art. 3.6B
e. Properties of thin-bed mortar for AAC masonry	NR	C/P[4]	C	-	Art. 2.1C.1
f. Sample panel construction	NR	P	C	-	Art. 1.6D
2. Prior to grouting, verify that the following are in compliance:					
a. Grout space	NR	P	C	-	Art. 3.2D & 3.2F
b. Placement of prestressing tendons and anchorages	NR	P	P	Sec. 10.8 & 10.9	Art. 2.4 & 3.6
c. Placement of reinforcement, connectors, and anchor bolts	NR	P	C	Sec. 6.1, 6.3.1, 6.3.6, & 6.3.7	Art. 3.2E & 3.4
d. Proportions of site-prepared grout and prestressing grout for bonded tendons	NR	P	P	-	Art. 2.6B & 2.4G.1.b
3. Verify compliance of the following during construction:					
a. Materials and procedures with the approved submittals	NR	P	P	-	Art. 1.5
b. Placement of masonry units and mortar joint construction	NR	P	P	-	Art. 3.3B
c. Size and location of structural members	NR	P	P	-	Art. 3.3F
d. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction	NR	P	C	Sec. 1.2.1(e), 6.2.1, & 6.3.1	-
e. Welding of reinforcement	NR	C	C	Sec. 6.1.6.1.2	-
f. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°C)) or hot weather (temperature above 90°F (32.2°C))	NR	P	P	-	Art. 1.8C & 1.8D
g. Application and measurement of prestressing force	NR	C	C	-	Art. 3.6B
h. Placement of grout and prestressing grout for bonded tendons is in compliance	NR	C	C	-	Art. 3.5 & 3.6C
i. Placement of AAC masonry units and construction of thin-bed mortar joints	NR	C/P[4]	C	-	Art. 3.3B.9 & 3.3F.1.b
4. Observe preparation of grout specimens, mortar specimens, and/or prisms	NR	P	C	-	Art. 1.4B.2.a.3, 1.4B.2.b.3, 1.4B.2.c.3, 1.4B.3, & 1.4B.4

1. Frequency refers to the frequency of inspection, which may be continuous during the listed task or periodically during the listed task, as defined in the table. NR=Not Required, P=Periodic, C=Continuous. Refer to CBC Section 202 for definition of continuous and periodic inspections.
2. The specific standards referenced are those listed in CBC Chapter 35.
3. Required for the first 5,000 square feet (465 square meters) of AAC Masonry.
4. Required after the first 5,000 square feet (465 square meters) of AAC Masonry.

NO	REVISIONS	DATE	APPR
1			
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CITY OF BELMONT PUBLIC WORKS

PASE 408.957.9220 www.pase.com

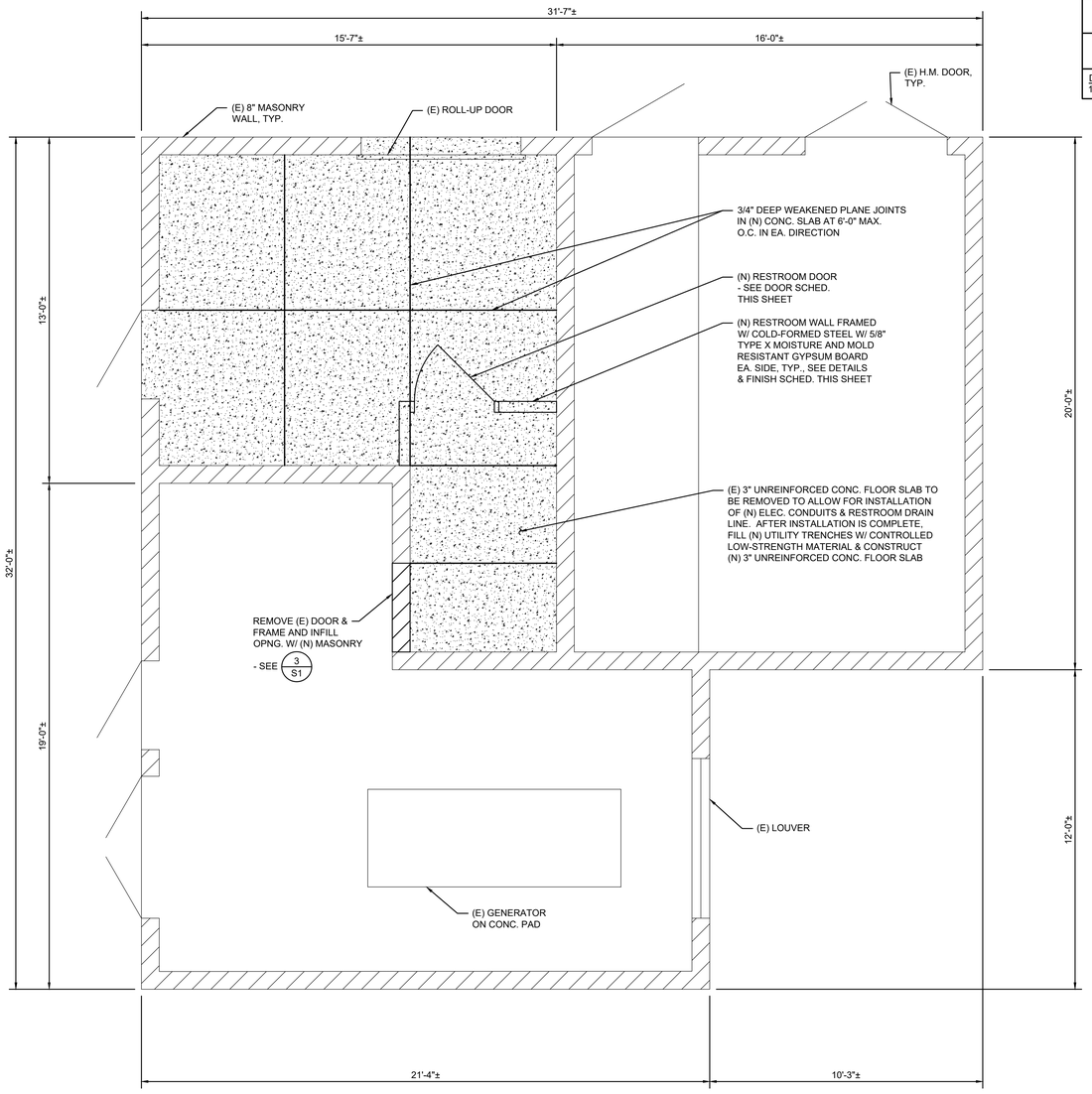
REGISTERED PROFESSIONAL ENGINEER TIMOTHY E. ELLIOTT C 63260 S 4946 CIVIL & STRUCTURAL STATE OF CALIFORNIA
04/08/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
STATEMENT OF SPECIAL INSPECTIONS

DATE: 04/10/26
SCALE: AS SHOWN
DESIGN: TEE
DRAWN: LTT
CHECKED: JAF

S2

SHEET: 53 OF 55



FOUNDATION PLAN
3/8"=1'-0"

SHEET NOTES:

1. SEE GENERAL STRUCTURAL NOTES & SPECIFICATIONS ON SHEET S1.
2. DRAWINGS HAVE BEEN PREPARED IN LARGE PART USING AS-BUILT DRAWINGS WHICH HAVE NOT BEEN INDEPENDENTLY CHECKED IN THE FIELD. CONTRACTOR SHALL CONFIRM ALL (E) DIMENSIONS & CONDITIONS IN THE FIELD PRIOR TO BEGINNING CONSTRUCTION. SEE GENERAL NOTE 4 ON SHEET S1.
3. DRILLED HOLES IN (E) CONCRETE AND MASONRY SHALL NOT CUT (E) REINF. BARS. HOLES STRIKING (E) BARS SHALL BE ABANDONED, PATCHED W/ NON-SHRINK, NON-METALLIC GROUT, AND RELOCATED.
4. (N) CONCRETE AND MASONRY SHALL BE ALLOWED TO CURE FOR AT LEAST 21 DAYS PRIOR TO DRILLING AND INSTALLING ANY TYPE OF POST-INSTALLED ANCHORS OR DOWELS AND INSTALLATION OF SHOT PINS.

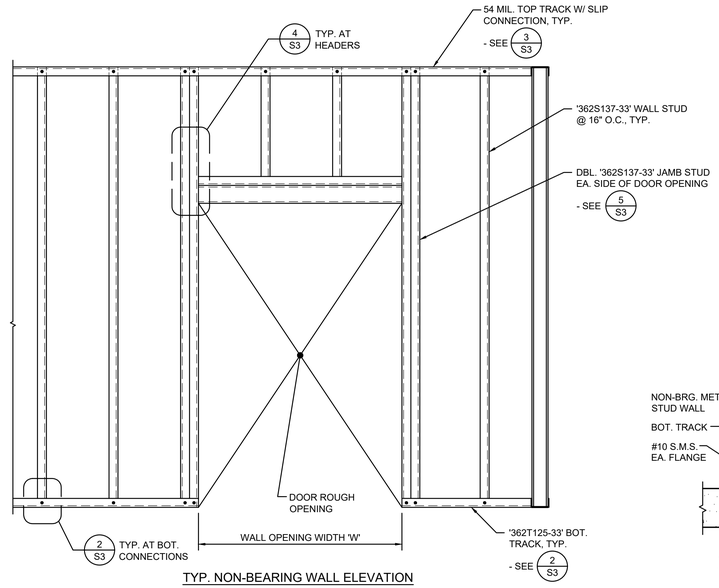
DOOR SCHEDULE

DOOR				FRAME		REMARKS
ROOM	MTL.	SIZE	DOOR HARDWARE TYPE (1)	MTL.	SIZE	
RESTROOM	H.M.	3'-0"x7'-0"	A	H.M.	2"x5 7/8"	NONE

DOOR NOTES:
1. DOOR HARDWARE TYPE PER PROJECT SPECIFICATIONS.

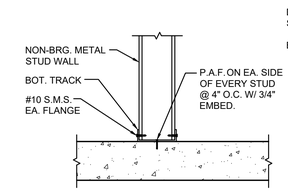
ARCHITECTURAL FINISH SCHEDULE

SPACE	FLOOR			WALLS			CEILING			
ROOM	MATERIAL	FINISH	COATING	MATERIAL	FINISH	COLOR	HEIGHT	MATERIAL	FINISH	COLOR
RESTROOM	CONCRETE	STEEL TROWEL	NONE	5/8" GYPSUM BOARD & CMU	PAINT	SEE SPECS.	10'-8"	5/8" GYPSUM BOARD	PAINT	SEE SPECS.

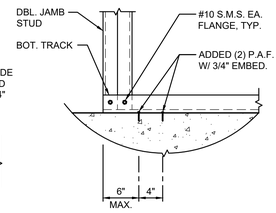


TYP. NON-BEARING WALL ELEVATION

1/S3 DETAIL N.T.S.

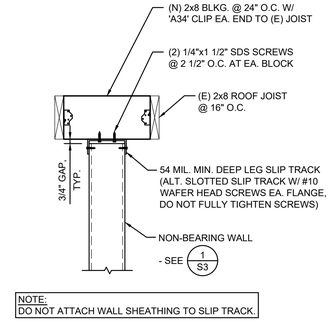


TYPICAL WALL BOTTOM TRACK ANCHORAGE



AT DOOR

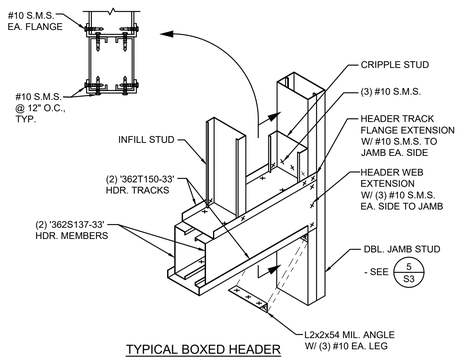
2/S3 DETAIL 1"=1'-0"



NOTE:
DO NOT ATTACH WALL SHEATHING TO SLIP TRACK.

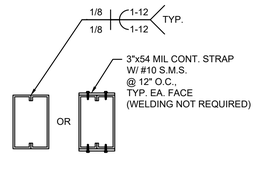
SLIP TRACK ATTACHMENT AT CEILING

3/S3 DETAIL 1"=1'-0"



TYPICAL BOXED HEADER

4/S3 DETAIL 1"=1'-0"



DOUBLE STUD

5/S3 DETAIL 1"=1'-0"

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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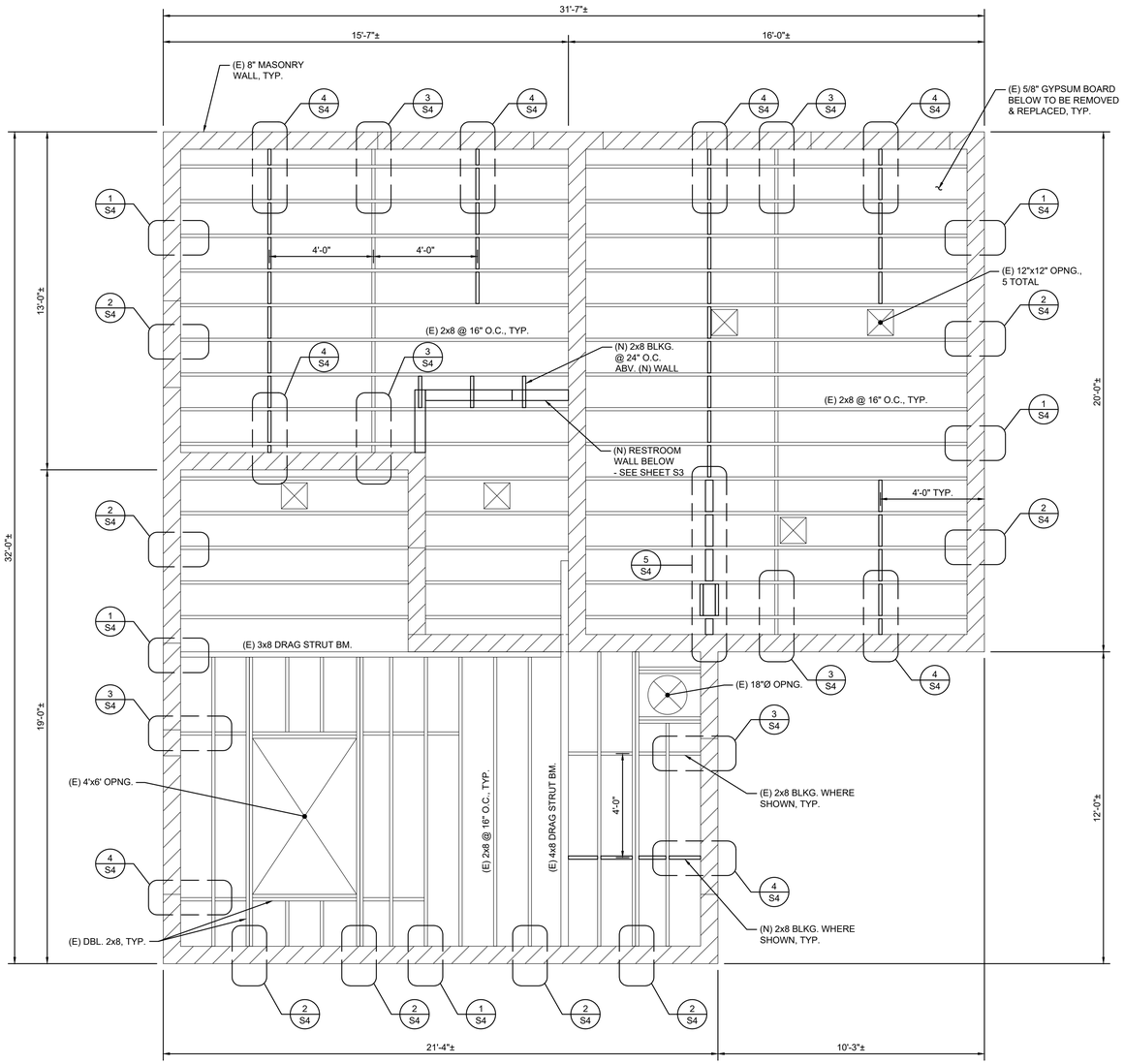
REGISTERED PROFESSIONAL ENGINEER TIMOTHY E. ELLIOTT C 63260 S 4946 CIVIL & STRUCTURAL STATE OF CALIFORNIA
04/08/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
FOUNDATION PLAN & DETAILS

DATE:	04/10/26
SCALE:	AS SHOWN
DESIGN:	TEE
DRAWN:	LTT
CHECKED:	JAF

S3

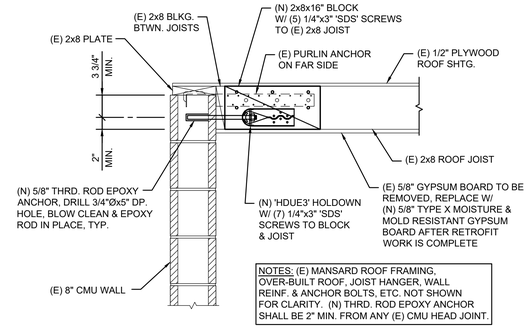
SHEET: 54 OF 55



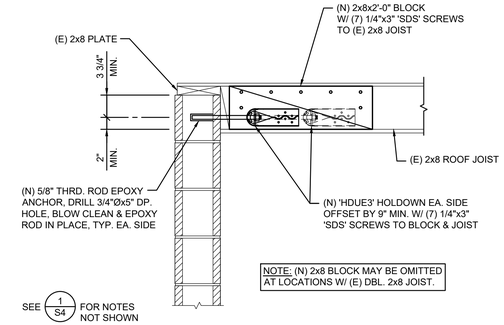
ROOF FRAMING PLAN
3/8"=1'-0"

SHEET NOTES:

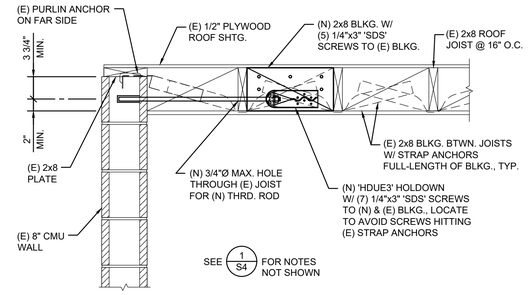
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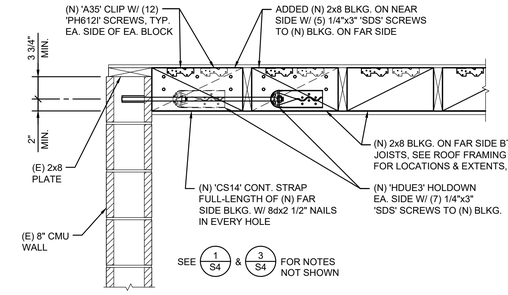
1/S4 DETAIL
1"=1'-0"



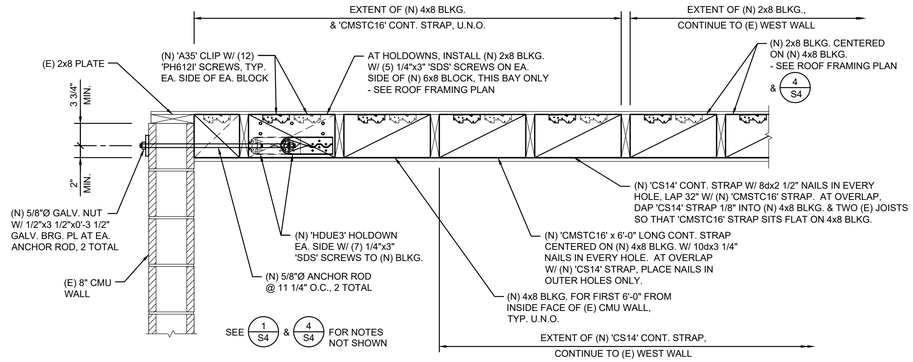
2/S4 DETAIL
1"=1'-0"



3/S4 DETAIL
1"=1'-0"



4/S4 DETAIL
1"=1'-0"



5/S4 DETAIL
1"=1'-0"

NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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REGISTERED PROFESSIONAL ENGINEER
TIMOTHY E. ELLIOTT
C 63260
S 4946
CIVIL & STRUCTURAL
STATE OF CALIFORNIA
04/08/26

DEPT. OF PUBLIC WORKS CCN 2026-645
SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT
ROOF FRAMING PLAN & DETAILS

DATE:	04/10/26
SCALE:	AS SHOWN
DESIGN:	TEE
DRAWN:	LTT
CHECKED:	JAF

S4

SHEET: 55 OF 55

CITY OF BELMONT
CONTRACT DOCUMENTS

San Juan Pump Station & Force Main Rehabilitation Project

City Contract Number 2026-645

INVITATION FOR SEALED BIDS

The City of Belmont invites sealed bids for public project construction described as: **San Juan Pump Station & Force Main Rehabilitation Project, CITY CONTRACT NUMBER 2026-645**. The public project construction is more specifically defined in the Contract Documents, but generally includes the following items of work: Construction of new sanitary sewer pump station, force main, gravity line, and other items as identified in the Contract Documents (the "Work").

1. **SOURCE OF PROJECT FUNDS**: This Project **DOES NOT** involve federal funds.

2. **PRE-BID CONFERENCE:** None.

3. **BID SUBMITTAL, WITHDRAWAL, IRREVOCABILITY**: Bids must be submitted on the bid forms supplied by the City. The Contractors are requested to drop off sealed proposals at the EOC room (Suite 210) at the Belmont City Hall located at 1 Twin Pines Lane, Belmont, CA 94002 (hereinafter the City) by May 27, 2026, at 2:00 PM local time. Any mailed delivery of sealed bid proposals must be confirmed with the City of Belmont, City Clerk's Office at (650) 595-7414, jplut@belmont.gov The Bids will be publicly open at 2:00 PM on May 27, 2026 ("Bid Deadline"), at the EOC Room (Suite 210). Bids received after the bid deadline will not be accepted. It is the bidder's responsibility to ensure that its bid package is duly delivered. Bidders are solely responsible for the cost of preparing their bids. No bidder may withdraw its bid for a period 60 days after the date set for bid opening, except as provided in Public Contract Code Section 5101 *et seq.*

4. **ENGINEER'S ESTIMATE:** The Engineer's estimated total construction cost for this Contract is $6,280,000. This estimate is intended to serve merely as a guideline of the magnitude of work. Neither the bidders nor the contractor shall be entitled to claims because of any inaccuracy in the estimated cost range.

5. **CONTRACT TIME; LIQUIDATED DAMAGES:** The construction Work is to be completed within a total of 270 working days including work under bid alternate after the date specified in the City's Notice to Proceed. The City will assess liquidated damages in the amount of $4,500 for each and every working day of delay in finishing the work in excess of the contract time.

6. **REQUIRED CONTRACTOR'S LICENSE(S):** Under Business & Professions Code Section 7028.15 and Public Contract Code Section 3300, all bidders must possess proper licenses for the performance of the work contemplated by the Project except as provided herein. Failure to possess the specified license(s) at the time of bidding will render the bid non-responsive. Contractors must possess a valid California class A contractor's license for this contract. Firms bidding as a joint venture or bidding must secure a joint venture license before award of this contract. Firms bidding on projects involving federal funds must secure a license before award of this contract.

7. **DEPARTMENT OF INDUSTRIAL RELATIONS REGISTRATION REQUIRED:** As provided in Labor Code Section 1771.1, the Bidder and all subcontractors listed on the bid proposal must be registered with the Department of Industrial Relations under Labor Code section 1725.5 at the time the bid is submitted, except as provided herein. Failure to be timely registered will render the bid non-responsive. If submitting a bid as part of a joint venture authorized by Business and Professions Code Section 7029.1 or for a Project involving federal funds, the Bidder's registration may be secured up to the time of contract awarded. No contractor or subcontractor may be awarded a contract for the project unless registered with the Department of Industrial Relations under Labor Code

section 1725.5. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

8. **CONTRACT DOCUMENTS:** Bidders may obtain the bidding documents including

9. and Specifications in electronic format at Peninsula Builders Exchange, or local Plan Rooms. Hard copy bid documents are not available at this time.

10. **BONDS AND INSURANCE:** Bid security in the amount of ten percent (10%) of the Bid Amount must accompany the Bid in accordance with Public Contract Code Section 20170. After award of the contract, the successful bidder must provide security for faithful performance and labor and materials (payment bond) as well as proof of insurance, in accordance with the requirements set forth in the Contract Documents. Bonds must be executed by a surety possessing a valid certificate of authority issued by the California Department of Insurance.

11. **SECURITIES SUBSTITUTION:** At the request and expense of the Contractor to whom the Contract is awarded, securities in a form approved by the City will be permitted in substitution for money withheld by the City to ensure performance under the Contract, as provided in Public Contract Code Section 22300.

12. **PREVAILING WAGE:** This project is a public work under Labor Code Section 1770, *et seq*., and the successful bidder will be required to comply with certain labor standards and employment requirements including payment of the prevailing wage rates in effect on the date this Invitation for Sealed Bids was first published. Copies of the prevailing wage rates can be viewed at: http://www.dir.ca.gov/DLSR/PWD/ and are on file with the Engineer at the address identified below, and shall be made available to any interested party upon request.

13. **SHORING AND BRACING**: If the construction involves trenches or open excavations, which are five feet or deeper, each bid submitted in response to this Invitation for Sealed Bids must contain, as a bid item adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life and limb in trenches and open excavation which shall conform to applicable safety orders, as required by Labor Code Section 6707.

14. **SPECIFIC BRAND NAME MATERIALS:** None

15. **WAIVER OF IRREGULARITIES**. The City reserves the right, in its sole discretion, to reject any or all Bids, to waive minor irregularities or defects in bidding and to reject nonconforming, nonresponsive or conditional bids.

INQUIRIES: If any bidder has questions regarding this Project, contact the Engineer: Bozhena Palatnik, One Twin Pines Lane, Suite 385, Belmont, CA 94002, Phone: (650) 595-7463, bpalatnik@belmont.gov. Any questions addressing the interpretation or clarification of the Contract Documents shall be in writing.

INSTRUCTIONS TO BIDDERS

1. OBTAINING COPIES OF CONTRACT DOCUMENTS

1.1. Bidders may obtain complete sets of the Contract Documents, at the location designated in the Invitation For Sealed Bids, for the purchase sum stated therein.

1.2. Each bidder shall use a complete set of Contract Documents in preparing its bid.

1.3. The Contract Documents are more particularly defined in the Construction Agreement.

1.4. The City makes copies of the Contract Documents available, on the above terms, for the sole purpose of obtaining Bids for the Work and does not confer a license or grant permission for any other use of the Contract Documents.

2. INTERPRETATION OR CORRECTION OF CONTRACT DOCUMENTS

2.1. Bidder must, before submitting its Bid, carefully study and compare the components of the Contract Documents and must examine the Project Site, the conditions under which the Work is to be performed, and the local conditions.

2.2. In the event Bidder has any question as to the meaning of any part of the Contract Documents, or Bidder finds any error, omission, inconsistency, or ambiguity in the Contract Documents, Bidder must make a written Request for Clarification before submitting its Bid. Requests for clarification or interpretation of the Contract Documents must be addressed only to the Engineer. It is the Bidder's responsibility to ensure that any such request is submitted to the City in a timely manner, in order to allow the City to issue a written Addenda.

2.3. If necessary, the City will make clarifications, interpretations, corrections, and changes to the Contract Documents by Addenda issued as provided in Section 4 of these Instructions to Bidders, below.

2.4. Purported clarifications, interpretations, corrections, and changes to the Contract Documents made in any other manner are not binding on the City, and Bidders may not rely upon them.

2.5. The plans and specifications, including drawing, plans, maps, diagrams and other graphic representations of the project, show conditions as they are believed by City to exist on the site, but the conditions shown do not constitute a representation by City that they actually exist. Utilities (underground or above-ground), buildings, structures and other improvements may be within or adjacent to the project site. These may or may not be included in the project's plans and specifications.

2.6. Submission of a bid shall constitute a representation by bidder that they have visited and examined the project site, and examined the plans and specifications. Bidder is relying on their own examination and knowledge of the site and plans in making their bid and not on any representation by City. No

claim for additional compensation shall be allowed that is based upon a failure to examine or lack of knowledge of, the work site or contract documents.

3. PREFERENCE FOR MATERIALS

3.1. In accordance with Public Contract Code Section 3400, except as otherwise specified on the Invitation for Sealed Bids, the City will not limit the bidding, directly or indirectly, to any one specific concern. Whenever any particular material (including product, thing, equipment, or service) is indicated in the Contract Documents by patent, proprietary or brand name, or by name of manufacturer, such wording is used for the purpose of facilitating its description and shall be deemed to be followed by the words "or equal." A listing of materials is not intended to be comprehensive, or in order of preference.

3.2. Unless a successful bidder (the Contractor) submits a request for substitution of "equal" materials in accordance with the requirements of the Contract Documents, and unless the City approves the substitution in accordance with the requirements of the Contract Documents, the Contractor shall furnish and install the specified material for the Bid Amount and within the Contract Time.

4. ADDENDA

4.1. Addenda will only be issued in writing. The City will make reasonable efforts to deliver (via facsimile or U.S. Mail) Addenda to all Bidders who are known by the City to have received a complete set of Contract Documents and who have provided a delivery address for receipt of Addenda.

4.2. Each Bidder shall be responsible for ascertaining, prior to submitting its Bid, that it has received all issued Addenda. City makes no guarantee that all Bidders will receive all the Addenda. Copies of Addenda will be made available for inspection at the office where Contract Documents are on file for inspection, as indicated on the Invitation for Sealed Bids.

4.3. Addenda withdrawing the Invitation for Sealed Bids or postponing the Bid Deadline may be issued any time before the Bid Deadline. However, if any Addenda results in a material change (addition or deletion) to the Contract Documents, the Bid Deadline will be extended by the City by not less than 72 hours, as provided in Public Contract Code Section 4104.5.

4.4. Each Bidder must acknowledge receipt of all Addenda on the Bid Form. Failure to acknowledge receipt of Addenda may render the bid non-responsive.

5. FILLING IN BID FORMS BY BIDDERS

5.1. All bids must be prepared on the forms provided by the City and submitted in accordance with these Instructions to Bidders. The documents required to be submitted in the bid package are as follows:

5.1.1. Bid

5.1.2. Equal Employment Opportunity Certification (Federal funded projects only)

5.1.3. Bidder's Non-collusion Affidavit

5.1.4. Debarment and Suspension Certification

5.1.5. Bidder's Security

5.1.6. Bidder's Statement of Responsibility

5.1.7. Any other information required by the Invitation For Sealed Bids

5.2. All blanks on the Bid Forms shall be filled in by typeface or printed legibly in ink.

5.3. Interlineations, alterations, and erasures must all be individually initialed by the Bidder.

5.4. Bidder shall acknowledge receipt of all Addenda on the Bid.

5.5. Bidder shall not modify or qualify the Bid Forms in any manner.

5.6. The Bid Forms shall be signed by a person or persons legally authorized to bind Bidder to the Contract. The individuals signing each document must warrant that they are authorized to bind the legal entity of the Bidder.

6. **DESIGNATION OF SUBCONTRACTORS**

6.1. The Bidder must comply with the Subletting and Subcontracting Fair Practices Act as set forth in Public Contract Code Section 4100 *et seq.* (hereinafter referred to as the "Subcontracting Act"). Any reference in these Contract Documents to the requirements of the Subcontracting Act are for the Bidder's reference, and do not limit the Bidder's or Contractor's obligations under law.

6.2. No contractor or subcontractor may be listed on a bid proposal for or work on a public works project unless registered with the Department of Industrial Relations under Labor Code section 1725.5 or submitting a bid as part of a joint venture authorized by Business and Professions Code Section 7029.1 or by Public Contract Code Section 10164 and 20103.5, provided the contractor is registered to perform public work under Section 1725.5 at the time the contract is awarded.

6.3. The Bidder must list, in the Bid:

6.3.1. The name and location of the place of business of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work for this Project, or a subcontractor licensed by the State of California who, under subcontract to the Bidder, specially fabricates and installs a portion of the Work or improvements according to detailed drawings contained in the plans and specifications, in an amount in excess of the minimum threshold of the Subcontracting Act. Generally, the minimum threshold is one-half of one percent (0.5%) of Bidder's Bid Amount; however, if the contract is for the construction of streets (including highways or bridges), the minimum threshold is the greater of: (a) onehalf of one percent (0.5%) of Bidder's Bid Amount, or (b) ten thousand dollars ($10,000).

6.3.2. The portion of the Work which will be done by each subcontractor described in Instructions To Bidders subsection 6.3.1.

6.4. The Bidder must list only one subcontractor for each portion of the Work as is defined by the Bidder in the Bid.

6.5. The Bidder must not list any subcontractor who is ineligible under Labor Code Sections 1777.1 and 1777.2, and Public Contract Code Section 6109.

6.6. The Bidder is subject to the penalties set forth in the Subcontracting Act if the Bidder lists in its Bid another contractor who will in turn sublet portions constituting the majority of Work covered by the prime contract.

6.7. If the Bidder fails to specify a subcontractor, or if the Bidder specifies more than one subcontractor for the same portion of the Work, the Bidder agrees that it is fully qualified to perform that portion itself, and that the Bidder must perform that portion itself.

6.8. If, after award of the Contract, the successful Bidder ("Contractor") subcontracts, except as provided in the Subcontracting Act, the Contractor is subject to the penalties set forth in the Subcontracting Act. If the Contractor violates any provisions of the Subcontracting Act, the Contractor violates the Contract and the City may either cancel this Contract or assess a penalty to the Contractor in accordance with the terms of the Subcontracting Act.

7. **BID SECURITY**

7.1. Each Bid shall be accompanied by Bid Security, in the amount of ten percent (10%) of the Bid Amount, as security for Bidder's obligation to enter into a Contract with the City on the terms stated in the Bidding Documents. Bid Security shall be in one of the following forms: cash, a cashier's check made payable to the City of Fremont, a certified check made payable to the City of Belmont, or a Bid Bond executed by an admitted surety insurer in the form contained in the Bidding Documents.

7.2. If a Bid Bond is submitted, and an attorney-in-fact executes the Bid Bond on behalf of the surety, a notarized and current copy of the power of attorney shall be affixed to the Bid Bond. The surety issuing the Bid Bond shall meet the requirements set by California law.

7.3. The City reserves the right to retain the Bid Security of all bidders until the occurrence of one of the following:

7.3.1. The successful Bidder has properly and timely executed and submitted all items required by Instructions To Bidders Section 13, including the Agreement.

7.3.2. The time period for the City's review of Bids as specified in Instructions To Bidders Section 9 has expired.

7.3.3. The Bids have been rejected by the City.

8. **SUBMISSION OF BIDS**

8.1. All Bid Forms (using the forms supplied by the City, as defined in Instructions to Bidders Section 5), including all documents required to be submitted with the Bid, shall be enclosed in a sealed opaque

envelope with the following address and identification on the face. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope.

(Name of Bidder)
Sealed Bid Proposal for City Contract No. 2026-645
San Juan Pump Station & Force Main Rehabilitation Project
City of Belmont

8.2.Bids may be mailed or delivered by messenger. It is the Bidder's responsibility alone to ensure that the Bid is received at the place (and before the Bid Deadline) specified in the Invitation for Sealed Bids. Any Bid received after the exact time of the Bid Deadline will be returned unopened.

8.3.Oral, telephonic, facsimile, telegraphic, or electronically transmitted Bids are invalid and will not be accepted.

9. WITHDRAWAL OF BIDS

9.1. After a Bid is received by the City, the Bid may be withdrawn only by a written request signed by the Bidder. In order to cause a withdrawal of the Bid, the request must be received by the City at the place (and before the Bid Deadline) specified in the Invitation for Sealed Bids.

9.2. No oral request for withdrawal will be considered. No oral or written request for modification will be considered.

9.3. The withdrawal of a Bid shall not prejudice the right of the Bidder to submit a new Bid, provided the new Bid is submitted in accordance with these Bidding Requirements.

9.4. After the Bid Deadline, a bidder may not withdraw its bid for a period of at least sixty (60) calendar days following the Bid Deadline, subject to the exceptions stated in this section 9.

9.4.1. The sixty (60) day review period may be extended upon the written request by the Engineer, and written approval by the affected Bidders.

9.4.2. If a bidder is not the low monetary bidder, a bidder may make a written request (no earlier than five working days after the Bid Opening) for an early release of bid security. The Engineer is authorized to release a bidder's bid security if the Engineer determines, in his/her sole discretion, that the bid is not likely to be recommended to the Awarding Body for award (based on the dollar amount of the bid in excess of the estimated project cost, or based on the number of responsive bidders with a lower monetary bid).

9.5. A Bidder shall be permitted to withdraw a Bid after the Bid Deadline only if the Bidder establishes, to the satisfaction of the Engineer, all of the elements identified in Public Contract Code Section 5103, including the following:

9.5.1. A clerical error was made by the Bidder in filling out the Bid; and the error was not due to error in judgment or to carelessness in inspecting the site of the Work, or in reading the plans or specifications.

9.5.2. The clerical error caused the Bid to be materially different than the Bidder intended the Bid to be.

9.5.3. The Bidder gave the City written notice within five working days, excluding Saturdays, Sundays, and state holidays, after the opening of the Bids of the mistake, specifying in the notice in detail the nature of the mistake and how the mistake occurred.

10. BID OPENING AND REVIEW OF BIDS BY THE CITY

10.1. Bids submitted in accordance with the requirements of the Bidding Documents, and received on or before the Bid Deadline in accordance with the requirements of the Invitation for Sealed Bids, will be opened publicly, and the dollar amounts of each bid will be read aloud.

10.2. The City reserves the right to:

10.2.1. reject all Bids;

10.2.2. reject any Bid not accompanied by the required Bid Security or any other item required by the Bidding Documents, or a Bid which is in any other way incomplete or irregular; and,

10.2.3. waive irregularities in a Bid, and to award the Contract to the Lowest Responsible Bidder (as determined by the City), only if the irregularities are non-material and inconsequential.

11. CITY'S DETERMINATION OF LOWEST RESPONSIBLE BIDDER

11.1. The term "Lowest Responsible Bidder" means the "Lowest Monetary Bidder" whose Bid is "responsive," and who is "responsible" to perform the Work required by the Contract Documents, as those terms are defined by State law, including Public Contract Code Sections 20161, *et seq*, and 22030 *et seq*. This Section 11 summarizes the procedure by which the City will determine the "Lowest Responsible Bidder" in accordance with State law.

11.2. The City shall determine the "Lowest Monetary Bidder" on the basis of the Bid Amount, in accordance with the calculation criteria set forth on the Bid.

11.3. After the "Lowest Monetary Bidder" has been determined, the Lowest Monetary Bidder's Bid will be evaluated by the Engineer in order to determine whether or not that Bid is "responsive." The term "responsive" is defined by State law, but generally means that the Bid has been prepared and submitted in accordance with the requirements of the Bidding Requirements.

11.4. If the Lowest Monetary Bidder's Bid is responsive, that Bidder's qualifications will be evaluated by the Engineer to determine whether or not the Bidder is "responsible" to perform the Work required by the Contract Documents. The Engineer shall review "responsibility" of Bidders based upon the City's analysis of the information submitted on the Bidder's Statement of Responsibility (as a part of the Bid Forms) in accordance with the criteria set forth in Instructions To Bidders Section 12.

11.5. If the Engineer finds that the Lowest Monetary Bidder submitted a responsive Bid, and that the Bidder is responsible, then that Bidder will be deemed the apparent "Lowest Responsible Bidder".

11.6. If the Engineer finds that the Lowest Monetary Bidder's Bid is not responsive, or that the Lowest Monetary Bidder is not responsible, then the Engineer may review the responsiveness and

responsibility of the next Low Monetary Bidder. If the Engineer finds that the next Low Monetary Bidder is responsive and responsible, then that next Low Monetary Bidder shall be deemed the apparent "Lowest Responsible Bidder. This process may continue until the Engineer finds the Lowest Monetary Bidder which is also responsive and responsible. In the event that one or more Low Monetary Bidders are found by the Engineer to be non-responsive or non-responsible, those Bidders will be given notice and a reasonable opportunity to present additional relevant evidence to the Engineer, within five working days after the Bidder receives the notice.

11.7. No Bid shall be binding upon the City until after the Contract is signed by both the Contractor and the City. The City may investigate the responsibility and qualifications of all Bidders to whom the award is contemplated for a period not to exceed sixty (60) days after the Bid opening. The sixty (60) day review period may be extended upon the written request by the Engineer and written approval by the affected Bidders.

11.8. Bid Protest. The City will issue a Notice of Intent to Award before the actual award. Any Bid protest must be submitted in writing to the Engineer before 5:00 p.m. of the fifth (5^{th}) calendar day following posting of a Notice of Intent to Award for Construction in the City Hall Lobby. City will use reasonable efforts to deliver by email a copy of the Notice of Intent to Award to all Bidders who submitted Bids and provided an email address no later than one working day after its issuance, although any delay or failure to do so will not extend the Bid protest deadline described above. The following conditions will apply to all protests.

11.8.1. The initial protest document must be in writing, contain a complete statement of the legal ground for the protest; all the relevant facts to the protest; and the form of relief requested and the legal basis for such relief.

11.8.2. The protest must refer to the specific portion of the document that forms the basis for the protest.

11.8.3. The protest must include the name, address and telephone number of the protesting party or the person representing the protesting party. If an email address is available, it should also be included.

11.8.4. The party filing the protest must concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest.

11.8.5. The procedure and time limits set forth in this paragraph are mandatory and are Bidders sole and exclusive remedy in the event of Bid protest. Bidders failure to comply with these procedures shall constitute a waiver of any right to further pursue the Bid protest, including filing a Government Code Claim or legal proceedings. A Bidder may not rely on a protest submitted by another Bidder, but must timely pursue its own protest. The City will respond to any properly submitted protest within fifteen (15) calendar days and shall provide a hearing to the protesting bidder but only if the hearing is requested by the protesting bidder in the protest. The City's decision on the protest shall be final.

12. CITY'S DETERMINATION OF RESPONSIBILITY

12.1. The term "responsible" is defined by California law, but generally means that the Bidder is able to demonstrate that it possesses: (1) the capacity to perform the Work required by the Contract Documents with respect to financial strength, resources available, and experience; and (2) the integrity and trustworthiness to complete performance of the Work in accordance with the Contract Documents. The City may consider the following factors, in relation to the Work to be performed for this Project, in determining whether nor not a Bidder is "responsible":

12.1.1. Demonstrated financial strength including, but not limited to, resources available, bonding capacity, and available insurance.

12.1.2. Demonstrated safety record including, but not limited to, Experience Modification Rate.

12.1.3. Successful completion of projects of similar scope and size. In reviewing this factor, the City may consider elements including, but not limited to, contract amount of completed projects, experience on public works projects, experience implementing prevailing wage certified payroll requirements, timeliness of performance, and, if necessary, evaluation of Bidder's work by previous cities, clients, design professionals, or subcontractors.

12.1.4. Sufficiency of contract administration and construction management systems including, but not limited to, proposed scheduling tools, proposed subcontract forms, proposed progress payment applications, and proposed certification of payroll documents.

12.1.5. History of claims, litigation, and termination or disqualification from projects.

12.2. The City will make its determination of responsibility based upon information submitted by Bidders contained in the "Bidders Statement of Responsibility," included in the Bid Forms, and, if necessary, interviews with previous cities, clients, design professionals, or subcontractors with whom the Bidder has worked. If a non-responsive or non-responsible Bidder submits additional evidence pursuant to Instructions To Bidders Section 11, then that additional evidence shall be considered by the Engineer in making a determination of the Lowest Responsible Bidder.

13. AWARD OF CONTRACT

After the determination as to which Bidder is the Lowest Responsible Bidder, the City will issue a Notice of Award to the Lowest Responsible Bidder. No contractor or subcontractor may be awarded a contract for the project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations under Labor Code section 1725.5. Within seven (7) calendar days after receipt of the Notice of Award, Bidder shall submit to the City all of the following properly signed items:

13.1.1. Two originals of the Agreement signed by Bidder.

13.1.2. Documentation of authority of individual or individuals to sign the Agreement on behalf of Bidder.

13.1.3. The Improvement Security required by Agreement Section 13.

13.1.4. Proof of Insurance required by Agreement Section 14.

13.1.5. Documentation of payment of City of Belmont business tax as provided in Agreement Section 12.

13.1.6. Copy of Contractor's State Contractor's License.

13.1.7. Identification of Contractor's Authorized Representative required by Agreement Section 6.

13.1.8. For joint ventures, proof of Department of Industrial Relations Registration for the Contractor and each subcontractor.

14. FORFEITURE OF BID SECURITY

In the event that Bidder does not properly and timely execute and submit the items set forth in subsection 13.1, above, the Bid Security shall be forfeited to the City and the City may award the Contract to next Lowest Responsible Bidder. The forfeited Bid Security may be utilized by the City in accordance with Public Contract Code Sections 20170 through 20174.

BID

BID TO: Belmont City Clerk
One Twin Pines Lane
Belmont, California 94002

BID FROM: _____ Insert
Full Legal Name of Bidder (Firm Submitting Bid)

NOTE: All portions of these Bid Forms (including the Bid, Bidder's Non-Collusion Affidavit, Bidder's Statement of Responsibility, and Bid Bond or alternative bidder's security) must be properly completed, signed, and submitted with the Bid. Failure to do so may result in the Bid being deemed non-responsive by the City.

SCOPE OF BID. Bidder hereby offers to furnish for the above referenced Project all labor (including supervision), materials and equipment (whether or not permanent or temporary, and whether or not actually incorporated into the Work), utilities (including water, sanitary facilities, electricity, fuel, light, heat, and telephone), tools, transportation, and services necessary to complete the Work on this Project in accordance with the Contract Documents and to complete all requirements of the Contract Documents for the amounts quoted in this Bid (including the costs of any and all applicable taxes, patent rights, royalties, licenses, and permits), as modified pursuant to the terms of the Contract Documents. Bidder will not withdraw its Bid for at least sixty (60) calendar days after the Bid Deadline, unless otherwise extended by the written agreement of the City and Bidder. If Bidder is selected as the Lowest Responsible Bidder, Bidder shall, within seven (7) calendar days after receipt of Notice of Award, sign and deliver to the City all documents identified in Section 13 of the Instructions to Bidders (including the Agreement, performance bond, payment bond, and proof of insurance). Time is of the essence. If awarded the Contract, Bidder agrees to complete the Work within the time specified in the Invitation For Sealed Bids.

ADDENDA. Bidder shall insert, in the blank lines below (or additional pages, if needed), each Addenda received by the Bidder, and incorporated herein by reference into this Bid. Bidder hereby acknowledges receipt of the following Addenda (Addendum No. and Date Issued):

Addendum No.	Date Issued
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

_____ _____

BID AMOUNT.

3.1.**Estimated Quantities.** Since the amounts identified in the Bid Spreadsheet (Section 4, below) are estimates for the purpose of comparing bids, the City reserves the right to increase or decrease the quantities to reflect the actual amount of work to be performed by the Contractor in accordance with the requirements of the Contract Documents.

3.2.**Unit Price Bids.** For each bid item identified in the Bid Spreadsheet (Section 4, below), the Bidder shall provide a bid item unit price and a bid item extension (bid item unit price multiplied by bid item estimated quantity equals bid item extension). In case of a math error or ambiguity, bid item unit prices shall prevail over the bid item extensions.

3.3.**Total Bid Amount.** The Bidder shall identify the Total Bid Amount, which shall equal the sum of all bid item extensions and bid alternates. The total bid amount shall include the total of all bid schedules. In case of a math error or ambiguity, bid item extensions shall prevail over the Total Bid Amount. The Total Bid Amount shall be the total dollar amount bid by the Bidder, for the Bidder's performance of all Work in accordance with the Contract Documents (and payment of all Bidder's costs required therefor, whether or not specifically identified herein). The Total Bid Amount may also be referred to in the Contract Documents as the Contract Amount.

3.4.**Basis of Award.** The City shall award the Contract to the lowest responsible Bidder submitting a responsive Bid. The lowest Bid will be determined on the basis of the Total Bid Price plus Alternates. City reserves right to award Alternates in any order or none at all based upon available funding.

3.5.**Alternate Bids.** Alternate bids proposed by the Bidder will be considered by the City.

BID SPREADSHEET. Bidder hereby offers to provide to the City the Work required by the Contract Documents (as defined in Agreement Section 2), for the amounts quoted in this Bid, as follows. Bidder shall complete bid schedule, the total bid amount shall constitute the total of all Bid Item Extensions.

Item No.	Item Description	Unit	Quantity	Unit Price	Item Cost
1	Mobilization and Demobilization	LS	1		
2	Water Pollution Control Plan	LS	1		
3	Pedestrian and Traffic Control	LS	1		
4	Sheeting, Shoring, and Bracing	LS	1		
5	Clearing, Demolition, and Abandonment	LS	1		
6	Bypass Pumping	LS	1		
7	Pump, Guide Rails and Accessories	EA	3		
8	Spare Pump	EA	1		
9	Submersible Mixer	EA	1		
10	Discharge Piping, Valves, Bypass Connection, and Fittings	LS	1		
11	Precast Concrete Valve Vault	LS	1		
12	Precast Concrete Wet Well	LS	1		
13	Flow Meter and Manhole	LS	1		
14	Force Main Access Structure	EA	9		
15	Motor Control Center	LS	1		
16	Pump Termination Cabinet	LS	1		
17	Electric Service and Pedestal	LS	1		
18	Misc. Electrical Work, Wiring and Sensors	LS	1		
19	4-inch Building Sewer Lateral	LF	30		
20	15-inch Gravity Sewer	LF	90		
21	18-inch Gravity Sewer	LF	289		
22	Precast Sanitary Sewer Manhole 432406A	EA	1		
23	Remove and Replace Sanitary Manhole 432401A	EA	1		
24	Manhole Coating	EA	2		
25	Chip & Reform Manhole Invert & Bench	EA	4		
26	14-Inch Force Main	LF	4884		
27	Air Release Valve	EA	2		
28	Startup, Testing, and Training	LS	1		
29	Modify Existing Wetwell	LS	1		
30	Abandon Sanitary Force Main	LS	1		
31	Abandon Sewer Gravity Main	LF	53		
32	Abandon Sanitary Manhole 432402	EA	1		
33	Monument Replacement	EA	1		
34	Miscellaneous Building Improvements	LS	1		
35	Miscellaneous Site Improvements	LS	1		
36	Bid Allowance and Permit Fees	LS	1		
37	Bid Alternate: Electrical Service Conduit	LS	1		
				Bid Total (including bid alternates and allowance)	

4. **BID SECURITY.** Bidder must attach Bid Security in the amount of ten percent (10%) of the Bid Amount (see Section 7 of the Instructions to Bidders).

5. **LIST OF SUBCONTRACTORS**.

6.1. Bidder will use Subcontractors for the Work:

YES_____ NO_____

6.2. If yes, the Bidder hereby certifies that the following is a list of all subcontractors which the Bidder is required by law to name in its bids. Generally, bidders are required to identify each subcontractor performing more than one half of one percent of the work. However, more particular requirements are contained in the Subletting and Subcontracting Fair Practices Act, Public Contract Code Sections 4100 *et seq*. (the "Subcontracting Act"), summarized in Section 6 of the Instructions to Bidders.

6.3. Bidders are reminded of the severe penalties imposed by the Subcontracting Act for a failure to list all required subcontractors (Work Activity, Name, and Address) on this sheet. Bids will not be found non-responsive for omission (at time of bid) of additional information regarding estimated dollar amount of subcontracted work or subcontractor license number. However, bidders shall submit all information required by this sheet by no later than 24 hours after written request by the City.

6.4. ALL BIDDERS ARE HEREBY NOTIFIED THAT: the successful bidder will be required to perform not less than ***fifteen*** percent (***15%***) of the Work with the successful bidder's own organization. A failure of the Bid to establish compliance with this requirement may render the bid non-responsive, or it may result in a determination of bidder non-responsibility based on a failure to demonstrate adequate resources available to perform the Work.

Subcontracted work activity	Subcontractor name including address (City and State)	Est. $ amt. of subcontracted work	Subcontractor's License no.	DIR #
_____	_____	$_____	_____	_____
_____	_____	$_____	_____	_____

NOTE: Provide additional sheets if required. (copy of this sheet is acceptable)

6. REPRESENTATIONS OF BIDDER.

7.1. By submitting this Bid, Bidder declares under penalty of perjury the following representations are true and correct:

7.1.1. Bidder has read and understands all requirements of the Contract Documents, and this Bid is made in accordance with those requirements. The Contract Documents are more particularly defined in the Agreement, and generally include: all Bidding Documents (including the Invitation For Sealed Bids, these Instructions to Bidders, Supplemental Instructions to Bidders, Addenda [if any], and Bid Forms), the Agreement, the Specifications (including the General Conditions, Special Provisions , the, and the Technical Specifications), the Exhibits (including bonds), and the Drawings (also defined as "Plans").

7.1.2. Any questions by the Bidder regarding the meaning of any part of the Contract Documents have been submitted, in writing, by the Bidder to the City, in accordance with Section 2 of the Instructions to Bidders.

7.1.3. Bidder has visited and examined the Project site of the proposed work, and Bidder is familiar with all the conditions related to the proposed work, including the availability of labor, materials (including transportation, handling, delivery, and storage), equipment, and utilities (including water and electricity), and is familiar with local conditions (including weather, road access and truck routes, and surface and subsurface conditions) as related to requirements of the Contract Documents.

7.1.4. The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

7.1.5. The Contract Time, as specified in the Invitation For Sealed Bids, is reasonable for performing the Work and that Contractor is able to perform the Work within the Contract Time.

7.1.6. Bidder has the expertise and financial capacity to perform and complete all obligations required by the Contract Documents.

7.1.7. Bidder is aware of and, if awarded the Contract, will comply with applicable legal requirements, including all City Regulations (including payment of City business license tax) in its performance of the Work.

7.1.8. The Bidder shall comply with the requirements of the Labor Code, including Sections 1770 *et seq.*, and the Bidder shall comply with the General Prevailing Wage Determination Made by the Director of Industrial Relations that is in effect on the date of the Invitation for Sealed Bids. The prevailing wage rate schedule is on file with the Engineer and will be made available for review upon request.

7.1.9. Bidder certifies that, for the excavation of any trench of a depth of five feet or more, its bid includes the cost for adequate sheeting, shoring, and bracing or equivalent method (including costs of design), for the protection of life or limb, which shall conform to applicable safety orders, in accordance with Labor Code Sections 6705 and 6707.

7.2. In accordance with Business and Professions Code Section 7028.15, Bidder certifies, under penalty of perjury, that the information contained in this subsection 7.2, below, is true and correct. Any bidder who is not licensed in accordance with the Business and Professions Code, and in accordance with the Invitation For Sealed Bids, shall be considered non-responsive and shall be rejected by the City.

7.2.1. State Contractor's License No. and Class _____.

7.2.2. Original date license issued, and License expiration date _____.

7.3. As required by Government Code Section 4552, in submitting a Bid to the City, Bidder offers and agrees that, if the Bid is accepted, it will assign to the City all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C., Section 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by Bidder for the sale to City pursuant to the Bid. Such assignment shall be made and become effective at the time City tenders final payment to Bidder.

7.4. Bidder acknowledges that, unless the bidder submits a request for substitution of "equal" materials in accordance with the requirements of the Agreement, and unless the City approves the substitution in accordance with the requirements of the Contract Documents, the Contractor shall furnish and install the specified material for the Bid Amount.

IN WITNESS WHEREOF, the individuals signing this Bid represent and warrant that they have the right, power, legal capacity, and authority to sign this Bid on behalf of the Bidder, and have caused this Bid to be executed by setting hereto their names, titles, and signatures at _____ County, in the State of _____.

BIDDER: _____
(Signature) (Date)

_____
(Name and Title of Signatories)

_____
(Legal Name of Bidder, including type of organization, e.g., corp. or partnership)

_____
(Bidder's Street and Mailing Address)

_____
(City, State, Zip Code)

_____ _____
(Telephone Number) (Email Address)

EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

The bidder _____ and proposed subcontractor hereby certifies that it has _____, has not ____ participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114 or 11246, and that where required, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)) and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts that are subject to the equal opportunity clause. Contract and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt).

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and the subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60.1.7(b)(1) prevents the award of contract or subcontracts unless such Contractor submits a reporting covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided. The above Certification is part of this Proposal. Signing this Proposal on the signature portion thereof shall also constitute an endorsement and execution of the certification. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

NON-COLLUSION DECLARATION

(Title 23 United States Code Section 112 and
Public Contract Code Section 7106)

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____[city], _____[state].

BIDDER: _____
(Signature) (Date)

_____
(Printed or Typed Name and Title of Signatories)

_____
(Legal Name of Bidder)

DEBARMENT AND SUSPENSION CERTIFICATION

Title 49, Code of Federal Regulations, Part 29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
- Does not have a proposed debarment pending; and
- Has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

The above Certification is part of this Proposal. Signing this Proposal on the signature portion thereof shall also constitute an endorsement and execution of the certification. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

BIDDER'S STATEMENT OF RESPONSIBILITY

(Must be executed by Bidder and submitted with Bid)

1. **SCOPE OF THIS STATEMENT OF RESPONSIBILITY.** In order to allow the City to make a determination of the Bidder's responsibility, the Bidder shall provide the information required herein as a part of its Bid.
   1.1. **City's Right to Use the Bidder's Statement of Responsibility.** The City shall use the information required by this Statement of Responsibility for the sole purpose of determining the Bidder's "responsibility." While the City conducts its deliberative process to determine whether a bidder is "responsible," the City will not disclose "confidential" information (as identified by the Bidder pursuant to paragraph 1(b), below) unless otherwise compelled by a court order. However, if there is a challenge regarding the City's determination of whether a Bidder is "responsible," the City shall have the right to use any and all information contained herein in support of the City's determination, and the Bidder waives any claim against the City for the City's use of information for this intended purpose.
   1.2. **Bidder's Obligation to Identify Confidential Information.** If a Bidder believes that any portion of this Statement of Responsibility is "confidential" and not legally subject to public disclosure in accordance with the requirements of the California Public Records Act (Government Code Sections 6250, *et seq*), the Bidder shall: (1) clearly mark the relevant portions of the Statement of Responsibility as "Confidential"; and (2) upon request from the City, identify the legal basis for exception from disclosure under the Public Records Act; and (3) the Bidder shall defend, indemnify, and hold harmless the City regarding any claim by any third party for the public disclosure of the "Confidential" portion of the Statement of Responsibility; and (4) if the Bidder fails to identify information as "Confidential," or if the Bidder fails to defend and indemnify the City regarding any claim by any third party for the public disclosure of a "Confidential" portion of the Statement of Responsibility, the Bidder shall hold the City harmless and waive any claim against the City for any damages allegedly related to any public disclosure of any portion of the Statement of Responsibility.
   1.3. **Additional Pages.** If additional pages are required to respond to any of the questions set forth in this Statement of Responsibility, the Bidder shall describe and list the additional pages in Section 16, below.

2. **EXPERIENCE**

   2.1. How many years has the Bidder been performing work as a contractor under the present business name?

   2.2. If any of the experience listed in this document refers to work performed under a different name, list the different business names and describe the relationship to the present business name on a separate page (list the additional pages in Section 13 below).

3. **CURRENT WORK IN PROGRESS**

   3.1. For how many construction projects is the Bidder under contract to perform (which are currently under construction)? _____

   3.2. What is the total dollar amount of the construction contracts listed in Subsection 3.1?
   _____ 3.3.

   What is the total bonding capacity of the Bidder? _____

   3.4. How many construction contracts listed in 3.1 are:

   3.2.1. in an amount of 50% or less of the Total Bid Amount? _____

   3.2.2. in an amount between 50% and 100% of the Total Bid Amount? _____

3.2.3. in an amount between 100% and 150% of the Total Bid Amount? _____

3.2.4. in an amount over 150% of the Total Bid Amount? _____

3.5. List the name of the project (with Contract Amount and Anticipated Completion Date), the name of the City/Client entity, and a City/Client contact person (with name and telephone number), for three current active projects referred to in Section 3.4:

3.5.1. Project Name _____

Contract Amount _____
Anticipated Completion Date _____

City/Client Entity _____
City/Client Contact _____
(Name and Phone) _____

3.5.2. Project Name _____

Contract Amount _____
Anticipated Completion Date _____

City/Client Entity _____
City/Client Contact _____
(Name and Phone) _____

3.5.3. Project Name _____

Contract Amount _____
Anticipated Completion Date _____

City/Client Entity _____
City/Client Contact _____ (Name and Phone) _____

4. COMPLETED WORK

Provide the requested information set forth below for the: (1) three most recent projects completed of a similar character to this Project (performed as a general contractor); and (2) three most recent public works projects completed (performed as a general contractor).

4.1. Three most recent projects completed of a similar character to this Project:

4.1.1. Project Name: _____

Project Description:_____
_____
_____

Contract Amount _____

Date Completed:_____

Owner: _____

Contact Person: _____

Contact Person's Phone Number: _____

4.1.2. Project Name _____

Project Description _____
_____

Contract Amount: _____

Date Completed: _____

Owner: _____

Contact Person: _____

Contact Person's Phone Number: _____

4.1.3. Project Name: _____

Project Description: _____
_____
_____

Contract Amount: _____

Date Completed: _____

Owner: _____

Contact Person: _____

Contact Person's Phone Number: _____

4.2. Three most recent public works project (City, State, County) completed:

4.2.1. Project Name: _____

Project Description: _____
_____
_____

Contract Amount: _____

Date Completed: _____

Public Agency: _____

Agency Contact Person: _____

Contact Person's Phone Number: _____

4.2.2. Project Name: _____

Project Description: _____
_____
_____

Contract Amount: _____

Date Completed: _____

Public Agency: _____

Agency Contact Person: _____

Contact Person's Phone Number: _____

4.2.3. Project Name: _____

Project Description: _____
_____
_____

Contract Amount: _____

Date Completed: _____

Public Agency: _____

Agency Contact Person: _____

Contact Person's Phone Number: _____

5. CLAIMS HISTORY

5.1. Has any claim been made against your company in the past five years, which has resulted in arbitration or litigation?_____

5.2. Has your company made any claim against any City or client in the past five years, which has resulted in arbitration or litigation?_____

5.3. If you answered "yes" to subsections 5.1 or 5.2 above, describe the claim(s) using the format below: (use additional sheets if necessary).

5.3.1. Project Name _____

Claim Amount _____

Other Party Entity Name _____
Other Party Contact _____
(Name and Phone) _____

6. Describe the claim(s) on a separate sheet (see Section 14, below).

7. **CONTRACT TERMINATION**

7.1. Has your company ever been terminated by a City or client, or rejected from bidding on a public works project in the last five (5) years? _____. If yes, identify each and provide an explanation below:

7.2. Project Name _____

City/Client Entity Name _____ City/Client Contact
(Name and Phone) _____

Date of Termination/Rejection _____

Explanation _____
_____
_____

8. If more than one (1), describe on additional sheet (see Section 14, below).

9. **COMPLETION BY SURETY**

9.1. Has your company ever failed to satisfactorily complete a construction contract, or has a surety ever completed any portion of a construction contract of your company within the last five (5) years? _____. If yes, provide an explanation below:

9.2. Project Name _____

Surety Contact
(Name and Phone) _____

Date Surety Took Over _____

Explanation _____
_____
_____

10. If more than one (1), describe on additional sheet (see Section 13, below).

11. **STORM WATER BEST MANAGEMENT PRACTICES**

11.1. Has bidder violated the Storm Water Best Management Practices for illegal or improper discharge(s) into storm drain systems two (2) or more times within the past five (5) years?

☐ Yes
☐ No

Note: This question refers to your firm's violation of sewer overflow to the storm drain system that was required to be reported to the State Water Board.

12. **SEWER AND WATER CROSS-CONTAMINATION**

12.1. Has work performed by the bidder resulted in cross-contamination with water and sewer facilities within the past five (5) years?

☐ Yes
☐ No

13. **OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) COMPLIANCE**

13.1. Has the federal Occupational Safety and Health Administration cited and assessed penalties against your firm for any "serious," "willful" or "repeat" violations of its safety or health regulations in the past five (5) years?

☐ Yes
☐ No

If "Yes," attach a separate signed page describing the citations, including information about the dates of the citations, the nature of the violation, the project on which the citation(s) was or were issued, the amount of penalty paid, if any. If the citation was appealed to the Occupational Safety and Health Appeals Board and a decision has been issued, state the case number and the date of the decision.

14. **PUBLIC WORKS CONTRACTS**

14.1. In the last five (5) years has your firm been denied an award of a public works contract based on a finding by a public agency that your company was not a responsible bidder?

☐ Yes
☐ No

If "Yes," explain on a separate signed page. Identify the year of the event, the owner, the project, and the basis for the finding by the public agency.

15. **ADDITIONAL DOCUMENTS**

In order to allow the City to make a determination of the Bidder's responsibility, the Bidder may be required to submit additional documents.

16. **ADDITIONAL PAGES**

The Bidder declares that the pages listed in this Subsection were added and included with these Bid Documents in order to accurately respond to the Bidding Requirements. The following descriptions include the general nature of the additional information. If no additional pages are submitted, write "None" on the blank line.

_____

_____

_____

17. PENALTY OF PERJURY

Bidder hereby declares and certifies under penalty of perjury under the laws of the State of California that the information contained herein is true, correct, and complete.

IN WITNESS WHEREOF, the undersigned represent and warrant that they have the right, power, legal capacity and authority to sign this document on behalf of the Bidder, and have caused this document to be executed by setting hereto their names, titles and signatures.

BIDDER: _____
(Signature) (Date)

_____
(Printed or Typed Name and Title of Signatories)

_____
(Legal Name of Bidder)

BID BOND

Bond No. _____

WHEREAS, ("Principal") submitted a Bid to the City of Belmont ("City") for the Project identified on this Bond, and the terms of the Bid require the Principal to submit bidder's security.

NOW, THEREFORE, Principal and _____ ("Surety"), are hereby held and firmly bound unto the City in the amount of ten percent (10%) of the Bid Amount set forth in the Principal's Bid (the terms and conditions of which are incorporated herein by reference) for the above referenced Project, for payment of which Principal and Surety hereby bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal's Bid is rejected by the City, or if Principal's Bid is accepted by the City and the Principal properly executes and submits to the City the Agreement and all required documents (including the Faithful Performance Bond, the Labor and Material Bond, and the proof of insurance), then this obligation shall be null and void; otherwise it shall be and remain in full force and effect.

The Surety hereby agrees, for value received, that its obligations under this bond shall in no way be impaired or modified by an agreement between the City and the Principal to extend the time within which the City may accept the Principal's Bid, and the Surety hereby waives notice of any such extension.

In the event suit is brought upon this bond, the surety shall pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit, which fees and costs shall be in addition to the face amount of the bond.

IN WITNESS WHEREOF, the undersigned represent and warrant that they have the right, power, legal capacity, and authority to enter into and execute this document on behalf of the Principal and the Surety, and have caused this document to be executed by setting hereto their names, titles, and signatures.

Principal	**Surety**
_____	_____
By: _____	By: _____
Title: _____	Title: _____
Date:	Date: _____
	Address for Notices to Surety: _____
	_____
	_____

NOTE: NOTARY ACKNOWLEDGMENT FOR SURETY AND SURETY'S POWER OF ATTORNEY MUST BE ATTACHED.

CONSTRUCTION AGREEMENT

This Construction Agreement (hereinafter "Agreement") is made and entered into by and between the CITY OF BELMONT, a municipal corporation (hereinafter "City"), and [***INSERT LEGAL NAME OF CONTRACTOR***name of business and description of legal entity, i.e., LLC, Partnership, Corporation, etc.] (hereinafter "Contractor").

RECITALS

A. In accordance with the applicable provisions of State law, including the California Public Contract Code, and local law, including the Belmont City Code, the City issued an invitation for competitive bids for this Project.

B. In response to the invitation for bids, the Contractor submitted the Bid Forms (with a Bid Amount of $_____), which are incorporated herein by reference, which were found by the City to be responsive to the invitation for bids.

C. After reviewing all bids submitted in response to the invitation for bids, the City found the Contractor to be the Lowest Responsible Bidder, and the Awarding Body awarded this Agreement to the Contractor on _____ [***INSERT DATE OF AWARD***].

D. The Project is more specifically described in the Contract Documents, but generally includes the following items of work Construction of new sanitary sewer pump station, force main, and other items as identified in the contract documents.

NOW THEREFORE, THE PARTIES MUTUALLY AGREE AS FOLLOWS:

1. **SCOPE OF WORK.** The Contractor shall perform, or cause to be performed, the Work described in the Contract Documents (hereinafter "Work"), to the satisfaction of the City Engineer, and subject to the final acceptance by the City.

2. **CONTRACT DOCUMENTS.**

2.1. **List of Contract Documents.** The Contract Documents consist of this executed Agreement; all Bidding Documents (including the Invitation for Bids, Instructions to Bidders, Supplemental Instructions to Bidders, Bid Forms, and Addenda (if any) as identified below); the Specifications (including General Conditions, Special Provisions, and all documents incorporated by reference therein, including City Standard Specifications, and Caltrans Standard Specifications), and the

Technical Specifications; the Drawings (also referred to as "Plans"); and the Exhibits (including bonds).

2.2. **Precedence of Contract Documents.** In the event of a conflict between component parts of the Contract Documents, the document highest in precedence shall control. The precedence shall be as follows: [***SPECIFICALLY IDENTIFY EACH INCORPORATED DOCUMENT, PARTICULARLY THE PLANS, AND ELIMINATE UNUSED PARTS***]

2.2.1. Agreement, as amended by contract change orders.

2.2.2. All Bidding Documents, as amended by Addenda.

2.2.3. Technical Specifications

2.2.4. Special Provisions.

2.2.5. General Conditions

2.2.6. City Standard Specifications.

2.2.7. Caltrans Standard Specifications (Standard Specifications for Construction of Local Streets and Roads, State of California, April 2025).

2.2.8. Drawings (also referred to as Plans), as defined on ********.

2.2.9. Standard Plans and Standard Details.

2.2.10. Exhibits.

2.3. **Addenda.** The following Addenda are hereby incorporated into the Contract Documents:

No.	Date of Issue:
____	_____
____	_____
____	_____

3. **CONTRACT TIME**.

3.1. After Contractor has provided to City all documents identified in the Instructions to Bidders and the Notice of Award (in a form satisfactory to the City, and in accordance with the requirements of the Contract Documents), City shall schedule the mandatory pre-construction conference, and Contractor shall attend and participate in the pre-construction conference.

3.2. After the pre-construction conference, the City shall issue a Notice to Proceed to Contractor. The Notice to Proceed will identify the date on which the "Contract Time" commences, and this date may be referred to as the "Contract Commencement Date." Contractor is authorized to commence Work on the Contract Commencement Date, and Contractor must

commence the Work no later than seven days after the Contract Commencement Date. The Work must be diligently prosecuted and all of the Work must be substantially completed within the Contract Time specified in the Invitation For Bids. Time is of the essence in the performance of all obligations under these Contract Documents, and all timing requirements must be strictly adhered to unless otherwise modified by the City in accordance with the Contract Documents. The Contractor must submit all requests for extensions of time to the City, in writing, no later than ten (10) working days after the start of the condition which purportedly caused the delay, and not later than the date on which performance is due.

3.3. Within the time set forth in the Special Provisions (or, if no time is specified in the Special Provisions, with seven (7) calendar days after written request from the City), Contractor shall submit to the City all required documents, including the following:

3.3.1. Contractor's safety program, and identification of Contractor's safety officer.

3.3.2. Contractor's cost distribution schedule of prices (schedule of values).

3.3.3. Contractor's Construction Schedule.

3.3.4. Contractor's schedule of submittals.

3.3.5. Copies of all required documentation for each subcontractor, including: State Contractor's License, identification of each subcontractors' authorized representative, copy of contract between Contractor and each subcontractor.

4. **CONTRACT AMOUNT.** City shall pay to Contractor, for the performance of the Work, the Contract Amount identified in the Bid Documents, subject to adjustment of estimated quantities (to reflect actual work performed by the Contractor), and as modified according to the terms of the Contract Documents. The Contractor's compensation shall include all costs incurred by the Contractor in the performance of the Work, including: furnishing all labor (including supervision), materials (including the costs of any and all applicable taxes, patent rights, royalties, licenses, and permits), equipment, tools, transportation, and services necessary to complete the Work (including costs to protect the Work, and all damages to the Work prior to acceptance of the Work by the City, unless otherwise specifically provided in the Contract Documents). The Contract Amount identified in the Bid Documents [*** , which includes alternate items _____ *** insert ***,] is $_____.

5. **LIQUIDATED DAMAGES.** If Contractor fails to complete the Work within the Contract Time, Contractor shall pay to the City, as liquidated damages and not as a penalty, the sum specified in the Invitation for Bids for each calendar day after the expiration of the Contract Time that the Work remains incomplete. The City and Contractor agree that in the event the Work is not completed within the Contract Time, the City's damages would be extremely difficult or impracticable to determine and therefore the City and Contractor agree that the amount stated herein is a reasonable estimate of the amount of such damages. The City may deduct any liquidated damages owed to the City, as determined by the City, from any payments otherwise payable to Contractor under this Contract. Nothing contained herein shall limit the City's rights or remedies against Contractor for any default other than failure to complete the Work within the Contract Time. This provision for liquidated damages shall not be applicable nor act as a

limitation upon the City if Contractor abandons the Work. In such event, Contractor shall be liable to the City for all losses incurred.

6. **CONTRACTOR REPRESENTATIVE.** At all times during the progress of the Work, Contractor shall have a competent supervisor, foreman, or superintendent (hereinafter "Contractor Representative") on site with authority to act on behalf of the Contractor. The Contractor Representative shall be authorized by the Contractor to sign, send, and receive all notices contemplated or required by the Contract Documents, and authorized to direct all Work being performed by (or on behalf of) the Contractor. The Contractor shall, at all times, keep the City Engineer informed in writing of the name and telephone number of the Contractor Representative. Throughout the term of this Contract, Contractor Representative shall meet and confer with the City Engineer in a good faith effort to resolve any outstanding issues related to performance required by the Contract Documents. The Contractor shall, at all times, keep the City Engineer informed in writing of the names and telephone numbers of all subcontractors performing the Work.

7. **ACCESS TO THE SITE.** In order to permit the City to inspect the Work, the Contractor shall, at all times, provide to the City (including agencies and entities designated by the City) proper and safe access to the Project site, and all portions of the Work, and to all shops wherein portions of the Work are in preparation.

8. DOCUMENTATION AND RECORD KEEPING.

8.1. **Contractor's Project Records.** Contractor's Project records shall include all of Contractor's accounting records, employment records, and project work records for all employees, subcontractors, and suppliers, including: the Contract Documents, one record copy of the plans and specifications, change orders, requests for clarifications, instructions from the City, contracts with suppliers and subcontractors, correspondence, submittals, samples, shop drawings, invoices, receipts, vouchers, purchase orders, notes, daily logs, and memoranda relating to the Work.

8.2. **Contractor's Maintenance of Project Records.** Contractor shall keep and preserve Project records in accordance with generally accepted accounting principles and state law requirements. During performance of the Work, Contractor shall keep all of Contractor's Project records in a secure location at the Project Site. After completion of the Work, Contractor shall maintain the Project records for no less than four years after final completion of the Work.

8.3. **Audit by the City.** All of Contractor's Project records, as identified above, shall be made available to the City (including agencies and entities designated by the City), and the Contractor shall provide copies of the Contractor's records upon request by the City.

9. **RESPONSIBILITY OF CONTRACTOR AND SUBCONTRACTORS**.

9.1. Contractor is an independent contractor and is solely responsible for all acts of its employees, agents, or subcontractors, including any negligent acts or omissions. Contractor is not City's employee and Contractor shall have no authority, express or implied, to act on behalf of the City

as an agent, or to bind the City to any obligation whatsoever, unless the City provides prior written authorization to Contractor.

9.2. For each subcontractor performing any portion of the Work for this Project, the Contractor shall include a provision in the subcontract documents incorporating by reference the requirements of these Contract Documents, to require the subcontractor to comply with the requirements of these Contract Documents as related to the portion of the Work performed by the subcontractor. This requirement shall specifically include: indemnification of the City (Agreement Section 16), business tax compliance (Agreement Section 12), insurance (Agreement Section 14), and nondiscrimination and compliance with law (Agreement Section 11.1).

10. **CONFLICTS OF INTEREST.** Contractor (including its employees, agents, and subcontractors) shall not maintain or acquire any direct or indirect interest that conflicts with the performance of this Agreement. In the event that Contractor maintains or acquires such a conflicting interest, any contract (including this Agreement) involving Contractor's conflicting interest may be terminated by the CITY.

11. **LEVINE ACT DISCLOSURE.** Contractor must disclosure on a form approved by the City whether Contractor or its agents have made contributions to one or more City officials that are subject to the requirements of the Levine Act (Calif. Gov't Code § 84308(e) or the regulations of the Fair Political Practices Commission that implement the Act (Title 2 Calif. Code of Regs., §18438.8(b)). If at any time during the term of this Agreement the total contributions to a City official by Contractor and its agents exceed $250, Contractor must promptly disclosure the contributions by submitting a supplement written disclosure.

12. **COMPLIANCE WITH LAW.** The Contractor shall comply with all applicable legal requirements including all federal, state, and local laws (including ordinances, resolutions, and City Regulations), whether or not said laws are expressly stated in this Agreement.

12.1. **Nondiscrimination.** Contractor shall comply with all applicable federal, state, and local laws regarding nondiscriminatory employment practices, whether or not said laws are expressly stated in this Agreement. Contractor shall not discriminate against any employee or applicant because of race, color, religious creed, national origin, physical disability, mental disability, medical condition, marital status, sexual orientation, or sex.

12.2. **Labor Compliance.** Contractor must comply with all applicable federal, state, and local laws regarding labor compliance, including, but not limited to, all applicable provisions related to working hours, the payment of prevailing wages, travel and subsidence payments, apprentices, payroll records, and labor code penalties (as required by California Labor Code Sections 1720 through 1861, and as outlined in the General Conditions). Copies of the prevailing wage rates are on file with the City Engineer, and shall be made available to any interested party upon request. See General Conditions Section 19 for more detail.

12.3. **Department of Industrial Relations Registration**. No contractor or subcontractor may be listed on a bid proposal for or work on a public works project unless registered with the Department of Industrial Relations under Labor Code section 1725.5 or submitting a bid as part

of a joint venture authorized by Business and Professions Code Section 7029.1 or by Public Contract Code Section 10164 and 20103.5, provided the contractor is registered to perform public work under Section 1725.5 at the time the contract is awarded.

12.4. **Subcontractor Eligibility.** Contractor acknowledges that under Public Contract Code Section 6109 no contractor or subcontractor who is ineligible to bid or work on, or be awarded, a public works project under Labor Code Section 1777.1 or 1777.7 may bid on, be awarded, or perform work as a subcontractor on, a public works project. Contractor is prohibited from performing work on a public works project with a subcontractor who is ineligible to perform work on the public works project under Labor Code Section 1777.1 or 1777.7.

13. **PERMITS AND LICENSES.** The Contractor must obtain and maintain all necessary permits and licenses for the performance of the Work.

13.1. **Belmont Business License Tax.** Contractor must apply for and pay the business tax and registration tax for a business license, in accordance with the Belmont City Code.

13.2. **Fees, Royalties, and Patents.** Contractor must pay all license fees and royalties related to or necessary for the Work and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device that is the subject of patent rights or copyrights held by others.

14. **IMPROVEMENT SECURITY.** Concurrently with the execution of this Agreement by the Contractor, and before the commencement of any Work, the Contractor shall furnish improvement security, in a form substantially the same as that set forth in the Exhibits, attached hereto, or in an alternate form authorized by state law and approved by the City, in the following amounts:

14.1. **Faithful Performance** security in the amount of 100% of the Contract Amount to secure faithful performance of this Agreement (until the date on which the City accepts the Work as complete).

14.2. **Labor and Material** security in the amount of 100% of the Contract Amount to secure payment by the Contractor to laborers and materialmen (until the date on which claims are required to be made by laborers and materialmen pursuant to law).

14.3. **Warranty** security in the amount of 10% of the Contract Amount to secure faithful performance of this Agreement (from the date on which the City accepts the Work as complete until one year thereafter).

15. **INSURANCE**.

15.1. Contractor must, throughout the duration of this Agreement, maintain insurance to cover Contractor (including its agents, representatives, subcontractors, suppliers, and employees) in connection with the performance of work under this Agreement, including against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work.

15.2. Contractor must at a minimum maintain the following types of insurance indicated by the check box next to the insurance type. Contractor must fully comply with the City's insurance specifications in Exhibit A "*Insurance Standards for Construction*", attached to this Agreement. City may modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

☒ **Workers Compensation (WC)**

☒ **Commercial General Liability (CGL)**

☐ The CGL limit level is modified as follows: _____.

☒ **Employers Liability (EL)**

☐ The EL limit level is modified as follows: _____.

☒ **Automobile Liability (AL)**

☐ The AL limit level is modified as follows: _____.

☒ **Professional Liability (PL)**

☐ The PL limit level is modified as follows: _____.

☒ **Pollution Legal Liability (PLL), Asbestos Legal Liability (ALL), Errors and Omissions (EO)**.

☐ The PLL/ALL/EO limit level is modified as follows: _____ _____.

☒ **Builder's Risk (Course of Construction).**

15.3. Contractor waives any right to subrogation against the City, its officers, elected officials, employees, agents, or volunteers which any insurer of Contractor may acquire against the City by virtue of the payment of any loss under such insurance.

16. **REPORTING DAMAGES.** If any damage (including death, personal injury or property damage) occurs in connection with the performance of this Agreement, Contractor must immediately notify the City Risk Manager's office by email at finance@belmont.gov, and Consultant shall promptly submit to the City's Risk Manager and the City's Authorized Representative, a written report (in a form acceptable to the City) with the following information: (a) name and address of the injured or deceased person(s), (b) name and address of witnesses, (c) name and address of Consultant's insurance company, and (d) a detailed description of the damage and whether any City property was involved.

17. **RESPONSIBILITY FOR LOSS**.

17.1. The City and its elected officials, officers, employees, agents and volunteers, shall not be answerable or accountable in any manner: for any loss or damage that may happen to the work or any part thereof; for any loss or damage to any of the materials or other things used or employed in performing the work; for injury to or death of any person (including but not limited to workers or the public) from any cause whatsoever; or for damage to property from any cause whatsoever.

17.2. The Contractor shall be responsible for any liability imposed by law and for injuries to or death of any person (including but not limited to workers and the public) or damage to property resulting from defects or obstructions or from any cause whatsoever during the progress of the work or at any time before its completion and final acceptance. The Contractor shall indemnify and save harmless the City of Belmont and its elected officials, officers, employees, agents and volunteers from all claims, suits or actions of every name, kind and description brought for, or on account of, injuries to or death of any person (including but not limited to employees of Contractor, of subcontractor, or of any other person, firm or entity and the public) or damage to property arising from any cause whatsoever during the progress of the work or at any time before its final completion and acceptance. Contractor's indemnification shall specifically include, but not be limited to, all claims arising out of: contract claims, property damage, personal injury, and any infringement of patent rights or copyrights incidental to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents. Contractor's indemnification shall include any and all costs, expenses, court costs, attorneys' fees and liability incurred by the City in enforcing the provisions of this section, and in defending against such claims, whether the same proceed to judgment or not. Contractor shall reimburse City for any expenditures City incurs by reason of such matters. The duty of the Contractor to indemnify and save harmless includes the duties to defend as set forth in Section 2778 of the Civil Code. This indemnification shall survive termination of the Contract.

The Contractor waives any and all rights to any type of express or implied indemnity against the City, and its officers, officials, agents, employees and volunteers. It is the intent of the parties that the Contractor shall indemnify and hold harmless the City, and its elected officials, officers, agents, employees and volunteers from any and all claims, suits, or actions arising from any cause whatsoever as set forth above regardless of the existence or degree of fault or negligence on the part of the City, the Contractor, the subcontractor or employee of any of these, other than the sole negligence, active negligence or willful misconduct of the City, and its elected officials, officers, agents, employees and volunteers.

17.3. In addition to any remedy authorized by law, so much of the money due the Contractor under and by virtue of the Agreement as shall be considered necessary by the City may be retained by the City until disposition has been made of such suits or claims for damages as aforesaid.

17.4. Neither the elected officials, officers, agents, employees not volunteers of City, nor any officer or employee of any county, city or district shall be personally responsible for any liability arising under or by virtue of the Agreement.

17.5. Nothing in the Agreement is intended to make the public or any person a third party beneficiary under this Contract, nor is any term and condition or other provision of the Agreement intended to establish a standard of care owed to the public or any member thereof. Attention is directed to Section ___, "Insurance Provisions," of the General Conditions for the Contractor's responsibility for providing and maintaining insurance.

18. **ACCEPTANCE OF WORK.** Before acceptance of the Work by the City, the Contractor shall be solely responsible for maintaining the quality of the Work, and maintaining safety at the Project

site. The Contractor's obligation to perform the Work shall not be satisfied until after the City Engineer has made a written determination that all obligations of the Agreement have been satisfied and all outstanding fees and charges have been paid, and the City has accepted the Work as complete.

19. **WARRANTY.**

19.1. **Quality of Work.** Contractor warrants to the City that all materials and equipment used in or incorporated into the Work will be of good quality, new, and free of liens, claims, and security interests of third parties; and that the Work will be of good quality and free from defects; and that the Work will conform with the requirements of the Contract Documents.

19.2. **Documentation of Warranty.** If required by the City Engineer, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. If required by the Contract Documents, the Contractor shall provide a written warranty from the manufacturer or supplier.

19.3. **Warranty Period.** The Contractor shall warrant the quality of the Work, in accordance with the terms of the Contract Documents, for the "Warranty Period." The Warranty Period shall be a one year period (unless a longer period of time is specified in the Contract Documents) commencing as follows: (a) for any Work not identified as incomplete in the Certificate of Substantial Completion, commencing on the date of Substantial Completion; and (b) for any Work that is identified as incomplete in the Certificate of Substantial Completion, commencing on the date of Final Completion.

19.4. **Default During Warranty Period.** In the event that (during the Warranty Period) any portion of the Work is determined by the City Engineer to be defective as a result of an obligation of the Contractor under this Agreement (including any faulty workmanship or material, or any failure of the Work to operate in accordance with the requirements of the Contract Documents), the Contractor shall be in default.

20. **DEFAULT**.

20.1. **Notice of Default**. In the event that the Contractor is in default of this Agreement, as defined in this section, the City Engineer shall provide written notice to the Contractor and the Contractor's surety (if any) in which the default is described.

20.2. **Circumstances Constituting Default**. Contractor shall be in default of this Agreement if the City Engineer determines that any one of the following conditions exists:

20.2.1. Contractor fails to perform any portion of the Work in accordance with the timing requirements of the Construction Schedule.

20.2.2. Contractor abandons the Project site.

20.2.3. Contractor fails to replace or repair any damage caused by Contractor or its agents, representatives, contractors, subcontractors, or employees in connection with performance of the Work.

20.2.4. Contractor fails to supply workers, subcontractors, or other personnel with the skills, certifications, or licenses required by the Contract Documents.

20.2.5. Contractor violates any legal requirement related to the Work.

20.2.6. Contractor is insolvent, files for bankruptcy, makes a general assignment for the benefit of its creditors, or fails to pay its debts as they become due.

20.2.7. Contractor fails to perform any portion of the Work in accordance with the requirements of the Contract Documents.

20.3. **City Remedies**. The City may, in the discretion of the City Engineer, take any or all of the actions identified in this subsection, if the Contractor fails to: (a) promptly commence, and diligently and continuously prosecute the cure of the default, or (b) within ten (10) days, cure the default, or provide adequate written assurance to the satisfaction of the City Engineer that the cure will be promptly commenced and diligently prosecuted to its completion:

20.3.1. Demand the Contractor to complete performance of the Work (including repair, or removal and replacement, of nonconforming Work).

20.3.2. Issue a Notice of Suspension of Work, by which the Contractor shall suspend all Work except for those portions of the Work authorized by the Notice, and for which the Contractor shall not be entitled to any adjustment of the Contract Amount or Contract Time. Notwithstanding the timing requirements of this Section 19.3, if the City Engineer determines that a default may have a potentially adverse impact on the safety of persons or property (including but not limited to a failure by the Contractor to maintain documentation of insurance or improvement security as required by this Agreement), the City Engineer may immediately issue a Notice of Suspension of Work in accordance with this subsection.

20.3.3. Cure the default and charge the Contractor for all costs resulting therefrom, including administrative costs (including City staff costs, City consultant costs, and attorney's fees) and interest in an amount equal to seven percent (7 %) per annum from the date of default, which charge may be deducted by the City from amounts otherwise payable to the Contractor.

20.3.4. Remove the Contractor from the site and demand the Contractor's surety (if any) to complete performance of the Work.

20.3.5. Take possession of the Project site and all materials, supplies, equipment, tools, and construction equipment and machinery thereon owned by Contractor; accept the assignment of any or all of the subcontracts; and then complete the Work by any method the City may deem expedient. If requested by the City, Contractor shall remove any part or all of Contractor's materials, supplies, equipment, tools, and construction equipment and machinery from the Project site within seven (7) days of such request; and if Contractor fails to do so, the City may remove or store, and after ninety (90) days sell, any of the same at Contractor's expense.

20.3.6. Terminate the Contract.

20.4. **Termination for Default**. In the event that the Contract is terminated by the City in accordance with this section:

20.4.1. Contractor shall not be entitled to receive any further payment until the expiration of thirty-five (35) days after Final Completion and acceptance of all Work by the City

20.4.2. If the unpaid balance of the Contract Amount (to which the Contractor is otherwise entitled in accordance with the Contract) exceeds the cost of completing the Work (including all additional costs and expenses made necessary thereby, plus all losses sustained, including any liquidated damages provided under the Contract Documents), such excess shall be paid to Contractor. If the cost of completing the Work exceeds the unpaid balance of the Contract Amount, Contractor shall pay such excess to the City.

20.4.3. No termination or action taken by the City after termination shall prejudice any other rights or remedies of the City provided by law or by the Contract Documents upon such termination; and the City may proceed against Contractor to recover all losses suffered by the City.

21. **NOTICES.** All notices or demands which the Contract Documents contemplates or requires shall be in writing and shall be delivered to the respective party as set forth in this section. Communications shall be deemed to be effective on the first to occur of: (a) actual receipt by a party's Authorized Representative; (b) actual receipt at the address designated below; or (c) three working days following the deposit in the United States Mail of registered or certified mail, sent to the address designated below. The Authorized Representative of either party may modify their respective contact information identified in this section by providing notice to the other party.

TO: City of Belmont	**To: Contractor**
Attn:.	Attn:
One Twin Pines Lane, Suite	
Belmont, CA 94002	

22. **HEADINGS.** The heading titles for each paragraph of the Contract Documents are included only as a guide to the contents and are not to be considered as controlling, enlarging, or restricting the interpretation of the Contract Documents.

23. **SEVERABILITY.** If any term of the Contract Documents (including any phrase, provision, covenant, or condition) is held by a court of competent jurisdiction to be invalid or unenforceable, the Contract Documents shall be construed as not containing that term, and the remainder of this Agreement shall remain in full force and effect; provided, however, this section shall not apply to the extent that enforcement of the Contract Documents without the term would be grossly inequitable under all the circumstances or would frustrate the purposes of the Contract Documents.

24. **INTERPRETATION OF CONTRACT DOCUMENTS**.

24.1. **Governing Law, Jurisdiction, and Venue.** The interpretation, validity, and enforcement of the Contract Documents shall be governed by and construed under the laws of the State of California. Any suit, claim, or legal proceeding of any kind related to this Agreement shall be filed and heard in a court of competent jurisdiction in the County of San Mateo.

24.2. **Industry Standards.** When Contract terms have a customary technical or trade meaning, the terms shall be interpreted in accordance with that meaning.

24.3. **Standard Specifications and Codes.** References to any regulations (including: standard specifications, manuals or codes of a technical society, organization or association; or laws or regulations of any governmental authority) shall mean the regulations in effect at the time of the Bid Opening, unless otherwise specifically identified in the Contract Documents.

25. **ATTORNEY'S FEES.** In the event any legal action is commenced to enforce the Contract Documents, the prevailing party is entitled to reasonable attorney's fees, costs, and expenses incurred, not to exceed $10,000.

26. **ASSIGNMENT AND DELEGATION**.

26.1. **Assignment of The Contract Documents.** The Contract Documents, and any portion thereof, shall not be assigned or transferred, nor shall any of the Contractor's duties be delegated, without the written consent of the City. Any attempt to assign or delegate the Contract Documents without the written consent of the City shall be void and of no force or effect. A consent by the City to one assignment shall not be deemed to be a consent to any subsequent assignment.

26.2. **Antitrust Claims.** As required by the instructions to bidders and Government Code Section 4552, the Contractor hereby agrees to assign to the City, all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Action (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the California Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the City tenders final payment to the Contractor, without further acknowledgment by the parties. The Contractor further warrants that all goods, services, and materials provided to the City in accordance with this Contract are free and clear of all liens and encumbrances.

27. **MODIFICATIONS.** The Contract Documents may not be modified orally or in any manner other than by an agreement of the parties, in writing, in accordance with requirements of the Contract Documents.

28. **WAIVERS.** Waiver of a breach or default under the Contract Documents shall not constitute a continuing waiver or a waiver of a subsequent breach of the same or any other provision of the Contract Documents.

29. **CONFLICTS.** If any conflicts arise between the terms and conditions of this Agreement and the terms and conditions of the attached exhibits or any documents expressly incorporated, the terms and conditions of this Agreement shall control.

30. **ENTIRE AGREEMENT.** The Contract Documents, including all documents incorporated herein by reference, comprise the entire integrated understanding between the City and Contractor concerning the Work to be performed for this Project. The Contract Documents supersede all prior negotiations, agreements, and understandings regarding this matter, whether written or oral. The Contract Documents are complementary; what is called for in one is binding as if called for by all. To the extent that portions of the Contract Documents are not attached to this Agreement, they shall be deemed incorporated herein by reference.

31. **SIGNATURES.** The individuals executing this Agreement represent and warrant that they have the right, power, legal capacity, and authority to enter into and to execute the Contract Documents on behalf of the respective legal entities of the Contractor and the City. The Contract Documents shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF the City and the Contractor do hereby agree to the full performance of the terms set forth herein.

CITY OF BELMONT	**CONTRACTOR**
By: _____ Afshin Oskoui, City Manager	By: _____ _____ (print name) (print title)
Date: _____	Date: _____
APPROVED AS TO FORM	By: _____ _____ (print name) (print title)
_____ Scott M. Rennie, City Attorney	Date: _____
FUNDING VERIFIED	
_____ Grace Castaneda, Finance Director	

City of Belmont Contract Documents
Project: San Juan Pump Station & Force Main Rehabilitation Project
City Contract Number 2026-645

INSTRUCTIONS FOR SIGNATURES – DO NOT INCLUDE WITH SIGNED CONTRACT

****
****

[PLEASE SELECT THE APPROPRIATE SIGNATURE BLOCK FROM THE FOLLOWING SAMPLES]

CORPORATIONS

XYZ Land Development Inc,

a California corporation

By: _____

Its: _____

[needs to be officer from the operations side:

President, CEO, Vice President]

By: _____

Its: _____

[needs to be officer from the finance side: Treasurer, CFO, Secretary]

One corporate signature is acceptable if the person is an officer if the signature is notarized (although we would like you to ask for a corporate resolution showing that person is authorized to sign). A single signature where the person is not a corporate officer – eg general manager, etc – must be supported by a corporate resolution indicating that person has been delegated authority to sign contracts on behalf of the corporation

GENERAL PARTNERSHIPS

XYZ Land Development,

a California general partnership

By: _____

Its: General Partner

LIMITED PARTNERSHIPS

XYZ Land Development, LLP,

A California limited partnership

By: _____

Its: General Partner

[need limited partnership agreement or certificate filed with state showing the person or entity is the general partner]

In many cases the general partner will be a corporation so the signature block would look like this:

XYZ Land Development, LP,

A California limited partnership

By: ABC Developers, Inc,

a California corporation

Its: General Partner

By: _____

Its: President, CEO, VP

By: _____

Its: Secretary, Treasurer, CFO

LIMITED LIABILITY COMPANY

XYZ Land Development, LLC,

a California Limited Liability Company

By: _____

Its: Managing Member

[we need to see the operating agreement or certificate filed with secretary of state showing the person or entity is the managing member]

If the Managing Member is not an individual, but is a business entity then you would indent the signature block for the appropriate persons to sign as in the example for the limited partnership above.

****

[PLEASE SELECT THE APPROPRIATE SIGNATURE BLOCK FROM THE FOLLOWING SAMPLES]

CORPORATIONS

XYZ Land Development Inc,
a California corporation

By: _____

Its: _____

*[needs to be officer from the operations side:
President, CEO, Vice President]*

By: _____

Its: _____
[needs to be officer from the finance side: Treasurer, CFO, Secretary]

One corporate signature is acceptable if the person is an officer if the signature is notarized (although we would like you to ask for a corporate resolution showing that person is authorized to sign). A single signature where the person is not a corporate officer – e.g. general manager, etc. – must be supported by a corporate resolution indicating that person has been delegated authority to sign contracts on behalf of the corporation

GENERAL PARTNERSHIPS

XYZ Land Development,
a California general partnership

By: _____

Its: General Partner

LIMITED PARTNERSHIPS

XYZ Land Development, LLP,
A California limited partnership

By: _____

Its: General Partner
[need limited partnership agreement or certificate filed with state showing the person or entity is the general partner]

In many cases the general partner will be a corporation so the signature block would look like this:

XYZ Land Development, LP,
A California limited partnership

By: ABC Developers, Inc,
a California corporation

Its: General Partner

By: _____

Its: President, CEO, VP

By: _____

Its: Secretary, Treasurer, CFO

LIMITED LIABILITY COMPANY
XYZ Land Development, LLC, a California Limited Liability Company

By: _____

Its: Managing Member
[we need to see the operating agreement or certificate filed with secretary of state showing the person or entity is the managing member]

If the Managing Member is not an individual, but is a business entity then you would indent the signature block for the appropriate persons to sign as in the example for the limited partnership above.

PERFORMANCE BOND **Bond No. _____**

WHEREAS,_____ ("Principal") has entered into an "Agreement" with the City of Belmont ("City") for the Project identified on this Bond, the terms and conditions of which are incorporated herein by reference; and the terms of the Agreement require the Principal to submit performance security.

NOW, THEREFORE, Principal and _____ ("Surety"), are hereby held and firmly bound unto the City in the amount of $_____, for payment of which Principal and Surety hereby bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal (or its heirs, executors, administrators, successors, or assigns approved by the City) performs the covenants, conditions, and obligations of the Agreement, including the obligation to indemnify, defend, and hold harmless the City, then this obligation shall be null and void; otherwise it shall be and remain in full force and effect.

The Surety's obligation under this bond shall arise after the City has provided written notice to the Surety, at the address set forth below, of the Principal's default under the Agreement, and the Principal's failure to cure the default in accordance with the terms of the Agreement.

The Surety hereby agrees, for value received, that its obligations under this bond shall in no way be impaired or modified by any modification to the Agreement by the City and the Principal, and the Surety hereby waives notice of any such modification.

In the event suit is brought upon this bond, the surety shall pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit, which fees and costs shall be in addition to the face amount of the bond.

IN WITNESS WHEREOF, the undersigned represent and warrant that they have the right, power, legal capacity, and authority to enter into and execute this document on behalf of the Principal and the Surety, and have caused this document to be executed by setting hereto their names, titles, and signatures.

Principal	**Surety**
_____	_____
By: _____	By: _____
Title: _____	Title: _____
Date:	Date: _____
	Address for Notices to Surety: _____
	_____
	_____

NOTE: NOTARY ACKNOWLEDGMENT FOR SURETY AND SURETY'S POWER OF ATTORNEY MUST BE ATTACHED.

PAYMENT BOND **Bond No. _____**

WHEREAS, _____("Principal") has entered into an "Agreement" with the City of Belmont ("City") for the Project identified on this Bond, the terms and conditions of which are incorporated herein by reference; and the terms of the Agreement require the Principal to submit payment (labor & material) security for the benefit of all "Claimants"; and the term "Claimants" is defined as any of the persons named in California Civil Code Section 3181, or their assigns.

NOW, THEREFORE, Principal and _____ ("Surety"), are hereby held and firmly bound unto the City, and all Claimants, in the amount of $_____, for payment of which Principal and Surety hereby bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the Principal (or its heirs, executors, administrators, successors, or assigns approved by the City) and all of its subcontractors pay: (a) all Claimants, and (b) all amounts due under the California Unemployment Insurance Code with respect to work or labor performed under the Agreement, and (c) all amounts required to be deducted, withheld, and paid over to the California Employment Development Department from the wages of employees of the Principal and its subcontractors pursuant to California Unemployment Insurance Code Section 13020 with respect to such work and labor; then this obligation shall become and be null and void; otherwise it shall remain in full force and effect.

The Surety's obligation under this bond shall arise, and the Surety shall make appropriate payments, after the Surety has received written notice, at the address set forth below, of the Principal's failure to make payment in accordance with the obligations of the Agreement or this bond. This bond shall inure to the benefit of the City and Claimants, as to give a right of action to any Claimant or their assigns in any suit brought upon this bond. In the event suit is brought upon this bond, the surety shall pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit, which fees and costs shall be in addition to the face amount of the bond. The Surety hereby agrees, for value received, that its obligations under this bond shall in no way be impaired or modified by any modification to the Agreement by the City and the Principal, and the Surety hereby waives notice of any such modification.

IN WITNESS WHEREOF, the undersigned represent and warrant that they have the right, power, legal capacity, and authority to enter into and execute this document on behalf of the Principal and the Surety, and have caused this document to be executed by setting hereto their names, titles, and signatures.

Principal	**Surety**
_____	_____
By: _____	By: _____
Title: _____	Title: _____
Date:	Date: _____
	Address for Notices to Surety: _____
	_____
	_____

NOTARY ACKNOWLEDGMENT FOR SURETY AND SURETY'S POWER OF ATTORNEY MUST BE ATTACHED.

MAINTENANCE BOND

(To be executed after acceptance of project by the City Council)

KNOW ALL MEN BY THESE PRESENTS, that we, _____ as Principal, and _____, as Surety, are held and firmly bound unto the City of Belmont (hereinafter called the Obligee), in the penal sum of _____ Dollars ($_____) for the payment of which, well and truly to be made, we do hereby bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has heretofore entered into a contract with the Obligee for the _____Project, City Contract No._____; and,

WHEREAS, the work called for under the contract has now been completed and accepted by Obligee;

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH, that if the Principal shall for a period of one (1) year from and after the date of the completion and acceptance of the contract indemnify the Obligee against any loss or damage directly arising by reason of any defect in the material or workmanship that may be discovered within the period aforesaid, then this obligation shall be void; otherwise to remain in full force and effect.

All suits at law or proceedings in equity to recover on this bond must be instituted within twelve (12) months after the expiration of the maintenance period provided for herein.

Principal: _____	Surety: _____
Corporate Seal (where appropriate)	Corporate Seal (where appropriate)
_____	_____
Authorized Signature	Authorized Signature
_____	_____
Printed name and title	Printed name and title
_____	_____
Date	Date
_____	_____
Street Address	Street Address
_____	_____
City, State, Zip Code	City, State, Zip Code

ALTERNATIVE CLAUSES

1. **Identification of Plans.** The Contract Documents are more particularly defined in the Agreement, and generally include: all Bidding Documents (including the Invitation For Bids, these Instructions to Bidders, Addenda [if any], and Bid Forms), the Agreement, the Specifications (including the General Conditions, the Special Provisions , and the Technical Specifications), the Exhibits (including bonds), and the Drawings (also referred to as "Plans").

2. **Truck Routes.** Pursuant to City ordinances, use only authorized truck routes. Additional information is listed below:

   The following streets are hereby declared to be truck routes for the movement of vehicles including loads in excess of EIGHT (8) TONS:
   - All of Old County road within the City
   - O'Neill Avenue from its intersection with Old County Road to its intersection with Kedith Street

   The following truck traffic routes shall be limited to a maximum gross weight, including load, of THIRTEEN (13) Tons:
   - All of Ralston Avenue

   The maximum combined total vehicle weight, plus load, on all remaining streets shall not exceed Eight (8) Tons.

   REQUIREMENT FOR PUBLIC NOTIFICATION
   If more than fifty (50) yards of material will be hauled, the permit applicant shall be required to notify all property owners within a three hundred (300) foot radius of the date and time that the hauling will take place. (Belmont City Code Section 14-94(f)).

Alternate Improvement Security Clauses for Agreement Section 13:

Warranty security in the amount of 10 % of the Contract Amount (in the form of the Faithful Performance security) to secure faithful performance of this Agreement (from the date on which the City accepts the Work as complete until one year thereafter).

Alternate Insurance Clauses for Agreement Section 14:

Risk Management may require additional insurance coverage (e.g., $3,000,000 for commercial general liability).

Deductibles and Self-Insured Retentions. Any deductibles (including any self-insured retentions) must be declared to and approved by the City.

If the amount of the deductible for commercial general liability is greater than $_____, the Contractor shall either: reduce the deductible to an amount less than or equal to

$_____, or the Contractor shall procure a bond in an amount sufficient to guarantee payment of claims within the deductible amount (including losses and related investigations, administration and defense expenses).

If the amount of the deductible for property insurance is greater than $_____, the Contractor shall either: reduce the deductible to an amount less than or equal to $_____, or the Contractor shall procure a bond in an amount sufficient to guarantee payment of claims within the deductible amount (including losses and related investigations, administration and defense expenses).

Alternative Clauses 1 of 1

GENERAL CONDITIONS

CITY OF BELMONT
CITY CONTRACT NUMBER 2026-645
San Juan Pump Station & Force Main Rehabilitation Project

G.C. 1 STANDARD SPECIFICATIONS

The State of California Department of Transportation Standard Specifications "Caltrans Standard Specifications" (2025) in conjunction with Standard Specifications for Public Works Construction "Greenbook" (2025) shall be the referenced standard specifications for this contract. All work shall conform to the aforementioned standard specifications, including General Conditions, Special Provisions and Technical Specifications, unless otherwise specified in the Contract Documents.

G.C. 2 DEFINITIONS

"City of Belmont," the "Contractor," and the "Contract Documents" are identified in the Standard Contract Agreement. The "City of Belmont" and the "Contractor" include their authorized representatives and are treated throughout as if each were singular in number and neuter in gender. "Contractor" includes its surety. Whenever in the Standard Specifications and Contract Documents the following terms are used, they shall be understood to mean and refer to the following:

A. Agency/City The City of Belmont, California

B. Engineer/The Director of Public Works and his authorized representatives.

G.C. 3 ENGINEER

The Engineer shall act as the City's representative during the construction period. He shall determine the amount, quality, acceptability and fitness of parts of the work and interpret the Contract Documents. The Engineer will make visits to the site and determine if the work is proceeding in accordance with the Contract Documents. No act or omission of the Engineer shall relieve the Contractor of the duty to proceed with the work in strict conformity with the Contract Documents.

At least one week prior to the start of work, the Contractor shall furnish to the Engineer a Schedule of Work showing the Contractor's planned sequence of operations. Such schedule shall be subject to the review and approval of the Engineer. No work shall be done until the Contractor and the Engineer have agreed to the schedule to be followed by the Contractor.

Upon request, the Engineer shall reduce to writing any oral order, objection requirement or determination. All communications to the City by the Contractor shall be via the Engineer. Whenever the Engineer's approval is requested, it shall be in writing only.
In accordance with Belmont's Construction Noise Ordinance, work within the City's right of way shall be done during normal working hours of 8 am to 5 pm, Monday through Friday.

The Contractor shall hand deliver written notification to the Engineer prior to any emergency overtime, weekend or holiday. The sum of the City Inspector's pay for inspection of overtime weekend or holiday work performed will be deducted from any moneys due to the Contractor.

Overtime is defined as work in excess of 8 hours in a day. The Contractor, and not the Engineer, shall be responsible for the construction means, controls, techniques, sequences, procedures and construction safety.

As stated elsewhere, amounts shown in the Proposal and Contract as to quantities are estimates only. From time to time, the Engineer shall direct the Contractor as to the prosecution of the work in such manner as to increase or decrease such estimates as to the work actually to be done. The Contractor shall comply with such instructions and shall be paid only for work actually done based on the unit prices set out in the Contract.

G.C. 4 AWARD AND EXECUTION OF CONTRACT

The right is reserved to reject any bids if the Engineer is not satisfied that the bidder is fully qualified to carry out the terms of the Contract.

G.C. 5 PROTECTION

At his expense the Contractor shall:

A. Protect all utilities from damage and not disturb such utilities without approval of the governing agency. Contact Underground Service Alert (USA) at 1-800-227-2600 at least 48 hours prior to commencing excavations.

B. Work with the respective utility companies to assure proper reconnection and relocation of such services. The Contractor is expected to include the cost of working with these utility companies in the price bid for the work involved.

C. Take every precaution against injuries to persons or damage to property.

D. Comply with regulations governing the use of the property. The Contractor shall furnish the City with a copy of written permission from the property owner to the Contractor prior to using private property for any storage of materials, equipment or debris.

E. Store and suitably protect its apparatus, equipment, materials, and supplies in an orderly fashion on site.

F. Place on the work only such loads as are consistent with the safety of the work.

G. Effect all cutting, fitting, or patching or its work required to make it conform to the Plans and Specifications and interrelated with other improvements but, except with the consent of the Engineer, shall not cut or otherwise alter existing improvements.

H. Protect and preserve established benchmarks and monuments, make no changes in the location of such without the prior written approval of the City, and replace and relocate any which may be lost or destroyed or which require shifting because of necessary changes in grades or locations. All replacement and relocation work shall be accomplished only after approval of the City and under the direct supervision and instructions of the Engineer.

I. Before final payment, remove all surplus material, false work, temporary structures, debris, and similar matter resulting from its operation from the site and put the site in an orderly condition.

J. Construct, operate and maintain all passageways, guard fences, lights, barricades and other facilities required for protection by state or municipal laws and regulations and local conditions during the course of the work.

K. Guard the City's property from injury or loss.

L. Take all reasonable precautions for dust and noise control and generally conduct operations so as not to constitute a nuisance.

M. Protect existing signs, fences, asphalt pavement, concrete curb, and gutter and other highway facilities which may be encountered in the roadway. The replacement or repair of any facilities which the City deems necessary as a result of the Contractor's operations shall be done by the Contractor at its own expense and to the satisfaction of the City.

G.C. 6 VALUE ENGINEERING

The City is receptive to proposals from the Contractor identifying ways to reduce project costs and will share 50% of the cost savings with the Contractor if the proposal is accepted. The City encourages the Contractor to submit cost saving proposals on construction methods, products or materials that are equal to, or better than, what is specified by the project plans or specifications. The City is not obligated to accept and implement the proposal; however, if the City does accept the proposal for implementation, the City will share 50% of the cost savings with the Contractor. The cost savings shall be limited to the project for which the proposal is made. The City retains the right to implement the Contractor's proposal on future projects without obligation to sharing the future cost savings. The cost saving/value engineering program is administered by the City in accordance with California Public Contract Code Section 7101.

G.C. 7 CHANGES IN THE WORK

The City shall have the right to make any reasonable changes in the project plans or quantities determined to be necessary or expedient. In case such changes increase or diminish the work shown, the Contractor shall be paid for the work actually done at a mutually agree upon adjustment to the Contract price, based upon the accepted Bid Proposal or according to the provisions of Paragraph 7, Changes in Work. The Contractor shall not be entitled to extra payment, nor shall any claim be made on account of anticipated profits on the work that may be omitted.

G.C. 8 CHANGES IN CONTRACT PRICES

Whenever corrections, alterations, or modifications of the work under this Contract are ordered by the Engineer and increase the amount of work to be done, such added work shall be known as extra work; and when such corrections, alterations, or modifications decrease the amount of work to be done, such subtracted work shall be known as work omitted.

The difference in cost of the work affected by such change will be added to or deducted from the amount of said Contract price, as the case may be, by a fair and reasonable valuation, which shall be determined in one or more of the following ways:

a. By agreed lump sum
b. By agreed unit prices
c. By Force Account

If neither a nor b methods can be agreed upon and the Contractor receives written order to make such changes, the Contractor shall be compensated by Force Account for his actual necessary

costs, including labor, material, and equipment rental, as determined by the Engineer, plus a negotiated fixed fee for profit and such overhead items as home and branch office expenses, general expenses, general superintendence, indirect labor, and licenses. The negotiated fixed fee shall not exceed fifteen percent (15%) of actual necessary direct costs.

In addition to the actual cost of labor, the amount due the Contractor shall include the cost of compensation insurance, contributions made to the State as required by the provisions of the Unemployment Reserve Act, Chapter 352, Statutes of 1935, as amended; and for taxes paid the Federal Government, as required by the Social Security Act, approved August 14, 1935, as amended to date, plus other payments the Contractor must make to, or on behalf of, the workers.

For use of equipment owned by the Contractor, the rental rates therefore shall be based upon the current prices prevailing in the locality, not to exceed the rates promulgated by the California (State) Department of Transportation in effect at the time the work was performed.

It is understood that labor, materials, and equipment may be furnished by the Contractor, or by the subcontractor, or by others on behalf of the Contractor. When the work is performed by other than the Contractor's organization, the Contractor shall reach an agreement with such other forces as to the distribution of payments made for such, and no additional payment therefore will be made by the City.

When Force Account work is performed by a bona fide and approved subcontractor, the negotiated fixed fee markup is limited to ten percent (10%) for the subcontractor, and five percent (5%) for the prime Contractor, on the performing subcontractor's actual costs, and no markup will be allowed for any intermediary subcontractor between the performing subcontractor and the prime Contractor.

All labor furnished on Force Account work shall be adjusted daily upon report sheets, furnished by the Contractor and signed by both parties, which daily report sheets hall thereafter by considered the true record of Force Account labor provided.

In order that a proper estimate may be made by the Engineer of the net cost of labor and materials entered into Force Account work, in accordance with the procedure hereinbefore stated, the Contractor shall furnish weekly an itemized statement of materials and labor supplied together with the cost of such material and the wages paid, and shall furnish vouchers for quantities and prices of such labor, material, or work. In case the Contractor fails to comply with the above provisions, he shall have no claim for compensation against the City.

City reserves the right to contract with any person or firm other than the Contractor for any or all extra work. The Contractor's attention is especially called to the fact that he shall be entitled to no claim for damages for anticipated profits on any portions of work that may be awarded to others.

When the Contractor considers that any changes ordered involve extra work that the Engineer has not recognized as such, he shall immediately notify the Engineer in writing as to when and where alleged extra work is to be performed. If the Engineer directs by written order that the alleged extra work be performed, the Contractor shall comply, and shall make claim for compensation therefore each month not later than the 20th day of the month during which the work claimed to be extra work was performed, and he shall submit a weekly complete statement

of materials used and expenses incurred on account of extra work performed, showing allocation of all materials and expenses. All such claims shall state the date of the Engineer's written order.

Unless such notification is made in writing and unless complete statements of materials used and expenses incurred on account of such alleged extra work are furnished as above required, the Contractor shall not be entitled to consideration for payment for alleged extra work, and any future claims for compensation for such alleged extra work shall be invalidated.

G.C. 9 BRAND OR TRADE NAME - SUBSTITUTE OF EQUALS

Reference is made in Section 3400 of the California Public Contracts Code, which is by this reference incorporated herein with like effect as if here set forth in full.

If a potential bidder believes he knows of an equal to a specified brand or trade name which is not mentioned in the Contract Documents, then such potential bidder may so advise the Engineer of such fact, giving all relevant information. If appropriate, an Addendum will be issued as to the alleged equal provided that such issuance may be accomplished at least 5 days before the time fixed for opening bids.

Unless the subject article or product is expressly designated for matching others in use in a particular public improvement either completed or in the course of completion, any bidder may, as part of its bid proposal, include a request for substitution of an item equal to any specified brand or trade name. At the preconstruction meeting, the Contractor may submit to the Engineer data substantiating such a request, and the difference, if any, in cost. The Engineer shall promptly investigate the request and make a recommendation to the City as to equality.

The City shall promptly determine where the substitute is equal in every respect to the item specified, and approve or deny the request accordingly, and shall notify the Engineer of the determination made, who shall advise the Contractor in writing of the decision. Unless the request is granted, substitution will not be permitted. In accordance with Section 3400 of the California Public Contracts Code, the Contractor shall be provided a period of not less than 35 days after the award of contract for submission of data substantiating a request for a substitution of "an equal" item.

The City has identified standardized pump station equipment and materials as listed in Appendix of the Technical Specifications. The Contractor shall supply the specific make and model of the standardized equipment as listed in the technical specifications and in Appendix to the Technical specifications, no other products will be considered "an equal".

Nothing herein shall authorize a change in the Contract price or prevent the use of change order in the manner provided elsewhere in the Contract Documents.

G.C. 10 FINAL INSPECTION, ACCEPTANCE AND NOTICE OF COMPLETION

Upon written notice from the Contractor that the entire work required by the Contract Documents is complete and that all submittals required by him are made, and after the Contractor has delivered the bonds, certificates of inspection, proof of insurance, guarantees, warranties, releases, and other documents, all as required by the Contract Documents or by law, a post construction conference will be held to review the work and resolve any unsettled matters.

Present at the conference shall be the Engineer, the Inspector, the Contractor, and the Contractor's Superintendent. Following this conference, Engineer will make a final inspection, the Contractor, and the City will notify the Contractor in writing of any deficiencies in the submittals and other documents required of him. The Contractor promptly shall make such corrections as are necessary to remedy all defects or deficiencies. After the Contract has completed any such corrections to the satisfaction of the City, the City will issue a written final acceptance of the work and file any notice of completion required by law or otherwise.

Final Inspection will be in two phases: a semi-final inspection by the Construction Inspector and the Contractor; and a final inspection, including representatives of the City, the Contractor, and any State or County agency. At the conclusion of the semi-final inspection, the Construction Inspector will provide the Contractor, in writing, a "punch list" of items requiring completion of remedial work. The Contractor shall rectify all matters on the "punch list" before making his formal request, in writing, for Final Inspection. Upon completion of the final inspection, if further completion or remedial work is determined to be necessary, the Engineer shall transmit to the Contractor a final list of items for remedial attention. After final inspection, the City Council will adopt a resolution determining that the contract work, or designated phases thereof, is substantially complete and is accepted.

G.C. 11 GUARANTEE AND WARRANTY OF WORK

The Contractor shall submit all products and materials to be used to the Engineer for approval. The Contractor shall provide a list of submittals at the pre-construction conference.

Notwithstanding inspections and acceptance by the City of work furnished under this contract, the Contractor warrants to the City that all materials and equipment furnished under the contract, including that provided pursuant to change orders, will be of good quality and new, that the work will be free from defects in material or workmanship and that the work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.

This warranty by the Contractor is in addition to any warranties or guarantees required by the special provisions or technical specifications for specified items of equipment or materials. This warranty shall be in effect notwithstanding any disclaimers, or limiting or conditional terms contained such separate warranties furnished by manufacturers or suppliers.

If, within one year after the date of final acceptance of the work by the City, any of the work is found not to be in accordance with the Contract Documents the Contractor shall correct it promptly after written notice from the City to do so, and pay for any damage to other property resulting from such non-conforming work. If the Contractor fails to make the repairs or replacements promptly, or in any emergency when delay could cause risk or damage or loss, the City may have the non-conforming work removed, replaced or corrected at the expense of the Contractor and his surety. If the amount of the performance bond is insufficient to cover such work, the Contractor shall be liable to pay any such deficiency on demand by the City. Nonconforming work which is remedied under this Section shall be subject to an extended warranty obligation for a period of one year after the non-conforming work has been remedied.

All workmanship performed, and materials/equipment installed, as part of this contract shall be guaranteed for a period of one year, commencing upon issuance of the Notice of Completion for the work under this contract.

G.C. 12 CITY'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

The City, without prejudice to such other right, remedy or relief it may be entitled to, may by giving ten (10) days notice to the Contractor, terminate the employment of the Contractor and it his right to proceed, if:

A. The Contractor shall be adjudged bankrupt or make an assignment for the benefit of creditors.

B. A receiver or liquidator is appointed for the Contractor or any of its property.

C. The Contractor shall refuse or fail after Notice of Warning from the City by the Engineer to supply sufficient properly skilled workmen or suitable materials.

D. The Contractor fails to prosecute the work with such diligence as will insure its completion within the stipulated time period.

E. The Contractor shall fail to make payments to persons supplying labor or materials for the work.

F. The Contractor does not comply with applicable law or instructions of the Engineer.

G. The Contractor is otherwise guilty of a substantial violation of any provision of the Contract Documents.

If the City determines that the Contractor has failed to perform any of its obligations under the Standard Contract Agreement or to otherwise comply with the Standard Contract Agreement, then, in addition to all other remedies provided by law, City may terminate the Standard Contract Agreement immediately upon written notice to the Contractor provided, however, that if the City's determination of the Contractor's failure to perform under or comply with the Standard Contract Agreement can be cured by Contractor within thirty (30) days from the date that City discovers Contractor's failure to perform or comply, then the City may provide Contractor with a notice of Contractor's failure to perform or comply and provide Contractor with a definite period of time, to be specified in the notice and not to exceed a maximum period of thirty (30) days from the date of the notice, to cure. Failure to perform or comply to City's satisfaction within the definite time period specified in the notice are grounds for termination by City.

The City Manager is empowered to terminate the Standard Contract Agreement and issue the notices provided for in this Section on behalf of City. In the event of termination, the Contractor shall immediately cease all work being performed under the Standard Contract Agreement. Termination of the Standard Contract Agreement by City shall constitute the withdrawal of any consent or authorization of City for Contractor to perform any construction or other work under the Standard Contract Agreement in the public right-of-way or on public property, excepting only that work necessary to leave all work site areas in a clean and safe condition.

The City's right to terminate may be for the entire work, or at the City's option, as to any portion thereof as to which delay shall have occurred or breach or miscompliance related, and may thereupon take possession of the entire work or portion thereof. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance shall exceed the expense of completion, and other damage, expense or loss of the City

occasioned by the Contractor's failure to properly perform, the Contractor shall pay such excess. If such expense and damage exceeds the unpaid balance, the Contractor is liable to the City for the excess. If the City elects to proceed under this Section, it may take possession of and utilize in completing the work such materials, supplies, pain and equipment on site which may be necessary or convenient for the purpose of completing the work. The City is expressly granted the right, acting via an Engineer or otherwise, to operate equipment and machinery on site for the purpose of determining whether it has a basis for proceeding under this Section.

G.C. 13 PAYMENT AND MONTHLY ESTIMATES

1. Schedules, Reports and Records As stated in Section 9-2 of the Standard Specification for Public Works Construction "Greenbook" (latest edition), the Contractor is required to submit to the Engineer for approval, a schedule of values for bid items. Lump Sum bid items are to be broken out into appropriate segments to create the schedule. This is to be integrated with the project work schedule and submittal schedule. These schedules will be used in the evaluation of Contractor Progress Payment Requests to the City.

2. Pay Period On or immediately after the first day of each month, the Contractor is to submit to the Engineer a "Request For Progress Payment." This request is to be for work performed and for materials on the site up to and including the last day of the month. The Request For Progress Payment is to be submitted on a "Payment Application and Certificate" form (CP-14).

3. Retentions Pursuant to Section 9-3.2 of the Specifications, 5 percent of each month's amount earned by the Contractor will be retained by the City until 50 percent of the contract work is completed. At that point, at the Engineer's discretion, if work is proceeding satisfactorily, retention may be discontinued except for the amount previously retained. Pursuant to Section 9-3.2 of the Standard Specification for Public Works Construction "Greenbook" (latest edition), the Contractor may elect to place sufficient acceptable securities with the City or in an escrow account, in lieu of the Engineer's retention of the funds. Earnings from such an escrow account shall accrue to the benefit of the Contractor. All procedures and documentation shall be as provided by State Law.

4. Preparation and Processing of Monthly Progress Payment Requests Each monthly progress payment shall be submitted on a copy of the form "Payment Application and Certificate" (CP-14). It shall be prepared and certified by the Contractor and submitted to the Engineer, on or immediately following the last day of the month. It shall include the Contractor's itemization, prepared in a format approved by the Engineer and including the approved schedule of values. The "Payment Application and Certificate" (Form CP-14) shall be signed by an authorized representative of the Contractor.

Preparation of the request for progress payment should be preceded by consultation between the Contractor and the Engineer to determine acceptable percentages of completion for items in the Schedule of Values for which work has been performed. The extension of the total amount due per Schedule Item should agree with the percentage of completion. This may necessitate expressing the percentage figure to four decimal places.

Pursuant to Section 9-3.3 of the Specifications, requests for payments for materials on the site shall be accompanied by invoices, bills of sale, delivery tickets or other documentation that establishes the City's title and the value of materials for which payment is requested.

Requests for payment of Change Orders authorized by the City shall be accompanied by signed daily work orders for labor, equipment and materials if performed on a time and material basis. These are to be submitted on "Cost of Work Record" forms (CP-18).

The Engineer will review the request, check all mathematical entries, percentages and extension, and when satisfactory, will transmit the Form CP-14 to the Director of Public Works with recommendation for payment. Upon approval, the Engineer will submit, the progress payment request to the City's Finance Department for payment to the contractor. Payment will then be issued to the Contractor by the City, with retention of a portion of the funds by the City, as indicated above. If a retention securities escrow account has been established, the City will make 100% payment of the approved monthly progress payment.

Upon satisfactory completion of the Contract work, and official acceptance by the City, the retained amount will be paid to the Contractor by City, or the City will authorize the release of impounded securities to the Contractor, all subject to the provisions of Section 9-3.1 of the Specifications.

G.C. 14 FAILURE TO COMPLETE THE WORK IN THE TIME AGREED UPON

It is agreed by the parties to the Contract that time is of the essence; and that in the case all the work is not completed before or upon the expiration of the time limit set forth, damage will be sustained by the City and it is, therefore, agreed that the Contractor will pay to the City as damages the amount of the actual damage as determined, due to the failure to complete the work in the time agreed upon. In addition, the City shall have the right to charge to the Contractor and to deduct from payments for the work the actual cost to the City of engineering, inspection, superintendence, and other overhead expenses, which are directly chargeable to the contract and which accrue during the period of such delay, except that the cost of final surveys and preparation of the final estimate shall not be included in such charges. The expenses and damages described above shall be deducted from any money due the Contractor under this contract; the Contractor and his sureties shall be liable for any such excess cost.

The Contractor shall not be deemed in breach of its contract and no forfeiture due to delay shall be made because of any delays in the completion of the work due to unforeseeable causes beyond the control and without the fault or negligence of the Contract, provided the Contractor requests an extension of time in accordance with the procedures set forth in Section 6-6 of the Standard Specification for Public Works Construction "Greenbook" (latest edition). Unforeseeable causes of delay beyond the control of Contractor shall include acts of God, acts of a public enemy, acts of the government, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and weather, or delays caused by failure of the City or the owner of a utility to provide for removal or relocation of existing utility. Failure of the Contractor, its agent, servants, employees, officers, subcontractors, directors, or of any party contracting to perform part or all of the work or to supply any equipment or materials shall not be excusable delays. Excusable delays (those beyond Contractor's control) shall not entitle the Contractor to any

additional compensation. The sole remedy of the Contractor shall be to seek an extension of time.

G.C. 15 FINAL ACCEPTANCE, RECORDING AND PAYMENT

Upon satisfactory completion of the contractor work or designated phase thereof, and receipt, by the City, of required releases and the "Contractor's Certificate of Release and Request for Final Payment" (CP-20), the acceptance process is as follows:

1. The Engineer recommends to the City Manager and the City Council that the contract work, or designated phase thereof, is substantially complete and ready for acceptance by the City.
2. The City Council adopts a resolution determining that the contract work, or designated phases thereof, is substantially complete and is accepted. The resolution directs the City Clerk to do the following:
   (a) Issue a "Notice of Substantial Completion" (Form CP-21) to the Contractor.
   (b) File with the County Recorder of the County of San Mateo a "Notice of Completion of Contract" (Form CP-22). Filing not to occur until after certification by the Engineer to the City Clerk that all required "punchlist" items have been satisfactorily remedied by the Contractor. On the date established in the "Notice of Completion" the Contractor's required one-year warranty period will commence, and the City will assume operational responsibility for the completed facilities.
3. Upon issuance of the "Notice of Substantial Completion" to the Contractor, the City will make final payment to the Contractor of the amount remaining after deducting all prior payments and deducting all amounts to be kept or retained by City under the provisions of the contract documents.
4. If all "punch list" items have been satisfactorily remedied, then within ten days of the City Council adoption of the resolution determining the contract work, or designated phase thereof, completed and accepted, the City Clerk will file with the County Recorder the "Notice of Completion of Contract." If a "punchlist" of remedial work remains to be performed by Contractor, then provisions of Section 2.b, above, shall govern as to the time of filing the "Notice of Completion of Contract."
5. A period of thirty-five (35) calendar days will elapse from the date of filing of the "Notice of Completion of Contract" with the County Recorder before the final payments of retained amounts will be made to the contractor.
6. If no stop notices are received by the City within the stated 35-day filing period, the City will issue final payment of retained amounts for the contract work, or designated phase thereof, to the contractor. If any stop notice is received by the City within the 35-day waiting period, it will be referred to the City's legal counsel and final payment of retained amounts will be deferred or adjusted in accordance with advice of legal counsel, until such stop notice matter has been satisfactorily resolved.

G.C. 16 RESOLUTION OF DISPUTES

The City of Belmont incorporates the provisions of Chapter 1414 of the State Public Contract Code (A.B. No. 4165) as part of its plan and specifications for the resolution of construction

claims through arbitration. A summary of its provisions are included in the modification to the Standard Specifications which the Contractor is directed to read. The Contractor is also directed to review the entire Statute, Chapter 1414, Section 20207.4 and Section 20104 of the Public Contract Code.

The City's records setting forth the fair and reasonable cost of repairing, replacing, rebuilding or reasonable cost of repairing, replacing, rebuilding or restoring any damage or defects when performed by one other than the Contractor shall be binding and conclusive as to the amount thereof upon the Contractor.

G.C. 16.1 CONTRACT INTERPRETATION BY THE ENGINEER

Questions regarding the meaning and intent of the Contract Documents shall be referred in writing by the Contractor to the Engineer. The Engineer will respond to the Contractor in writing with a decision.

G.C. 16.2 CLAIMS

G.C. 16.2.1 NOTICE

If the Contractor disagrees with the Engineer's decision in G.C.16.1, Contract Interpretation by the Engineer, or in any case, where the Contractor deems additional compensation or a time extension to the contract period is due him for work or materials not covered in the contract or which the Engineer has not recognized as extra work, the Contractor shall notify the Engineer, in writing, of his intention to make claim. Claims pertaining to decisions provided in G.C.16.1 shall be filed in writing to the Engineer within five (5) days of receipt of such decision. All other claims notices for extra work shall be filed in writing to the Engineer prior to the commencement of such work. Written notice shall use the words "Notice of Potential Claim." Such Notice of Potential Claim shall state the circumstances and the reasons for the claim, but need not state the amount.

Additionally, no claim for additional compensation or extension of time for a delay will be considered unless provisions of G.C.7, Changes in the Work; G.C.8, Changes in Contract Prices; and G.C.25, Termination of Contract by Contractor of these General Conditions, are complied with. No claim filed after the date of final payment will be considered.

It is agreed that unless notice is properly given, the Contractor shall not recover costs incurred by him as a result of the alleged extra work, changed work or other situation which had proper notice been given would have given rise to a right for additional compensation. The Contractor should understand that timely notice of potential claim is of great importance to the City, and is not merely a formality. Such notice allows the City to consider preventative action, to monitor the Contractor's increased costs resulting from the situation, to marshall facts, and to plan its affairs. Such notice by the Contractor, and the fact that the Engineer has kept account of the cost as aforesaid, shall not in any way be construed as proving the validity of the claim.

G.C. 16.2.2 SUBMISSION OF CLAIM COSTS

Within thirty (30) days after the last cost of work for which the Contractor contends additional compensation is due, but if costs are incurred over a span of more than 30 days, then within fifteen (15) days after the thirtieth day and every month thereafter, the Contractor shall submit to

the Engineer the costs incurred for the claimed matter. Claims shall be made in itemized detail satisfactory to the Engineer in content, detail and format of presentation. If the additional costs are in any respect not knowable with certainty, they shall be estimated. If the claim is found to be just, it shall be allowed and paid for as provided in G.C.7, Changes in the Work.

G.C. 16.2.3 CLAIM MEETINGS

From time to time the Engineer may call special meetings to discuss outstanding claims. The Contractor shall cooperate and attend, prepared to discuss outstanding claims, making available the personnel necessary for claim resolution, and providing documents reasonably requested by the Engineer.

G.C. 16.3 RESOLUTION OF CLAIMS

For all contracts awarded during the effective dates of Public Contract Code Section 20104, where claims cannot be resolved between the parties, claims for three hundred and seventy-five thousand ($375,000) or less shall be resolved pursuant to the provisions of that code section, which is summarized in G.C.16.3.1 and 16.3.4 are applicable; however, G.C.16.3.5, Civil Action for claims less than $375,000 is not applicable.

G.C. 16.3.1 CLAIMS LESS THAN $50,000

1. For claims of less than fifty thousand dollars ($50,000), the Engineer shall respond in writing to written claims within 45 days of receipt of the claim in G.C.16.2, Claims, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the City may have against the Contractor.

2. If additional information is thereafter required, it shall be requested and provided pursuant to this section, upon mutual agreement of the City and the Contractor.

3. The Engineer's written response to the claim, as further documents, shall be submitted to the Contractor within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

G.C. 16.3.2 CLAIMS GREATER THAN $50,000

1. For claims of over fifty thousand dollars ($50,000), the Engineer shall respond in writing to all written claims within 60 days of receipt of the claim in G.C.16.2, Claims, or may request, in writing, within 30 days of receipt of claim, any additional documentation supporting the claim or relating to defenses or claims the City may have against the Contractor.
2. If additional information is thereafter required, it shall be requested and provided pursuant to this paragraph, upon mutual agreement of the City and the Contractor.
3. The Engineer's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

G.C. 16.3.3 CLAIM CONFERENCE

If the Contractor disputes the Engineer's written response, or if the Engineer fails to respond within the time prescribed, the Contractor may so notify the City, in writing, either within 15 days of receipt of the Engineer's response or within 15 days of the Engineer's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the City shall schedule a meet and conference within 30 days for settlement of the dispute.

G.C. 16.3.4 CLAIM FILING

If following the meet and conference described in G.C.16.3.3, Claim Conference, the claim or any portion remains in dispute, the Contractor may file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period time within which a claim must be filed shall be tolled from the time the Contractor submits his or her written claim pursuant to G.C.16.2, Claims, until the time the claim is denied, including any period of time utilized by the meet and conference.

G.C. 16.3.5 CIVIL ACTIONS FOR CLAIMS LESS THAN $375,000

The following procedures are established for all civil actions filed to resolve claims for less than three hundred seventy-five thousand dollars ($375,000).

1. Within 60 days, but not earlier than 30 days, following the filing or responsive pleading, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court.

2. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that Code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

3. In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, (A) arbitrators shall, when possible, be experienced in construction law, and (b) any party appealing an arbitration award who does not obtain a more favorable judgment shall, in addition to payment of costs and fees under the chapter, also pay the attorney's fees on appeal of the other party.

G.C. 16.3.6 UNRESOLVED ISSUES

Unless this contract provides otherwise, all claims, counterclaims, disputes, and other matters in question between the City and the Contractor that are not resolved between the City and the Contractor and are not governed by Public Contract Code 20104 shall be decided by a court of competent jurisdiction. Arbitration shall not be used for resolution of these disputes. Should

either party to this Agreement bring legal action against the other, the case shall be handled in the California County where the work is being performed.

G.C. 16.4 RECORDS OF DISPUTED WORK

In proceeding with a disputed portion of the work, the Contractor shall keep accurate records of its costs and shall make available, to the Engineer, a daily summary of the hours and classification of equipment and labor utilized on the disputed work, as well as a summary of any materials or any specialized services which are used. Such information shall be submitted to the Engineer on a monthly basis, receipt of which shall not be construed as an authorization for or acceptance of the disputed work.

G.C. 17 DOCUMENTS OF CONTRACTOR

Upon demand, the Contractor shall make available to the City all documents in its possession relevant to the work accomplished or to be accomplished or any demand or claim of the Contractor as to the City. This includes copies of documents sent by the Contractor to others relevant to the work. The Contractor shall further make available to the City conformed copies of all documents submitted to the sureties who executed indemnification made to such surety by others for such purpose. The Contractor shall maintain in its possession all documents to the work for three years after Notice of Completion.

G.C. 18 PROJECT SAFETY AND RESPONSIBILITY OF CONTRACTOR TO ACT IN AN EMERGENCY

The Contractor shall take all responsible precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

1. All employees on the work and all other persons and organizations who may be affected thereby.
2. All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor of any of its subcontractors or sub-subcontractors.
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structure and utilities not designated for removal, relocation, or replacement in the course of construction.
4. Vehicular and pedestrian traffic on or near the project site. These requirements shall apply continuously and not be limited to normal working hours.

The Contractor shall give all notice and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss. Except where otherwise expressly required by applicable laws, the City may monitor the Contractor’s compliance with any laws or regulations.

The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and uses of adjacent utilities.

Full compensation for the work involved in carrying out the safety precautions shall be considered as included in the various items of work and no additional payment will be made therefor.

In case of an emergency which threatens loss or injury to property or life, the Contractor shall act without previous instructions as the situation may warrant. The Contractor shall notify the Engineer immediately thereafter. Any compensation for emergency work claimed by the Contractor, together with substantiating documentation, shall be submitted to the City via the Engineer.

G.C. 19 LABOR CODE

A. Public Works. The services to be performed under this contract are for "public works" within the meaning of Labor Code Section 1720. The Contractor must comply with the requirements applicable to public works contractors as contained in Chapter 1, Part 7, Division 2 of the California Labor Code (commencing with Section 1720) and as set forth in this section. *This contract is subject to compliance monitoring and enforcement by the Department of Industrial Relations.*

B. Hours of Labor. As required by Labor Code Section 1810 and 1813, the parties stipulate as follows. Eight hours labor constitutes a legal day's work. The Contractor shall forfeit, as penalty to the City, $25 for each workman employed in the performance of the Contract by the Contractor or by any subcontractor under him for each calendar day during which such workman is required or permitted to work more than eight hours in any one day and 40 hours in any one calendar week in violation of Labor Code Sections 1810 to 1815, except that work performed by employees of the Contractor in excess of eight hours per day and 40 hours during any one week shall be permitted upon compensation for all hours worked in excess of eight hours per day at not less than one-and-one-half times the basic rate of pay.

C. Prevailing Wage. Contractor must comply with the prevailing wage requirements of Labor Code Sections 1720 to 1780. D. Wage Rates.

1. In accordance with Labor Code Section 1773.2, the City has obtained from the Director of the California Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which the work is to be performed for each craft, classification, or type of worker needed to execute the contract, a copy of which is hereby incorporated by reference. Copies of the prevailing rates of per diem wages are on file in City's office and are available to any interested party.

2. The Contractor must post a copy of the prevailing rate of per diem wages at each job site.

3. The term "per diem wages" is defined in Labor Code Section 1773.1. E. Failure to Pay Prevailing Wages.

1. In accordance with Labor Code Section 1775, the Contractor will forfeit as a penalty to the City an amount determined by the Labor Commissioner under Section 1775 for each calendar day or portion thereof for each workman paid less than stipulated prevailing wage

rates for such work or craft in which such worker is employed for any work done under the Contract by the Contractor or by any subcontractor under the Contractor in violation of the provisions of the Labor Code.

2. As required by Labor Code Section 1775, the parties stipulate that the contractor and subcontractors must comply with Section 1775, and in the event of non-compliance with payment of prevailing wages to workers, the contractor or subcontractor must pay the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate to each worker.

3. The City will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth in the Contract. The possibility of wage increases is one of the elements to be considered by the Contractor in determining his bid, and will not under any circumstances be considered as the basis of a claim against the City on the Contract.

F. Payroll Records.

1. The Contractor and each subcontractor must comply with Labor Code Section 1776 and all requirements of contractors stated therein for the maintenance, inspection and certification of payroll records.

2. *The Contractor and each subcontractor must furnish electronic certified payroll records directly to the Labor Commissioner.*

3. The Contract and each subcontractor must furnish certified payroll records to the City with each progress payment request.

4. The Contractor and each subcontractor who fails to timely furnish payroll records or make the records available for inspection will forfeit to the City the penalty for noncompliance set forth in Labor Code Section 1776 for their respective failure.

G. Apprentices. This subsection applies to contracts for Public Works involving $30,000 or more.

1. The contractor and each subcontractor must comply with the requirements for employment and compensation of apprentices as set for in Labor Code Section 1777.5. The prime Contractor is responsible for compliance with Labor Code Section 1777.5 for all apprenticeable occupations.

2. As required by Labor Code Section 1773.3, the City will send notice of the award of this Contract to the Division of Apprenticeship Standards within five days after award.

H. Discrimination. The contractor and each subcontractor must comply with the antidiscrimination requirements of Labor Code Section 1777.6.

I. Worker's Compensation.

1. In accordance Labor Code Section 1860, the contractor and each subcontractor must secure the payment of workers' compensation for their employees as required by Labor Code Section 3700.

2. Before performing the work, the Contractor must sign and file with the City, the certification required by Labor Code Section 1861.

J. Excavation Plans. As required by Labor Code Section 6705, for all public works projects in excess of $25,000 that involve excavation or trenching to a depth of five feet or more, the Contractor must submit a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation or trenching. The plan must comply with the following provisions.

1. If the plan varies from the shoring system standards, the plan must be prepared by a registered civil or structural engineer.

2. A note must be included on the plan by the registered civil or structural engineer certifying that the plan complies with the CAL OSHA Construction Safety Orders or that the plan is not less effective than the shoring, bracing, sloping, or other provision of the Construction Safety Orders.

3. If the Engineer has investigated subsurface conditions in area where the work is to be performed, these investigations are identified in the Special Provisions and the records of the investigations are available for inspection in the Public Works Department. The plan will not be accepted by the City if the plan is based on subsurface conditions which are more favorable than those revealed by the Engineer's investigations, or if the plan is based on soils related design criteria which is less restrictive than the criteria set forth in the Engineer's report of investigations or subsurface conditions.

4. The detailed plan must include surcharge loads for nearby embankments and structures for spoil banks and for construction equipment and other construction loadings. The plan must indicate for all trench conditions, the minimum horizontal distances from the side of the trench at its top to the near side of the surcharge loads.

5. Nothing contained in this Section shall be construed to impose tort liability on the City or any of its employees or to relieve the Contractor of the full responsibility for providing shoring, bracing, sloping, or other provisions which are adequate for worker protection.

K. Subcontractor Eligibility. Contractor acknowledges that under Public Contract Code Section 6109 no contractor or subcontractor who is ineligible to bid or work on, or be awarded, a public works project under Labor Code Section 1777.1 or 1777.7 may bid on, be awarded, or perform work as a subcontractor on, a public works project. Contractor is prohibited from performing work on a public works project with a subcontractor who is ineligible to perform work on the public works project under Labor Code Section 1777.1 or 1777.7.

G.C. 20 SUPERVISION BY CONTRACTOR

The Contractor will supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the work

in accordance with the Contract Documents. The Contractor will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall be responsible to see that the finished work complies accurately with the Contract Documents. The Contractor will employ and maintain on the work site a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the work site at all times as required to perform adequate supervision and coordination of the work. The Contractor shall not change job supervisor without written approval of the Engineer. Full compensation for conforming to the requirements of this Section shall be considered included in the contract prices paid for the various items of work and no additional compensation shall be allowed therefore.

G.C. 21 ALTERNATIVE METHODS OF CONSTRUCTION

Whenever the Contract Documents provide more than one method of construction or more than one specified type of construction equipment may be used to perform portions of the work and the Contract Documents leave the selection of the method of construction or the type of equipment to be used up to the Contractor, it is understood that the City does not guarantee that every such method of construction or the type of equipment can be successfully used throughout all or any part of any project. It shall be the Contractor's responsibility to select and use the alternative or alternatives which will satisfactorily perform the work under the conditions encountered. In the event some of the alternatives on any project or equipment specified cannot be utilized, the Contractor shall be responsible for completing the work in a satisfactory and workmanlike manner to provide the intended service and full compensation for any additional cost involved shall be considered as included in the contract price paid for the item of work involved and no additional compensation will be allowed therefore.

G.C. 22 PROJECT APPEARANCE

The Contractor shall maintain a neat appearance of the work. In any area visible to the public, broken concrete and debris developed during clearing and grubbing shall be disposed of concurrently with its removal. If stockpiling is necessary, the material shall be removed or disposed weekly.

Full compensation for conforming to the provisions in this Section not otherwise provided for shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.

G.C. 23 INSURANCE HOLD HARMLESS

The Contractor shall, before the commencement of work herein specified, procure and maintain in full force and effect during the life of the contract, at its sole expense, insurance as described in Section 14 of the Construction Agreement.

G.C. 24 EQUAL EMPLOYMENT OPPORTUNITY

General: The Contractor shall not discriminate in its recruiting, hiring, promotion, demotion or termination practices on the basis of race, religious creed, color, national origin, ancestry, sex, age, physical handicap, medical condition, or marital status in the performance of this Contract and shall comply with the provisions of the California Fair Employment and Housing Act

(commencing with Section 12900 of the Government Code), Federal Executive Order No. 11246 (30 Federal Register 12319), as amended, and all administrative rules and regulations issued pursuant to said Acts and Order. See particularly 41 Code of Federal Regulation (CFR) Chapter 60.

The Contractor shall require each of its subcontractors to comply with the preceding paragraph and shall include in each subcontract language similar to the preceding paragraph.
Each bidder shall submit with the bid proposal a fully executed Certificate of Nondiscrimination by Contractors. Bids will not be considered unless accompanied by the completed Certificate.

A. Transactions of $10,000 and Less

1. Contracts and subcontracts not exceeding $10,000 are exempt from the requirements of this clause.
2. No Contractor or subcontractor shall procure supplied and/or services in less than usual quantities to avoid applicability of the Equal Opportunity Clause. With respect to contracts and subcontracts for indefinite quantities, the Equal Opportunity Clause shall apply unless it is determined by the City that the amount to be ordered in any one year under such contract reasonably will be expected not to exceed $10,000.

B. Transactions in Excess of $10,000, but Less Than $50,000

1. Each prime contractor shall certify that it has in effect an affirmative action plan and agrees to comply with all state and federal laws and regulations concerning Fair Employment Practices.
2. The contractor shall maintain a written copy of its affirmative action plan and will furnish a copy to the City upon request by the City. The City reserves the right, during the life of this Contract, to require the contractor to complete an affirmative action compliance report furnished by the City setting definite goals and timetables and indicating progress in meeting the goals.

C. Transactions of $50,000 or More

1. Each prime contractor who has fifty or more employees and a contract of $50,000 or more shall develop and submit to the City within thirty days of award a written affirmative action compliance program including definite goals and timetables with proposed dates of compliance. The prime contractor shall make, as a condition of its subcontract, the same requirement of each subcontractor who has fifty or more employees and a subcontract of $50,000 or more. Each contractor shall include in its affirmative action compliance program a complete table of its employees' job classifications. This table must include, but need to be limited to, job titles, duties and rates of pay.
2. The contractor agrees to permit access to its records or employment advertisement, application forms and other pertinent data and records by the City or its designee and any state or federal agency having jurisdiction for the purposes of investigation to ascertain compliance with the Fair Employment Practices section of this contract.
3. The City shall have the right to assign an affirmative action representative to monitor the conduct of the contractor and subcontractors under this contract. The affirmative action

representative shall have the right to enter the construction or manufacturing site to obtain information from persons performing work on the project, providing such inspection shall not in any way interfere with the progress of the work under contract.

G.C. 25 TERMINATION OF CONTRACT BY CONTRACTOR

The Contractor may terminate the contract upon ten (10) days calendar day's written notice to the City whenever (1) the entire work has been suspended in accordance with these provisions for sixty (60) consecutive calendar days through no fault or negligence of the Contractor, and notice to resume work or to terminate the contract has not been received from the City within this time period; or (2) the City should fail to pay the Contractor any substantial sums due it in accordance with the terms of the contract and within the time limits prescribed. In the event of such termination, the Contractor shall have no claims against the City except for those claims specifically enumerated in these provisions and determined in accordance thereof.

SPECIAL PROVISIONS

CITY OF BELMONT
City Contract Number 2026-645
San Juan Pump Station & Force Main Rehabilitation Project

Unless otherwise noted, Section Numbers used in these Special Provisions refer to corresponding Sections in the State of California Department of Transportation 2025 Standard Specifications ("Caltrans Standard Specifications").

Where noted, certain other Section Numbers used in these Special Provisions refer to corresponding Sections in "The GREENBOOK" Standard Specifications for Public Works Construction, 2024 Edition.

If General Conditions conflict with these Special Provisions, these Special Provisions and Technical Specifications shall prevail.

Full compensation for actions taken by the Contractor in order to comply with public health orders or advisories issued by local, County, State, or Federal government agencies shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor The Health Orders can be accessed at the San Mateo County website at https://www.smchealth.org/coronavirus .

S.P. 2-6 WORK TO BE DONE

The Contractor shall furnish all materials, equipment, tools, labor and incidentals necessary to complete the work shown on the plans and described in the specifications in a satisfactory and workmanlike manner, as more particularly described herein. The Contractor shall declare any extra work at the time and may proceed with this work only after engineer's change order has been approved in writing by the Director of Public Works.

Jobsite Maintenance

The Contractor shall perform daily clean-up operations to keep the jobsite and adjacent properties free from accumulation of waste materials and debris resulting from the Contractor's operations. The Contractor shall deposit waste material in on-site containers or at a legal disposal area away from the site at the end of each working day.

Nothing herein shall be construed as relieving the Contractor of responsibility for final cleanup of the site as provided in Section 4-1.13, "Cleanup", of the Caltrans Standard Specifications.

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the street right of way as required in the Caltrans Standard Specifications within 2 days of excavation. The depth of excavation shall be to such lines and grades required to reconstruct the street as shown on the plans or as directed by the Engineer.

The Contractor shall keep existing streets free from dirt and debris at all times. The Contractor shall be prepared to sweep surfaces immediately if deemed necessary by the Engineer for public

safety and to avoid damage to properties. If streets are not satisfactorily cleaned within 12 hours from verbal notice by the Engineer, the City will issues Stop Work Notice.

S.P. 6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK

The Contractor shall provide a schedule of work and temporary traffic control plan (TTC Plan) ten (10) calendar days prior to the pre-construction conference and receive approval from the Engineer before starting any work. The construction schedule shall detail sufficient information to be used to notify homeowners of expected work in their area and to permit the City to schedule inspection and testing. Work shall begin within (7) seven calendar days after the Notice to Proceed is issued by the City.

A pre-construction conference will be held at the Belmont Public Works Department, 1 Twin Pines Lane, Suite 385, Belmont, California. The contractor is directed to arrange for the following:

A. Attendance

1. Contractor's Superintendent
2. Major Subcontractors
3. Others, as appropriate

B. Submittals:

1. Construction Schedule (Submit 10 calendar days in advance)
2. Temporary Traffic Control Plan (Submit 10 calendar days in advance)
3. General Notice to Residents
    a. Contractor's telephone number (including 24-hour emergency contact)
    b. Nature of work
    c. Expected duration
4. All material submittals and planned storage of equipment and materials.
5. EEO, IIPP, and Safety Policy

Prior to commencing work, the Contractor shall submit to the Engineer a copy of his construction schedule. The Contractor shall submit an updated (written) copy of the construction schedule to the Engineer on a weekly basis, during construction, subject to approval. Updates of the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a weekly basis.

The Contractor is required to obtain a Temporary Encroachment Permit from the Department of Public Works for any work or storage of material in the public right-of-way.

S.P. 6-2 PROSECUTION OF THE WORK

Working hours for this project shall be from 8:00 a.m. to 5:00 p.m. Monday through Friday unless otherwise noted and except for designated legal holidays.

The designated legal holidays are:

New Year's Day (January 1)

Martin Luther King's Birthday (third Monday in January)

Presidents' Day (third Monday in February)

Memorial Day (last Monday in May)

Independence Day (July 4)

Labor Day (first Monday in September)

Columbus Day (second Monday in October)

Veterans Day (November 11)

Thanksgiving Break (fourth Thursday and following Friday in November)

Christmas Day (December 25).

When a designated legal holiday falls on a Saturday, the preceding Friday shall be the designated legal holiday. When a designated legal holiday falls on a Sunday, the following Monday shall be the designated legal holiday.

S.P. 6-7 TIME OF COMPLETION

Total Contract time for all work is 270 working days. Punchlist items are included in Contract time.

S.P. 6-9 LIQUIDATED DAMAGES

In accordance with Public Contracts Code, Section 10226, it is agreed by the parties to the contract that for each day, including weekends and holiday's that completion of the work, including Punchlist items is delayed beyond the specified time will cause damage to the City of Belmont. The Contractor shall forfeit and pay to the City $4,500.00 per day for each working day in excess of the contract time.

Liquidated damages shall not apply for excusable delay, as defined in Section GC-01. However, the Contractor shall not be entitled to additional compensation as a result of the completion date being extended due to excusable delay.

S.P. 7-7 COOPERATION AND COLLATERAL WORK

The City reserves the right to perform other and additional work, by contract or otherwise, at or near the site (including materials sites) at any time by the use of other forces. Should work be underway or subsequently undertaken within or adjacent to this project, the Contractor shall cooperate with all other Contractors or other forces and conduct this work so that the operations of both suffer the least interference and delay. If there should be any disagreement between the

Contractors or the Contractor and the City as to the manner and order of performing work, such disagreement will be resolved by the Engineer, and his/her determination shall be final.

If the contract gives notice of other work that may affect the work of this contract, the coordination of the work shall be taken into account by the Contractor, and any resulting costs shall be considered as included in the contract items.

S.P. 7-9 PROTECTION AND RESTORATION

The Contractor is responsible for replacing damaged improvements on private property and within the street right-of-way including, but not limited to, shrubs, lawns, irrigation lines, and sidewalks, except that fences within the street right-of-way or easements may be removed only if approved by the Engineer in order to perform the work and allow the property owner to salvage materials in advance. Every effort must be made by the contractor to work around existing improvements.

Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

S.P. 7-10 PUBLIC CONVENIENCE AND SAFETY

Safety throughout the site is the Contractor's responsibility. The Contractor shall provide a safe working environment for employees and the public, meeting all standards of the State of California. All differences in grade greater than four (4) inches in any vehicular travel area shall be ramped with temporary asphalt/cutback until such time as final paving takes place. All differences greater than one (1) inch in grade in pedestrian areas shall be considered a "trip hazard" and shall be ramped with temporary AC or other acceptable means until such time as final restoration takes place. All excavations shall be covered during "non- working hours." All excavations in vehicular areas shall be covered with 3/4" thick steel plates (minimum). Excavations in pedestrian areas shall be covered with plywood and barricades. All steel plates and plywood shall have a non-skid surface. All barricades on the project site shall be equipped with lights (in working condition).

Construction Area Signs

The Contractor shall furnish, install, maintain and remove construction area signs when no longer required in accordance with the provisions in Section "Temporary Traffic Control" of the Caltrans Standard Specifications and these Special Provisions. The base material of construction area signs shall not be plywood. Signs shall list out approximate construction dates. Contractor shall anticipate the need for four (4) signs at locations directed by the City.

The cost for construction area signs as provided herein shall be considered as included in the contract lump sum (LS) price paid for “Mobilization and Demobilization”.

Temporary Traffic Control

The Contractor shall notify the Engineer of his intent to begin work on each street at least five (5) days before work is begun on that street. The Contractor shall cooperate with local authorities relative to handling traffic through the area.

Notifications to the public shall be accomplished in the following manner:

1. General Notice, by mail, shall be sent to all residences along and adjacent to each street to be reconstructed 2 weeks in advance of commencement of work for that street. Such General Notice, by mail, shall be reviewed and approved by the Engineer prior to mailing. Contractor's emergency telephone number and contact individual shall be provided.

2. Contractor shall post “No Parking” signs along each street to be reconstructed at least forty-eight (48) hours in advance of commencement of work for that street; and shall arrange with the Police Department for removal of vehicles as required. “No Parking” signs may be posted without the approval of the Engineer. "No Parking" signs shall indicate the date, time (civilian hours), hours, and day of the week of the parking prohibition. The Contractor shall contact the Police Department to verify the posting of “No Parking” signs in advance.

Delays to the Contractor caused by the presence of parked vehicles will not be grounds for additional compensation or extension of time.

The minimum width of a temporary traffic lane shall be 10 feet, unless otherwise permitted by the Engineer. The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress. No parking will be permitted in the construction area. Personal vehicles of the Contractor's employees shall not be parked on the traveled way, including any section closed to public traffic.

Temporary Traffic Control Plans

The Contractor shall provide a temporary traffic control plan (TTC Plan) for each street ten (10) calendar days prior to pre- construction conference and receive approval from the Engineer prior to commencement of work. Each TTC Plan shall clearly show how the Contractor proposes to handle both vehicular and pedestrian traffic during construction for each street.

Each TTC Plan shall include details such as follows:

A. Work area and operations for which the traffic control is proposed.

B. Hours of the day and proposed dates that the plan will be in effect.

C. Salient dimensions and features of the existing roadways.

D. Location, width, direction and turning movements of traffic for proposed traffic revisions.

E. Type, location, reference distances, spacing, etc. for such items as signs, cones, barricades,

arrow boards and flagmen.

F. Conformance to the California Manual on Uniform Traffic Control Devices, CA MUTCD 2026 (January 18, 2026).

G. Conformance to the order of work requirements in these Special Provisions.

H. Conformance to all the applicable traffic control requirements specified in these Special Provisions.

I. Any alterations to a TTC Plan, proposed lane closures, before or after initial implementation, shall be approved in advance by the Engineer.

J. Traffic shall be maintained by complying with the approved TTC Plan and alterations, if any.

Contractor shall notify Belmont Police Dispatch (650-595-7400) and Engineer's representative (510-760-8394) on a daily basis (as needed) at the beginning of each shift to inform them of **ANY** lane closure and at the end of each shift to inform them of the street opening to through traffic. Note: Contractor shall provide access for emergency vehicles at all times during his operations.

Full compensation for conforming to the provisions in this section shall be considered as included in the contract lump sum (LS) price paid for "Pedestrian and Traffic Control" and no additional compensation will be allowed therefor.

TECHNICAL SPECIFICATIONS

FOR

CONSTRUCTION OF

SAN JUAN PUMP STATION & FORCE MAIN REHABILITATION PROJECT

FOR

CITY OF BELMONT, CALIFORNIA

CITY CONTRACT NO. 2026-645

April 10, 2026

SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 Range Avenue, Suite 201
Santa Rosa, CA 95403
(707) 528-4848

SECTION 01005
CERTIFICATION

THE FOLLOWING SECTIONS:

Division 1 through 15 (except certified structural sections)

OF THESE TECHNICAL PROVISIONS WERE PREPARED UNDER THE SUPERVISION OF:

Curran L. Price, P.E.
California Registered Civil Engineer No. C74913
Expiration 12/31/27

Schaaf & Wheeler, Consulting Civil Engineers
2200 Range Avenue, Suite 201
Santa Rosa, California 95403
(707) 548-4848



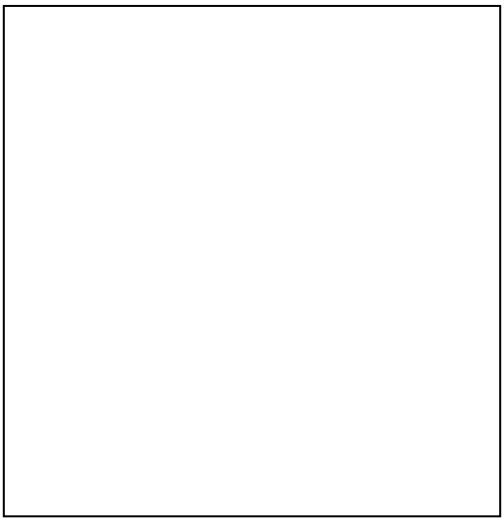
THE FOLLOWING SECTIONS:

Divisions 16

OF THESE TECHNICAL PROVISIONS WERE PREPARED UNDER THE SUPERVISION OF:

Thomas Frisch, P.E.
California Registered Electrical Engineer No. E15761
Expiration 9/30/26

Frisch Engineering, Inc.
13405 Folsom Blvd, Unit 600
Folsom, CA 95630
(916) 353-1025



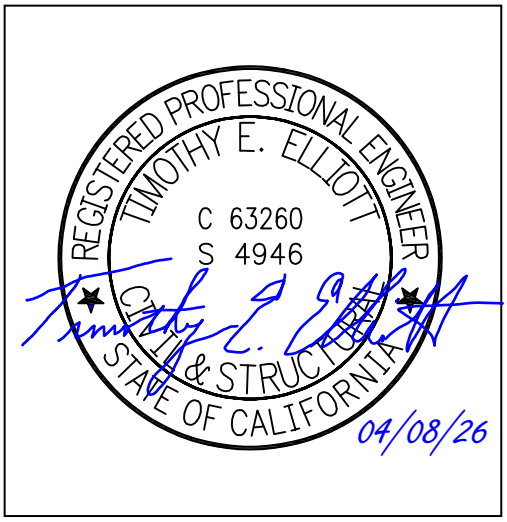
THE FOLLOWING SECTIONS:

01610, 01611, 03301, 03600, 04200, 05400, 05500, 05501, 06100, 08110, 08710, 09290, 11002

OF THESE TECHNICAL PROVISIONS WERE PREPARED UNDER THE SUPERVISION OF:

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DIVISION 1 – GENERAL REQUIREMENTS

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01120	WORK CONSTRAINTS
01125	MEASUREMENT AND PAYMENT
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01505	MOBILIZATION/DEMOBILIZZTION
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02532	MANHOLE AND PIPE ABANDONMENT AND DEMOLITION
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02760	CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION
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09900	WASTEWATER STRUCTURES COATING

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APPENDICES

SECTION NO.	TITLE
A	GEOTECHNICAL INVESTIGATION, SAN JUAN PUMP STATION WET WELL AND VALVE VAULT, MARCH 2025
B	STRUCTURAL EVALUATION REPORT FOR SAN JUAN PUMP STATION, MAY 23, 2025
C	SAN JUAN PUMP STATION REHABILITATION, PROJECT 337B, NOVEMBER 11, 1996
D	MODIFICATIONS TO SAN JUAN PUMP STATION, MARCH 9, 1977
E	2024 SAN JUAN BLVD SEWER CAPACITY IMPROVEMENTS, MAY 2024
F	STANDARDIZATION OF MAJOR EQUIPMENT COMPONENTS FOR SEWER PUMP STATIONS
G	PG&E PM DRAWINGS (TO BE ADDED ONCE RECEIVED)

END OF SECTION

SECTION 01110
SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Work will take place in existing roadways, easements, landscaped areas, and in unimproved areas. The work will occur on a heavily traveled roadway and will require significant pedestrian and traffic control throughout construction. A description of work items is included below.

B. As indicated on the Project Drawings, work includes:
   1. Coordination with private property owners, the City of Belmont, Mid-Peninsula Water District, Samtrans, and other agencies and utility companies as necessary to complete the work.
   2. Demolition, abandonment, and modifications of existing sanitary sewer main, force main, manholes and pump station.
   3. Clearing and grubbing of existing site features.
   4. Construction of new sanitary sewer main and manholes.
   5. Installation of new pumps, new wet well, valve vault, discharge piping, force main, and appurtenances.
   6. Construction of pump station electrical controls, conduits, and pull boxes.
   7. Manhole and wet well lining/coating.
   8. Backfilling and paving trenches.
   9. Curb, sidewalk, pavement, and fence removal and replacement.
   10. Modifications and improvements of the existing pump station building.
   11. Bypass pumping and/or rerouting of sewage as necessary for construction of the project per plans and specifications.
   12. Dewatering and the construction of all temporary shoring required to complete the work. The Contractor shall carefully review the geotechnical report and technical specifications to clearly understand the existing conditions and requirements.
   13. Stormwater pollution prevention and site protection measures.
   14. Traffic and pedestrian control throughout construction.
   15. Site restoration.
   16. Other miscellaneous and incidental improvements for complete facilities.

1.02 WORK PLAN

A. Contractor shall submit a Work Plan for review and approval by the City, fully describing the proposed procedures to conform to the Contract Documents.

B. The Work Plan shall fully describe the planned sequence of operations for all phases of the project, list major milestones of completion, include a milestone schedule, and include a contingency plan for potential weather delays. The Work Plan shall also include submittals and procurement, including fabrication and delivery of key and long lead time items.

C. Contractor shall expedite the preparation of submittals for all long lead time items, see Section 01020-1.03.

1.03 OCCUPANCY REQUIREMENTS

A. None

1.04 CITY FURNISHED MATERIALS

A. None

1.05 WORK UNDER OTHER CONTRACTS

A. None

1.06 REFERENCE DOCUMENTS

A. The City has prepared a number of project documents that are provided in the appendices of these technical specifications for inspection by the Contractor for his reference and information.
   1. Geotechnical Investigation, San Juan Pump Station Wet Well and Valve Vault, March 17, 2025
   2. Structural Evaluation Report for San Juan Sewer Pump Station, May 23, 2025
   3. San Juan Sewage Pump Station Record Drawings
   4. San Juan Gravity Sewer and Force Main Record Drawings
   5. PG&E PM Drawings for new electric service to pump station

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01120
WORK CONSTRAINTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Site Use and Construction Restrictions.
   2. Temporary Construction Access Requirements and Limitations
   3. Utility restrictions and requirements.
   4. Temporary Construction Easement restrictions and requirements.

B. Related Work Specified Elsewhere:
   1. Contract Time and Order of Work: Section 01020 and Special Provisions
   2. Environmental Protection: Section 01600

1.02 SITE USE AND CONSTRUCTION RESTRICTIONS

A. The project site is within existing streets, within City property and along City right of way. The existing pump station is located within the City of Belmont property.

B. It might be desirable to access or have temporary staging areas within the City of Belmont or neighboring cities. Contractor is responsible for obtaining any necessary staging or storage areas and shall comply with all jurisdiction regulations for which the work is to occur.

C. The site has low hanging overhead utilities.

D. Contractor shall visit the site to review project location, site conditions, and restrictions.

E. Construction impacts due to identified or observable site constraints shall be considered by the Contractor when making his bid, and the costs associated with such constraints shall not be compensated for beyond the provisions contained herein.

F. Contractor shall provide access to residences and businesses at all times during construction. Contractor shall maintain access to driveways to the maximum extent possible.

G. City will coordinate initial public construction notice at least one month prior to businesses and residences. Contractor shall provide additional notice to the property owners, by delivering or mailing a City approved flyer that lists planned work dates, work hours, work duration, a general description of planned work, and contractor's contact information with phone number approximately working within streets that may affect access.

H. See the City's General conditions for work hours and limitations.

1.03 DOCUMENTATION OF EXISTING CONDITIONS

A. The Contractor is responsible for reviewing and documenting the existing site conditions prior to performing any work. Documentation shall include photographs, videos, notes, and other items as necessary to accurately document the condition of all items that may be affected by the work.

B. The Contractor shall submit the documentation of existing conditions to the City prior to proceeding with the work.

1.04 UNDERGROUND FACILITIES

A. The Contractor shall note that not all existing utilities are shown on the plans and the location of the utilities shown are approximate. The location of the utilities shown on the plans are based on utility basemaps, pavement markings, and potholing where indicated on the Drawings and are approximate in nature.

B. The Contractor shall have all utilities located by contacting USA, and review utility locations.

C. Some, but not all potential utility conflicts are shown on the plans. The Contractor shall pothole all potential utility conflicts prior to construction. Potholing results and any identified conflicts shall be submitted to the City for review prior to construction.

D. The Contractor is responsible for coordinating all project documentation, including but not necessarily limited to, the Contract Documents, and existing record drawings for the determination of the location of all underground facilities. Contractor shall have utilities marked in the field by Underground Services Alert a minimum of 48 hours prior to the start of construction.

E. The Contractor shall exercise care in all excavations to avoid damage to existing underground facilities. This shall include potholing or hand digging in those areas where underground facilities are known to exist until they have been sufficiently located to avoid damage to the facilities.

F. The Contractor shall notify the Engineer of any potential utility conflicts as soon as they are known.

G. Contractor shall notify the Mid-Peninsula Water District prior to excavating within 5 feet of all existing water mains. District will depressurize all water main within 5 feet of excavation per Section 01120-1.11.

1.05 OVERHEAD ELECTRIC UTILITIES

A. Low hanging high voltage overhead power transmission utilities are present at project locations.

B. Contractor shall consider the proximity of overhead electric utilities when bidding, and no additional compensation shall be made for additional work necessitated by the presence of overhead electric utilities (smaller equipment, sheet pile limitations, shoring provisions, etc.).

C. Contractor shall insure a minimum clearance between the power lines and the work at all times as dictated by OSHA and PG&E regulations.

1.06 SEASONAL RESTRICTIONS

A. All construction activity with the potential to cause erosion, sedimentation, or water pollution shall be suspended during periods of inclement weather. See Section 01600 for additional requirements and restrictions.

1.07 TREE AND PLANT PROTECTION

A. Preserve and protect all existing trees and plants at or adjacent to the site unless otherwise noted.

1.08 WORK SEQUENCE

A. The overall sequence of the Work is at the Contractor's discretion, subject to City approval.

B. The use of multiple crews is at the sole discretion of the Contractor and no additional compensation will be allowed to meet the contract requirements.

C. As detailed in specification section 01531, the Contractor shall phase the project in a manner that minimizes the use of the existing force main for bypass pumping to the extent feasible. Therefore, the Contractor shall phase the work such that the new force main is constructed prior to decommissioning the existing pump station and installing bypass pumping systems to the extent feasible.

1.09 MAINTAINING SEWER SERVICE

A. Contractor shall maintain existing sewer service. Refer to Section 01531 Temporary Flow Control for additional information.

B. EMERGENCY RESPONSE
   1. For the duration of construction, Contractor shall be available on a 24-hour on-call basis to respond to an emergency situation. The Contractor shall provide the City with a minimum of three (3) names of persons and their telephone numbers for this purpose. All persons listed shall be able to respond to any sanitary sewer overflow or trench safety emergency within 30 minutes of being notified.
   2. Should a sewage spill occur during construction, Contractor shall be responsible for the following:
      a. Clean up of the site in accordance with City, County, Health Department, Regional Water Quality Control Board and any other regulatory agency requirements.
      b. Reporting of the spill to the proper jurisdictional agency and preparing all required documentation per the State Water Board Sanitary Sewer Overflow (SSO) Guidelines.
      c. Payment of any and all fines assessed against the City for the spill.
      d. Coordination and payment of any analytical testing (lab) required at the site by jurisdictional agencies.
      e. Protection of the public from exposure to contaminated area.

1.10 TRAFFIC CONTROL

A. The Contractor shall supply and install all traffic control devices (including all warning, regulatory, and guide signs) required for the Project. The City will not furnish signs nor any other traffic control devices for the Project. The City has standard no parking signs that may be available or copied by the Contractor.

B. Contractor is responsible for traffic control. Contractor shall submit traffic control plans for approval by the City.

C. The Contractor shall submit for City review and approval its Traffic Control and Detour Plan. Submit said plan a minimum of five (5) full Calendar Days prior to the Pre-Construction Meeting. The plan shall include (where necessary) lane closures, detours, no parking areas, signing program for construction, access to private property and business establishments, pedestrian traffic, transit routes, loading areas, the proposed routing of the construction vehicles, hours required for access and the safe guards and procedures necessary to carry out the Work, as well as where Contractor plans to park construction vehicles and equipment, and other matters which might be important to the safe movement of traffic. The plan shall also indicate placement and type of warning signs, lights, devices, flag persons; and have a schedule for implementation.

D. It is imperative that field traffic control be handled in such a manner as to adequately and safely direct all traffic movements in the Project area. The Contractor shall not be allowed to proceed with construction at any time that, in the opinion of the Engineer, traffic control is inadequate to meet the field conditions. Traffic control measures, in addition to those indicated on the approved traffic control plans, may be required as field conditions dictate.

E. The Contractor shall not be allowed to restrict vehicle access to any of the properties in the Project area at all times during construction if practical. If restricting vehicle access is absolutely necessary, Contractor shall notify property owners advanced notice of the extent of any delays. Contractor shall not restrict vehicle access outside of working hours.

F. Areas to be posted with “No Parking” signs must be verified as correct by the City Police Department. Signs must be verified by the Police Department and posted a minimum of forty-eight (48) hours prior to the start of construction in each area requiring parking restrictions.

G. The Contractor shall conduct his operations as to cause the least possible obstruction and inconvenience to both vehicular and pedestrian traffic.

H. Traffic Routing and Parking Restrictions: Below are specific City traffic and parking restrictions:
   1. Construction Traffic and Vehicles: All inbound and outbound construction related traffic to and from the Site is restricted to public street(s) immediately adjacent to the Site.
   2. Construction Parking: Construction vehicles and equipment parking is restricted to areas within the Site and other areas as determined by the City.

3. Alternative Parking: The Contractor can negotiate with any other entity to accommodate parking by its workers. However, the City does not make any guarantee that such parking is available to the Contractor.

I. Street Lane and Sidewalk Closures: Below are specific lane and sidewalk closure requirements and restrictions which shall apply unless specifically modified by an approved Traffic Control Plan. Said Plan may be reviewed or modified by the Engineer at any time when, in the opinion of the Engineer, changes are necessary to provide for the safety, health, welfare, or convenience of the public.
   1. City Street Lane Closures: Contractor shall provide continuous pedestrian traffic access. All traffic lanes shall remain open during the non-working hours as defined in the City's General Conditions. Lanes may individually be closed during working hours.
   2. Residents and businesses along the road or street shall be provided passage. Convenient access to driveways, houses, and buildings along the road or street shall be maintained. Temporary crossings shall be provided and maintained in good condition.
   3. The blocking of industrial, commercial, or institutional driveways shall not be allowed. Access shall be provided to permit the movement of vehicles to and from the grounds of such establishments. Contractor shall provide vehicular access to all other types of driveways at all times except during actual construction.
   4. Wherever it is necessary that trenches and excavation be bridged, these bridges shall permit unobstructed flow of traffic or pedestrians (ADA compliant) and shall meet the following criteria:
      a. Bridging shall be secured against displacement by using adjustable cleats, angles, bolts, or other devices.
      b. Bridging shall be installed to operate with minimum noise.
      c. The trench shall be adequately shored, to support the bridging and traffic.
      d. Only steel plates shall be used for bridging. Steel plates used for bridging shall extend one foot (minimum) beyond the edges of the trench.

J. Bus Routes: Project location is adjacent to bus stops near the intersection of San Jaun Blvd and Cipriani Blvd. The Contractor is responsible for identifying impacts to the bus routes, coordinating with the transit operator, and accommodating any necessary detours, notifications, and signage requirements. The Contractor shall submit the proposed impacts to the City for review and approval prior to coordinating with the transit operator.

K. Sidewalk Closures: Contractor must comply with the following requirements.
   1. Where walks, pathways, or access ways are closed by the Work, an ADA complaint, alternate walkway shall be provided, preferably within the immediate location of the pathway or access to be closed. Where it is necessary to divert pedestrians into a major detour and/or into a parking lane or traffic area, at no time shall pedestrians be diverted into a portion of a street used for vehicular traffic. Any deviation from the above must have prior approval of the Engineer.
   2. At locations where adjacent alternate walkways cannot be provided (i.e., where no pathway or access is available within the immediate location of the interruption) ADA compliant detours shall be clearly planned, marked, and constructed. Appropriate signs and barricades must be installed at the limits of construction and in advance of the closure (or detour) in order to divert pedestrians to the appropriate walkway or detour.

3. Contractor shall provide sufficient signage, indicating by way of arrows and text, pedestrian route closures, and new pathways and detours required for alternate pedestrian routes around the construction. Alternate pedestrian routes, the final sign configuration, the exact wording of the base sign and all mounting locations shall be approved by the City.

L. The Contractor shall pay for all street and sidewalk closures, including but not limited to, the appropriate street closure and temporary directional signage, crosswalks, flag persons as required to control construction traffic and implement the Traffic Control and Detour Plan. Contractor shall take all necessary precautions to protect the public from construction activities.

M. The Contractor shall observe all posted traffic signage on and in adjacent neighborhoods.

N. The Contractor shall not be relieved from responsibility for public safety by City's direction, lack of same, or approval of the Traffic Control and Detour Plan with respect to signs, lights, and/or protective devices.

1.11 WATER MAIN SEPARATION AND SHUTDOWN REQUIREMENTS

A. Mid-Peninsula Water District will temporarily shut down or depressurize water mains during construction where the clearance between the water main and sewer main is less than five (5) feet. The water main shutdown requirements are listed below.

B. Water Main Shutdown Requirements:
1. The Contractor shall notify the Mid-Peninsula Water District three (3) working days in advance of all required water main shutdowns.
2. Shutdowns are limited to six (6) hours maximum during the hours of 9:00 AM to 5:00 PM, Monday through Thursday.
3. Any open trench within five (5) feet of horizontal clearance between parallel existing water mains, new sewer mains, and/or outside edge of the manholes shall be fully backfilled and compacted prior to the end of the shutdown.
4. Shutdowns for the same customers are limited to two days within a ten working day window.
5. Notification from the Contractor under item one above is considered a shutdown, even if the contractor later decides a shutdown needs to be rescheduled or is no longer needed.
6. Contractor shall take great care to insure the existing water main and appurtenances are not damaged. The Contractor will be responsible for repairs to the water main should any damage or leaks occur due to the Contractor's work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01125
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section includes description of requirements and procedures for determining amount of Work performed and for obtaining payment for Work performed.

1.02 REFERENCES

A. California Public Contract Code

B. California Code of Civil Procedure

C. California Government Code

1.03 SCOPE OF WORK

A. Work under Contract Documents, or under any Bid Item, allowance, or alternate, shall include all labor, materials, taxes, transport, handling, storage, supervision, administration, and all other items necessary for the satisfactory completion of Work, whether or not expressly specified or indicated.

1.04 DETERMINATION OF QUANTITIES

A. Quantity of work to be paid for under any item for which a unit price is fixed in the Contract Documents shall be, as determined by the Engineer, the number of units of work satisfactorily completed in accordance with Contract Documents or as directed by City. Unless otherwise provided, determination of number of units of work so completed will be based, so far as practicable, on actual measurement or count within prescribed or ordered limits, and no payment will be made for work done outside of limits. Measurements and computations will be made by methods set forth in Contract Documents. If methods are not so set forth, measurements shall be made in any manner which the City considers appropriate for class of Work measured (e.g., preassigned values, percentage completion, units completed, or incremental milestones). Contractor must immediately inform City of any disputes regarding quantity measurements and shall immediately supply City with any documentation supporting the disputed measurements.

1.05 UNITS OF MEASUREMENT

A. Measurements shall be in accordance with U.S. Standard Measures. A pound is an avoirdupois pound. A ton is 2,000 pounds avoirdupois. The unit of liquid measure is the U.S. gallon.

1.06 CERTIFIED WEIGHTS

A. When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales, or when approved by the Engineer, on a completely automated weighing and recording system. The Contractor shall furnish the Engineer with duplicate licensed weighmaster's certificates showing the actual net weights. The Engineer will accept the certificates as evidence of the weights delivered.

1.07 METHODS OF MEASUREMENT

A. Materials and items of work, which are to be paid for on the basis of measurement, shall be measured in accordance with the method stipulated in the particular sections involved. In determining quantities, all measurements shall be made in a horizontal plane unless otherwise specified.

B. Material not used in the work and remaining on a transporting vehicle shall be determined by the Engineer and deducted from the certified tag.

C. When material is to be measured and paid for on a volume basis and it would be impractical to determine the volume, or when requested by the Contractor in writing and approved by the City in writing, the material will be weighed and converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the City and shall be agreed to by the Contractor before such method of measurement of pay quantities will be adopted.

D. Full compensation for all expense involved in conforming to the above requirements for measuring and weighing materials shall be considered as included in the unit prices paid for the materials being measured or weighed and no additional allowances will be made therefore.

E. Quantities of material wasted or disposed of in a manner not called for under the Contract; or rejected loads of material, including material rejected after it has been placed by reason of failure of the Contractor to conform to the provisions of the Contract; or material not unloaded from the transporting vehicle; or material placed outside the lines indicated on the plans or given by the Engineer; or material remaining on hand after completion of the Contract, will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling rejected material.

1.08 BASIS OF PAYMENT

A. Unit Price Quantities: When estimated quantity for specific portions of Work is listed in the Bid, quantity of Work to be paid for shall be actual number of units satisfactorily completed, as determined by City and agreed to by Contractor, in accordance with Contract Documents.

B. Lump Sum: When estimated quantity for specific portion of Work is not indicated and unit is designated as lump sum, payment will be on a lump sum basis for Work satisfactorily completed in accordance with Contract Documents and the approved

Schedule of Values. Progress payments will be based on a percentage complete basis for each line item of the accepted Schedule of Values.

C. City does not expressly, or by implication, agree, warrant, or represent in any manner, that actual amount of Work will correspond with amount shown or estimated and reserves right to increase or decrease amount of any class or portion of Work, to leave out entire Bid Item or Items, or to add work not originally included in Bid or Contract Documents, when in its judgment such change is in best interest of City. No change in Work shall be considered a waiver of any other condition of Contract Documents. No claim shall be made for anticipated profit, for loss of profit, for damages, or for extra payment whatsoever, except as otherwise expressly provided for in Contract Documents, because of any differences between the amount of work actually done and estimated amount as set forth herein, or for elimination of Bid Item.

PART 2 DESCRIPTION OF BID ITEMS

2.01 GENERAL

A. The bid items are presented to indicate major categories of the work for purposes of comparative bid analyses, and a preliminary breakdown for monthly progress payments. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item as shown and specified.

B. Contractor shall perform all w ork depicted in the Contract Documents whether it is specifically mentioned in the Bid Schedule and bid item descriptions or not. The Bid Schedule and the Bid Item Descriptions below are intended to cover any and all Work depicted in the Contract Documents. Not all elements of every part of the Work are explicitly listed. It is the intention of City and a provision of this Contract, that any and all of the Work depicted shall be included in Contractor's bid and installed complete at a price included in a Bid Item submitted with Contractor's bid. No adjustments will be made to unit, extended, or total prices for an item that is depicted in the contract documents but is not specifically described or itemized. Such items may be included for payment in a bid item of the Contractors' choice, as long as the chosen bid item is closely related.

C. Bid items described to be in easements occur in locations where access is difficult, typically requiring work to be completed with hand held equipment. Locations that are in or adjacent to paved streets and driveways are described to be in the public right of way.

D. The locations referenced in the bid item descriptions below are shown in more detail on the project plans,

2.02 BID ITEM DESCRIPTIONS

1. Mobilization and Demobilization

   The contractor shall include in this lump sum bid item full compensation for all labor, supervision, materials, tools, equipment and incidentals, and for all the work

involved in mobilization, including, but not limited to, furnishing all specified contract bonds and insurance certificates, required project forms, public notification, transporting equipment, establishing a storage area, sanitary restroom facilities, and all other work not otherwise attributable to any specific bid item and as directed by the Engineer. No additional compensation will be allowed therefore. This item shall also include all costs necessary to demobilize at the conclusion of all work. This item may be paid in installments as determined by the Engineer.

2. Water Pollution Control Plan

This bid item includes all work necessary to prepare and implement a Storm Water Pollution Control Plan and erosion controls plan in conformance with the applicable permits, including the City's NPDES permit for Storm Water Pollution Prevention. This bid item will be paid on a monthly basis based on the percentage of work that is completed that requires storm water pollution prevention.

3. Pedestrian and Traffic Control

This bid item includes all work necessary to prepare, implement, and maintain a pedestrian and traffic control plan. This item will be paid monthly based on the percentage of work that is completed that requires pedestrian and traffic control.

4. Sheeting, Shoring, and Bracing

This bid item includes all work necessary to comply with OSHA, Cal OSHA, and California Labor Code Section 6707, including the preparation of an excavation safety plan. This Bid Item shall include full compensation for completion of all planning, design, engineering fees, furnishing and construction, and removal and disposal of such temporary sheeting, shoring and bracing, complete, as required under the provisions of any permits, and in accordance with the requirements of OSHA and the Construction Safety Orders of the State of California, pursuant to the provisions of Section 6707 of the California Labor Code. Payment for this bid item shall be a lump sum basis paid out based on a percentage excavation completed.

5. Clearing, Demolition, and Abandonment

This Bid item includes all work necessary for Site preparation, including but not limited to, clearing, grubbing and stripping on Site as necessary to remove all interfering or objectionable material from work areas, and the demolition, removal, and disposal of items designated to be demolished and removed. This bid item also includes removal of the existing valve vault, piping, and valves, and abandonment of existing wetwell, piping, conduits, and other items as identified on the plans and as necessary to complete the project. Payment for this item shall be on a lump sum basis.

6. Bypass Pumping

This lump sum Bid price for this item shall constitute full compensation for providing all materials, labor, tools, equipment, services, and power to provide adequate pumping of sanitary sewage throughout construction. This Bid item also includes any necessary temporary re-routing of gravity sewer lines during construction. Sewage service must be maintained at all times and the Contractor

shall be responsible for providing adequate pumping capacity as specified in Section 01531. This Bid item includes coordination with the City of Belmont and PG&E, and the payment of any required fees.

7. Pump, Guide Rails, and Accessories

The Bid item shall include all materials, labor, and equipment needed to furnish and install new pump, mounting hardware, pump rails, spare parts, and other pump related equipment. This item includes furnishing operation and maintenance manuals. Payment for this item shall be on a per each pump basis.

8. Spare Pump

The Bid item shall include the purchase of a spare pump, spare parts, operating, and maintenance manuals delivered for storage at a City directed facility. Payment for this item shall be on a per each pump basis.

9. Submersible Mixer

The Bid item shall include all materials, labor, and equipment needed to furnish and install a submersible mixer, mounting hardware, mast mounting and rail system, and other related equipment. Furnish installation, operating, and maintenance manuals.

10. Discharge Piping, Valves, Bypass Pumping Connection, and Fittings

The Bid item shall include all materials, labor, and equipment necessary to provide all piping before the HDPE force main connection, valves, fittings, pipe connection, pipe supports, wall seals, and bypass pumping connection within the wetwell and valve vault as shown on the Drawings. Payment for this item shall be on a lump sum basis.

11. Precast Concrete Valve Vault

This bid item includes all necessary labor, materials, and equipment to furnish and install a precast concrete valve vault, access hatch, interior coating system, excavation, backfill, compaction, AC replacement as necessary, and drain system conforming to the requirements of these Specifications and the Contract Drawings. Payment for this bid item shall be on a lump sum basis.

12. Precast Concrete Wet Well

This bid item includes all necessary materials, equipment, and labor necessary to furnish and install a precast concrete wet well, top slab, access hatch, influent baffle, excavation, backfill, compaction, dewatering, AC replacement as necessary and interior coating conforming to the requirements of these Specifications and the Contract Drawings. Payment for this item shall be paid on a lump sum basis.

13. Flow Meter and Manhole

This bid item includes all material, labor, and equipment required to furnish and install a flow meter and manhole. This bid item includes all necessary excavation, backfill, compaction, pipe penetrations, fittings, pipe supports, flow meter and all appurtenances, electrical conduits and wiring for the flow meter, AC pavement

replacement, and other items necessary to construct a functioning flow meter within a new manhole structure. Payment for this bid item shall be on a lump sum basis.

14. Force Main Access Structure

    The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new force main access structure as shown on the Plans and specified herein. This price includes excavation, backfilling, compaction, manhole structure, piping, fittings, appurtenances, and other items as required to facilitate the construction of the work.

15. Motor Control Center

    This Bid item shall include all labor, equipment, and materials necessary to provide a functioning pump station motor control center including concrete equipment pad, pump controller, level sensing system, alarm/SCADA system, Automatic Transfer Switch (ATS), battery backup, and other items indicated on the Drawings and Specifications. Payment for this item shall be on a lump sum basis.

16. Pump Termination Cabinet

    This Bid item shall include all labor, equipment, and materials necessary to provide a functioning pump termination cabinet and concrete equipment pad as detailed in the Drawings and Specifications. Payment for this item shall be on a lump sum basis.

17. Service Pedestal

    This bid item includes all labor, materials, and equipment necessary to furnish and install a fully functional electrical service and pedestal conforming to the requirements of these specifications and the Contract Drawings. This bid item includes all labor, materials, and equipment necessary to coordinate with the electrical utility and construct the improvements from the point of service connection to the service pedestal. This bid item also includes all necessary excavation, bedding, backfill, concrete pad, AC pavement necessary to construct the electrical service and pedestal. Payment for this bid item shall be on a lump sum basis.

18. Miscellaneous Electrical Work, Wiring, and Sensors

    This bid item includes all materials, equipment, and labor necessary to furnish and install all miscellaneous electrical related items required to provide a fully functioning electrical system conforming to the Contract Documents. Work includes, but is not limited to, supply and installation of conduits and conductors, pull boxes, supply, installation and calibration of sensors and electrical devices, wiring, mounting of level sensors, and any additional work required to provide a fully functional system. This bid item also includes all necessary excavation, backfill, compaction, and other items as necessary to construct the improvements. Payment for this bid item shall be on a lump sum basis.

19. 4-Inch Building Sewer Lateral

    The unit price bid per linear foot for the following bid item shall include saw cutting, utility locating, excavation, backfilling, compacting, abandoning existing lateral, disposal excavated materials, installing 4-inch sewer lateral and connecting with existing fixtures, fittings, pipe bedding, pipe testing, furnishing and installing cleanout, cleanout box with lid, rebar and doweling, concrete and asphalt surface restoration, CCTV inspection, and all other work necessary to install the lateral, cleanout and associated appurtenances, complete, in-place.

20. 15-Inch Gravity Sewer

    The unit price bid per linear foot for the following bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new 15-inch sanitary sewer gravity pipe using trenching construction methods for the size and location indicated. This price includes locating utilities, trenching, dewatering, backfilling, compacting, removal of existing 12-inch gravity sewer pipe, excavating under the retaining wall or removing and replacing retaining wall in kind, site restoration, AC pavement replacement, CCTV inspection, and other items as required to facilitate the construction of the work.

21. 18-Inch Gravity Sewer

    The unit price bid per linear foot for the following bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new 18-inch sanitary sewer gravity pipe using trenching construction methods for the size and location indicated. This price includes locating utilities, potholing prior to construction, trenching, dewatering, backfilling, compacting, removal of existing pipe, manhole connections, site restoration, AC pavement replacement, concrete curb, gutter, and sidewalk replacement, traffic striping, CCTV inspection, and other items as required to facilitate the construction of the work.

22. Precast Sanitary Sewer Manhole 432306A

    The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new sanitary sewer manhole 432306A as shown on the Plans and specified herein. This price includes excavation, dewatering, backfilling, compacting, concrete collar, manhole connections, and other items as required to facilitate the construction of the work.

23. Precast Sanitary Sewer Manhole 432306A

    The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly remove sanitary sewer manhole 432306A and install a new sanitary sewer manholes as shown on the Plans and specified herein. This price includes removal of the existing manhole, excavation, dewatering, backfilling, compacting, concrete collar, manhole connections, and other items as required to facilitate the construction of the work.

24. Manhole Coating

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to coat the new manhole. This price includes all preparation, coating material, application and testing. Coating for larger structures, such as wet wells, are included in separate bid items.

25. Chip and Reform Manhole Invert Bench

    The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to chip and reform manhole invert and bench. This includes chipping out the wall and invert and reforming the new invert and bench.

26. 14-inch Force Main

    The unit price bid per linear foot for the following bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install new force main using trenching construction methods for the size and location indicated. This price includes locating utilities, potholing prior to construction, trenching, dewatering, backfilling, compacting, fittings, warning tape, tracer wire, tracer wire terminal boxes, site restoration, AC and concrete pavement replacement, concrete curb, gutter, and sidewalk replacement, traffic striping and markings, testing, and other items as required to facilitate the construction of the work.

27. Air Release Valve

    The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools, and services necessary to furnish and properly install air release valves and associated appurtenances on the new sanitary sewer force main within the force main access structures, as shown on the plans and specified herein. This price includes the air release valve, and other items as required to facilitate the construction of the work.

28. Startup, Testing, and Training

    The lump sum bid for this item shall include all labor, equipment, and materials necessary to provide equipment startup, testing, and training services for all electrical, mechanical, and piping systems.

29. Modify Existing Wetwell

    The lump sum bid item shall constitute full compensation for all material, labor, equipment, tools and services necessary to modify the existing wet well as indicated on the plans. This bid item includes but is not limited to the removal of existing access hatches, beams, lower platform pumps, discharge piping and appurtenances, the overhead crane, grouting floor to slope to new discharge, repairing any damaged concrete surfaces and coating existing wetwell structure, installation of safety railing, and any other items indicated on the plans. This bid item also includes the installation of new removeable guard railings as indicated on the plans.

30. Abandon Sanitary Force Main

The lump sum bid item shall constitute full compensation for all material, labor, equipment, tools and services necessary to abandon the existing sanitary sewer force main. This price includes capping the pipe ends with concrete and other items as required to facilitate the construction of the work.

31. Abandon Sewer Gravity Main

The unit price bid per linear foot for the following bid item shall constitute full compensation for all material, labor, equipment, tools and services necessary to abandon the existing 12-inch sewer. This price includes removal of the existing pipe within the excavations, capping pipe ends with concrete, and filling the pipe as indicated on plans, and other items as required to facilitate the construction of the work.

32. Abandon Sanitary Manhole 432402

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools and services necessary to abandon each manhole. This price includes removal of existing frame, lid, cone, and structure below grade as indicated on drawings, fill of existing manhole, and site restoration.

33. Monument Replacement

The unit price bid per each for this bid item shall constitute full compensation for all material, labor, equipment, tools and services necessary to replace a monument. This price includes surveying of the monument, removal of the existing monument, installation of the new monument, and recording the monument with the county.

34. Miscellaneous Building Improvements

The lump sum for this bid item shall include all building improvements indicated on the plans. This bid item includes the removal of the lockers, storage shelves, control panels, transformer, panelboard, metering panels, switchboard, pump conduits, ceiling gypsum boards, bathroom partition, door where indicated, and desk. It also includes the filling of wall opening as indicated on drawings, installing new walls, installing roof anchorage, new ceiling gypsum board, patching locations where equipment anchorage was removed, painting of above grade walls, ceiling, gutters, downspouts, and soffit, and other items as required to facilitate the construction of the work.

35. Miscellaneous Site Improvements

The lump sum for this bid item shall include all site improvements necessary to complete the work indicated on the Contract Documents that are not covered by other bid items. This bid item may include, but is not limited to replacement of bollards, curbs, gutters, asphalt surfaces at the pump station site, and regrading site for proper drainage around new structures.

36. Bid Allowance and Permit Fees

This bid allowance may be used at City's discretion for items that could not be reasonably anticipated from the construction documents. This item may be used by the City for payment for items such as relocating utilities, or other items that could not be reasonably anticipated from the bid documents or pre-bid site visits. At the completion of the Construction Contract, a balancing change order will be issued and funds not used from the Bid Allowance lump sum amount named in the Bid Schedule will be revoked.

37. Bid Alternate: Electrical Service Conduit

This bid alternate may be used by the City if a new electrical conduit is required by PG&E between PG&E service pole at the street to the transformer. This item includes excavation, backfill, compaction, conduit casing pipe with an assumed length of 80 linear feet, surface restoration between the pole at the street to the transformer, and other items as necessary to complete the work in conformance with PG&E Greenbook standards. This item does not include installation or pulling of the of the power cable wire to the transformer which is performed by PG&E.

2.03 CONTRACTOR'S COST BREAKDOWN

A. The Contractor shall submit a Schedule of Values to the Engineer at the preconstruction conference. The price breakdown, as agreed upon by the Contractor and the Engineer, shall be used for preparing future estimates for partial payments to the Contractor, and shall list the major items of work with a price fairly apportioned to each item. Overhead and other general costs and profit shall be prorated to each item so that the total of the prices for all items equal the lump sum price.

B. The price breakdown shall be generally in the same format as the Contract specifications divisions and subdivisions, with major items of work listed individually. The price breakdown shall be by structural, civil, landscaping, or other logical division of work. The price breakdown shall include separate allowances for any testing and startup work required. Measurable approximate quantities of work performed by the Contractor or its subcontractors shall be provided. For quantities that are the sum total of several individual quantities, backup summaries shall be provided which list the individual descriptions and quantities. These summaries then will be used to determine the quantities of work in place in subsequent progress payment requests.

C. The above is a statement of the intent of the Contract Documents to provide a moderate level of detail, acceptable to the Engineer, to allow a fair and reasonable estimate to be made of the value of work installed. The detail of the price breakdown must be sufficient to provide timely processing of the monthly progress payment request.

D. The price breakdown will be subject to the approval of the Engineer, and upon request, the Contractor shall substantiate the price for any or all items and provide additional level of detail, including quantities of work. The price breakdown shall be sufficiently detailed to permit its use by the Engineer as one of the bases for evaluating requests for payments. The Engineer shall be the sole judge of the adequacy of the price breakdown.

E. The Schedule of Values shall be solely used to determine progress payments. The Schedule of Values shall not be considered in determining payment or credit for additional or deleted work.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01300
CONTRACTOR SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL

A. Wherever submittals are required hereunder, all such submittals by the CONTRACTOR shall be submitted to the ENGINEER.

B. Within 14 business days after the date of commencement as stated in the Notice to Proceed or at Preconstruction Conference, which may occur within 10 working days of the date of commencement, the CONTRACTOR shall submit the following items to the ENGINEER for review:
   1. A preliminary schedule of Shop Drawings, Samples, and proposed Substitutes ("Or-Equal") submittals listed in the Bid.
   2. A list of all permits and licenses the CONTRACTOR shall obtain indicating the agency required to grant the permit and the expected date of submittal for the permit and required date for receipt of the permit.

1.02 MEASUREMENT AND PAYMENT

A. Full compensation for conforming to the Provisions of this Section will be considered as included in the prices paid for the various items of Work and no additional compensation will be allowed therefore.

1.03 SUBMITTAL TIMING

A. The CONTRACTOR shall submit the following items to the ENGINEER for review one week prior to the pre-construction conference:
   1. Proposed construction schedule for entire project.
   2. Proposed Traffic Control Plans (see Section 01120-1.10)

B. At the pre-construction conference referred to in the Special Provisions, the CONTRACTOR shall submit the following items to the ENGINEER for review:
   1. A preliminary list of submittals.
   2. A list of all permits and licenses the CONTRACTOR shall obtain indicating the agency required to grant the permit, the expected date of submittal for the permit, and required date for receipt of the permit.
   3. Proposed Resident notification letter
   4. A 21-day plan of operation.
   5. Sewer bypass plan (see Section 01531)
   6. Water Pollution Control Plan (WPCP)
   7. Sanitary Sewer Overflow (SSO) Emergency Response Plan

C. Several items have significantly long lead times. It is the Contractor's responsibility to expedite the submittal and material procurement process for long lead time items as necessary to complete the work within the contract time provided. The following items have been identified as items that may have significantly long lead times. This list may

not include all items with long lead times and it is being provided for informational purposes only.

1. Motor Control Center
2. Pump Termination Cabinet
3. Wetwell Mixer
4. Magnetic Flow Meters
5. Submersible Pumps
6. Piping, valves, and fittings
7. Precast concrete structures

D. The following submittals are required to be turned in within 10 working days after the Notice to Proceed date:

1. Wetwell Mixer
2. Magnetic Flow Meters
3. Submersible Pumps
4. Piping, valves, and fittings

E. The following submittals are required to be turned in within 25 working days after the Notice to Proceed date:

1. Motor Control Center
2. Pump Termination Cabinet
3. Precast concrete structures

1.04 SHOP DRAWINGS

A. Wherever called for in the Contract Documents, or where required by the ENGINEER, the CONTRACTOR shall furnish to the ENGINEER for review, 4 copies of each shop drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication, and installation drawings, erection drawings, list, graphs, catalog sheets, data sheets, and similar items. Whenever the CONTRACTOR is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of an ENGINEER registered in the appropriate branch and in the state wherein the project is to be built, unless otherwise directed.

B. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. A multiple-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the ENGINEER.

C. Except as may otherwise be indicated herein, the ENGINEER will return prints of each submittal to the CONTRACTOR with its comments noted thereon, within 14 working days following their receipt by the ENGINEER. It is considered reasonable that the CONTRACTOR shall make a complete and acceptable submittal to the ENGINEER by the second submission of a submittal item. The OWNER reserves the right to withhold monies due to the CONTRACTOR to cover additional costs of the ENGINEER's review beyond the second submittal. The ENGINEER'S maximum review period for each submittal, including all resubmittals, will be 14 working days per submittal. In other words, for a submittal that requires two resubmittals before it is complete, the maximum review period for that submittal could be 28 working days. No extension of

Contract Time will be granted for delays due to resubmittals that are reviewed within the number of days specified.

D. If the submittal is returned to the CONTRACTOR marked "NO EXCEPTIONS TAKEN," formal revision and resubmission of said submittal will not be required.

E. If the submittal is returned to the CONTRACTOR marked "MAKE CORRECTIONS NOTED," formal revision and resubmission of said submittal will not be required.

F. If the submittal is returned to the CONTRACTOR marked "REVISE AND RESUBMIT," the CONTRACTOR shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the ENGINEER.

G. If a submittal is returned to the CONTRACTOR marked "REJECTED-RESUBMIT," the CONTRACTOR shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the ENGINEER.

H. Fabrication of an item shall be commenced only after the ENGINEER has reviewed the pertinent submittals and returned copies to the CONTRACTOR marked either “NO EXCEPTIONS TAKEN” or “MAKE CORRECTIONS NOTED.” Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.

I. All CONTRACTOR shop drawings submittals shall be carefully reviewed by an authorized representative of the CONTRACTOR, prior to submittal to the ENGINEER. Each submittal shall be dated, signed, and certified by the CONTRACTOR, as being correct and in strict conformance with the Contract Documents. In the case of shop drawings, each sheet shall be so dated, signed, and certified. No consideration for review by the ENGINEER of any CONTRACTOR submittals will be made for any items which have not been so certified by the CONTRACTOR. All non-certified submittals will be returned to the CONTRACTOR without action taken by the ENGINEER, and any delays caused thereby shall be the total responsibility of the CONTRACTOR.

J. The ENGINEER's review of CONTRACTOR shop drawings submittals shall not relieve the CONTRACTOR of the entire responsibility for the correctness of details and dimensions. The CONTRACTOR shall assume all responsibility and risk for any misfits due to any errors in CONTRACTOR submittals. The CONTRACTOR shall be responsible for the dimensions and the design of adequate connections and details.

1.05 CONTRACTOR'S SCHEDULE

A. Prepare construction schedule showing sequence of activities and proposed shutdowns.

B. Preliminary construction schedule submitted five days prior to Pre Construction Meeting.

C. Update construction schedule on monthly basis and submit with request for Progress Payment.

1.06 RECORD DRAWINGS

A. The CONTRACTOR shall keep and maintain, at the job site, one record set of Drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or

deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or directed to indicate, fully, the WORK as actually constructed. These master record drawings of the CONTRACTOR's representation of as-built conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of the WORK.

B. Record drawings shall be accessible to the ENGINEER at all times during the construction period.

C. Final payment will not be acted upon until the CONTRACTOR prepared record drawings have been prepared and delivered to the ENGINEER. Said up-to date record drawings shall be in the form of a set of Contract Documents prints with any changes from the original Contract Documents carefully plotted on the prints in red ink.

D. Upon substantial completion of the WORK and prior to final acceptance, the CONTRACTOR shall finalize and deliver a complete set of record drawings to the ENGINEER for transmittal to the OWNER, conforming to the construction records of the CONTRACTOR. This set of drawings shall consist of corrected drawings showing the reported location of the WORK, and shall become the property of the OWNER. The information submitted by the CONTRACTOR and incorporated by the ENGINEER into the Record Drawings will be assumed to be correct, and the CONTRACTOR shall be responsible for the accuracy of such information, and for any errors or omissions which may appear on the Record Drawings as a result.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01354
HAZARDOUS MATERIALS CONDITIONS AND PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION

A. Section includes description of existing site conditions, general requirements, and procedures for work in the presence of hazardous materials, and requirements for personal protective equipment, training, and monitoring.

B. Requirements of this section apply to the Work or any portion thereof which involves disturbance of or exposure to hazardous materials.

1.02 DEFINITIONS

A. Hazardous Materials: Materials consisting of or containing any substances defined, regulated or listed as hazardous substances, hazardous materials, hazardous wastes, health hazards, toxic waste, pollutant or toxic substances or similarly identified as hazardous to human health or the environment in or pursuant to CERCLA, the Hazardous Materials Transportation Act, RCRA, the Clean Water Act, California Health and Safety Code, the Clean Air Act, the California Water Code or any other appropriate regulation or law including without limitation friable asbestos, polychlorinated biphenyls, petroleum, natural gas and synthetic fuel products and by-products.

B. Personal Protective Equipment (PPE): Individually donned equipment and clothing used in conjunction with appropriate engineering controls and work practices to protect project workers from unacceptable risk related to the handling of soil, building material, or groundwater impacted with hazardous materials.

C. Training and Personnel Monitoring – Labor, materials, equipment, and analyses, utilized to provide appropriate baseline and ongoing training, communication, and verification, including medical surveillance (if needed), of conditions related to employee exposure to hazardous materials.

D. Contaminated Materials:
   1. Contaminated Soil: Soil that cannot be disposed of at a Class II or III landfill/disposal site.
   2. Contaminated Water: Ground water from dewatering operations containing constituents at measured levels in excess of permit thresholds for discharge into the sanitary sewer system.
   3. Contaminated Sludge: Sludge, sediment and debris removed from the sanitary sewer facilities that cannot be disposed of at a Class II or III landfill/disposal site.
   4. Site materials, whether existing or new, other than soil or water that cannot be disposed of at a Class II or III landfill/disposal site shall also be considered as contaminated material.

1.03 SUBMITTALS

A. Hazardous Materials Site-Specific Health and Safety Plan (HMSSHASP): Submit for acceptance by the Engineer within 21 days after Notice to Proceed.

B. Amendments: Submit amendments to the HMSSHASP for review and acceptance by the Engineer as they occur.

C. Contaminated Soil Excavation and Disposal Work Plan (CSEDWP):
   1. The CONTRACTOR shall prepare and submit to the ENGINEER for approval a CSEDWP. The plan shall be approved prior to beginning any excavation work.
   2. The CSEDWP shall address the management of contaminated soils and ground water that may be encountered during the prosecution of the Work. All contaminated material encountered in work areas shall be disposed of at a landfill/disposal site approved for the type of material encountered.
   3. The CSEDWP shall address removal and disposal procedures for contaminated soils encountered along the pipeline alignments. The Plan will provide, at a minimum, the following information:
      a. The name(s) and address(es) of Subcontractor(s) for work of this Section.
      b. As discussed in 2.01, the methodology for all waste tracking activities to prevent the occurrence of cross contamination; excavation methods detailing operations necessary to ensure no blending of contaminated soil with non-contaminated soil; and temporary stockpiling methods.
      c. Corporate name, address, and contact person information (name, telephone, and fax number) of all hazardous waste transporters. Include proof of current permit, license, and/or authorization to transport hazardous waste within the state.
      d. Disposal facility information described in 2.01 herein.
      e. The CONTRACTOR shall submit documentation certifying that all contaminated materials were transported to, accepted, and disposed of, at the disposal facility.

1.04 EXISTING SITE CONDITIONS

A. Contaminated Material:
   1. City is not aware of substantial contamination at these Work sites, but given the historic use of the facilities, contaminated material could include lead-based paint, Asbestos concrete pipe, residual solvents, and petroleum hydrocarbons from maintenance activities.

1.05 GENERAL REQUIREMENTS

A. No work that disturbs existing structures, soil, or groundwater containing hazardous materials shall be performed until the Hazardous Substance Site-Specific Health and Safety Plan is reviewed and accepted by the Engineer.

B. Documentation:
   1. Maintain logs on-site of monitoring equipment calibration.
   2. Maintain logs on-site of the results of field monitoring measurements.
   3. Maintain copies on-site of any laboratory analytical results associated with health and safety monitoring.

C. Contractor shall comply with the following general work practices:
   1. Do not smoke, chew gum, apply cosmetics, or consume food and beverages in areas where hazardous materials are being handled.
   2. Wash hands thoroughly before eating, smoking, or drinking.
   3. Do not store food in areas where it may come in contact with hazardous materials, including soil and dusts.
   4. To the extent practical, stay upwind from operations that emit vapors, gases, or particulates.
   5. Clean clothing and footwear upon leaving jobsite and prior to entering any vehicle, mobile equipment, or office.
   6. Clean vehicle interiors and hand held tools as needed to prevent accumulation of particulates.

D. Follow guidelines for the selection and use of proper personal protective equipment as outlined in the applicable job safety or task hazard analysis from the Hazardous Material Site Specific Health and Safety Plan. At a minimum all Contractor personnel that may come into contact with site soils shall be suitably dressed to perform their work in a safe manner that minimizes exposure to soil and does not interfere with their hearing, vision, or free use of their hands or feet. The following minimum PPE shall be worn by all Contractor employees who may come into contact with site soils:
   1. Waist length shirts with sleeves.
   2. Trousers covering the entire leg.
   3. Work boots.
   4. Eye protection meeting the latest American National Standard for Occupational and Educational eye and face protection.
   5. Work gloves when handling soil or hand tools in contact with soil.
   6. Additional equipment may modify this minimum requirement and, if required, will be outlined in the Hazardous Material Site Specific Safety and Health Plan as part of the job safety or task hazard analysis.

E. Use equipment, in addition to the minimum outlined herein, if listed in the Hazardous Material Site Specific Safety and Health Plan as part of the job safety or task hazard analysis.

1.06 HAZARDOUS MATERIALS SITE-SPECIFIC HEALTH AND SAFETY PLAN

A. Prepare a Hazardous Materials Site-Specific Health and Safety Plan (HMSSHASP) for all site personnel in accordance with the federal OSHA, and Cal/OSHA regulations.
   1. The Plan shall include:
      a. Provisions specific to handling soils and ballast containing elevated concentrations of petroleum hydrocarbons, poly-nuclear aromatic hydrocarbons, and the metals lead and arsenic.
      b. Additional information or procedures as determined necessary by the Contractor for safe performance of work in the presence of hazardous materials.

B. Implement the HMSSHASP, including use of engineering controls, providing its site personnel with the appropriate training and monitoring and personal protective equipment (PPE) based upon the type of work to be performed and the associated hazard, and ensuring proper use of PPE and compliance with safe work practices. The

Contractor shall perform all monitoring necessary to determine the ongoing appropriate level of PPE for the work.

C. The Engineer will have the authority to stop work if, in the opinion of the Engineer, the level of PPE selected by the Contractor is not appropriate or site personnel are not complying with the requirements of the HMSSHASP.

1.07 UNKNOWN HAZARDOUS MATERIALS

A. When the presence of hazardous materials are not indicated in the Contract Documents and the Contractor encounters materials, including groundwater, which the Contractor reasonably believes to be hazardous and the hazardous materials have not been rendered harmless, the Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing. The Contractor may continue work in unaffected areas reasonably believed to be safe.

B. The Engineer will direct the Contractor as to sampling, testing, disposal, and/or remedial work that might take place either through the Contractor's forces or City's own forces or an authorized agent. If the consequent delay of work in the affected area delays a current controlling operation, the delay will be considered in accordance with the Contract General Provisions.

PART 2 PRODUCTS

2.01 CONTAMINATED SOILS

A. The CONTRACTOR shall perform all work of this Section in accordance with the Hazardous Materials Site Specific Health and Safety Plan. The Hazardous Materials Site Specific Health and Safety Plan shall contain the information listed below.

B. Hazardous Materials Site Specific Health and Safety Plan
   1. Detail the Methods and Procedures to comply with California Labor Code Section 6401.7, Federal, and Local Health and Safety Laws, Rules and Requirements for the duration of the Contract Times. Include the following:
      a. Identification of the certified or licensed safety consultant, who will prepare, initiate, maintain, and supervise safety programs, and procedures. Consultant shall meet the following requirements:
         1) Health, Safety, and Environmental (HSE) consultants per OSHA requirements, or
         2) Certified Safety Professionals (CSP) per OSHA requirements.
      b. Procedures for providing workers with an awareness of safety and health hazards expected to be encountered in the course of construction.
      c. Safety equipment appropriate to the safety and health hazards expected to be encountered during construction. Include warning devices, barricades, safety equipment in public right-of-way and protected areas, and safety equipment used in multi-level structures.
      d. Methods for minimizing employees' exposure to safety and health hazards expected during construction.
      e. Procedures for reporting safety or health hazards.
      f. Procedures to follow to correct a recognized safety and health hazard.

g. Procedures for investigation of accidents, injuries, illnesses, and unusual events that have occurred at the construction site.
h. Periodic and scheduled inspections of general work areas and specific work stations.
i. Training for employees and workers at the jobsite.
j. Methods of communication of safe working conditions, work practices and required personal protection equipment.

2. Assume responsibility for every aspect of Health and Safety on the jobsite, including the health and safety of subcontractors, suppliers, and other persons on the jobsite.
   a. Employ additional health and safety measures specified by the Safety Consultant, as necessary, for workers in accordance with OSHA guidelines.
3. Transmit to CITY and ENGINEER copies of reports and other documents related to accidents or injuries encountered during construction.

C. On all portions of the work involving grading or excavation, the CONTRACTOR shall examine soil as evidenced by site history, discoloration, odor, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
1. If the project is not within an area of known soil contamination and no evidence of soil contamination is found, then testing of the soil will only be required if directed by the ENGINEER. The CONTRACTOR shall follow the paragraphs below, if contamination is suspected or found.
2. If the work is within an area of known soil contamination or evidence of soil contamination is found, then soil from grading or excavation operations shall be tested.
   a. The soil shall be managed as required by the governing agencies.
   b. The CONTRACTOR shall test excavated material suspected of contamination for disposal characteristics.
   c. All confirmation and stockpile soil samples for testing shall be submitted to a State-certified analytical laboratory for chemical analysis.
3. If the project is found to be within an area of soil contamination not identified by the CITY in the Contract Documents, a change order shall be negotiated to cover additional work performed by the CONTRACTOR.

D. During excavation, if the CONTRACTOR encounters contaminated soil, the CONTRACTOR shall immediately implement the CSEDWP. Any non-contaminated soil that becomes mixed with contaminated soil shall be designated as contaminated and shall be handled and disposed as such at no additional cost to the CITY. CONTRACTOR will not be paid for handling and disposal of the volume of non-contaminated soil at the contaminated soil price, if it is mixed with contaminated soil.

E. The CONTRACTOR shall temporarily stockpile excavated soil in piles not exceeding a volume of 500 cubic yards pending soil characterization and analytical results. Stockpiles shall be securely barricaded and clearly labeled. Excavated material will not have to be segregated into different stockpiles for sampling and disposal. However, if a clearly segregable material is encountered (railroad ballast or other soil that is stained, odorous, or discolored) the material shall be stockpiled separately and sampled for disposal characteristics.

F. Contaminated soils stored at the temporary stockpile area shall be covered with visqueen material to prevent the migration of contaminants from the material. CONTRACTOR

shall provide temporary berms constructed of clean soil or hay bales and covered with visqueen to contain runoff from the stockpiled soil. Visqueen material shall have a thickness of at least 10 milli-inches. CONTRACTOR shall recover all rainwater or other water that collects in the temporary stockpile area.

G. The CONTRACTOR shall implement a material tracking system to track all contaminated soil between collection, excavation, stockpiling or storage, sampling and testing, and final disposition. The waste tracking system shall include identification of the source of the soil (location, depths, and date of excavation) and stockpile or storage location.
   1. The CONTRACTOR shall identify a minimum of one landfill that is permitted to and will accept the contaminated soils expected for disposal. The CONTRACTOR shall select landfills that are established, fully operational, and in full compliance with all applicable federal, state, and local regulations.

H. All construction equipment used for the handling of contaminated material shall be decontaminated prior to use for other work elements or removal from site.

2.02 CONTAMINATED WATER

A. The CONTRACTOR shall perform all work of this Section in accordance with the Construction Safety Plan described in this specification.

B. The CONTRACTOR shall contain and properly dispose of all water generated from excavation work in contaminated areas, as described in this Section.

C. The CONTRACTOR shall test excavated ground water for disposal characteristics. The CONTRACTOR shall allow the suspended particles to settle out of solution prior to testing water. Water samples taken during initial studies included suspended particles that contained metals. All confirmation samples will be submitted to a State-certified analytical laboratory for chemical analysis.

D. During excavation operations, if the CONTRACTOR encounters contaminated water, the CONTRACTOR shall immediately implement the CSEDWP. Any non-contaminated water that becomes mixed with contaminated water shall be designated as contaminated water and shall be handled and disposed as such at no additional cost to the CITY. CONTRACTOR will not be paid for handling and disposal of the volume of non-contaminated water at the contaminated price, if it is mixed with contaminated water.

E. The CONTRACTOR shall temporarily store water from dewatering activities pending water characterization and analytical results. Stored water shall be clearly labeled. Contractor shall install in-line filtration system prior to disposal for water if required by disposal facility.

F. The CONTRACTOR shall identify a minimum of one disposal site that is permitted to and will accept the contaminated water expected for disposal. The CONTRACTOR shall select facilities that are established, fully operational, and in full compliance with all applicable federal, state, and local regulations.

G. All construction equipment used for the handling of contaminated material shall be decontaminated prior to use for other work elements or removal from site.

PART 3 EXECUTION

3.01 HAZARDOUS MATERIALS INDEMNITY

A. From and after CONTRACTOR undertakes work on the property subject to this Agreement, CONTRACTOR shall indemnify, defend (with counsel selected by CITY) and hold harmless CITY, from and against all Liability concerning CONTRACTOR's operations on said property. CONTRACTOR and CITY agree that upon receipt of any notices of a release or potential release of Hazardous Materials during work on the property subject to this Agreement or transportation to or from the disposal facility at which the hazardous soils may be placed, the parties will provide prompt notice to the other. CONTRACTOR shall timely initiate and diligently pursue and complete all appropriate response, remediation, and removal actions for the release, within the deadlines specified by applicable laws and regulations.

B. So long as CONTRACTOR is not in material breach hereof, and is discharging its defense and indemnity obligations in a reasonable and responsible manner for a Liability, and it has accepted and is discharging responsibility hereunder for such liability without any reservation of rights, CITY hereby assigns to CONTRACTOR all of its present and future rights to recover, or receive contribution, from any and all potentially responsible third parties for those costs, expenses and fees incurred by CONTRACTOR pursuant to this Indemnity. Subject to the foregoing, CITY hereby also assigns its rights to CONTRACTOR to bring an action against or otherwise cause any or all of such potentially responsible parties to take responsive actions, and to remove and remediate the Hazardous Materials. Each party agrees to cooperate fully with the other in the preservation and prosecution of all such claims and private enforcement actions.

C. So long as CONTRACTOR is not in material breach hereof, and is discharging its defense and indemnity obligations in a reasonable and responsible manner for a Liability, and it has accepted responsibility hereunder for such liability without any reservation of rights, CONTRACTOR shall have control over the defense of such Liability without any reservation of rights, and over all negotiations relating to the settlement thereof. CONTRACTOR's exercise of control over settlements shall not relieve CONTRACTOR of its indemnity and defense obligations to CITY.

3.02 HAZARDOUS MATERIAL AND WASTE MANAGEMENT

A. Storage: The CONTRACTOR shall label and store all hazardous materials, such as pesticides, paints, thinners, solvents, and fuels; and all hazardous wastes, such as waste oil and antifreeze; in accordance with all applicable local, State and Federal regulations.
   1. The CONTRACTOR shall store all hazardous materials and all hazardous wastes in accordance with secondary containment regulations, and it is recommended that these materials and wastes be covered, as needed, to avoid potential management of collected rain water as a hazardous waste.
   2. The CONTRACTOR shall keep an accurate, up-to-date inventory, including, but not limited to, Material Safety Data Sheets (MSDSs) of hazardous materials and

hazardous wastes stored on-site, to assist emergency response personnel in the event of a hazardous materials incident.

B. Usage: When rain forecast within 24 hours or during wet weather, the Engineer may prevent the CONTRACTOR from applying chemicals in outside areas. The CONTRACTOR shall not over-apply pesticides or fertilizers and shall follow material manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.

C. Disposal: The CONTRACTOR shall arrange for regular hazardous waste collection to comply with time limits on storage of hazardous wastes. The CONTRACTOR shall dispose of hazardous waste only at authorized and permitted Treatment, Storage, and Disposal Facilities, and use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits for transportation specified in State and Federal regulations. CONTRACTOR shall ensure that CITY receives a copy of the Uniform Hazardous Waste Manifest form completed by the hazardous waste facility that accepted said materials.

END OF SECTION

SECTION 01505
MOBILIZATION/DEMOBILIZATON

PART 1 - GENERAL

1.01 GENERAL

A. Mobilization shall include the obtaining of all permits; moving onto and off of the site of all personnel and equipment; furnishing and erecting temporary facilities, temporary fence, and other construction facilities, including the dismantling and removal of such facilities; and implementing security requirements; all as required for the proper performance and completion of the WORK. Mobilization shall include the following principal items:

1. Moving on to the site of all CONTRACTOR's equipment required for first month operations.
2. Providing on-site sanitary facilities and potable water facilities.
3. Arranging for and erection of CONTRACTOR's work and storage areas.
4. Obtaining all required permits including, but not limited to, City of Belmont Encroachment Permit, discharge permit from the Silicon Valley Treatment Plant, OSHA permits, and all other permits necessary to complete the work.
5. Having all OSHA required notices and establishment of safety programs.
6. Having the CONTRACTOR's superintendent at the job site full time.
7. Submitting initial submittals, including those required for the Preconstruction Conference.
8. Completing the Preconstruction Conference.
9. Obtaining temporary construction water permit and meter from Mid-Peninsula Water District (MPWD). The contractor is responsible for providing a backflow prevention device with current test certification and conveying water to the point of use.

B. Demobilization shall include moving off the site all equipment and temporary facilities; final cleaning of all work sites and the Contractor’s staging area; completion of all punch list items; and submittal of construction record drawings, any required permits signed by the issuing agency, certifications, and operation and maintenance manuals.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01531
TEMPORARY FLOW CONTROL

PART 1 - GENERAL

1.01 DEFINITION

A. Bypass Pumping: Temporary flow control accomplished by diverting flow away from the Work area using one or more pumps

B. Temporary Flow Control: Reducing, limiting, or excluding flow in or to a sanitary sewer, storm sewer, pump station, force main, or other facility as required for performing the Work under the Contract. Draining, handling, and disposal of sanitary sewage and stormwater from pipelines and other facilities as required for performing the Work under the Contract is also part of temporary flow control.

C. Temporary Flow Control Plan: Plan prepared by Contractor containing complete information on how Contractor proposes to perform temporary flow control in accordance with specified requirements.

1.02 SYSTEM DESCRIPTION

A. Provide facilities and controls required to intercept, convey, and discharge sanitary sewer flows to the pump station and adjacent gravity sewer lines at all times during Construction.

B. Include standby and emergency equipment as specified herein, and as necessary to adequately convey the inflows.

C. The estimated flow rates at the Pump Station are listed below:
   1. Haskins Pump Station Peak Wet Weather Flow (PWWF): 354 gpm.
   2. Gravity Sewer Peak Wet Weather Flow (PWWF): 1,329 gpm
   3. San Juan Pump Station Peak Wet Weather Flow (PWWF): 1,683 gpm (Combined Gravity and Haskins PWWF)
   4. Existing Measured San Juan Pump Station Peak Discharge Flow Rate: 940 gpm

D. The existing pump station and force main is not capable of conveying the PWWF. The Contractor shall not increase the operating pressure and flow rate within the existing force main beyond the existing pump station operating conditions. Increasing the pressure/flow rate may damage and/or a break the existing force main. See the pumping system capacity requirements below.

E. Bypass pumping system capacity requirements:
   1. When the bypass pumping system utilizes the existing force main, the system shall be designed using the following capacity: 940 gpm at 225 total feet of head. The pump curves shall be within 5% of the identified operating points.
   2. When the bypass pumping system utilizes the new force main the system shall be designed to convey the PWWF of 1,683 gpm at 250 feet of total dynamic head.

F. Installation of the new force main may conflict with the existing force main due to utility congestion. The contractor shall assume that there may be up to three locations (200 linear

feet of pipe per location) where the existing force main needs to be removed to install the new force main.

1. A temporary bypass force main will be required to accommodate installation of the new force main.
2. Contractor shall develop a detailed plan for draining the force main, handling and conveying all sewage, making connections to the existing force main, installing temporary bypass pipes, etc.
3. Temporary bypass pipes may need to be installed at night when flows to the pump station are limited.
4. Bypass system may require the use of multiple vactor trucks to handle and convey sewage during draining of the existing force main and installation of temporary bypass pipes.
5. Access to driveways shall be provided at all times during construction.
6. The use of temporary bypass pipes shall be limited to the extent practicable. The Contractor shall phase the work requiring temporary bypass pipes to occur at the end of the force main installation to limit the duration of temporary bypass pipe use.

G. Contractor shall phase the project in a manner that minimizes the use of the existing force main for bypass pumping to the extent feasible.

H. The new force main shall be fully installed, inspected, and tested prior to utilizing it for bypass pumping.

I. All sewer flows shall be pumped to and discharged to the gravity sewer system at or downstream of the existing sanitary sewer force main discharge location. There are no City of Belmont gravity sewer lines closer to the pump station that the flow can be pumped to.

J. Contractor shall assume responsibility for the pump station, all pump station equipment, and all pump station flows to the completion of the project once the contractor modifies any of the following:
   1. Existing force main or discharge piping
   2. Existing pump station equipment, including but not limited to, electrical equipment, power source, alarms, floats, guide rails, pumps, and backup generator.

K. Conform to regulatory requirements.

L. Protect water resources, wetlands, and other natural resources.

M. Temporary flow control shall be done in a manner that will not damage private or public property, or create a nuisance or public menace. Flow shall be conveyed in enclosed pipes that are adequately protected from traffic or other hazards.

N. Bypass systems that are left in place unsupervised (i.e. during non-working hours), shall be a completely redundant system, with alarms that will alert the Contractor and City if desired, of issues that occur on the system. **Minimum measures needed to be completely redundant include a backup pump (capable of conveying the entire design peak flow rate), backup power, automatic transfer switch to backup power, and backup water level monitor/floats.**

1.03 SITE CONDITIONS

A. Obtain approval and secure permits for placement of temporary flow control facilities within public right-of-way.

B. Existing facilities are shown on Drawings.

1.04 SUBMITTALS

A. Informational Submittals:
   1. Temporary Flow Control and Bypass Plan.
   2. Emergency Cleanup Plan.
   3. Emergency Contact Information.
   4. Names and qualifications of industrial hygienist and standby cleanup Subcontractor, including but not limited to, certification by the Institute of Inspection, Cleaning, and Restoration Certification (IICRC).
   5. Information describing equipment and materials to be used and showing conformance with specified requirements.

B. Notification Letter:
   1. Provide notification letter to City with the date that the Contractor will be responsible for managing the existing pump station and flows associated with it.

1.05 QUALITY ASSURANCE

A. Qualifications:
   1. Industrial Hygienist and Cleanup Subcontractor: Certified by the Institute of Inspection, Cleaning, and Restoration Certification (IICRC).
   2. Temporary Flow Control System Designer: Professional engineer who has at least 5 years' experience in design of such systems and who is registered in the State of California.

PART 2 - MATERIALS

2.01 GENERAL REQUIREMENTS

A. Provide materials and equipment that will ensure continuous and successful operation of temporary flow control systems.

B. Contractor shall regularly inspect the bypass system and repair or modify systems as necessary.

C. Unless otherwise shown or specified, materials and equipment may be new or used at Contractor's option.

2.02 PLUGS

A. Provide with taps for connection of pressure gauges and air hoses and flow-through capability.

B. Pipe Diameters 24 Inches and Smaller: Use mechanical plugs with rubber gaskets or pneumatic plugs with rubber boots.

C. Pipe Diameters Larger than 24 Inches:
   1. Use inflatable bag stoppers made in two or more pieces.
   2. Manufacturers:
      a. Lansas
      b. Cherne Industries
      c. Or approved equal

2.03 PUMPS

A. Provide full pumping redundancy that will be automatically implemented immediately upon failure of primary pump.

B. Pumps shall be fully automatic, self-priming units that do not require use of foot valves or vacuum pumps in priming system.

C. Pumps shall be solids handling design with ability to pump minimum 3-inch diameter sphere.

D. Pumps shall be able to run dry for long periods of time to accommodate cyclical nature of flows.

E. Engine: Equipped to minimize noise. Noise levels shall not exceed 55 dBA at a distance of 50 feet from source

2.04 GENERATOR

A. Generator shall be able to simultaneously start and run electric powered pumps required for flow to be controlled.

B. Equipped to minimize noise. Noise levels shall not exceed 55 dBA at a distance of 50 feet from source.

C. Include automatic transfer switch if flow control system is to operate unattended.

D. Use of the existing generator during bypass pumping is acceptable with an approved submittal detailing the proposed wiring, connection, and alarm modifications. The Contractor is responsible for all temporary connections, confirming compatibility, fuel, maintenance, and ensuring it is capable of starting and running all bypass equipment.

E. Contractor is responsible for providing all fuel required during bypass pumping. Contractor shall fill the existing fuel tank upon completion of bypass pumping.

F. Temporary generators shall be registered with the California Air Resource Board (ARB) and shall meet all ARB and Bay Area Air Quality Management District (BAAQMD) requirements.

2.05 LEVEL SENSORS, ALARM AND NOTIFICATION SYSTEM

A. Provide redundant backup level sensors that will automatically start and stop the pumps in the event of a primary level sensor failure.

B. At a minimum, the Contractor shall maintain high level and power failure alarms at all times during bypass pumping. The existing pump station alarm system can be used during construction where feasible and applicable.

2.06 STANDBY EQUIPMENT

A. Standby equipment shall be on site during bypass pumping operations include:
   1. Standby Pump with capacity to meet the required flows if the primary pump failure.
   2. Power Generator: Backup power generator is required, capable, or starting and running the pumps in case primary power fails.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Install temporary flow control facilities only within public right-of-way, Owner's property, temporary construction easement, permanent easement, or easement obtained by Contractor.

B. Operate and maintain temporary flow control 24 hours per day, 7 days per week, including without limitation, holidays, as required to control flows.

C. Bypass pumping equipment shall remain in place until the new pump station is fully function and has passed all testing requirements. Promptly remove temporary flow control facilities as soon as they are no longer needed.

D. Sewage shall not be conveyed within the soil in open trenches at any time during construction.

3.02 TEMPORARY FLOW CONTROL PLAN

A. Prepare and submit Temporary Flow Control Plan at least 30 days before starting the Work requiring temporary flow control; include following information:
   1. Drawings indicating location of temporary sewer plugs and bypass discharge lines.
   2. Locations where flow will be intercepted and discharged.
   3. If trucks are to be employed include the following:
      a. Numbers and sizes of trucks.
      b. Configuration of facilities to be used to load trucks at each interception location.
      c. Locations where trucks will unload.
      d. Time for loading, unloading, and travel.
   4. Complete descriptions and performance characteristics of pumps, electric power generators, and standby equipment.
   5. Acoustical information for equipment to be used showing compliance with noise control requirements.
   6. Details of temporary force mains, including horizontal and vertical alignments, pipe materials, protection of existing buried and aboveground facilities and improvements, maintenance of traffic and access to properties.
   7. Design calculations proving adequacy of temporary system and selected equipment to convey all flows.

8. Drawings showing layouts and configurations of temporary flow control facilities and also showing locations relative to right-of-way easement, and property boundaries.
9. Drawings and design calculations of temporary bulkheads and plugs.
10. Drawings and design calculations for thrust restraint of temporary piping.
11. Details of system controls and control logic; include diagrams and narrative.
12. Anticipated schedule for the Work.
13. Other information to completely describe temporary flow control facilities and conformance to specified requirements.

3.03 BLOCKING FLOW

A. Flow control may consist of blocking flow with mechanical or pneumatic plugs if only small amount of flow needs to be controlled and adequate storage is available.

B. Use primary and secondary plugs for each flow control location.

C. When blocking flow is no longer needed for performance and acceptance of the Work, remove plugs in a manner that permits sewage flow to slowly return to normal without surcharging or causing other major disturbances downstream.

D. Remove temporary plugs at end of each working day and restore normal flow. If downstream work is not or cannot be completed during workday provide, operate, and maintain bypass pumping system or other method of flow control to accommodate flows.

3.04 PIPING

A. Minimize disturbance of existing utilities.

B. Where temporary flow control pipelines cross streets and private driveways, install pipeline in trench and cover with temporary pavement.

C. Installation of bypass pipelines is prohibited in salt marsh/wetland areas.

3.05 TEMPORARY SANITARY SEWAGE FLOW REDUCTION

A. Due to the significantly large sewershed area, it is not possible to significantly reduce the sewage flow to the pump station and adjacent sewer mains; however, Contractor may request sewer service customers upstream of the Work area to reduce or curtail sewer flow, only when approved by City. The following notices must occur if approved.
   1. First Notice: Not less than 1 week nor more than 2 weeks prior to when sewer flow deduction or curtailment is requested.
   2. Second Notice: Not more than 24 hours nor less than 12 hours prior to when sewer flow deduction or curtailment is requested.

B. When service lateral must be disconnected from main, temporary piping and connections shall be made to provide continuous sewer service at all times during construction.

C. Promptly notify sewer service customers that were requested to reduce sewer flow when the Work is complete and full uninterrupted service restored.

D. Contractor shall be responsible for control of sewage flows and under no circumstances be entitled to rely on flow reduction by upstream sewer service customers.

3.06 FIELD QUALITY CONTROL

A. Hydrostatic Pressure Test for Pump Bypass Systems:
   1. Prior to operation, test each section of discharge piping with the maximum operating pressure of system.
   2. Notify Owner 24 hours prior to testing.

B. Full Scale Test:
   1. At least 14 days prior to test, notify Engineer of date and time of test.
   2. Do not begin temporary flow control activities until successful test has been completed.
   3. Conduct test on proposed temporary flow control at least 14 days before scheduled date of actual proposed temporary flow control.
   4. Purpose of test is to demonstrate capability, function, and reliability of Contractor's proposed method of temporary flow control.
   5. Duration: Minimum of 4 hours.
   6. Conduct between 8:00 a.m. and 4:00 p.m. Do not conduct test on Saturday, Sunday, or holiday.
   7. If electric pumps are being used, provide standby generators to ensure continuity of pumping operation in event of power failure.
   8. Demonstrate system controls and operation, reliability, and transfer to standby equipment during test.
   9. Conduct until flow is accommodated for minimum specified test duration.
   10. Failure:
      a. Test shall be deemed to have failed if during test flows are not accommodated for whatever reason and for whatever length of time.
      b. If test fails, determine and correct deficiencies that caused test to fail and conduct another Full Scale Test.
   11. Determination by Engineer of a successful test, permission by Engineer to proceed with the Work requiring temporary flow control, or anything else shall not relieve Contractor from responsibility to provide temporary flow control.

*****END OF SECTION*****

SECTION 01550
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: temporary facilities for the project including sanitary facilities, storage of materials, safety requirements, first aid equipment, fire protection, security measures, protection of the Work and property, access roads and parking, environmental controls, disposal of trash, debris and excavated material, and pest and rodent control.

1.02 CONTRACTOR'S RESPONSIBILITY

A. Comply with applicable requirements as specified in other Sections.
   1. Maintain and operate temporary facilities and systems to assure continuous service.
   2. Modify and extend systems as Work progress requires.
   3. Completely remove temporary materials and equipment when their use is no longer required.
   4. Restore existing facilities used for temporary services to specified or to original condition.
   5. Maintain sewer service as described in Section 01531.

1.03 TEMPORARY UTILITIES

A. Obtaining Temporary Service:
   1. Make arrangements with utility service companies for temporary services as necessary to compete the work.
   2. Abide by rules and regulations of the utility service companies or authorities having jurisdiction.
   3. Be responsible for utility service costs until the Work is substantially complete. Included are fuel, power, light, heat, water, and other utility services necessary for execution, completion, testing, and initial operation of the Work.

B. Water:
   1. Provide water required for and in connection with Work to be performed or for other use as required for proper completion of the Work.
   2. The Contractor is responsible for obtaining temporary construction water permit and meter from Mid-Peninsula Water District (District). The contractor is responsible for providing a backflow prevention device with current test certification and conveying water to the point of use.
   3. Provide and maintain an adequate supply of potable water for domestic consumption by Contractor personnel and Engineer or his Representatives.

C. Electricity and Lighting:
   1. Provide electric power service as required for the Work. Provide power for operation of the Contractor's equipment, or for any other use by Contractor.

D. Sanitary Facilities:
   1. Provide and maintain sanitary facilities for persons on the job site; comply with the regulations of State and local departments of health.

2. Enforce the use of sanitary facilities by construction personnel at the job site. Such facilities shall be enclosed. Pit-type toilets will not be permitted. No discharge will be allowed from these facilities. Collect and store sewage and waste so as not to cause a nuisance or health problem; have sewer and waste hauled off-site and properly disposed in accordance with applicable regulations.
3. Locate toilets near the Work site and secluded from view insofar as possible. Keep toilets clean and supplied throughout the course of the Work.

1.04 FIELD OFFICE

Not Used.

1.05 STORAGE OF MATERIALS

A. Storage of materials not susceptible to weather damage may be on blocks off the ground.

B. Store materials in a neat and orderly manner. Place materials to permit easy access for identification, inspection, and inventory.

C. Stockpile materials in a way that provides drainage temporary and existing buildings and facilities.

D. Materials and equipment shall not be stored on private property without receiving written approval from property owner.

1.06 SAFETY REQUIREMENTS

A. Conduct operations in strict accord with applicable Federal, State and local safety codes and statutes and with good construction practice. The Contractor is fully responsible and obligated to establish and maintain procedures for safety of all work, personnel, and equipment involved in the Project.

B. Observance of and compliance with the regulations shall be solely and without qualification the responsibility of the Contractor without reliance or superintendence of or direction by the Engineer or the Engineer’s representative. Immediately advise the Engineer of investigation or inspection by Federal Safety and Health inspectors of the Contractor or subcontractor's work or place of work on the job site under this Contract, and after such investigation or inspection, advise the Engineer of the results. Submit one copy of accident reports to Engineer within 10 days of occurrence.

C. Protect areas occupied by workmen using the best available devices for detection of lethal and combustible gases. Test such devices frequently to assure their functional capability. Constantly observe infiltration of liquids into the Work area for visual or odor evidences of contamination, immediate take appropriate steps to seal off entry of contaminated liquids to the Work area.

D. Safety measures, including but not limited to safety personnel, first-aid equipment, ventilating equipment and safety equipment, in the specifications and shown on the Drawings are obligations of the Contractor.

E. Maintain required coordination with the Police and Fire Departments during the entire period covered by the Contract.

1.07 FIRST AID EQUIPMENT

A. Provide a first aid kit throughout the construction period. List telephone numbers for physicians, hospitals, and ambulance services in each first aid kit.

B. Have at least one person thoroughly trained in first aid procedures present on the site whenever Work is in progress.

1.08 FIRE PROTECTION

A. Conform to specified fire protection and prevention requirements established by Federal, State or local governmental agencies and as provided in Contractor's Safety Program.

1.09 SECURITY MEASURES

A. Protect all Work materials, equipment, and property from loss, theft, damage, and vandalism. Contractor's duty to protect property includes Owner's property used in connection with the performance of the Contract.

B. If existing fencing or barriers are breached or removed for purposes of construction, provide and maintain temporary security fencing equal to existing.

1.10 PROTECTION OF PUBLIC UTILITIES

A. Prevent damage to existing public utilities during construction. Give owners of utilities at least 48 hours notice before commencing Work in the area, for locating utilities during construction, and for making adjustments or relocation of utilities when they conflict with the proposed Work.

1.11 PROTECTION OF THE WORK AND PROPERTY

A. Preventive Actions:
   1. Take precautions, provide programs, and take actions necessary to protect the Work and public and private property from damage.
   2. Take action to prevent damage, injury or loss, including, but not be limited to, the following:
      a. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with progress of the Work or the Owner's operations.
      b. Provide suitable storage for materials which are subject to damage by exposure to weather, theft, breakage, or otherwise.
      c. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
      d. Frequently clean up refuse, rubbish, scrap materials, and debris caused by construction operations, keeping the Project site safe and orderly.
      e. Provide safe barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways, and other hazardous areas.
   3. Obtain written consent from proper parties before entering or occupying with workers, tools, materials or equipment, privately-owned land.
   4. Assume full responsibility for the preservation of public and private property on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect, or misconduct in execution of the Work by the Contractor, it shall be restored by

the Contractor to a condition equal to or better than that existing before the damage was done.

B. Barricades and Warning Signals: Where Work is performed on or adjacent to any roadway, right-of-way, or public place, furnish and erect barricades, fences, lights, warning signs, and danger signals; provide watchmen; and take other precautionary measures for the protection of persons or property and protection of the Work. Use barricades painted to be visible at night. From sunset to sunrise, furnish and maintain at least one light at each barricade. Erect sufficient barricades to keep vehicles from being driven on or into Work under construction. Furnish watchmen in sufficient numbers to protect the Work. Maintain barricades, signs, and lights, and provide watchmen until the Project is accepted by the City.

C. Protection of Existing Structures:
   1. Underground Structures:
      a. Underground structures are defined to include, but not be limited to, sewer, water, gas, and other piping, and manholes, chambers, electrical and signal conduits, tunnels, and other existing subsurface installations located within or adjacent to the limits of the Work.
      b. Known underground structures, including existing siphons are shown on the Drawings. This information is shown for the assistance of the Contractor in accordance with the best information available, but is not guaranteed to be correct or complete.
      c. Explore ahead of trenching and excavation work and uncover obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption of utility services. Restore to original condition damages to underground structure at no additional cost to the Owner.
      d. Necessary changes in location of the Work may be made by the Engineer to avoid unanticipated underground structures.
      e. If permanent relocation of an underground structure or other subsurface installations is required and not otherwise provided for in the Contract Documents, the City will direct Contractor in writing to perform the Work, which shall be paid for under the provisions for changes in the Contract Price as described in the City's General Conditions.
   2. Surface Structures: Surface structures are defined as existing buildings, structures and other constructed installations above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks, guard cables, fencing, and other facilities that are visible above the ground surface.
   3. Protection of Underground and Surface Structures:
      a. Support in place and protect from direct or indirect injury underground and surface structures located within or adjacent to the limits of the Work. Install such supports carefully and as required by the party owning or controlling such structure. Before installing structure supports, Contractor shall satisfy the Engineer that the methods and procedures to be used have been approved by the owner of the structure.
      b. Avoid moving or in any way changing the property of public utilities or private service corporations without prior written consent of a responsible official of that service or public utility. Representatives of these utilities reserve the right to enter within the limits of this project for the purpose of maintaining their properties, or of making such changes or repairs to their property that may be considered necessary by performance of this Contract.

c. Notify the owners and/or operators of utilities and pipelines of the nature of construction operations to be performed and the date or dates on which those operations will be performed. When construction operations are required in the immediate vicinity of existing structures, pipelines, or utilities, give a minimum of 5 working days advance notice. Probe and flag the location of underground utilities prior to commencement of excavation. Keep flags in place until construction operation reach and uncover the utility.

d. Assume risks attending the presence or proximity of underground and surface structures within or adjacent to the limits to the Work including but not limited to damage and expense for direct or indirect injury caused by his Work to any structure. Immediately repair damage caused, to the satisfaction of the owner of the damaged structure.

4. Protection of Installed Products:
   a. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.
   b. Control traffic to prevent damage to equipment, materials, and surfaces.
   c. Provide coverings to protect equipment and materials from damage.
5. Protection of Landscaping
   a. The Contractor shall be responsible for the protection of all the trees, shrubs, irrigation systems, fences, and other landscape items adjacent to or within the work area, unless they are directed to do otherwise on the plans.
   b. In the event of damage to landscape items, the Contractor shall replace the damaged items to the satisfaction of the engineer and the owner, or pay damages to the owner as directed by the City.
   c. When the proposed pipeline is to be within planted or other improved areas in public or private easements, the Contractor shall restore such areas to the original condition after completion of the work. Restoration shall include a placement of 5 inches of topsoil, resoding, seeding, and replacement of all landscaped items.
   d. If the Contractor does not proceed with the restoration after completion of the work or does not complete the restoration in a satisfactory manner, the City reserves the right to have the work done and to charge the Contractor for the actual cost of the restoration including all labor, material, and overhead required for restoration.

D. See Section 01120-1.14 for Temporary Construction Easement restrictions and requirements.

1.12 ROADS, PARKING, AND TRAFFIC CONTROL

A. See Section 01120 for Traffic Control Requirements.

B. Prevent interference with traffic on existing roads to the maximum extent possible.

C. Designate temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking. Locate as approved by City.

D. Minimize use by construction traffic of existing streets and driveways.

E. Do not allow heavy vehicles or construction equipment in existing parking areas.

1.13 ENVIRONMENTAL CONTROLS

A. Provide and maintain methods, equipment, and temporary construction as necessary for controls over environmental conditions at the construction site and adjacent areas.

B. Comply with statutes, regulations, and ordinances which relate to the proposed Work for the prevention of environmental pollution and preservation of natural resources, including but not limited to the National Environmental Policy Act of 1969, PL 91-190, Executive Order 11514.

C. The City recognizes that the site has considerable natural value and that construction of projects should have minimum impact to the surrounding environment. The Contractor shall adopt construction procedures that do not cause unnecessary excavation and filling of the terrain, indiscriminate destruction of vegetation, air or stream pollution, nor the harassment or destruction of wildlife.

D. Recognize and adhere to the environmental requirements of the Project. Disturbed areas shall be strictly limited to boundaries established by the Contract Documents. Particularly avoid pollution of "on-site" streams, wells or other water sources.

E. Burning of rubbish, debris, or waste materials is not permitted.

1.14 POLLUTION CONTROL

A. Prepare a Spill Response and Prevention Plan, specific to the Contractor's means and methods. Submit prior to mobilization per Section 01300, Contractor Submittals.

B. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by discharge of noxious substances from construction operations.

C. Provide equipment and personnel to perform emergency measures required to contain any spillage, and to remove contaminated soils or liquids. Excavate and dispose of any contaminated earth off-site, and replace with suitable compacted fill and topsoil.

D. Take special measures to prevent harmful substances from entering public waters. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.

E. Prevent toxic concentrations of chemicals.

F. Prevent harmful dispersal of pollutants into the atmosphere.

G. Use equipment during construction that conforms to current Federal, State and local laws and regulations.

H. Dispose of all trash and debris in permitted landfills or recycling facilities, as applicable, in accordance with state and local laws and regulations.

1.15 PEST AND RODENT CONTROL

A. Provide rodent and pest control as necessary to prevent infestation of construction or storage areas.

B. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.

1.16 NOISE CONTROL

A. Provide vehicles, equipment, and construction activities that minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and the City of Belmont's Construction Noise Ordinance.

B. Conduct construction operations during daylight hours except as approved by Engineer.

C. Select construction equipment to operate with minimum noise and vibration.

1.17 DUST CONTROL

A. Control objectionable dust caused by operation of vehicles and equipment. Apply water or use other methods, subject to approval of the Engineer, which will control the amount of dust generated.

PART 2 - MATERIALS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01600
ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 REGULATORY REQUIREMENTS

A. These specifications reflect regulatory permit requirements known at the time of bidding.

B. Contractor shall adhere to all related requirements set forth in the State Water Resources Control Board NPDES General Permit Requirements (Order No. 2009-0009-DWQ). Permit requirements are available for download on the State Water Resource Control Board's website (http://www.waterboards.ca.gov).

1.02 SUBMITTALS

A. Storm Water Pollution Control Plan (WPCP)
   1. Submit to the City a Storm Water Pollution Control Plan (WPCP) detailing the placement of physical Best Management Practices (BMPs) to comply with the requirements set forth in the State Water Resources Control Board NPDES General Permit Requirements (Order No. 2009-0009-DWQ) and required for the Work, and the methods used to comply with those BMPs directed at operational procedures, Monitoring Program and Reporting Plan. The plan shall specifically address and detail changes from the alternatives called out in this section. The Contractor's preferred techniques shall show how it will comply with the stated objectives of the program.
   2. The Contractor shall submit details and product data for proposed BMP's. Details shall be from the CASQA Stormwater Best Management Practice (BMP), Handbook Portal, Construction, and shall be marked to show compliance or marked to show deviation.
   3. The entire plan shall be kept and maintained by the Contractor on the construction site during the duration of the project.
   4. The Contractor shall be responsible for taking the proper actions to prevent contaminants and sediments from entering the storm sewer drainage system should any unforeseen circumstance occur. The Contractor shall take immediate action if directed by the Engineer, or if the Contractor observes contaminants and/or sediments entering the storm drainage system, to prevent further storm water from entering the system.

B. Product Data: On all proposed products.

PART 2 PRODUCTS

2.01 GENERAL

A. All necessary erosion control products and systems required by the State Water Resources Control Board NPDES General Permit (Order No. 2009-0009-DWQ) shall be

used. All products and installations shall adhere to the CASQA Stormwater Best Management Practice Handbook.

2.02 FIBER ROLLS

A. Contractor shall install fiber rolls as shown in the submitted pollution control plan and as directed by the Engineer to sufficiently control erosion.

B. Cylinders of biodegradable plant material such as weed-free straw, coir, compost, wood chips, excelsior, or wood fiber or shavings encased within biodegradable netting.

C. Fiber rolls shall be 8” minimum diameter.

D. Fiber rolls shall be staked with oak stakes with minimum dimensions of 0.75 inches square by 24 inches long.

E. Netting Material: Clean, evenly woven, and free of encrusted concrete or other contaminating materials such as preservatives. Also free from cuts, tears, or weak places with a minimum lifespan of 6 months.

2.03 FILTER FABRIC

A. Woven or nonwoven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material, in continuous rolls of longest practical length.
B. Grab Strength: 100 psi in any principal direction (ASTM D-4632), Mullen burst strength >200 psi (ASTM D-3786), and equivalent opening size between 50 and 140.
C. Furnish ultraviolet inhibitors and stabilizers for minimum 6 months of expected usable construction life at temperature range of 0 degrees F to 120 degrees F.

2.04 SANDBAGS

A. Polypropylene, polyethylene, or polyamide woven fabric, with minimum unit weight of 4 ounces per square yard, Muller burst strength exceeding 300 psi, and ultraviolet stability exceeding 70 percent. Fill bags with bank-run sand.

PART 3 EXECUTION

3.01 SITE PROTECTION

A. All site protection measures described herein, including stormwater pollution prevention and habitat protection as described in the Special Provisions, shall be maintained in place continuously for the duration of construction.

B. The Contractor shall maintain a controlled and stable work area at all times. The Contractor is responsible to take those measures needed to control site runoff and soil disturbance, including the placement of temporary aggregate base course at work sites to prevent soil erosion during construction as required.

3.02 DUST CONTROL

A. The Contractor at its expense shall take whatever steps, procedures, or means as are required to prevent abnormal dust conditions being caused by its operations in connection with the execution of the Work; and on any unpaved road which the Contractor or any of its subcontractors are using, excavation or fill areas, demolition operations, or other activities. Control shall be by sprinkling, use of dust palliatives, modification of operations, or any other means acceptable to agencies having jurisdiction.

B. All construction areas shall be watered at least twice daily and more often during windy periods. Active areas adjacent to residences should be kept damp at all times.

C. Unless the construction dictates otherwise, and unless otherwise approved by the City's Representative, the Contractor shall furnish and operate a self-loading motor sweeper with spray nozzle. The paved streets, parking areas, and staging areas shall be swept at the end of each day of construction as necessary to keep paved areas acceptably clean and to prevent sediment discharges from reaching the drainage system. Adjacent public streets where visible material has been carried onto shall be swept daily.

D. Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)

E. Vehicles driving on dirt areas will travel at speeds no greater than 10 mph to minimize noise and dust disturbance.

F. Cover all trucks hauling soil, sand, and other loose materials or require trucks to maintain at least two feet of freeboard above the load.

G. Suspend construction activities that cause visible dust plumes that extend beyond the construction site.

3.03 NOISE ABATEMENT

A. Operations at the work sites shall be performed so as to minimize unnecessary noise. Special measures shall be taken to suppress noise during any approved working hour variances. Noise levels due to construction activity shall not exceed the levels specified by local ordinance.

B. Internal combustion engines used on the Work shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated without said muffler.

C. All noise generating activity shall comply with City of Belmont’s noise Ordinance.

3.04 INSTALLATION OF FIBER ROLLS

A. Fiber roll materials shall be as specified herein.

B. The Engineer will monitor fiber rolls for effectiveness (see also Section 3.10). Should the installed fiber rolls prove to be an ineffective means of runoff pollution control as

measured below, the Contractor shall replace fiber rolls as required until adequate pollution control is achieved.

3.05 REMOVAL OF SEDIMENT CONTROLS

A. All spoil material trapped behind sediment controls shall be disposed of off-site in conformance with all applicable regulatory requirements.

3.06 MAINTAINING WORK AREAS

A. The Contractor shall, at all times, keep property on which work is in progress and the adjacent property free from accumulations of waste material or rubbish caused by employees or by the Work. All surplus material shall be removed from the site immediately after completion of the work causing the surplus materials. Upon completion of the construction, the Contractor shall remove all temporary structures, rubbish, and waste materials resulting from its operations.

B. This provision also applies to any material stockpile and equipment storage areas.

C. All equipment (including personal gear) will be cleaned of soil, seeds, and plant material prior to arriving on-site and after working in areas with invasive non-native plants, such as perennial pepperweed (*Lepidium latifolium*), to prevent the spread of weeds.

D. All stockpiled materials not actively being used shall be bermed and covered from wind and rain. All chemicals shall be stored in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed. All waste containers shall be covered at the end of each day and before rain events.

E. Concrete transit mixers shall only be washed out in designated wash-out areas where the water will flow into a temporary pit in dirt area or onto stockpiles of aggregate base or sand. Concrete washouts must be water tight.

F. All construction entrances and exits shall be stabilized to sufficiently control sediment tracking from the site. Construction activity traffic to and from the project shall be limited to the stabilized entrances and exits.

G. All storm drain inlet and perimeter controls, as well as construction entrances and exits shall be maintained and replaced as necessary or as determined by the City inspector. BMP maintenance and repair shall begin within 72 hours of failure or shortcoming identification.

3.07 EQUIPMENT AND VEHICLE REFUELING

A. Contractor shall prepare and implement a spill prevention and response plan for refueling equipment, machinery, and vehicles at the project site. Appropriate spill response personnel must be assigned and trained.
   1. Submit to Engineer for review prior to beginning any refueling activity.

B. Machinery, vehicles, and construction equipment shall not be refueled within 60 feet of the creek.

3.08 DISPOSAL OF MATERIAL

A. The Contractor shall make arrangements for disposing of materials outside the Site and the Contractor shall pay all costs involved. The Contractor shall first obtain permission from the property owner on whose property the disposal is to be made and absolve the City from any and all responsibility in connection with the disposal of material on said property. When material is disposed of as provided above, the Contractor shall conform to all required codes pertaining to grading, hauling, and filling of earth.

B. This provision also applies to any material stockpile and equipment storage areas.

C. During the course of construction activities, all trash and debris shall be collected in trash receptacles with a tightly secured lid to prevent attracting predators to the site. All trash cans shall be removed and emptied at an appropriate facility once per week at minimum. If no garbage receptacles are available, all debris including food wrappers and drink containers shall be collected and removed from the area on a daily basis for disposal at an appropriate facility.

3.09 SITE CONTROL DURING INCLEMENT WEATHER

A. The Contractor is solely responsible for site protection during periods of inclement weather.

B. All construction activity with the potential to cause erosion, sedimentation, or water pollution shall be suspended during periods of inclement weather.
   1. Inclement weather is defined as a rain event with a forecasted probability of 50% or greater of measurable (0.01 inch or more) rainfall.
   2. The Contractor is responsible for keeping track of upcoming inclement weather and must obtain the precipitation forecast information from the National Weather Service Forecast Office (http://www.srh.noaa.gov/).
   3. Contractor shall notify the City 48 hours prior to forecast inclement weather.
   4. Contractor shall develop a Rain Event Action Plan (REAP) 48 hours prior to any likely precipitation event forecast of 50% or greater probability. The REAP shall be a written document, specific for each rain event and shall be designed to protect all exposed portions of the site. REAP shall contain all information outlined in the State Water Resources Control Board NPDES General Permit Requirements (Order No. 2009-0009-DWQ) for Risk Level 2 sites. Permit requirements are available for download on the State Water Resource Control Board's website (http://www.waterboards.ca.gov).
   5. Contractor shall begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.
      a. If a defined rain event is forecast for a weekend or holiday, all site protection shall be deployed and in place before the Contractor stops work prior to that weekend or holiday.
      b. The Contractor has discretion as to how he runs his operations while maintaining an adequately protected site at the onset of rainfall.

3.10 WATER POLLUTION MONITORING

A. The City will monitor the Contractor's operations and site maintenance to ensure compliance with the NPDES General Construction Permit and other regulatory requirements.

B. During discharge events the City will sample site runoff for the following constituents and compare to Regional Water Quality Control Board numeric effluent limits (NELs):
   1. Turbidity: Maximum turbidity measured in runoff leaving the construction sites will not be allowed to exceed 250 NTU (roughly equivalent to 750 mg/l).
   2. pH: Measured pH runoff leaving the construction sites must be between 6.5 and 8.5 pH units.

C. If effluent limits are exceeded during a discharge event, all work shall cease and the Engineer will direct the Contractor to employ other housekeeping and pollution control measures until compliance is reached.

D. The contractor is responsible for maintaining the identified effluent limits for all runoff leaving the construction site. No exceptions will be made for poor quality run-on water. Run-on from off site shall be directed away from the disturbed area or shall collectively be in compliance with the effluent limits.

3.11 FINES FOR PERMIT VIOLATION

A. Contractor is responsible for all permit violation fines and necessary corrective actions due to his negligence.

B. NPDES permit violation fines will be identified within the permit language. Typical fines per violation are:
   1. Maximum of $25,000/day and $10/gallon over 1,000 gallons discharged
   2. Minimum mandatory penalties of $3,000 per violation

3.12 DOCUMENTATION

A. Contractor shall retain storm water monitoring and control and BMP records for a period of at least three years. Records shall be retained on-site while construction is ongoing. Documentation shall be well organized and shall contain the following items at a minimum:
   1. Document all housekeeping BMPs in the WPCP and REAP(s) in accordance with the nature and phase of the construction project.
   2. Printed copies of all likely precipitation event forecast of 50% or greater probability during all phases of construction.
   3. Copies of all storm water related inspection, sampling, observation, and annual reports.
   4. Records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections.

3.13 ACCIDENTAL DISCOVERIES

A. Significant cultural resources are not known to exist at the project sites.

1. In the event than an archaeological resource is found during construction, all construction work within a 50-foot radius of the find shall be halted, and the Engineer notified.
2. A qualified archaeologist will be retained by the City to examine the find and a mitigation plan may be implemented.
3. Any resulting changes in the scope of work or time delays caused by the discovery of cultural resources shall be dealt with in conformance with these Contract Documents.

B. In the event that human remains are encountered during excavation or backfilling activities, there shall be no further disturbance until the County Coroner has made the necessary findings as to origin and disposition.
1. Notify the Engineer immediately upon the discovery of possible human remains.
2. Do not resume work until so directed in writing.

END OF SECTION

SECTION 01610
SEISMIC ANCHORAGE AND BRACING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for seismic anchorage and bracing for equipment, tanks, pipe, ducts, conduit and other nonstructural components.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01300 – Contractor Submittals
2. Section 01611 – Seismic Design Requirements
3. Section 05501 – Anchor Bolts

1.03 AREAS OF DESIGN RESPONSIBILITY

A. The Contractor shall be responsible for:

1. Designing seismic attachments, braces, and anchors to the structure for tanks, mechanical equipment and electrical equipment included in the Work that weigh more than 20 pounds.
2. Design of seismic anchorage and bracing for piping systems and ventilation ducting

B. Equipment manufacturers shall provide design calculations and details for their specific pieces of equipment as part of the submittal for that equipment.

1.04 REFERENCES

A. The following is a list of standards which may be referenced in this section.

1. International Code Council (ICC)
2. California Building Code (CBC)
3. Evaluation Service (ICC-ES) Reports and Legacy Reports
4. American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads for Building and Other Structures.

1.05 SUBMITTALS

A. Comply with Section 01300.

B. Seismic Anchorage and Bracing Calculations

1. Submit manufacturer’s engineered seismic hardware data and installation requirements.

2. Provide calculations for seismic attachments, braces and anchorages clearly showing the criteria used for the design. Calculations for anchorage of components shall be sealed by a California registered Civil Engineer.

C. Shop Drawings: Show details of seismic attachment assemblies including connection hardware, bracing, and anchor bolts.

1.06 DESIGN AND PERFORMANCE REQUIREMENTS

A. In accordance with CBC, tanks, mechanical and electrical components, and other elements of the Work that are permanently attached to structures shall be designed and constructed to transfer the component seismic forces specified in ASCE 7, Chapter 13 to the structure.
   1. Seismic attachments, braces, and anchorages shall be designed in accordance with the provisions of the California Building Code and the site-specific criteria in Section 01611.

PART 2 PRODUCTS

2.01 MATERIALS

A. Attachments and supports transferring seismic loads to the structure shall be constructed of materials and products suitable for the application and designed and constructed in accordance with the design criteria shown on the Drawings and nationally recognized standards.

B. Powder driven fasteners and sleeve anchors shall not be used for seismic attachments and anchorage where resistance to tension loads is required.

C. Anchor Bolts: In accordance with Section 05501.

PART 3 EXECUTION

3.01 GENERAL

A. Design seismic anchorage systems to provide restraint in all directions, for each component or system so anchored.

B. Tall and narrow equipment such as motor control centers and electrical control panels shall be anchored at the base and within 12 inches from the top of the equipment.

C. Mechanical and electrical components shall not be attached to more than one element of a building structure at a single restraint location where such elements may respond differently during a seismic event. Such attachments shall also not be made across building expansion and contraction joints.

D. Seismic attachments and braces shall be provided and installed by the Contractor in accordance with the size and number of braces determined by the design calculations prepared by the Contractor.

E. Anchor bolts and concrete and masonry anchors for the anchorage of equipment shall be provided and installed by the Contractor in accordance with the bolt sizing, minimum embedment, and spacing requirements determined by the calculations prepared by the Contractor.

*****END OF SECTION*****

SECTION 01611
SEISMIC DESIGN REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The following primary and secondary structural system elements, non-structural components, and/or equipment supported by structures.

1. Pre-Engineered Metal Buildings and Canopies.
2. Mechanical, electrical, and plumbing equipment and appurtenances.
3. Conduit, piping, cable trays, raceways, ducts and similar systems.
4. Tanks and vessels (include contents), including support systems.
5. Storage racks, suspended ceilings, light fixtures, raised floors, partitions, store-fronts, windows, louvers, architectural features and other non-structural components.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01300 – Contractor Submittals
2. Section 05501 – Anchor Bolts

1.03 REFERENCES

A. 2025 California Building Code (CBC)

1.04 DEFINITIONS

A. Engineer of Record: The Engineer responsible for the preparation of Contract Documents.

B. Specialty Engineer: Structural or Civil Engineer provided by the Contractor licensed in the State where the project is being built responsible for specific elements of the primary structural system, the secondary structural system, non-structural elements and/or equipment supported by structures.

1.05 GENERAL DESIGN REQUIREMENTS

A. The Contractor is responsible for producing designs that resist the total seismic forces in accordance with the seismic design criteria.

B. The Contractor is responsible for coordinating between the Engineer of Record and the Specialty Engineer.

C. The seismic design for non-structural components and equipment shall be in accordance with the CBC Chapter 16, and the required coefficients and factors for determining the total design seismic forces are provided in the Seismic Design Criteria in Paragraph E below.

D. Coordinate the layout so that adequate space is provided between items for relative motion. Provide additional supports and restraints between items of different systems when necessary to prevent seismic impacts or interaction.

E. Seismic forces shall be determined in accordance with the following seismic design criteria:

1. Site-Specific Spectral Response Coefficients

   a. Short Period Mapped Maximum Considered Earthquake, 5 Percent Damped: Ss = 2.480g

   b. 1 Second Period Mapped Maximum Considered Earthquake, 5 Percent Damped: S_1 = 0.970g

   c. Short Period Design Spectral Response Acceleration, 5 percent Damped: S_{DS} = 1.770g

   d. 1 Second Period Design Spectral Response Acceleration, 5 percent Damped: S_{D1} = 1.290g

2. Site Class: CD

3. Seismic Design Category: F, unless noted otherwise

4. Risk Category: IV, unless noted otherwise

5. Component Importance Factor, Ip:

   a. Mechanical and Electrical Equipment: Use 1.5.

   b. Tanks and Tank Anchorage: Use 1.5.

   c. Components that contain hazardous materials: Use 1.5.

   d. Components that are required for life safety: Use 1.5.

   e. Components that must remain functional after an earthquake, such as fire protection sprinkler systems: Use 1.5.

6. Do not use more than 60 percent of the weight of tanks and mechanical and electrical equipment for designing anchors for resisting overturning due to seismic forces.

7. Do not use friction to resist sliding due to seismic forces.

1.06 DESIGN REQUIREMENTS FOR PIPING, CONDUIT, AND DUCTS

A. The Contractor is responsible for producing designs for support of piping, conduit, duct or other systems to resist total seismic forces based on the seismic design criteria coefficients specified above, unless shown on the Contract Documents. Except where the technical specifications give specific exemption from resistance of seismic forces, all supports shall be designed to meet seismic criteria.

B. Where possible, pipes, conduit, and their connections shall be constructed of ductile materials (e.g., copper, ductile iron, steel or aluminum and brazed, welded or screwed connections). Pipes, conduits and their connections, constructed of nonductile materials (e.g., cast iron, no-hub pipe and plastic), shall have the brace spacing reduced to one-half of the spacing allowed for ductile material.

C. Seismic restraints may be omitted for the following conditions, where flexible connections are provided between components and the associated ductwork, piping and conduit:

1. Fuel piping less than 1-inch inside diameter.

2. All other piping less than 2.5-inches inside diameter or all piping suspended by individual hangers 12 inches or less in length from the top of the pipe to the bottom of the structural support for the hanger or electrical conduit less than 2.5-inches trade size.

3. All rectangular air-handling ducts less than 6 square feet in cross-sectional area or all round air-handling ducts less than 28-inches diameter or all ducts suspended by individual hangers 12 inches or less in length from the top of the duct to the bottom of the structural support for the hanger, where the hangers are detailed to avoid bending of the hangers and their connections.

D. All trapeze assemblies supporting pipes, ducts and conduit shall be braced to resist the total seismic forces considering the weight of the elements on the trapeze. Pipes, ducts and conduit supported by a trapeze where none of those elements would individually be braced need not be braced if connections to the pipe/conduit/ductwork or directional changes do not restrict the movement of the trapeze. If this flexibility is not provided, bracing will be required when the aggregate weight of the pipes and conduit exceed 10 pounds/foot. The weight shall be determined assuming all pipes and conduit are filled with water.

E. As an alternative to designing the supports and anchorage, where an approved national standard provides a basis for the earthquake-resistant design, submit standard, data, and details for piping, conduit, duct or other systems:

1. For ductwork, mechanical piping, process piping and electrical conduits, follow Guidelines for Seismic Restraints of Mechanical Systems by SMACNA modified as follows:

a. Seismically brace piping regardless of size or location. Provide transverse braces at all changes in direction and at the end of all pipe runs. Space transverse braces not more than 20 feet apart. Provide longitudinal braces at 40-foot centers.

b. Seismically brace all ductwork regardless of size or location. Provide transverse braces at all changes in direction and at each end of run. Space braces not over 20 feet apart. Provide longitudinal braces at 40-foot centers.

2. For fire protection systems, follow NFPA 13 modified as in Paragraph 1.b above. Ensure that no seismic interaction occurs with items of other systems.

1.07 DESIGN REQUIREMENTS FOR UNDERWATER ITEMS

A. To allow for water sloshing, design rigid items such as piping or equipment supports for twice the lateral force, computed as if the item were above water.

B. Design flexible items to accommodate sloshing motions without damage to rigid machinery.

C. Provide retainers to hold items from falling and damaging rotating equipment below, if bolted connections will fail because of ground motion displacing the supports.

1.08 SUBMITTALS

A. Comply with Section 01300.

B. Shop Drawings

1. Submit signed and sealed structural calculations and detailed drawings for the following listed elements and where required in Divisions 2 through 16 of the primary structural system and their attachments, the secondary structural system and their attachments, permanent non-structural components and their attachments, and the attachments and anchorage for all permanent equipment supported by the structures.

C. Structural calculations and detailed drawings shall be prepared by a Specialty Engineer licensed in the State where the project is being built.

D. Structural calculations and detailed drawings shall clearly show the total design seismic forces which will be transferred from the elements of the structural system, non-structural components, and/or equipment and their attachments to the primary structure.

E. The Engineer's review of items within a Specification Section cannot be completed until all related items have been coordinated and submitted for review.

F. Quality Assurance Submittals

1. Test Reports: Submit test reports for tension testing of anchors.
2. Where required in the equipment specifications in Divisions 2 through 16 submit certification that the equipment itself is designed to resist all internal seismic forces based on the seismic design criteria for the project.
3. Where required in the equipment specifications in Divisions 2 through 16, submit signed and sealed structural calculations and detailed drawings from a specialty Structural or Civil Engineer licensed in the State where the project is being built for the attachments and anchorage to the primary structure.
4. Where required in the equipment specifications in Divisions 2 through 16, submit certification that the attachments and anchorage are designed to resist all seismic forces based on the seismic design criteria for the project.

1.09 QUALITY ASSURANCE

A. Qualifications: The Contractor is responsible for submitting signed and sealed structural calculations and detailed drawings from a Specialty Structural or Civil Engineer licensed in the State where the project is being built.

1. Regulatory Requirements: Comply with the State of California adopted and amended versions of CBC Chapter 16 - Earthquake Design plus clarifications and additions specified in this Section.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Site Tests: Tension testing of expansion or adhesive anchors utilized for anchorage shall be done in the presence of the special inspector and a report of the test results shall be submitted. See Specification Section 05501 for additional requirements.

B. Inspection: Special inspection shall be provided for high strength bolting or bolts installed in concrete. See Specification Section 05501 for additional requirements.

*****END OF SECTION*****

SECTION 02100
CLEARING AND DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes all work necessary to move or remove and legally dispose of all interfering or objectionable material from the project site, including but not necessarily limited to trees, tree branches, tree stumps, brush, shrubs, weeds, debris, roots, rocks, concrete rubble, concrete masonry units, pipe, concrete curbs and gutters, asphalt pavement, concrete structures and concrete slabs, but only as required.

B. Related Sections:
   1. Section 02200 – Excavation and Backfill.
   2. Section 02532 – Manhole and Pipe Abandonment and Demolition

1.02 REFERENCES

A. State of California Department of Transportation (Caltrans).

1.03 DEFINITIONS

A. Clearing: Clearing shall consist of cutting, removing, and disposing of trees, shrubs, brush, limbs, and other vegetative growth. Clearing shall also include the removal and disposal of trash piles, rubbish, and fencing, and the preservation of trees, shrubs, and vegetative growth which are not designated for removal.

B. Grubbing: Grubbing is the removal and disposal of wood or root matter below the ground surface remaining after clearing.

C. Stripping: Stripping refers to the removal and disposal of all organic sod, topsoil, grass, and grass roots; all evidence of surface improvements and other objectionable material remaining after clearing and grubbing.

D. Demolition: The removal of existing structures, portions of existing structures, equipment, utilities, concrete curbs, sidewalks, driveways, pipelines and other appurtenances.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EQUIPMENT

A. Equipment shall be suitable for the work to be done and shall be in good operating condition. Equipment operators and workmen are to be skilled in such operations and shall be competently supervised.

3.02 CLEARING, GRUBBING AND STRIPPING

A. Clearing and grubbing shall be in accordance with the provisions of Section 16 of the Caltrans Standard Specifications.

B. Clear, grub and strip areas to be excavated or surfaced.

3.03 DEMOLITION

A. Remove existing structures, portions of existing structures, and equipment called for on the plans and as directed by the Engineer.

B. Contractor shall not demolish existing facilities beyond the limits designated on the drawings unless specifically directed to do so by the Engineer.

3.04 PRESERVATION OF PROPERTY

A. The project area shall be cleared and grubbed **only** to the extent necessary to accommodate the work in conformance with the notes and details shown on the plans. Trees or growth shall not be trimmed back unnecessarily.

B. Contractor shall take extreme care not to damage shrubs, trees, fences, irrigation systems, and other improvements of adjacent property owners.

C. All existing improvements not specifically designated on the plans to be removed or relocated shall remain in their original condition and location undisturbed. However, upon written permission by the Owner, existing improvements may, for the convenience of the Contractor, and at his expense, be removed and temporarily relocated during construction and shall be replaced in their original location in as good or better condition as when the Contractor entered upon the work site.

3.05 DEMOLITION OF SURFACE IMPROVEMENTS

A. Removal of sidewalks, curbs and gutters, driveways, concrete slabs, pavement, pavement markings, and traffic striping if necessary shall be in accordance with the provisions of Section 15-1.03B of the Caltrans Standard Specifications. Curbs, gutters, sidewalks, driveways, slabs and pavement shall be removed by full depth saw cut to the nearest joint from the lines shown on the plans or as directed by the Engineer.

B. Where the plans indicate replacement of existing asphaltic pavement, the existing pavement shall be removed and disposed of off-site.

3.06 DEMOLITION OF UNDERGROUND PIPE

A. Demolition of underground pipe shall be only as shown on the Drawings or necessary as determined in the field by the Engineer.

3.07 DEMOLITION OF EXISTING PUMP STATION

A. Demolition, removal, and disposal of existing sanitary sewer pump station equipment shall be performed by the Contractor as shown on the Drawings and as necessary to remove all pump station equipment indicated for removal.

B. The following pump station equipment shall be salvaged by the Contractor and delivered to 3the City's maintenance yard at 110 Sem Lane, Belmont, CA.
1. Pumps
2. Mission Communication Box
3. Electrical Cabinet with all components in one piece
4. Transducer level sensor
5. Automatic Transfer Switch (ATS)
6. Stainless steel chains and hardware

3.08 REMOVAL OF DEBRIS

A. All demolished and cleared material shall become the property of the Contractor and shall be legally disposed of by the Contractor.

B. Removed concrete and asphalt concrete shall be legally disposed of off the right-of-way at a location provided by the Contractor. Demolished concrete shall not be buried in structure backfill areas.

*****END OF SECTION*****

SECTION 02200
EXCAVATION AND BACKFILL

PART 1 GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all excavation, backfill, fill, grading and related work as shown on the plans and/or specified herein.

B. Section Includes:
1. Removal of excess and unsuitable material from the site.
2. Excavation of material to allow for the placement of underground structures, including any necessary shoring and bracing.
3. Backfilling of underground conduit, pipe, and structures.
4. Preparation of subgrade for concrete slab work and pavement.
5. Furnish and compact artificial fill.
6. Finish grading.
7. Shoring of excavations
8. Control of water (groundwater)
9. Hazardous materials

C. Related Sections:
1. Section 02100 - Clearing and Demolition
2. Section 02318 - Trenching
3. Section 02742 - Asphaltic Concrete Paving
4. Section 02722 - Aggregate Base
5. Section 02772 - Concrete Curbs, Gutters, and Sidewalks

1.02 REFERENCES

A. Associated General Contractors (AGC):
1. Manual of Accident Prevention in Construction (Section 9).

B. American Society for Testing and Materials (ASTM):
1. C 131 - Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
2. C 136 - Test Method for Sieve Analysis of Fine and Course Aggregates.
3. D 422 - Standard Test Method for Particle - Size Analysis of Soils.
4. D 1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
5. D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m).
6. D 2419 - Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
7. D 2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

8. D 6938 - Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
9. D 4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
10. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
11. D 6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

C. Division of Industrial Safety (DIS).

D. Occupational Safety and Health Act (OSHA).

E. State of California Department of Transportation (Caltrans).

F. Project geotechnical report: Geotechnical Investigation, San Juan Pump Station Wet Well and Valve Vault, March 2025, which is included as Appendix A to these specifications.

1.03 DEFINITIONS

A. Excavation: Work shall consist of excavation, storage and any necessary removal of native soil material for structures, foundations, and pavement. Excavation may include the removal and disposal of existing on-site soil and bedrock (including cobbles and boulders), pavement, or concrete slab materials.

B. Fill: Material placed to backfill excavations.

C. On-Site Material: Material obtained from the project site.

D. In-Place Density of Compacted Backfill: Is the in-place density determined in accordance with ASTM D 1556, or with ASTM D 2922 and ASTM D 6938.

E. Maximum Dry Density: Is maximum dry density obtained in the laboratory when tested in accordance with ASTM D 1557 and ASTM D4253.

F. Optimum Moisture Content: Is the water content at the maximum dry density when tested in accordance with ASTM D 1557.

1.04 SUBMITTALS

A. Product Data: Submit material source, gradation, Plasticity Index, and other test data as required for all materials, including imported and on-site materials to be used as backfill.

B. Dewatering Plan: Submit dewatering plan including arrangement, location and depths of system components, size, type, and required permits.

PART 2 PRODUCTS

2.01 MATERIALS

A. General:
   1. All fill material shall be free from sod, large lumps, boulders, rocks, roots, brush, or other objectionable material (as determined by the Engineer), and free of hazardous materials as defined by Section 25117 of the State Health and Safety Code.

B. Class 2 AB shall conform to Section 02722 of these specifications.

C. CDF shall conform to specification Section 03301.

D. Bedding Material:
   1. Where shown on the plans bedding material shall be Class 1, Type a Permeable Material meeting the requirements identified herein.
   2. The percentage composition by weight of Class 1, Type A permeable material in place must comply with the gradation requirements shown in the following table:

Sieve Size	% Passing Sieve
¾”	100
½”	95-100
3/8”	70-100
No. 4	0-55
No. 8	0-10
No. 200	0-3

   3. Bedding Material shall be CDF where shown on the plans, as specified in Section 03301.

E. Native Backfill Material:
   1. Use of native material for backfill is not acceptable except for in landscaped areas where topsoil material is being reused.

F. Drain Rock:
   1. Drain rock shall match the requirements of the Crushed Rock Material as specified herein.

G. Crushed Rock:
   1. Crushed rock shall be clean and durable meeting the requirements of ASTM No. 57 stone with the following gradation:

Sieve Size	% Passing Sieve
1-1/2”	100
1”	95-100
½”	25-60
No. 4	0-10
No. 8	0-5

H. Geotextiles, Filter Fabrics, and Geogrid:
   1. Stabilization Fabric:
      a. Mirafi 140N
      b. Approved Equal

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
   1. The Contractor shall, prior to submitting his bid, visit all sites and become familiar with actual site and soil conditions. No allowance will be made by the City for any unfavorable conditions or events which should have been foreseen from a thorough examination of the contract documents, the geotechnical reports, the site, and working conditions.

B. Verification of Prepared Subgrade prior to Constructing Improvements:
   1. The Contractor shall request the City to visually inspect and provide written confirmation of the suitability of prepared subgrade soils prior to the continuation of work.
      a. Work completed without such confirmation is at the Contractor's risk and subject to removal at the direction of the City.
   2. Contractor shall protect excavation prior to and during the inspection.

C. Retaining walls and structures shall not be backfilled for at least 10 days after the last concrete and until concrete has attained 3000 psi minimum per Section 03100 - Concrete Forming and Accessories section 3.08E.

3.02 HAZARDOUS MATERIALS

A. See Section 01354.

3.03 OFF-HAUL TESTING

A. The Contractor shall remove and dispose of all excess excavated material to a suitable site. The proper and legal disposal shall be the responsibility of the Contractor.

B. Contractor shall include export and disposal of material in the cost of work to be performed. The Contractor shall include environmental analytical testing in the cost of the work to be performed.

C. Contractor shall maintain proper documentation, in accordance with applicable laws, to provide evidence of proper disposal of off-hauled materials.

3.04 PROTECTION

A. If existing live utilities are encountered, they are to be protected from damage and the proper authorities and affected utility companies notified.

B. Service shall not be interrupted except as directed or accepted; allow sufficient time for

utility companies to arrange for continuation of services.

C. Record unmarked utility locations on record drawings and notify the Engineer.

D. Open excavations, trenches, and the like are to be protected with fences, barricades, covers, and railings as required.

E. Every precaution shall be taken to prevent spillage when hauling on or adjacent to any public street or highway. Any spillage shall be promptly removed.

F. Except where trees are shown to be removed, trees shall be protected from injury during construction operations. No tree roots over 2 inches in diameter shall be cut without written permission of the Engineer. Trees shall be supported during excavation by means previously reviewed by the Engineer and no construction work shall occur within the tree dripline unless authorized by the Engineer. See the tree preservation notes on the Plans.

3.05 SAFETY

A. The Contractor is solely responsible for excavation safety, including support to all adjacent improvements at all times.

B. Excavation shall be in accordance with the State of California Construction Safety Orders. The Contractor shall, in accordance with Section 6705 of the California Labor Code, submit a detailed drawing to the Engineer before excavation begins, showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during any excavation of five or more feet in depth

C. If the Contractor presents a drawing which varies from shoring system standards established by the Construction Safety Orders, the drawing shall be prepared and signed by a registered civil or structural engineer licensed by the State of California. Any Engineer's review of said drawings will in no way relieve the Contractor from responsibility and liability for the adequacy of shoring systems and excavations.

3.06 EXCAVATION SUPPORT AND PORTECTION

A. Shoring and support of the excavation shall be in conformance with specification section 02260.

3.07 CONTROL OF WATER

A. Water may be encountered within the Work at any time, and the presence of such water is likely to be continuous. Contractor shall control site water so that work may be done in the dry in a safe working environment according to relevant provisions of the Safety Orders.

B. Prior to the preparation of bedding or subgrade, the excavation shall be thoroughly dewatered by the use of sump pumps and dewatering equipment as necessary to safely convey water away from structural excavations to positive draining outlets.

C. All site water discharge shall be into a City’s sewer system or at an approved facility.

D. The Contractor shall apply for and obtain a **discharge permit from the Silicon Valley Clean Water Treatment Plant** prior to discharging any water into the sanitary sewer system. Contractor shall adhere to all permit conditions including testing, filtering, discharge rates, fees, etc.

E. The Contractor shall notify the City two working days prior to discharging into the sewer system. The notice shall include the proposed discharge location, flow rate, and duration.

F. Contractor shall make adequate provisions for the removal of sediment from groundwater prior to discharge.

G. The Contractor shall prevent surface water (e.g. rainwater) and subsurface or groundwater from flowing into excavations and from flooding the project site and surrounding areas.

H. The Contractor shall remove all water which accumulates in all excavations during the progress of work so that all work can be done in the dry. Excavated areas shall be kept free from water while structures are constructed, while concrete is setting and until backfill has been placed to a sufficient height to anchor the work against possible floatation.

I. Contractor shall implement sufficient measures to limit the inflow of groundwater so that the maximum allowed dewatering pumping rate of 50 gpm is sufficient to keep excavated areas free from water.

J. Provide sufficient pumping capacity to maintain the groundwater level at least two feet below the lowest level of excavation or backfill at all times.

K. Sufficient pumping equipment for immediate use shall be on the project site at all times, including standby pumps for use in case other pumps become inoperable. Water shall be disposed of so as to cause no injury to public or private property, or to be a menace to the public health.

L. Dewatering devices shall be adequately filtered to prevent the removal of fines from the soil.

M. The Contractor shall be responsible for any damage to foundations or other parts of existing structures or of the new work, caused by the failure of any part of the Contractor's protective works.

N. Depending upon groundwater conditions and the degree of project completion, underground structures are susceptible to floatation prior to backfill and anchorage. Contractor shall prevent the floatation or movement of structures during construction.

O. As recommended by the Engineer or City, the Contractor shall be prepared to backfill the trench with drain rock (3/4" crushed rock) encapsulated with filter fabric to control groundwater. All drain rock shall be compacted as specified herein.

P. Groundwater cutoff plugs shall be placed as indicated on the plans or as directed by the Engineer/City.

Q. After dewatering is no longer necessary, all dewatering pumps and appurtenances shall be removed by the Contractor.

3.08 PREPARATION OF SUBGRADE

A. Strip surface vegetation, weeds, and at least the top six inches from areas underlying surface structures and areas to be paved. Excavate soft, wet, or otherwise unsuitable base grade to firm, unyielding soil.

B. Where mud or other soft or unstable material is encountered as determined by the Engineer in the field, remove such material to a minimum of 12 inches. The bottom of the over-excavation should then be completely covered with geotextile and backfilled with drain rock. The stabilization fabric should be wrapped around the backfill to completely encapsulate the drain rock.

3.09 EXCAVATION

A. Contractor shall notify the Engineer of any site condition not reflected on the plans or in these specifications, such as conflict in grade, bad soil, or unexpected utility lines. The Engineer will observe the excavation bottom prior to placing permeable material, and may recommend further excavation if soils are not suitable.

B. Strip surface vegetation, weeds, and at least the top six inches from areas underlying surface structures and areas to be paved. Excavate soft, wet, or otherwise unsuitable base grade to firm, unyielding soil.

C. Excavation to the lines, grades, and dimensions shown on the plans. Excavations shall be made to such width outside the lines of the structure to be constructed as may be required for proper working methods, the erection of forms, and the protection of work. Any resulting over-excavation extending beyond the lines, grades, and dimensions shown on the plans shall be backfilled with material complying with these specifications at no additional cost to the District.

D. Care shall be taken to preserve foundation surfaces in an undisturbed condition, and excavation at or near property lines shall be performed in a manner that minimizes disturbances to adjacent property. Any foundation surfaces disturbed without the Engineer's authorization shall be replaced at the Contractor's expense with material approved by the Engineer so that by test, the bearing capacity of the replacement material is equal to or better than the undisturbed foundation material.

E. Existing structures and completed work shall be adequately braced and cared for so that no damage will result.

F. Excavated material unsuitable for backfill or in excess of the amount required for backfill shall be disposed of by the Contractor off the site at his expense, and in accordance with "Greenbook", Subsection 300- 2.6.

3.10 BACKFILLING

A. All debris, form work, etc. shall be removed from the excavation prior to backfilling.

B. Pipe and conduits shall be supported during the placement and compaction of bedding and backfill.

C. Backfill with crushed rock encapsulated in geotextile fabric in areas where groundwater is encountered as recommended by the Engineer or City.

D. Contractor shall construct backwater cutoff plugs as indicated on the plans and as directed by the Engineer or City.

E. Fill materials shall be spread in level layers of appropriate thickness for the compaction equipment to be used and moisture content of the material, and compacted as specified. Layers shall not exceed 8 inches in thickness after compaction.

F. Granular backfill shall be tamped mechanically or manually along the sides of pipes and structures to minimize voids in the material between the pipe or structure and excavation walls. No flooding or jetting shall be used to compact bedding or backfill materials.

G. Where the backfill material moisture content is too low to permit the specified degree of compaction, water shall be added before or during spreading until the proper moisture content is achieved. Jetting will not be permitted for compaction.

H. Where the backfill material moisture content is too high to permit the specified degree of compaction, the material shall be dried until the moisture content is satisfactory.

I. No fill shall be placed during conditions that will alter the moisture content of the fill material sufficiently to make adequate compaction impossible. After placing operations have been stopped due to adverse conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified densities.

J. All ground surfaces shall be finished to uniform grades and slopes as indicated on the plans so that the ground drains properly and is free from depressions which may cause areas of standing water. Drainage shall be away from foundations and slabs. Clods are to be broken up and the surface of the ground shall be uniformly pulverized and graded

K. Crushed rock should be consolidated in place with light vibratory equipment. Rubber-tire equipment should not be allowed to operate on the exposed subgrade; the crushed rock should be stockpiled and pushed out over the stabilization fabric.

L. Excavations should be backfilled simultaneously with shoring removal to ensure that all voids are filled.

M. Placement of CDF as Structural Backfill: Where indicated on the Drawings, CDF shall be placed around structures as backfill evenly so that uneven loading of the structure does not occur as a result of the CDF placement. A minimum of two lifts shall be used in placing the CDF around structures. Where structures have pipes entering/exiting the structure, CDF shall be placed in accordance with placement of CDF for pipe installation locations.

N. Placement of CDF as Pipe Backfill: Where CDF is used as trench backfill within the pipe zone, it shall be placed into the trench around the pipe so that the CDF is placed

evenly on both sides of the pipe to prevent uneven loading of the pipe. CDF shall not be placed directly onto the pipe. The maximum depth of the first lift of CDF shall not allow the pipe to move or float. Subsequent lifts of CDF shall be placed so that the pipe does not shift or float. CDF placed in trenches with steep slopes shall be placed in lifts to prevent flotation of the pipe, and the Contractor shall install approved anchor blocks as needed to secure the pipe in place during placement of the CDF. Use of anchor blocks or deadman concrete collars may be used by Contractor with written approval by the City.

O. Tests: Tests are to be made on each layer of fill to assure adequate compaction throughout the entire area. If the field densities are not satisfactory, the Contractor will be required to recompact each layer and/or work area as necessary to achieve the specified densities. Compaction testing will be performed in accordance with ASTM D1556, D1557, D2922, and D6938. Compaction testing will be performed and paid for by the City. See Section 02318-3.03 for additional compaction testing requirements.

3.11 COMPACTION

A. Unless otherwise indicated on the drawings, fill materials shall be compacted to relative compactions based on the ASTM D1557 maximum dry density as follows:

Pipe or Conduit Bedding	90%
Trench Backfill under Paved Areas	95%
Backfill under structures	95%
Trench Backfill under Non-Paved Areas	90%
All Other Backfill	90%

3.12 GRADING

A. Contractor shall grade the site as required to match improvements to existing contours.

B. All ground surfaces shall be finished to uniform grades and slopes as indicated on the plans so that the ground drains properly and is free from depressions which may cause areas of standing water. Drainage shall be away from foundations and slabs. Clods are to be broken up and the surface of the ground shall be uniformly pulverized and graded.

C. Temporary benches cut into hillsides shall be restored to pre-construction contours. Benches shall be backfilled and compacted as specified herein.

D. At the completion of grading work, the site shall be left in a clean and finished condition.

*****END OF SECTION*****

SECTION 02260
EXCAVATION SUPPORT AND PROTECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for designing, furnishing and installing, maintaining, and removing excavation support and protection.

B. Related Sections:
   1. Section 02200 – Excavation and Backfill
   2. Section 02318 – Trenching.

1.02 REFERENCES

A. American Institute of Steel Construction, Inc. (AISC):
   1. Manual of Steel Construction Allowable Stress Design.

B. American Society of Civil Engineers:
   1. Guidelines of Engineering Practice for Braced and Tied-Back Excavations.

C. California Code of Regulations (CCR):
   1. Title 8 - Construction Safety Orders.

D. California Labor Code Sections 6705 to 6707 (CLC).

E. Department of the Navy Naval Facilities Engineering Command (NAVFAC):
   1. NAVFAC Design Manual 7.2 - Foundations and Earth Structures.
   2. NAVFAC Design Manual 7.3 - Soil Dynamics Deep Stabilization and Special Geotechnical Construction.

F. California Building Code (CBC).

G. State of California Department of Transportation (Caltrans):
   1. Caltrans California Trenching and Shoring Manual.

H. United States Steel Corporation (USS):
   1. USS Steel Sheet Piling Design Manual.

1.03 DEFINITIONS

A. General Engineering Design Practice: General engineering design practice in area of the Project, performed in accordance with recent engineering literature on subject of shoring and stability of excavations.

B. Shoring: A temporary structural system designed to support vertical faces, or nearly vertical faces, of soil or rock for purposes of excavation. Shoring includes internally braced sheet piling, slurry walls, soldier piles and lagging, and other similar shoring systems. Sloping of the soil is not shoring.

1.04 CONTRACTOR'S RESPONSIBILITIES

A. Contractor assumes full and complete responsibility for excavation support and protection, including shoring design and installation.

B. The review of Contractor's shoring system design, submittals, and/or installations by the Engineer does not relieve Contractor of his responsibility for excavation safety. This requirement shall apply continuously and is not limited to normal working hours.

C. Contractor's reliance upon documents furnished by City does not provide relief from these requirements.

1.05 SYSTEM DESCRIPTION

A. Where General Engineering Design Practice is specified, provide drawings and signed calculations and have design performed by civil or structural engineer registered in California.
   1. Provide design calculations that clearly disclose assumptions made, criteria followed, and stress values used for the materials being used.
   2. Furnish references acceptable to Engineer substantiating appropriateness of design assumptions, criteria, and stress values.

B. Design Requirements:
   1. General:
      a. Design means for safe and stable excavations in accordance with general engineering design practice.
         1) The preceding requirement shall not apply to trench excavation support conforming to standards set forth in CCR Title 8 - Construction Safety Orders.
      b. Design steel members in accordance with the Uniform Building Code and the AISC Manual of Steel Design.
      c. Design shoring involving materials other than steel in accordance with Uniform Building Code.
      d. When electing to design with material stresses for temporary construction higher than allowable stresses prescribed in the Manual of Steel Construction and the Uniform Building Code, increase in such stresses shall not exceed 10 percent of value of prescribed stresses.
      e. Minimum safety factor used for design shall not be less than 1.5.
      f. The calculated minimum depth of penetration of shoring below the bottom of the excavation shall be increased not less than 30 percent if the full value of passive pressure is used in the design.
      g. The maximum height of cantilever shoring above the bottom of excavation shall not exceed 15 feet. Use braced shoring when the height of shoring above the bottom of excavation exceeds 15 feet.
      h. The location of the point of fixity for shoring shall not be less than half the calculated minimum embedment depth below the bottom of the excavation.
      i. Generally acceptable references for the design of shoring and excavations are as follows:
         1) Caltrans California Trenching and Shoring Manual.
         2) NAVFAC Design Manual 7.2 - Foundations and Earth Design.
         3) NAVFAC Design Manual 7.3 - Soil Dynamics Deep Stabilization and Special Geotechnical Construction.

4) USS Steel Sheet Piling Design Manual.
5) Guidelines of Engineering Practice for Braced and Tied-Back Excavations published by American Society of Civil Engineers.

Shoring design shall be performed by a Civil or Structural Engineer licensed to practice in California. Include costs for this shoring design in the bid.

2. Soldier Piles and Lagging:
   a. Soldier pile and lagging systems shall not be used in areas where bay mud soils are encountered.
   b. Provide lagging over the full face of the excavation. Joints between pieces of lagging shall be tight to prevent loss of soil.
   c. Provide full face lagging all around penetrations through the lagging.
   d. If the soldier piles are installed in predrilled holes, the predrilled holes shall be filled with control density backfill after the soldiers piles are installed.
   e. The effective width of driven soldier piles for passive soil resistance shall not exceed 2 times the width of the pile. The effective width of concrete encased soldier piles for passive soil resistance shall not exceed 2 times the width of the concrete encasement.
   f. Fill voids behind lagging with gravel or other material acceptable to the Engineer.
   g. Apply loads from tie back soil, rock, or deadman anchors concentrically to soldier piles or wales spanning between soldier piles. Wales shall be back-to-back double channels or other members acceptable to the Engineer. Eccentrically loaded with section soldier piles or wales are not acceptable.
   h. Tie backs shall not be used in bay mud soils.
3. Soil Anchors, Rock Anchors, and Deadmen Anchors:
   a. Design tie back anchors for a safety factor of not less than 2 times the calculated load from the shoring.
   b. Proof load all production anchors to not less than 125 percent of the calculated load from the shoring. Lock off anchors at the calculated anchor load.
   c. The length of soil anchors used to calculate resistance to load from the shoring, shall not include any length within the potential active pressure soil failure zone behind the face of shoring.
   d. Apply load from anchors concentrically to wales and other shoring members.
   e. Design tie rods for anchors for 130 percent of the calculated load from the shoring.
   f. Design tie rods for anchors for 150 percent of the calculated load from the shoring when tie rod couplers are used and for other conditions where stress concentrations can develop.

C. Performance Requirements:
   1. General:
      a. Support faces of excavations and protect structures and improvements in vicinity of excavations from damage and loss of function due to settlement or movement of soils, alterations in ground water level caused by such excavations, vibration associated with installation and removal of excavation support structures, and related operations.
      b. Herein Specified Provisions:
         1) Complement, but do not substitute or diminish, obligations of Contractor for the furnishing of a safe place of work pursuant to provisions of the Occupational Safety and Health Act of 1970 and its subsequent

amendments and regulations and for protection of the Work, structures, and other improvements.

2) Represent minimum requirement for:
   a) Number and types of means needed to maintain soil stability.
   b) Strength of such required means.
   c) Methods and frequency of maintenance and observation of means used for maintaining soil stability.

2. Provide safe and stable excavations by means of sheeting, shoring, bracing, sloping, and other means and procedures, such as draining and recharging groundwater and routing and disposing of surface runoff, required to maintain the stability of soils and rock.
3. Provide support for trench excavations for protection of workers from hazard of caving ground.
4. Provide Shoring:
   a. Where, as result of excavation work and analysis performed pursuant to general engineering design practice, as defined in this Section:
      1) Excavated face or surrounding soil mass may be subject to slides, caving, or other types of failures.
      2) Stability and integrity of structures and other improvements may be compromised by settlement or movement of soils, or changes in soil load on structures and other improvements.
   b. For trenches 5 feet and deeper.
   c. For trenches less than 5 feet in depth, when there is a potential for cave-in.
   d. Where indicated on the Drawings.
5. For safe and stable excavations, use appropriate design and procedures for construction and maintenance to minimize settlement of supported ground and to prevent damage to structures and other improvements, including:
   a. Using stiff support systems.
   b. Following appropriate construction sequence.
   c. Preventing soil loss through or under support system.
      1) Provide support system that is tight enough to prevent loss of soil and extend deep enough to prevent heave or flow of soils from supported soil mass into the excavation.
   d. Providing surface runoff routing and discharge away from excavations.
   e. Where dewatering is necessary, recharge groundwater as necessary to prevent settlement in area surrounding excavation.
   f. Where sheet piling is used, use interlocking type sheets including interlocking corners. The sheet piles shall be continuous and driven in interlock. If the bottom of the excavation is located below the water table, use "thumb and finger" type interlock.
   g. Not applying shoring loads to existing structures and other improvements.
   h. Not changing existing soil loading on existing structures and other improvements.
   i. Provide welded steel packing between soil retaining members such as sheet piles and wales and similar members when the gap exceeds 1/2 inch before the wales are loaded.
6. Do not use cantilever sheet pile shoring. When sheet piling is used, provide a braced system with a minimum of 2 levels of wales and braces. Locate top level of wales and bracing within 5 feet of the top of the sheets.
7. Use template for driving sheet piles to minimize need for pulling and redriving sheet piles in the attempt to drive them plumb in areas where bay mud is present.

1.06 SUBMITTALS

A. Shop Drawings and Calculations:
   1. In accordance with requirements in California Labor Code for trench excavations 5 feet or more in depth and for trenches less than 5 feet in depth when there is potential for cave-in. Submit in advance of excavation work, detailed drawings showing means for safe and stable excavations.
      a. Where such drawings vary from excavation support standards set forth in California Code of Regulations Title 8 - Construction Safety Orders, submit design calculations pursuant to general engineering design practice.
      b. Provide means for safe and stable excavations that are not less effective than required in CCR Title 8 - Construction Safety Orders.
   2. For excavations other than trenches, submit, in advance of excavation work, design calculations as performed pursuant to general engineering design practice, as specified in this Section, and detail drawing showing means for safe and stable excavations. In design calculations and detail drawing, cover, as a minimum:
      a. Excavations adjacent to structures and other improvements, and
      b. Excavations 5 feet or more in depth, or less than 5 feet in depth when there is potential for cave-in, at other locations.
   3. Submit Following:
      a. Provide calculations for the different load, support, and other conditions that occur during the sequence of installation of shoring, construction of facilities protected by the shoring, and sequence of removal of shoring.
      b. Provide sketches showing the condition at various stages of installation and removal of shoring.
      c. Show structures, pipelines, and other improvements located near the shoring, and the shoring on a plan.
      d. When utilities penetrate the shoring, submit an elevation of all sides of the shoring showing the locations of the penetrations. Submit details on ground support and sealing around utility penetrations.

B. Detailed Sequence of Installation and Removal of Shoring:
   1. Consider effects of ground settlement in the sequence of installation and removal of shoring.
   2. Provide sketches showing the conditions at various stages in the sequence of installation and removal of shoring.
   3. Clay and silt may stick to sheet piles when sheet piles are removed.
   4. Backfilling of excavations shall occur simultaneously with shoring removal. Backfilling of the excavation with shoring measures in-place will not be acceptable.

C. Submit submittals for stability of excavations as a complete package and include all items required in this section. Incomplete submittals will not be reviewed and will be returned for resubmittal as a complete package. Complete submittal shall include all necessary information regarding the dewatering system as specified in Section 02300.

1.07 SEQUENCING AND SCHEDULING

A. Do not begin work on excavations, trenches, and means for providing stability of excavation and trenches until submittals have been accepted by Engineer and until materials necessary for installation are on site.

B. Submit submittals a minimum of 30 days prior to the scheduled date to begin excavation work.

C. Do not begin construction of any shoring or excavation operations until:
   1. Control points as specified in this Section and as indicated on the Drawings on existing structures and other improvements have been established and surveyed to document initial elevations and locations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 INSTALLATION AND REMOVAL

A. Install means for providing safe and stable excavations as indicated in the submittals section above.

B. Except for concrete encased soldier piles, slurry walls, and similar shoring systems, remove shoring by completion of the Work. Select shoring system and method of removal, which will minimize soil that sticks to shoring from creating large voids and causing settlement. To prevent settlement caused by pulling shoring, fill voids with sand, pea gravel, or pressure injected grout. The methods used shall prevent settlement. Pressure preservative treated wood lagging may be left in place when acceptable to the Engineer.

C. Backfilling of excavations shall occur simultaneously with shoring removal. Backfilling of the excavation with shoring measures in-place will not be acceptable.

3.02 MAINTENANCE

A. Where loss of soil occurs, plug gap in shoring and replace lost soil with fill material acceptable to Engineer.

B. Where measurements and observations indicate possibility of failure or excessive movement of excavation support, determined in accordance with general engineering design practice, take appropriate action immediately.

END OF SECTION

SECTION 02318
TRENCHING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Trench excavation, fine grading, pipe bedding, backfilling, compaction, tracer wire, and warning tape for the construction of new pipe.

B. Related Sections:
1. Section 02200 – Excavation and Backfill
2. Section 02700 – PVC Pipe and Fittings
3. Section 02710 – HDPE Pipe
4. Section 02720 – Ductile Iron Pipe and Fittings

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. C 131 - Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
2. C 136 - Test Method for Sieve Analysis of Fine and Course Aggregates.
3. D 1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
4. D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft.lbf/ft^3 (2,700 kN.m/m^3)).
5. D 2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
6. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.03 SUBMITTALS

A. Products Data: For all proposed bedding and backfill materials.
1. Material source.
2. Gradation.
3. Testing data and testing laboratory qualifications including lab certification.

PART 2 PRODUCTS

2.01 MATERIALS

A. General:
1. Materials derived from processing demolished or removed asphalt concrete are not acceptable.

B. Geotextile Filter Fabric: As specified in Section 02200.

C. Bedding: As specified in Section 02200 and as shown on the plans.

D. Backfill: Backfill as specified in Section 02200 and as shown on the plans.

E. Tracer Wire: Shall be No. 8 AWG, standard copper THW or THHN, 600 volt with solid green insulation.

F. Warning Tape: Shall be metallic foil bonded to plastic film 2-inches or greater wide. The warning tape shall identify the appropriate utility with letter such as "Caution Force Main Buried Below" with 3/4-inch-tall minimum lettering and colored per the appropriate AWWA utility color designation.

PART 3 EXECUTION

3.01 PREPARATION

A. General:
   1. Trench Condition:
      a. Install pipe and materials as specified herein and detailed on the Plans.
   2. Embankment Condition:
      a. Exists where width of pipe trench exceeds limits specified herein.
      b. Before laying pipes in fill, place fill and compact it to not less than 2 feet above top of pipe or conduit.
      c. After placing and compacting fill, excavate through fill and fine grade as required in this Section.

3.02 INSTALLATION

A. Trench Excavation:
   1. General Requirements:
      a. Trench Widths: As shown on the plans
      b. For Manholes, inlets, or Other Accessories:
         1) Provide excavations sufficient to leave at least 12 inches clear between their outer surfaces and embankment or shoring which may be used to hold banks and protect them.
         2) Do not backfill with earth under manholes, vaults, tanks, or valves.
         3) Fill any unauthorized excess excavation below elevation indicated on the Plans for foundation of any structure with foundation material at no additional cost. Backfill material may be substituted for foundation material in areas where foundation material is not required and when approved by the Engineer.
         4) Backfilling of Manhole Excavation: Conform to backfilling requirements as specified for trenches in this Section.

B. Pipe Bedding:
   1. Bedding material shall be as scheduled herein unless otherwise specified.
   2. General:
      a. Over excavate bottom of trench as shown on the plans.
      b. Place bedding material at uniform density.
   3. Bell or Coupling Holes:
      a. Dig holes after trench fine grading has been placed.

b. Provide holes of sufficient width to provide ample room for grouting, banding, or welding.
c. Excavate holes only as necessary in making joints and to ensure that pipe rests upon prepared trench bottom and not supported by any portion of the joint.

4. Depressions for Joints, Other than Bell-and-spigot:
   a. Make in accordance with recommendations of joint manufacturer for particular joint used.
5. After Pipe Laid:
   a. Place bedding material under, around, and above pipe in maximum 6-inch lifts and compact to the maximum density identified on the plans and in Section 02200.
6. Pipe Displacement:
   a. Take necessary precautions in placement and compaction of bedding material to prevent displacement of piping.
   b. In event there is movement or floating, re-excavate, re-lay, and backfill the pipe.
7. Consolidation:
   a. Bedding shall be mechanically compacted at optimum moisture content or above according to ASTM D1557 with non-vibratory compaction equipment. Water settling methods such as flooding and jetting are prohibited.

C. Trench Backfill:
1. Backfill material shall be as scheduled herein unless otherwise specified.
2. See Section 02200 for CLSM backfill placement requirements.
3. Place and compact backfill in accordance with following requirements:
   a. From top of pipe zone backfill to natural surface level. Match finish grade as indicated on the plans.
   b. Backfill trench from top of pipe zone backfill to finish grade with backfill material compacted to maximum density specified in Section 02200 and as shown on the plans.
   c. Existing Conditions: Where existing underground pipes or conduits larger than 3 inches in diameter cross trenches above new work:
      1) Refer to drawings where there is less than 12 inches of clearance.
      2) Where there is more than 12 inches of clearance:
         a) Backfill from bottom of intersecting trench to spring line of intersecting pipe or conduit with backfill material compacted to 95 percent of maximum density when tested in accordance with ASTM D 1556 or ASTM D 2922.
         b) Provide Controlled Low Strength Material (CLSM) as specified herein, below existing pipe or conduit where backfill cannot be placed and compacted as specified. CLSM shall have a minimum thickness of 12 inches beneath the existing pipe or conduit and shall extend up to the springline of the pipe or conduit. CLSM shall extend a minimum of 12 inches beyond the outside of the pipe or conduit in either direction and as a minimum shall extend to the edge of the trench crossing the pipe or conduit.
         c) Extend backfill material 2 feet on either side of intersecting pipe or conduit to ensure that material remains in place while other backfill is placed.

d. Backfill shall be mechanically compacted at optimum moisture content or above according to ASTM D1557 with non-vibratory equipment weighing no more than 12 tons static weight. All backfill shall be placed in maximum 8-inch lifts. Water settling methods such as flooding and pooling or jetting are prohibited.

D. Warning Tape and Tracer Wire

1. Place warning tape and tracer wire above the pipe as indicated on the Drawings. Tracer wire shall be terminated at tracer wire connection boxes.

E. Excess Material:
1. Remove excess excavated material from the project site and dispose of legally off-site.

3.03 FIELD QUALITY CONTROL

A. Tests: Compaction testing will be performed by the City or the City's consultant.
1. Initial Compaction Demonstration:
a. Adequacy of Compaction Equipment and Procedures: Demonstrate adequacy of compaction equipment and procedures before exceeding any of following amounts of earthwork quantities:
1) 50 linear feet of trench backfill.
2) 50 cubic yards of structural backfill.
3) 100 cubic yards of embankment work.
4) 50 cubic yards of base material.
b. Compaction Sequence Requirements: Until specified degree of compaction on previously specified amounts of earthwork is achieved, do not perform additional earthwork of the same kind.
c. After satisfactory conclusion of initial compaction demonstration and at any time during construction, provide confirmation tests as directed by the Engineer.
2. Confirmation Tests:
a. The Contractor shall accomplish specified compaction of trench backfill.
b. Confirmation Test submittals are not required.
c. Coordination with Engineer during Testing: Remove overburden above level at which the Engineer wishes to test and backfill and recompact excavation after testing is completed.
3. If compaction fails to meet specified requirements, perform remedial work by one of the following methods:
a. Remove and replace backfill at proper density.
b. Bring density to specified level by means acceptable to the Engineer.
c. Retesting:
1) Costs of Retesting: Costs of any retesting required to confirm and verify that remedial work has brought compaction within specified requirements shall be borne by the CONTRACTOR.
2) CONTRACTOR is responsible for compliance testing of remedial work.
3) Confirmation Tests during performance of remedial work will be performed as follows:
a) Tests will be performed in a manner acceptable to the Engineer.
b) Frequency: Double amount specified for initial compaction tests.

*****END OF SECTION*****

SECTION 02532
MANHOLE AND PIPE ABANDONMENT AND DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes the abandonment of existing sewer mains and manholes as indicated on the contract drawings.

B. Related Sections:
1. Section 02100 – Clearing and Demolition
2. Section 02200 – Excavation and Backfill
3. Section 03301 – Cast in Place Concrete

1.02 REFERENCES

1. Not Used.

1.03 SUBMITTALS

A. Products Data: For all proposed fill materials.
1. Material source.
2. Gradation.
3. Testing data and testing laboratory qualifications including lab certification.

B. Plans:
1. For abandonment, describing proposed sequence and methods of plugging and filling mains and manholes to be abandoned

PART 2 PRODUCTS

2.01 MATERIALS

A. CDF: As specified in Section 03301.

B. Concrete: As specified in Section 03301.

C. Crushed Rock: As specified in Section 02200.

D. Sand:
1. Free from clay and organics
2. Sand Equivalent: 35 minimum
3. Percent composition by weight determined by laboratory sieves:

Sieve Size	Percent Passing
No. 4	100
No. 10	95 - 100
No. 40	20 - 65
No. 100	5 - 30
No. 200	0

PART 3 EXECUTION

3.01 PREPARATION

A. General:
   1. Contractor shall submit abandonment plan detailing approximate volume of fill required to abandon each pipe segment and each manhole.

3.02 INSTALLATION

A. Gravity Sewer Pipe Abandonment: Fill pipe with CDF, sand, or concrete as indicated on Drawings. When filling with Sand, contactor shall plug pipe at each end with 6" minimum thick concrete plug. Material placed within pipe shall be placed by the use of a horizontal tremie to fill the entire pipe volume. Contractor shall calculate the volume of material required to fill the pipe and document the volume of material placed to ensure all voids are filled.

B. Force Main Pipe Abandonment: Plug all exposed ends of pipe with a concrete plug as shown on the plans.

C. Manhole Abandonment:
   1. Contractor shall puncture the structure base with a minimum of 2-inch holes at 18" maximum on center.
   2. Fill structure with CDF or crushed rock as indicated on Drawings.
   3. Remove upper portion of wet well as indicated on Drawings.
   4. Restore site as indicated on the Drawings.

D. See Section 02100 for additional demolition and abandonment requirements.

END OF SECTION

SECTION 02700
POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. PVC Pipe and Fittings.

B. Related Sections:
   1. Section 02200 – Excavation and Backfill.
   2. Section 02318 – Trenching.
   3. Section 02760 – Closed Circuit Television (CCTV) Inspection.
   4. Section 02770 – Sanitary Sewer Testing
   5. Section 03301 – Cast in Place Concrete.
   6. Section 03400 – Pre-Cast Concrete.
   7. Section 03600 – Grouts.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 3034 – Specifications for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
   2. D 3212 – Specification for Joint for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
   3. D 3965 – Classification System and Basis for Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings.
   4. F 477 - Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

B. American Water Works Association (AWWA):
   1. C110 - Ductile Iron and Gray Iron Fittings, 3-inch through 48-inch
   2. C116 - Protective Fusion-bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile Iron and Gray Iron Fittings

1.03 SUBMITTALS

A. Product Data:
   1. PVC Pipe.
   2. Fittings.

B. Summary of deflection test results.

C. Post installation CCTV inspection report and video.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Pipe Manufacturers:

1. Diamond Plastic Corporation.
2. JM Eagle.
3. North American Specialty Products.
4. Or Approved Equal.

B. Manhole Connection:
1. New manholes: Refer to water stops Section 03301 and 03400.
2. Existing manholes:
a. Concrete manhole adapter water stop manufactured by Fernco.
b. Or approved equal.

2.02 MATERIALS

A. Gravity PVC Pipe and Fittings:
1. Minimum wall and strength requirements of SDR-26 in conformance with ASTM D-3034.
2. Pipe shall be made of PVC plastic having a cell classification of 12454 or 12364 as defined in ASTM D 1784.
3. Bell and spigot type joints conforming to ASTM D 3212.
4. Sealing gaskets shall meet the requirements of ASTM F477.
5. Pipe shall be marked with "SANITARY SEWER" in 1-5/8" high block lettering with permanent ink. The marking shall be repeated at 2-foot spacing along the pipe length.

B. Bedding and Backfill
1. Per specification Sections 02200 and 02318 and as detailed on the Plans.

PART 3 EXECUTION

3.01 PIPE STORAGE

A. Pipe may be stored on the project site at the Contractor's own risk. Precautions shall be taken to prevent damage to the stored pipe.

B. PVC shall be protected from damage due to sunlight exposure.

3.02 HANDLING

A. Care shall be taken in handling, transporting and placing pipe to prevent damage. No interior hooks or slings shall be used in lifting pipe. All handling operations shall be done with an exterior sling or with a suitable fork lift.

B. No damaged pipe will be accepted and will be replaced with new pipe to the next joint.

3.03 EXCAVATION AND BACKFILL

A. Trenching, Excavating and Backfilling shall be done in accordance with Sections 02200 and 02318.

3.04 CONNECTIONS

A. Thoroughly clean pipe and fittings of dirt, dust, and moisture before installation. Installation and joining methods shall be as recommended by the pipe and fitting manufacturers.

B. Cut pipe square for good joint integrity. After cutting pipe, ream inside and chamfer outside to remove burrs, shoulders, and ragged edges.

3.05 MANHOLE CONNECTION

A. Core drill through existing manhole as necessary to accommodate the new sewer pipe.

B. Manhole sewer connection shall be installed with a water stop and non-shrink epoxy grout applied 360 degrees around new sewer pipe in conformance with manufacturer's instructions.

3.06 INSPECTION

A. All installed sewers and connections shall be visually inspected by the City prior to backfill. The City may require the Contractor to excavate any sewer pipe or connection that is not visually inspected by the City prior to backfill.

B. All new sewer pipes shall be video inspected by the contractor per Section 02760.

C. Post installation videos shall be prepared and submitted to the City in accordance with Section 02760.

3.07 TESTING

A. Testing shall be done in accordance with Section 02770.

*****END OF SECTION*****

SECTION 02710
HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. High Density Polyethylene (HDPE) Pipe.

B. Related Sections:
   1. Section 02200 – Excavation and Backfill.
   2. Section 02318 – Trenching.
   3. Section 02760 – Closed Circuit Television (CCTV) Inspection.
   4. Section 03301 – Cast in Place Concrete.
   5. Section 03400 – Pre-Cast Concrete.
   6. Section 03600 – Grouts.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 2122 – Determining Dimensions of Thermal Plastic Pipe and Fittings
   2. D 2321 – Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications
   3. D 2837 – Hydrostatic Design Basis for Thermal Plastic Pipe Materials
   4. D 3350 – Polyethylene Plastics Pipe and Fittings Material
   5. F 714 – Polyethylene Plastic Pipe Based on Outside Diameter
   6. F 1667 – Guide for Construction Procedures for Buried Plastic Pipe

1.03 SUBMITTALS

A. Product Data:
   1. HDPE Pipe.
   2. Fittings, flange adapters, etc.
   3. Electrofusion Couplings.

B. Submit debeading process and equipment for use in removing the internal bead for the newly joined HDPE pipe sections.

C. The Contractor shall submit a copy of the technician's certification(s) for the operation of the fusion equipment.

D. The Contractor shall perform trial fusion welds and submit samples to the City for review prior to installation of the pipe. The fusion machine used for the trial welds shall be the same machine to be utilized for the installation work.

E. Pipe Fusion Logs.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials used for the manufacture of HDPE pipe and fittings shall be extra high molecular weight, high density ethylene/hexene copolymer PE 3408 polyethylene resin meeting a minimum cell classification of 445474C or 445574C per ASTM D3350.

B. The HDPE pipe manufacturer shall provide certification that stress regression testing has been performed on the specified material. Said certification shall be done in conformance with ASTM D2837, and the manufacturer shall provide a product supplying a minimum hydrostatic design basis (HDB) of 1,600 psi.

C. HDPE materials shall be listed by the Plastics Pipe Institute in PPI TR-4 with a 73°F hydrostatic design stress rating of 800 psi, and a 140°F hydrostatic design stress rating of 400 psi. The PPI listing shall be in the name of the pipe manufacturer, based on ASTM D2837 and PPI TR-3 testing and validation of samples of the pipe manufacturer's production pipe.

D. The physical properties of the pipe and fittings material shall be as indicated in the table below:

PROPERTY	TEST METHOD	VALUE
Density	ASTM D 1505	>0.947 g/cm^3
Melt Index	ASTM D 1238	<0.15 g/10 min
Tensile Strength, Yield	ASTM D 638	>3,000 psi
Flexural Modulus	ASTM D 790	>80,000 psi

2.02 HDPE PIPE

A. Pipe supplied under this specification shall have a nominal **IPS (iron pipe size)** outside diameter. Pipe shall be produced to the specifications of ASTM F714.

B. The **DR (dimension ratio) shall be 11** for the sanitary sewer force main.

C. Pipe shall have green stripes along the exterior of the pipe.

D. Pipe shall be marked with nominal size, dimension ration (DR), trade name, material classification (PE4710), certification base (ASTM F714), and date produced.

2.03 HDPE FITTINGS

A. Material for HDPE fittings shall comply with ASTM A 3261 for butt heat fusion fittings. Material for standard HDPE fittings shall comply with ASTM D3350.

B. Standard HDPE fittings shall be commercial products manufactured by injection molding or by extrusion and machining, or shall be fabricated from HDPE pipe conforming to this specification.

C. Fittings shall be fully pressure rated by the manufacturer to provide a working pressure equal to that of the pipe.

D. Fittings shall be manufactured from the same resin type, grade and cell classification as the pipe itself.

E. HDPE Flange Adapters:
   1. HDPE Flange Adapters shall be provided as shown on the Drawings.
   2. New HDPE Flange Adapter and back up ring shall be ANSI Class 150/AWWA C207.
   3. All collar-type adapters shall be installed with butt fusion methods per manufacturer instructions. Couplings shall be factory coated to prevent corrosion.

F. Electrofusion Couplings:

   1. The use of electrofusion couplings shall be minimized to the extent feasible. The Contractor shall submit proposed electrofusion coupling locations for review and approval prior to use.

   2. HDPE electrofusion couplings shall be installed by a qualified installer with equipment certified for use with the supplied coupling.

   3. Electrofusion coupling shall be specifically designed for use with the SDR rating of the host pipes.

   4. Shall be manufactured in accordance with ASTM F-1055 for use with pipe conforming to ASTM D2513/3035.

   5. Shall be supplied with a 24 Digit ISO Compliant Universal Barcode Label.

   6. Shall be tested and supplied in accordance with AWWA C906 specification and supplied with a 24-digit ISO compliant barcode label which facilitates the fusion of electrofusion fitting with other manufacturer's processors.
   7. This resin shall have a NSF Standard 61 listing for use with potable water.

PART 3 EXECUTION

3.01 PIPE STORAGE AND HANDLING

A. Pipe shall be stored and handled in conformance with the pipe supplier's guidelines.

B. Pipe may be stored on the project site at the Contractor's own risk. Precautions shall be taken to prevent damage to the stored pipe.

C. Care shall be taken in handling, transporting and placing pipe to prevent damage. No interior hooks or slings shall be used in lifting pipe. All handling operations shall be done with an exterior sling or with a suitable fork lift.

D. No damaged pipe will be accepted.

3.02 FUSION PROCESS

A. Fusing pipe shall only be done by qualified fusion technicians holding current qualification credentials for the pipe being fused.

B. Pipe supplier's procedures shall be followed at all times during fusion operation.

C. Each fusion join shall be recorded and logged by an approved electronic monitoring device (data logger) connected to the fusion machine, which utilizes a current version of the pipe supplier's recommended and compatible software. A copy of all fusion logs shall be submitted to the City.

D. Use only appropriately sized and outfitted fusion machines.

E. Pipe shall be joined using the butt fusion method providing a joint weld strength equal or greater than the tensile strength of the pipe.

F. All internal beads for newly joined HDPE force main pipe sections shall be removed.

3.03 INSTALLATION

A. Refer to the plans and Sections:
   1. Section 02200 – Excavation and Backfill.
   2. Section 02318 – Trenching.

3.04 TESTING

A. Testing shall be done in accordance with Section 02770.

*****END OF SECTION*****

SECTION 02720
DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Ductile Iron Pipe (DIP) and fittings.

B. Related Sections:
   1. Section 02200 – Excavation and Backfill.
   2. Section 02318 – Trenching.
   3. Section 09800 – Coating System

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 1248 - Specification for Polyethylene Plastic Extrusion Materials for Wire and Cable
   2. F 593 - Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
   3. F 594 - Specification for Stainless Steel Nuts

B. American Water Works Association (AWWA):
   1. C 105 - Polyethylene Encasement for Ductile-Iron Pipe Systems
   2. C 110 - Ductile-Iron and Gray-Iron Fittings
   3. C 111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
   4. C 151 - Ductile-Iron Pipe, Centrifugally Cast
   5. C 153 - Ductile-Iron Compact Fittings
   6. C219 – Bolted, Sleeve-Type Couplings for Plan-End Pipe
   7. C 600 - Installation of Ductile Iron Water Mains and Their Appurtenances

C. Society for Protective Coatings (SSPC)
   1. 10 – Near-White Blast Cleaning

1.03 SUBMITTALS

A. Product Data:
   1. Ductile Iron Pipe
   2. Fittings

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Mechanical Joints and Coupling Adapters:
   1. EBAA
   2. Or Approved Equal

B. Pipe:
   1. American Pipe

2. Griffin Pipe Products Company
3. McWane
4. United States Pipe and Foundry Company (U.S. Pipe)
5. Or Approved Equal

2.02 MATERIALS

A. Ductile Iron Pipe and Fittings:
   1. Manufactured in accordance with AWWA C151.
   2. Pressure class 350.
   3. Material for ductile iron fittings shall comply with ASTM A536, Grade 65-45-12. Fittings shall meet specifications included in ASME/ANSI B16.1.
   4. Pipes shall be joined by flanged or mechanical joints as shown on the Drawings. Flanges shall be factory assembled
   5. All fittings shall be flanged to ANSI B16.1 Class 125 standard pattern.

B. Pipe and Fittings Coating Systems:
   1. Fittings and Valves: All fittings and valves shall be fusion bonded epoxy lined and coated as specified herein unless otherwise specified. Additional ferrous metals for immersed service shall also be fusion bonded epoxy lined and coated.
   2. Ductile Iron Pipe: Ductile iron pipe shall be lined and coated as specified herein:
      a. Interior lined with Protecto 401 Ceramic Epoxy or Tnemec 431 Perma-Shield. The lining material shall be amine cured novalac epoxy containing at least 20 percent by volume of ceramic quartz pigment. The dry film thickness shall be no less than 40 mils. Exterior coating shall be:
         1) Buried Pipe: Buried pipe shall be coated with asphaltic material as specified in AWWA C151. A minimum thickness of 1-mil asphaltic coating shall be applied.
         2) Exposed Pipe: Exposed pipe within the wetwell and valve vault shall be prepared per the National Association of Pipe Fabricators Standard NAPF 500-03 and coated with an exterior protective pipe coating incorporating high solids amine cured epoxy for maximum protection of the exterior of ductile iron pipe. Coating shall be Tnemec Series 141 at a minimum of 16 mils dry film thickness, or US Pipe Ceramawrap at a minimum dry film thickness of 20 mils.
   3. Buried Pipe and Fittings: Ferric discharge piping and associated fittings for buried service shall be coated in conformance with these specifications and in addition, shall be wrapped with a plastic film wrap as specified herein.

C. Gaskets:
   1. Gaskets shall be rated for wastewater service, made of synthetic rubber such as Buna-N not less than one-eighth (1/8) inch thick. All gaskets shall be the full width of the flange to which applied.

D. Plastic Film Wrap
   1. All ductile-iron pipe, fittings, and valves buried underground shall be protected with plastic film wrap in accordance with AWWA C105, unless noted otherwise below. Wrap shall be a loose 8-mil-thick polyethylene tube. All joints between plastic tubes shall be wrapped with 2-inch-wide polyethylene adhesive tape, Polyken 900, Scotch wrap 50, or approved equal.

E. Thrust Restraint Glands: All fittings, joints, and connections shall be restrained against trust. Thrust restraint glands shall be EBAA Iron MEGALUG Series 1100 or approved

equal. Cast gland bodies shall be coated with MEGA-BOND. The wedge assemblies and all nuts and bolts shall be coated with Xylan Fluoropolymer coating.

F. Coupling Adapters: All fittings, joints, and connections shall be restrained against thrust. Coupling adapters shall be EBAA Iron MEGA-COUPLING Series 3800 or approved equal. Cast gland bodies shall be coated with MEGA-BOND. The wedge assemblies and all nuts and bolts shall be coated with Xylan Fluoropolymer coating.

G. Restrained Flanged Coupling Adapters (RFCA):
   1. Flange coupling adapters shall be provided as shown on the Drawings or as deemed necessary by the Contractor for pipe assembly.
   2. Couplings shall be EBAA Megaflange Series 2100 or Romac restrained flange coupling adapter, or approved equal. Adapter material shall be ductile iron coated with fusion bond epoxy in conformance with AWWA C116.
   3. Coupling shall be specifically designed for the pipe material and size.

H. Restrained Couplings: Restrained couplings shall be constructed with a solid ductile iron mechanical joint sleeve with thrust restrain glands on both sides. Ductile iron sleeve shall be fusion bond epoxy lined and coated at the factory in conformance with AWWA C116.

I. Bolts and Nuts
   1. All bolts and nuts shall be Type 316 stainless steel conforming to ASTM F593 G or H for bolts. All nuts and bolts shall be coated with Xylan Fluoropolymer coating.
   2. The length of each bolt or stud shall be such that between 1/4 inch and 3/8 inch will project through the nut when drawn tight.

J. Flanged Fittings:
   1. Fittings for flanged connection shall be Fusion Bonded Epoxy coated and lined in conformance with AWWA C110.
   2. Flanges shall match the connecting flanges on adjacent fitting, valve, or piece of equipment.
   3. Provide full face gaskets per AWWA C111.

K. Flexible Ring Adapter Couplings:
   1. Collar-type Ring Adapters and Couplings shall be provided as shown on the Drawings. See Section 02710.

L. Cam-lock Fitting:
   1. Fittings shall be 316 stainless steel.
   2. Metal coupling shall be able to withstand 100 psi of working pressure
   3. The body of the fitting shall meet material requirements included in ASTM A356 and ASTM A380.

PART 3 EXECUTION

3.01 GENERAL

A. Pipe shall be installed in accordance with good trade practice and AWWA C600. The methods employed in the handling and placing of pipe, fittings, and equipment shall be such as to insure that after installation and testing they are in good condition. Should damage occur to the pipe, fittings, or equipment, repairs satisfactory to the City shall be made prior to final acceptance at no additional cost to the City.

3.02 EXCAVATION AND BACKFILL

A. Excavate and Backfill in accordance with Sections 02200 and 02318.

3.03 PLACING PIPE

A. During loading, transportation, and unloading, every precaution shall be taken to prevent pipeline damage. Any damaged pipe shall be replaced or repaired to the satisfaction of the City. Where pipe is placed in stockpiles, it shall be neatly piled and blocked with strips between tiers.

B. All damaged coatings shall be coated after assembly with a mastic, 3M, Minnesota Mining and Manufacturing EC 244, or an approved equal.

3.04 TESTING FOR PRESSURE PIPE

A. See Section 02770.

END OF SECTION

SECTION 02722
AGGREGATE BASE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Aggregate base.

B. Related Sections:
   1. Section 02200 - Excavation and Backfill.
   2. Section 02742 - Asphaltic Concrete Paving.
   3. Section 03301 - Cast in Place Concrete.
   4. Section 03400 – Precast Concrete

1.02 REFERENCES

A. American Concrete Institute (ACI):
   1. C 117 - Test Method for Material Finer than 75-µm (No. 200) Sieve in Mineral Aggregate by Washing.
   2. C 136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
   3. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

B. State of California Department of Transportation.
   1. CALTRANS - Standard Specifications.

1.03 SUBMITTALS

A. Product Data:
   1. Source, gradation, and testing data for aggregate base course.

B. Quality Control:
   1. Test Reports: Reports for tests required by Sections of CALTRANS Standard Specifications.

C. Certificates of Compliance: Certificates as required by Sections of CALTRANS Standard Specifications.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection: Protect from segregation and excessive moisture during delivery, storage, and handling.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate Base Course:
   1. Class 2, 3/4-inch maximum aggregate size free from vegetable matter and other deleterious substances, and of such nature that aggregate can be compacted readily under watering and rolling to form a firm, stable base.
   2. Materials derived from processing demolished or removed asphalt concrete are not acceptable.
   3. Coarse aggregate material retained in Number 4 sieve shall consist of material of which at least 25 percent by weight shall be crushed particles when tested in accordance with California Test 205.
   4. Aggregate shall not be treated with lime, cement, or other chemical material before the Durability Index test is performed.
   5. Aggregate grading and sand equivalent tests shall be performed to represent not more than 500 cubic yards or one day's production of material, whichever is smaller.
   6. Grade within the limits and conform to quality requirements as follows when tested in accordance with California Test 202:

Sieve Sizes (Square Openings)	Percent by Weight Passing Sieve
1 inch	100
3/4 inch	90-100
Number 4	35-55
Number 30	10-30
Number 200	2-9

Quality Requirements		
Description	California Test	Minimum Test Result
Resistance (R Value)	301	78
Sand Equivalent	217	22
Durability Index	229	35

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine conditions upon which the work specified in this Section depends for defects that may influence installation and performance.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Subgrade Preparation: Prepare as specified in Section 02200, "Excavation and Backfill"

3.03 INSTALLATION

A. Furnish, spread, and compact aggregate base course material to the lines, grades, and dimensions indicated on the Drawings.
   1. Spreading: Spread in accordance with sections of CALTRANS Standard Specifications.
   2. Compacting: per Sections 02200 and 02318.

3.04 FIELD QUALITY CONTROL

A. Tests: Perform field tests per Sections 02200 and 02318.

*****END OF SECTION*****

SECTION 02742
ASPHALTIC CONCRETE PAVING

PART 1 GENERAL

1.01 SUMMARY

A. All asphaltic concrete paving shall adhere to the requirements within this specification section.

B. Section Includes: Asphaltic concrete pavement on prepared subgrade or aggregate base course or on existing pavement to lines, grades and compacted thickness as indicated on the Plans and as necessary to restore all existing asphaltic concrete pavement disturbed during the course of the Work.

1.02 REFERENCES

A. State of California Department of Transportation Standard Specifications, 2018 (CALTRANS Standard Specifications).
   1. Section 37 - Bituminous Seals.
   2. Section 39 - Hot Mix Asphalt.
   3. Section 92 - Asphalts.
   4. Section 93 - Liquid Asphalts.
   5. Section 94 - Asphaltic Emulsions.

B. CALTRANS Standard Test Methods:
   1. Calif Test 202 - Sieve Analysis of Fine and Coarse Aggregates.
   2. Calif Test 304 - Preparation of Bituminous Mixtures for Testing.
   3. Calif Test 362 - Determining Asphalt Content in Bituminous Mixtures by Vacuum Extraction.
   4. Calif Test 375 - Determining the In-Place Density and Relative Compaction of AC Pavement.
   5. Calif Test 379 - Determining Asphalt Content in Bituminous Mixtures (Troxler Nuclear Gage Model 3241).

C. American Society for Testing and Materials (ASTM) Standards:
   1. ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
   2. ASTM D1561 - Practice for Preparation of Bituminous Mixture Test Specimens by Means of California Kneading Compactor.

1.03 SYSTEM DESCRIPTION

A. This WORK shall consist of furnishing and mixing aggregate and asphalt binder at a central mixing plant, spreading and compaction of the mixtures as specified and as indicated on the Plans.

B. In general, asphalt concrete and asphalt concrete base shall conform to Section 39 "Hot Mix Asphalt" and all applicable referenced sections of the CALTRANS Standard Specifications.

1. Where conflicts exist, this specification shall govern.

1.04 DEFINITIONS

A. "Asphalt Concrete" as used by CALTRANS shall be considered the "Surface Course," or the final lift of the pavement section.

B. "Asphalt Concrete Base" as used by CALTRANS shall be the remaining portion of the asphalt pavement section excluding the final lift.

C. "Asphalt Pavement" shall be the total pavement section of asphalt including Asphalt Concrete and Asphalt Concrete Base.

1.05 SUBMITTALS

A. Proposed Mix Design and Gradation of Materials.

B. Product data:
1. Asphalt.
2. Asphalt aggregate
3. Pavement reinforcing fabric.

C. Quality Control Submittals:
1. Test Results.
2. Certificate of Compliance.
3. Certificate of Competence.

D. Equipment List.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Asphalt Pavement Delivery:
1. Transport the mixture from the mixing plant to the point of use in vehicles having tight bodies previously cleaned of all foreign materials.
2. Treat bodies as necessary to prevent material from sticking to the bodies.
3. Cover each load with canvas or other suitable material of sufficient size and thickness to protect the asphalt mixture from the weather.

1.07 PROJECT CONDITIONS

A. Environmental Requirements:
1. Asphalt Concrete:
a. Place asphalt concrete only when surface is dry, when atmospheric temperature in the shade is 40 degrees F and rising, or above 50 degrees F if falling.
b. Do not place asphalt concrete when weather is foggy or rainy nor when base on which material is to be placed is in wet or frozen conditions or when, in

the opinion of the Engineer, weather conditions will prevent proper handling, finishing, compaction of the mixtures.

2. Prime Coat:
   a. Do not apply prime coat when atmospheric temperature is below 60 degrees F.
   b. Apply prime coat only when base course is dry or contains moisture not in excess of that which will permit uniform distribution and desired penetration.

PART 2 PRODUCTS

2.01 ASPHALT PAVEMENT MATERIALS

A. Asphalts:
   1. Asphalt Binder: Grade PG64-10 conforming to Section 92-1.02 "Grades" of the CALTRANS Standard Specifications.
   2. Prime Coat and Tack Coat: Grade SC-70, conforming to Section 93-1.01 of the CALTRANS Standard Specifications.
   3. Fog Seal: Asphaltic Emulsion, Grade SS-1h, conforming to Section 94-1.01 of the CALTRANS Standard Specifications.
   4. Slurry Seal: Asphaltic Emulsion, Grade CQS1h Cationic., conforming to Section 94-1.02E, and aggregate Type II conforming to Section 37-3 of the CALTRANS Standard Specifications.

B. Asphalt Aggregate:
   1. Aggregate for asphalt concrete shall conform to Section 39-1.02 of the CALTRANS Standard Specifications for Type A or B grading, 1/2-inch maximum.

C. Asphalt pavement shall be produced in a batch mixing plant, a continuous pugmill mixing plant, or drier-drum mixing plant.
   1. Mixing shall conform to Section 39-1.08 of the CALTRANS Standard Specifications.

2.02 AGGREGATE BASE COURSE

A. Aggregate base shall conform to Section 02722.

B. Aggregate Base Course shall be placed at the following locations:
   1. Under all asphalt pavement.

C. Compacted thickness of Aggregate Base Course shall be as indicated on the Plans.

2.03 EQUIPMENT

A. Spreading and Compacting Equipment:
   1. Spreading and compacting equipment shall conform to Section 39-3.03 and all applicable referenced sections, of the CALTRANS Standard Specifications.

2.04 SOURCE QUALITY CONTROL

A. The ENGINEER will perform sampling and tests of materials in accordance with California Test Method Number 304 and California Test Method Number 362 or 379, as applicable. Samples will be taken from materials as delivered to the site.

PART 3 EXECUTION

3.01 ASPHALT DEMOLITION

A. Asphalt shall be cut away, grinded, and/or milled to the depth and width as indicated on the Drawings in a manner that does not damage existing utilities and nearby pavement and concrete that is to remain. Removed asphalt and aggregate shall be disposed of by the contractor.

B. Streets that have been ground shall be overlaid within three (3) days of grinding operation. In the event that the CONTRACTOR cannot pave the streets that are ground within three calendar days, the CONTRACTOR shall be prohibited to grind any more streets and must complete all paving work.

3.02 PREPARATION

A. Preparation:
   1. Immediately prior to applying prime coat or tack coat, or immediately prior to placing the asphalt pavement when prime coat or tack coat is not required, the subgrade to receive asphalt pavement shall conform to the compaction requirement and elevation tolerances specified for the material involved and shall be cleaned to remove any loose or extraneous material.
   2. If the asphalt pavement is to be placed on an existing base or pavement which was not constructed as part of the contract, the CONTRACTOR shall clean the surface by sweeping, flushing or other means to remove all loose particles of paving, all dirt and all other extraneous material immediately before applying the prime coat or tack coat. If the asphalt pavement is to be placed against a vertical gutter face or other vertical surface, the CONTRACTOR shall roughen and clean vertical surface as required for proper bonding of asphalt immediately before applying prime coat or tack coat.

3.03 ADJUSTMENT OF UTILITY FRAMES AND COVERS TO GRADE

A. Utility frames and covers within an area to be paved or graded will be set by the CONTRACTOR with coordination with owners thereof to finished grade. Repaving required as a result of reconstructing or adjusting all manhole and vault frames and covers to grade shall be the responsibility of the CONTRACTOR and the cost thereof shall be included in the bid item for pavement. The CONTRACTOR shall remove all debris from the interior of utility riser and shall clean all foreign material from the top of the frames and covers.

B. The CONTRACTOR shall adjust utility riser/rings/covers within three (3) days after paving is done.

C. In the event that the CONTRACTOR fails to complete adjusting all manholes and other utility frames and covers within ten (10) days after the street is resurfaced, the CONTRACTOR shall cease all grinding and paving operations until all utility frames and covers are adjusted to finished grade or as directed by the ENGINEER.

D. Utility covers located outside of the paving areas shall not be adjusted to grade as part of this contract unless directed by the ENGINEER.

E. Utility structures extending 2 inches or more above the new subgrade shall be removed by the CONTRACTOR to the new subgrade before paving. Structures projecting less than 2 inches above the subgrade may be paved over and later adjusted to grade. All structures from which frames and covers have been removed to facilitate paving shall be temporarily covered with a steel plate by the CONTRACTOR. When this procedure is impractical, such as for large vaults, special structures, pressure manhole frames and covers, or where portland cement concrete pavement is to be constructed, all remodeling or reconstruction shall be completed to finish permanent surface prior to paving operations. The CONTRACTOR shall notify utility owners, at least 2 working days in advance, of the need to commence work required prior to paving operations and again for work required after paving operations. After the pavement has been completed, the necessary portions of the subgrade, base, and pavement shall be neatly removed, the structure built up, and the manhole frame set to be backfilled to within 1-1/2 inches of the surface with portland cement concrete. The CONTRACTOR shall fill the remaining 1-1/2 inches with an asphalt concrete wearing surface mixture to match the project surface course. This material shall be placed and compacted in a workmanlike manner to conform to the appearance of the surrounding pavement.

3.04 PRIME COAT AND TACK COAT

A. Prime Coat:
   1. A prime coat of liquid asphalt shall be applied on all surfaces of base course material to be paved.
   2. Prime coat shall be applied at a rate of 0.25 gallons per square yard, and shall conform to Section 93 of the CALTRANS Standard. Specifications for the distributor application of the grade of liquid asphalt being used.

B. Tack Coat:
   1. A tack coat of asphaltic emulsion shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints in the surfacing against which additional material is to be placed, or as otherwise specified herein.
   2. Tack coat shall be applied in one application at a rate of 0.1 gallons per square yard of surface covered.

3.05 ASPHALT PAVEMENT

A. Asphalt Pavement thickness section shall be 4-inches minimum or match existing pavement thickness (whichever is greater).

B. Placing materials in a windrow, then picking it up and placing it in the asphalt paver with loading equipment will not be permitted.

C. Unless lower temperatures are directed by the ENGINEER, asphalt concrete shall be spread, and the first coverage of initial or breakdown compaction shall be performed when the temperature of the mixture is not less than 250 degrees F, and all breakdown compaction shall be completed before the temperature of the mixture drops below 205 degrees F.

D. Asphalt pavement shall be spread and compacted in the number of layers and of the thicknesses indicated in the following table:
   1. A thickness tolerance of ±0.1 inches is allowed for asphalt concrete.
   2. A total thickness tolerance of ±0.2 inches is allowed for asphalt concrete base.
   3. Permeable pavement shall be 2.5 inches thick.

Total Thickness Indicated on Plans(1)	Number of Lifts	Top Layer Thickness		Next Lower Layer Thickness		All Other Lower Layer Thicknesses	
		Min	Max	Min	Max	Min	Max
< 2¾"	1	-----	-----	-----	-----	-----	-----
3"	2	1¼"	1½"	1¼"	1½"	-----	-----
3¼" - 4¾"	2	1¾"	2¼"	1¾"	3"	-----	-----
> 5"	(2)	1¾"	2¼"	1¾"	3"	1¾"	4¾"

(1) When pavement reinforcing fabric is shown to be placed between layers of asphalt pavement, the thickness of asphalt pavement above the pavement reinforcing fabric shall be considered to be the "Total Thickness Indicated on the Plans" for the purpose of spreading and compacting the asphalt pavement above the pavement reinforcing fabric.

(2) At least two layers shall be placed if the total thickness is less than 5". At least three layers shall be placed if the total thickness is more than 5", and less than 10½". At least four layers shall be placed if the total thickness is greater than 10½".

E. A layer shall not be placed over another layer which exceeds 3 inches in compacted thickness until the temperature of the layer which exceeds 3 inches in compacted thickness is less than 160 degrees F at mid depth.
   1. If the temperature of any layer drops below 140 degrees F, or if directed by the ENGINEER, apply tack coat before placing next layer.

F. Unless otherwise indicated on the Plans, asphalt mixtures shall not be handled, spread or windrowed in a manner that will stain the finished surface of any pavement or other improvements.

G. The completed mixture shall be deposited on the prepared subgrade at a uniform quantity per linear foot, as necessary to provide the required compacted thickness without resorting to spotting, picking-up or otherwise shifting the mixture.

H. Spreading:
   1. All layers of asphalt pavement shall be spread with an asphalt paver and shall conform to Section 39-3.03 and all applicable referenced sections of the CALTRANS Standard Specifications.

2. At locations where the asphalt pavement is to placed over areas inaccessible to spreading and rolling equipment, all layers of asphalt pavement shall be distributed directly out of the back of the dump truck and spread by hand.
    a. Asphalt pavement spread by hand shall be compacted thoroughly to the required lines, grades and cross-sections by means of pneumatic tampers, or by other methods that will produce the same degree of compaction as pneumatic tampers.

I. Compaction:
1. Compaction of asphalt pavement shall conform to Section 39-3.03 and all applicable referenced sections of the CALTRANS Standard Specifications.
2. Minimum required density for each layer of asphalt pavement shall be 95 percent of that obtained in the laboratory according to ASTM Test Method D-1561.
3. Vibratory compaction equipment shall not be used irrespective of the Standard Specifications.

J. Segregation shall be avoided and the surfacing shall be free of pockets of coarse or fine material. Asphalt pavement containing hardened lumps shall not be used.
1. In areas inaccessible to paving and compacting equipment where spreading is done by hand, minimize the amount of segregation.

K. Location of longitudinal joints in the top layer will be determined by the Engineer and shall not adversely affect the quality of the finished product.

L. At all locations, or as directed by the ENGINEER, the asphalt concrete shall be square and at least 1 inch thick when conforming to existing surfacing. Tapering or feathering is not allowed.

3.06 SLURRY SEAL

A. Slurry Seal shall be mixed and spread in conformance with Section 37-3 of the CALTRANS Standard Specifications.

3.07 FIELD QUALITY CONTROL

A. The CONTRACTOR shall control the quality of WORK and shall provide adequate testing to assure compliance with these Specifications.
1. The CITY will arrange and pay for samples to be taken to determine conformance with stability, density, thickness and other specified requirements. The CONTRACTOR shall replace the pavement where samples are removed.

B. All asphalt pavement shall match the grades indicated on the Plans and shall be completely free from unintended hollows and high spots.

1. After completion of paving work, all paving shall be flooded with water. Any ponding that results in standing water greater than 3/4 inches in depth shall be ringed with chalk. Such hollows shall be corrected by removing and replacing the asphalt concrete. The asphalt concrete patch shall be square and at least 1 inch thick when conforming to existing surfacing. Tapering or feathering is not allowed.

C. The City will arrange and pay for in-place density and compaction tests of the completed pavement in accordance with California Test Method Number 375, to determine compliance with the specified requirements.
   1. If compaction fails to meet specified requirements, the CONTRACTOR shall perform remedial work to meet the specified requirements.
   2. Retesting:
      a. Costs of Retesting: Costs of any retesting required to confirm and verify that remedial work has brought compaction within specified requirements shall be borne by the CONTRACTOR.
      b. CONTRACTOR is responsible for compliance testing of remedial work.
      c. Confirmation Tests during performance of remedial work will be performed in a manner acceptable to the Engineer.

D. Cracks, settling of surface, improper drainage, improper compaction, and sloppy connection to previously laid surfaces will be construed as improper workmanship and will not be accepted.

3.08 MAINTENANCE OF PAVEMENT

A. Upon completion of final rolling, traffic shall not be permitted on the finished pavement for at least 6 hours, or until the asphalt pavement has cooled sufficiently to withstand traffic without being deformed.

3.09 WORKMANSHIP AND WARRANTY

A. Contractor shall provide written warranty against defects in materials or workmanship for a period of not less than 1 year upon completion of Work.

*****END OF SECTION*****

SECTION 02750
PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: All Pavement and Concrete paint, markings, and reflectors.

B. Related Sections:
   1. Section 02742 – Asphaltic Concrete Paving
   2. Section 02772 – Concrete Curbs, Gutters, and Sidewalks

1.02 REFERENCES

A. State of California Department of Transportation Standard Specifications, latest edition (CALTRANS Standard Specifications).
   1. Section 84 –Markings

1.03 WORK RESTRICTIONS

A. Prior to the removal of any of the existing traffic control delineation and markings, the CONTRACTOR shall document existing striping configuration including lane width, type of details, arrows, markings and legends and any other existing delineation for reinstallation. The CONTRACTOR shall take whatever action is necessary to ensure that said delineation can be accurately replaced at its previous location upon completion of paving operations.

B. If on those streets not designated to be resurfaced, the existing traffic control system is impacted construction activities, the CONTRACTOR shall install traffic tape or paint until the permanent traffic control system can be replaced by the CONTRACTOR.

C. The CONTRACTOR shall provide temporary stop legend and cross-walk replacement as necessary until the permanent installation has been done per direction of the ENGINEER.

1.04 SUBMITTALS

A. The CONTRACTOR is required to provide shop drawings and/or submittals for the following items listed:
   1. Thermoplastic Striping Paint

1.05 QUALITY ASSURANCE

A. The CONTRACTOR warrants and guarantees that all material and equipment used or furnished and all workmanship are of the type and quality specified herein. The CONTRACTOR further guarantees that any latent fault in construction or defective material discovered within one year after acceptance of the work shall be remedied by him without cost to the CITY, upon written notice given to him. Other subsequent latent defects shall be covered by responsibilities set forth in the law.

B. In the event of failure to comply with the above-mentioned conditions within a reasonable time after notice, the CITY will have the defects repaired and made good at the expense of

the CONTRACTOR, who agrees to pay the costs and charges therefore immediately upon demand.

PART 2 MATERIALS

2.01 PAINT AND PROTECTIVE COATINGS FOR TRAFFIC STRIPING, PAVEMENT MARKING, CURB MARKING, AND RELFLECTIVE MARKERS

A. Paint shall conform to the provisions of Section 84 of Caltrans Specifications. Thermoplastic paints are required on this project.

B. Paint Colors:
   1. Text: White
   2. Parking Dividers: White
   3. No Parking Curb: Red
   4. Directional Arrows: White
   5. Driving Lane Dividers: White
   6. Intersection Stop Lines: White
   7. Crosswalk Lines: White
   8. Road Centerlines: Yellow

C. Pavement Markers shall conform to the provisions of Section 85 of Caltrans Specifications.

D. Reflective Markers shall conform to ASTM D7888 Grade 8. Location and type of markers shall conform to Caltrans standard drawings.

PART 3 EXECUTION

3.01 PAINT AND PROTECTIVE COATINGS FOR TRAFFIC STRIPING, PAVEMENT MARKING, AND CURB MARKING

A. Application of striping, marking, and setting pavement markers shall conform to Sections 84 of Caltrans Specifications, in addition to the requirements in this Section.

B. Remove dirt, oil, grease, and other materials which may affect paint adhesion.

C. Apply paint with specifically designed and manufactured equipment for pavement marking. Provide:
   1. Uniform straight edges without overspray.
   2. Six inch wide lines, unless indicated otherwise.

D. Apply paint to obtain thickness recommended by paint manufacturer.

E. Replace removed or damaged control markings, including striping, directional arrows, cross walks, lettering, symbols, and reflective markers in accordance with Caltrans standards. Use stencils for arrows, lettering, and symbols.

*****END OF SECTION*****

SECTION 02760
CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Closed circuit television (CCTV) inspection of sanitary sewer pipes.

B. Related Sections:
   1. Section 02700 – PVC Pipe and Fittings
   2. Section 02710 – HDPE Pipe and Fittings
   3. Section 02720 – Ductile Iron Pipe and Fittings

1.02 DEFINITIONS

A. NASSCO: National Association of Sewer Service Companies.

B. PACP: Pipeline Assessment Certification Program.

C. MACP: Manhole Assessment and Certification Program

1.03 SUBMITTALS

A. Inspections on hard drive at the completion of inspection:
   1. Inspection videos saved in MPEG format or Windows Media video format.
   2. Electronic version (.pdf) of the pipe inspection reports.
   3. PACP export pipe inspection database (.mdb).
   4. Inspection digital photographs in JPEG format.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection: Protect from segregation and excessive moisture during delivery, storage, and handling.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. Closed Circuit Television Camera:
   1. The television camera used for the inspection shall be one specifically designed and constructed for sanitary sewer inspection with an accurate footage counter. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The rotating camera and lighthead configuration shall provide 240 degrees of pan and tilt angle measuring centerline to centerline and 70 degree lens viewing angle.
   2. The camera shall be color and shall provide a minimum of 1280H x 720W pixels for a total of 921,600 pixels at 30 frames per second resolution. Geometrical distortion of the image shall not exceed one percent (1%).
   3. The color camera shall be equipped with the necessary circuitry to allow for the remote adjustment of the optical focus and iris from the power control unit at the viewing station.

B. Video Capture System:
   1. The video and audio recordings of the sewer inspections shall be made using digital video equipment. A video enhancer may be used in conjunction with, but not in lieu of, the required equipment. The digital recording equipment shall capture sewer inspection on hard drive, with each sewer reach inspection recorded as an individual movie file (.MPEG, .MPG, or .WMV) or approved equal.
   2. The video file name shall contain both the upstream and downstream manhole number and date of inspection.
   3. The video file names will be referenced in the inspection database and in an inspection report generated in PDF format. The pipeline collection and real time video capture and data acquisition systems shall be provided.
   4. The system shall use the most current PACP compliant application software and shall be fully object oriented or approved equal. It shall be capable of printing pipeline inspection reports with captured images of defects or other related significant visual information on a standard color printer.
   5. The imaging capture system shall store digitized color picture images and be saved in digital format on a hard drive or approved equal storage device. Also, this system shall have the capability to supply the City with inspection data reports for each line segment.
   6. The contractor's equipment shall have the ability to "Link". “Linking” is defined as storing the video time frame code with each observation or defect with the ability to navigate from/to any previously recorded observation or defect instantaneously.
   7. The system shall be able to produce data reports to include, at a minimum, all observation points, and pertinent data. All data reports shall match the defect severity codes in accordance with PACP naming conventions.
   8. Camera footage, date, & manhole numbers shall be maintained in real time and shall be displayed on the video monitor as well as the video character generators illuminated footage display at the control console.
   9. The audio portion shall be sufficiently free of background and electrical noise so as to produce an oral report that is clear and discernible.
   10. Acceptable Inspection software includes Pipeline Observation System Management (POSM) or approved equal.
   11. The CCTV equipment/software shall be capable of producing digitized images of all sewer line defects, manhole defects, and sewer line service connections in .jpeg format. CONTRACTOR shall plan to take digital still images of each defect, construction features and service connection to clearly depict it. More images may be necessary depending upon the condition of the pipe.

2.02 REPORTING CAPABILITIES

A. The following information is mandatory for all inspections:
   1. Inspection Information – Refers to the area of pipe to be inspected between two manholes or the address of the lateral to be inspected.
      a. Project Name;
      b. Surveyed by (Operator/Surveyor’s name);
      c. Operator/Surveyor Certificate number;
      d. Date;
      e. Time;
      f. Street Name and Number;
      g. Additional Location Information (e.g. backyard, parking lot, etc.);
      h. Upstream Manhole Number (City standard Asset Number);
      i. Upstream MH rim to invert (depth);

j. Downstream Manhole Number (City standard Asset Number);
k. Downstream MH rim to invert (depth);
l. Direction of inspection (Upstream or Downstream);
m. Flow control (e.g. plugged, lift station, bypassed, not controlled);
n. Type of Pipe;
o. Pipe Size;
p. Pipe Material;
q. Lining Material (for lined sewers);
r. Purpose of Inspection (pre-construction, post construction, etc.)
s. Pre Cleaning (jetter, heavy cleaning, no pre-cleaning);
t. Weather;
u. Additional information/Comments

2. Observation Data – Refers to the portion of pipe where an observation is discovered. Observations shall be noted by text descriptions and defect code number using PACP defects codes, still frame pictures and video clips captured and recorded. Each observation shall include the following:
    a. Actual observation footage;
    b. Location and clock position of any defects;
    c. Location and clock position of any connection;
    d. Code (Group/Descriptor/Modifier/Severity)
    e. Whether it is a continuous defect
    f. Whether the defect occurs at a joint
    g. Severity level;
    h. Counter;
    i. Final footage;
    j. Video clip ID for each observation
    k. Image reference (file name of photos)
    l. Remarks (as appropriate or needed)
3. Formats - Standard and/or custom designed reports shall have the following formats available and shall be able to be produced in hard copy or viewed on the monitor.
    a. Site Observation: Displays detailed site observation reports in landscape or portrait views.
    b. Directory Report: Displays a list of all the projects sorted by pump station number and manhole number
    c. Picture Reports: Displays site data and include full size single photos or half size double photos of discrepancies
    d. Pipe Run: Displays a graphical display of the site indicating footage, observations, and comments.
    e. Project Data: Displays the project, client, and contractor information.
    f. Custom Sort: Creates user-defined reports of selected site, project, and observation data.

PART 3- EXECUTION

3.01 GENERAL

A. Sewers shall be cleaned by contractor within 24 hours prior to performing inspection.

B. Inspection of newly installed sewers (not yet in service) shall not begin prior to completion of the following:

1. Deflection pipe testing
2. All manhole work, including installation of inverts
3. Installation of all lateral services

C. After the sewer main and/or lateral cleaning operation is completed, the line sections shall be visually inspected internally by means of color closed-circuit television. The television inspection shall be performed one line section at time.

D. The camera shall pan the periphery of the start and finish manhole from casting to invert. To achieve this, the CCTV camera operator shall pan and zoom the manhole to obtain the best possible image of the manhole, including the wall, cone and chimney section(s).

E. The depth of each manhole shall be measured to the nearest $1/10^{th}$ of a foot and documented on the inspection forms. Estimates of manhole depths will not be accepted.

F. The CCTV camera shall be positioned as close to the spring line as possible while maintaining the required equipment stability.

G. Wherever possible the inspections shall be performed in the upstream to downstream direction. All sewer segments shall be recorded in a logical order in the same direction they are cleaned and televised.

H. When sewer conditions prevent forward movement of the camera, the camera shall be withdrawn, and CONTRACTOR shall televise the line from the opposite direction.

I. The camera shall be directed through the sewer in a downstream direction, with the flow, at a uniform, slow rate. In no case will the video camera record while moving at a speed greater than 30 feet per minute. If, during the course of the project, the inspection is rejected due to camera speeds exceeding 30 feet per minute, the inspection recordings shall be redone, at no additional cost to the City.

J. Flow levels within existing sewers to be inspected shall not exceed 5% of the pipe diameter. If water levels prevent adequate televising of the sewer, then conducting the work during low flow periods or other methods like plugging and bypass pumping shall be implemented.

K. For inspection of new sewers (not yet in service), the CONTRACTOR shall introduce clean water into the upstream manhole and keep water flowing until flow is observed at the downstream manhole location.

L. The survey unit shall be slowed, stopped, or backed-up to perform detailed inspections of significant features. The camera shall be stopped at all defects, changes in material, water level, size, side connections, manholes, junctions, or other unusual areas. When stopped at the defect or feature, the operator shall pan the camera to the area and along the circumference of the pipe. When stopped at a connection the camera shall pan to look into the connected pipe.

M. The camera unit shall be paused long enough at areas suspected of leaking to determine if a leak exists currently or if deposits have occurred.

N. The operator shall also record audio of the type of defect or feature, clock position, footage, extent or other pertinent data.

O. Audio shall be recorded during each inspection by the operating technician, and shall include the sewer location (address), identification of beginning and terminating manholes, inspection direction, length of inspection, side sewer identification, flow information, complete descriptions of the sewer line conditions as they are encountered, reason for termination, and other relevant commentary to the inspections. Voice descriptions should be made:
    1. At points of pipe failure or weakness,
    2. At points of infiltration,
    3. At service connections,
    4. Where unusual conditions are noted, and
    5. Where digital still photos are taken

P. Audio reports shall include the distance traveled on the specific run, a description of abnormal conditions in the sewer and side sewer connections as they are encountered, explanations for pausing, backing up, or stopping the survey, and the final measured center to center distances between consecutive manholes. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio dubbing after the inspection is prohibited.

Q. If the video and/or audio recording is of poor quality, the City has the right to require a re-submittal of the sewer and no payment will be made until an acceptable video and audio recording is made and accepted by the City.

R. The contractor shall be responsible for all traffic control measures required to perform the work.

3.02 PRE-CONSTRUCTION INSPECTION

A. Procedure:
    1. Prior to construction the entire existing gravity sewer line (from manhole to manhole) shall be televised. The pre-construction inspection shall be used to determine lateral locations and depths.
    2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the contractor shall set up his equipment so that the inspection can be performed from the opposite manhole (reverse set-up).
    3. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communication between members of the crew.
    4. The importance of accurate distance measurements is emphasized. The location of laterals shall be within one (1) foot.
    5. During the internal inspection the television camera shall be temporarily stopped at each lateral along the line. The contractor shall record the location. Flows from service connections that are determined to be infiltration/inflow shall also be recorded.

B. Documentation:

1. Television Inspection Logs - Printed location records shall be kept by the contractor and will clearly show the location in relation to an adjacent manhole of each lateral. In addition, other points of significance such as locations of unusual conditions, roots, storm sewer connections, broken pipe, presence of scale and corrosion, and other discernible features will be recorded and a copy of such records shall be supplied to the City. The contractor shall record all visuals observations on a "Television Inspection Report" form.
2. Once recorded, the digital data shall be labeled and become the property of the City. The contractor shall have all readings and necessary playback equipment readily accessible for review by the City during the project.
3. The Contractor shall deliver pre-construction inspections to the City for review prior to proceeding with the proposed work.

3.03 POST CONSTRUCTION INSPECTION

A. Procedure:
1. After the sewer line installation has been completed, the entire sewer line from manhole to manhole shall be televised. The post construction inspection shall be used to determine whether or not all of the approved sewer line defects and infiltration sources previously located have been fully repaired to the satisfaction of the City.
2. **All new gravity sewer and force mains shall be CCTV inspected.**
3. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, power rewinds, or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the contractor shall set up his equipment so that the inspection can be performed from the opposite manhole or direction.(reverse-setup)
4. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communication between members of the crew.
5. The importance of accurate distance measurements is emphasized. The location of defects shall be within one foot.
6. During the internal inspection the television camera shall be temporarily stopped at each repair. The camera shall also be stopped at any unnoticed or non-repaired point source of infiltration.

3.04 SEWER BYPASSING AND DEWATERING

A. Contractor shall be responsible for bypassing sewer flow around his work and dewatering of sewer lines in accordance with the requirements of Section 01531. Where sags or submerged sections of the sewer are encountered during TV inspection, the contractor shall first complete inspection of the entire reach to determine the extent of such areas prior to dewatering the sewer. Dewatered sections of the sewer shall then be TV inspected.

B. On all sewer mains which have sags or dips, to an extent that the television camera lens becomes submerged during the television inspection, the contractor shall use a high pressure

cleaner to draw the water out of the pipe, or other means, to allow inspection of the pipe and identification of pipe defects, cracks, holes and location of service connections.

3.05 LINEAR MEASUREMENT

A. The CCTV camera location footage counter shall be zeroed at the beginning of each inspection. The survey unit location entered on the footage counter at the start of the inspection shall allow for the distance from the accepted start of the length of the sewer to the initial point of observation of the camera (pre-set footage). In the case of resuming an inspection at an intermediate point within a sewer reach, the footage counter shall be set to start at the distance from the upstream maintenance hole to that point, as previously recorded by the counter. The CONTRACTOR shall ensure that the footage counter starts to register immediately when the survey unit starts to move.

B. The lateral camera shall be pushed from cleanouts to the sewer main and be equipped with a footage counter to display and record inspection footage. Maximum rate of travel shall be 30 feet per minute when recording.

C. Prior to commencing inspections, the CONTRACTOR shall demonstrate compliance with the linear measurement tolerance specified below:
   1. After the sewer line rehabilitation has been completed, the entire sewer line from manhole to manhole shall be televised. The post construction inspection shall be used to determine whether or not all of the approved sewer line defects and infiltration sources previously located have been fully repaired to the satisfaction of the City.
   2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, power rewinds, or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the contractor shall set up his equipment so that the inspection can be performed from the opposite manhole or direction.(reverse-setup)

3.06 CCTV MONITOR DISPLAY

A. The images displayed on the CCTV monitors will be a view of the pipe above the water surface as seen by the CCTV camera as the unit is conveyed through the sewer.

B. The camera lighting shall be fixed in intensity prior to commencing the survey and the white balance set to the color temperature emitted. In order to ensure color constancy, no variation in illumination shall take place during the survey.

C. The video equipment shall be checked using an approved test card with a color bar prior to commencing each day's survey. The camera shall be positioned centrally and parallel to the test card at a distance where the full test card just fills the monitor screen. The card shall be illuminated evenly and uniformly without any reflection.

3.07 DATA DISPLAYS

A. The CCTV images shall include an initial data display that identifies the sewer reach being surveyed and a survey status display that provides continuously updated information on the location of the survey unit as the survey is being performed. These data displays shall be in alphanumeric form. The size and position of the data shall not interfere with the main subject of the monitor picture.

B. The on-screen display should be white during inspections where the background behind the display is dark and, conversely, black where the background is light.

C. At the beginning of each reach of sewer being inspected, the following information shall be electronically generated and displayed on the CCTV monitors as well as included in the audio track:
   1. Date of survey
   2. Inspection company name and inspector
   3. Street name or location
   4. Manhole number to manhole number (in order of inspection)
   5. Direction of survey (upstream or downstream)
   6. Time of start of survey

D. During inspections, the following information shall be electronically generated, automatically updated, and displayed on the CCTV monitors:
   1. Survey unit location in the sewer line in feet and tenths of feet from adjusted zero
   2. Sewer diameter
   3. Upstream and downstream manholes reference numbers as per approved drawings

3.08 MANHOLE NUMBERING AND DEFECT CODES

A. The Contractor will be required to use the manhole numbering as shown on the contract drawings.

B. The defect codes, inspection forms, inspection database and inspection protocols shall be in accordance with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP).

END OF SECTION

SECTION 02770
SANITARY SEWER TESTING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Testing of sanitary sewer systems.

B. Related Sections:
   1. Section 02318 – Trenching.
   2. Section 02700 – Polyvinyl Chloride (PVC) Pipe and Fittings
   3. Section 02710 – High Density Polyethylene (HDPE) Pipe and Fittings
   4. Section 02720 – Ductile Iron Pipe and Fittings
   5. Section 02760 – Closed Circuit Television (CCTV) Inspection.
   6. Section 03301 – Cast in Place Concrete
   7. Section 03400 – Precast Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C 969 – Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
   2. C 1091-03a – Test Method for Hydrostatic Infiltration Testing of Vitrified Clay Pipe Lines
   3. F 1417 – Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air
   4. F 2164 – Standard Practice for Field Leak Testing of Polyethylene (PE) and Crosslinked Polyethylene (PEX) Pressure Piping Systems Using Hydrostatic Pressure
   5. D 3034 – Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
   6. F 1667 – Guide for Construction Procedures for Buried Plastic Pipe

B. Uni-Bell PVC Pipe Association
   1. B-6 – Recommended Practice for low Pressure Air Testing of Installed Sewer Pipe

PART 2 PRODUCTS

2.01 GENERAL

A. Mandrels, temporary plugs, bypass pumping, low-pressure testing equipment and all other necessary materials shall be provided by the Contractor, subject to the City's approval. All testing shall be performed by the Contractor in the presence of the City's representative. No materials shall be used which would be injurious to the public, personnel, adjacent improvements or the pipeline.

2.02 PRESUUSRE GAUGES

A. Pressure gauges shall be laboratory-calibrated test gauges and shall be recalibrated by a certified laboratory prior to the leakage test. Gauge shall be easy to read in no more than one (1) pound per square inch (psi) increments and have a maximum full-scale range of five (5) psi.

PART 3 EXECUTION

3.01 PIPE SHAPE AND DEFLECTION TESTING FOR GRAVITY SEWER

A. Deflection testing shall be performed after the trench has been completely backfilled and compacted.

B. Newly installed pipe (8) inches in diameter or larger gravity sewer pipe shall be tested for deflection, joint displacement, or other obstruction by passing a rigid mandrel through the pipe.

C. The mandrel shall be a full circle, rigid, non-adjustable, an odd-numbered leg (9 leg minimum), approved by the Engineer as to design and manufacturer. Mandrel size shall meet the minimum requirements set forth in ASTM D 3034 and ASTM F 679. The circular cross section of the mandrel shall have a diameter of at least ninety five percent (95%) of the specified average inside diameter of the pipe and the minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe.

D. Where obstructions and excessive deflection are encountered by the mandrel, the Contractor shall remove, replace, and retest the deficient section. Re-rounding will not be allowed.

3.02 LEAKAGE TESTING FOR GRAVITY SEWER

A. Pipe leakage testing shall be performed after the pipe has been installed and prior to replacing laterals.

B. Testing shall be performed in the presence and under the direction of the City or its appointed Representative, prior to re-connecting laterals.

C. All plugs shall be adequately braced and restrained to support the full load developed. No workers shall be allowed in the excavation or manhole while the line is under pressure. The Contractor shall make provisions for reading the pressure at the ground surface and for safely releasing the air pressure without entering the manhole or excavation.

D. If any leaks are found, the air pressure shall be released, the leaks eliminated, and the test procedure re-started.

E. The following procedure shall be used for air testing:
   1. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
   2. If the pipe to be tested is submerged in groundwater, insert a pipe probe by boring or jetting into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the backpressure due to groundwater submergence over the end of the probe. All gauge pressures in the test shall be increased by this amount.

3. Add air slowly to the portion of the pipe being tested until the internal pressure is raised to 4.0 psig.
4. After an internal pressure of 4.0 psig is obtained, allow at least two (2) minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure. After two (2) minute period, disconnect the air supply.
5. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any leakage is observed, bleed off air and make necessary repairs.
6. Begin the test period. In no case shall the air pressure within the line be less than four (4) pounds per square inch at the beginning of the test period.
7. Main Sewers:
   a. If the pressure drop during the required test period equal to or less than 1 psi (6.9 kPa), the line has passed. If the pressure drop is greater than 1 psi (6.9 kPa) during the test time, the line has failed the test.
   b. The required test time shall be based on the diameter and length of pipe to be tested and in accordance with the following, or 10 minutes, whichever is greater:

Minimum Test Time for Various Sewer Main Pipe Sizes

Nominal Pipe Size (inches)	Minimum Time (min:sec)	Length for Minimum Time (ft)	Time for Longer Length (sec)
4	3:46	597	0.380L
6	5:40	398	0.854L
8	7:34	298	1.520L
10	9:26	239	2.374L
12	11:20	199	3.418L
15	14:10	159	5.432L
18	17:00	133	7.692L
21	19:50	114	10.470L
24	22:40	99	13.674L

L = Length in feet

   c. At the City's option, one half of the test time specified above may be used with a maximum pressure drop of 0.5 psi (3.45kPa).

F. **TEST REPORT:** Contractor shall prepare and submit a report detailing all pipes tested. The report shall include the pipe location, pipe size, upstream and downstream manhole ID, testing date, testing pressure, pressure drop, test time, and test date. The report shall be submitted to the City within one week of performing the test. The City will review the report and if acceptable the City will sign the report for acceptance of the test.

3.03 ALLOWABLE PIPELINE SAG FOR GRAVITY SEWER

A. For new gravity sewer piping installed, if it is determined that a sag is present during the post-installation CCTV inspection and the sag depth is equal to or greater than ten (10) percent of the new pipe inside diameter, the contractor shall repair the sag at no additional cost to the City.

B. The Contractor shall re-perform testing as specified herein and post-installation CCTV inspection after the pipeline sag has been repaired. All costs associated with re-testing and re-inspection of the pipeline shall be borne by the Contractor.

3.04 MANHOLE TESTING

A. All new concrete manholes shall be vacuum tested by the Contractor for leakage after installation and prior to backfilling. Testing shall be performed in the presence and under the direction of the City or its appointed Representative.

B. Prior to vacuum testing, all manholes shall be visually inspected. All defects shall be repaired by the Contractor, with grout, to the satisfaction of the City or the City's Representative.

C. All pipes entering the manhole shall be sealed at a point outside the manhole walls so as to include testing of the pipe/manhole joints.

D. A vacuum of ten (10) inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test hood closed and the vacuum pump shut off. The manhole shall be deemed to have passed the test if the vacuum drop is less than one (1) inch of mercury during the required test period. The minimum duration of the test period shall be based on the inside diameter of the manhole and shall conform to the following table:

Vacuum Test Time for Manholes	
Manhole Inside Diameter (inches)	**Test Time (seconds)**
48	60
60	75
72	90

E. If the manhole does not pass the vacuum testing, then the Contractor shall either replace the manhole or make the necessary repairs and re-test at no additional Cost to the City.

F. **TEST REPORT:** Contractor shall prepare and submit a report detailing all manholes tested. The report shall include the manhole location, manhole ID, testing date, testing pressure, pressure drop, test time, and test date. The report shall be submitted to the City within one week of performing the test. The City will review the report and if acceptable the City will sign the report for acceptance of the test.

3.05 WET WELL TESTING

A. Precast concrete wet well shall be hydrostatically leak tested prior to acceptance and prior to coating as specified below:
   1. Test Procedure:
      a. Plug all inlets and outlets with temporary plugs
      b. Fill structure with water
      c. Let stand for 24 hours
      d. Fill to rim of structure
      e. Let stand for 2 hours

f. Calculate water loss. Leakage shall not exceed 0.1 gallon per hour per foot of water depth during the test.

2. Repair all structures which do not meet the test requirement. Re-test structure until it passes.

3.06 CCTV VIDEO INSPECTION

A. All new sewer gravity mains and force mains shall be visually inspected using CCTV video inspection in accordance with specification Section 02760.

3.07 FORCE MAIN TESTING

A. Testing of new force main carrier pipe shall be in accordance with ASTM F2164. Contractor shall provide all equipment and personnel necessary to properly test. Testing shall be done in the presence of the City inspector.

B. Testing shall be done after the pipe has been fused, installed, and backfilled. Ensure thrust restraints have been installed and allow sufficient time for any required concrete thrust blocks to achieve required sufficient strength. Ensure fused joints have sufficiently cooled.

C. Testing shall not be done only when the temperature of pipe is 80 degree Fahrenheit or less.

D. Testing against closed valves is not allowed. Contractor shall install blind flanges for isolation.

E. Testing Procedure:
   1. Fill the pipeline with water at a maximum velocity of 10-feet per minute and bleed off any trapped air (testing with air will not be acceptable).
   2. Gradually increase the pressure so the lowest element in the system achieves a test pressure that is 1.5 times the pipe design pressure or 150 psi, whichever is less. Monitor pipe for any leaks.
   3. Provide additional water to maintain sufficient test pressure. After the pipe has been pressurized at test pressure for 4 hours, testing can begin.
   4. To test, reduce test pressure by 10 psi and stop adding test liquid. Monitor the pressure for 1 hour. Test pressure shall remain within 5% of the target value, and no visual leakage shall occur. If pipe does not pass these requirements, contractor shall repair leaks and retest the pipe.

F. Under no circumstance shall the pipe be pressurized over the design pressure for more than 8 hours. If the test is not complete within this time limit, the pipeline shall be depressurized at or below the design pressure and allowed to "relax" for at least 8 hours before testing.

*****END OF SECTION*****

SECTION 02772
CONCRETE CURBS, GUTTERS, AND SIDEWALKS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Concrete curbs, gutters, sidewalks, driveways, access ramps, and alley intersections to replace those demolished or damaged during construction

B. Related Sections:
   1. Section 02200 - Excavation and Backfill.
   2. Section 02722 - Aggregate Base.
   3. Section 03100 - Concrete Formwork and Accessories.
   4. Section 03301 - Cast-In-Place Concrete.

1.02 SUBMITTALS

A. Product Data: Submit data completely describing all products to be used.

1.03 PROJECT CONDITIONS

A. Any concrete flatwork damaged during the course of construction, including transportation and delivery, shall be replaced to that flatwork's pre-existing condition or better.

B. Contractor shall be responsible for all field measurements necessary to meet these specifications.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete: Shall conform to the applicable requirements of Section 03301. All sidewalk and curb concrete shall contain 1 lb. of lamp black per cubic yard.

B. Curb Finishing Mortar: 1 part portland cement to 2 parts sand.

C. Form Release Material: Light oil or other releasing agent of concrete type that does not discolor concrete or interfere with the application of finishing mortar to curb tops and faces.

D. Joint Materials:
   1. Expansion: Comply with requirements as specified in Section 03100.
   2. Construction: Steel dividers or plastic inserts.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Verify field conditions, including subgrade condition and interferences, before beginning construction.

3.02 DEMOLITION

A. Concrete Removal:
   1. Concrete shall be removed to neatly saw cut edges at the nearest existing score line unless directed otherwise by the Engineer.

3.03 PREPARATION

A. Surface Preparation:
   1. Subgrade:
      a. Construct and compact true to grades as specified in Section 02200.
      b. Remove soft or unsuitable material to depth of not less than 6 inches below subgrade elevation and replace with satisfactory material.
   2. Forms and Subgrade: Water immediately in advance of placing concrete.

3.04 INSTALLATION

A. Special Techniques:
   1. Contractor's Option:
      a. Construct concrete curbs and gutters by conventional use of forms, or by means of curb and gutter machine when acceptable to the Engineer.
      b. When use of machines designed specifically for work of this Section are accepted by the Engineer, results must be equal to or better than those produced by use of forms.
      c. Applicable requirements of construction that apply to use of forms also apply to use of machines.
      d. Discontinue use of machines when results are not satisfactory to the Engineer.

B. Reinforcement:

   1. Drill 5/8-inch diameter holes, 6-inches deep, on 24-inches on center along the face of the saw cut concrete and install 12-inch long #4 rebar into the drilled holes and secure with epoxy.

C. Forms:
   1. Carefully set to line and grade and securely stake in position forms conforming to dimensions of items to be constructed.
   2. Thoroughly clean prior to each use and coat with form releasing material.

D. Expansion and Contraction Joints:
   1. Expansion Joints:
      a. Construct vertically, and at right angles to centerline of street and match joints in adjacent pavement or sidewalks.
      b. Constructed at radius points, driveways, alley entrances, and at adjoining structures.
      c. Fill joints with expansion joint filler material.
   2. Contraction Joints:
      a. Constructed not more than 15 feet apart.

b. Make joints of construction joint material, scoring or saw cutting to depth of not less than 1-1/2 inches and matching joints in adjacent pavement or sidewalk.

E. Wheelchair Ramps
1. All wheelchair ramp construction shall include new depressed curb and gutter, raised truncated dome pattern with yellow detectable warning surface, installing and compacting 6” of aggregate base and installing and compacting 6” thick AC plug.

F. Concrete:
1. Placing:
a. Thoroughly spade concrete away from forms so that no rock pockets exist next to forms and so that no coarse aggregate will show when forms are removed.
2. Compacting:
a. Compact by mechanical vibrators accepted by the Engineer.
b. Continue tamping or vibrating until mortar flushes to surface and coarse aggregate is below concrete surface.
3. Form Removal:
a. Front Form Faces: Do not remove before concrete has taken initial set and has sufficient strength to carry its own weight.
b. Gutter and Rear Forms: Do not remove until concrete has hardened sufficiently to prevent damage to edges.
4. Finishing and Curing:
a. As soon as curb face forms are stripped, apply finishing mortar to the top and face of curb and trowel to a smooth, even finish. Finish with fine haired broom in direction of work.
b. Where curb is installed without integral gutter, extend finish 2 inches below grade.
c. Edge concrete at expansion joints to 1/4-inch radius.
d. Flow lines of gutters shall be troweled smooth 4 inches out from curb face for integral curb and gutter and 4 inches on both sides of flowline 4 gutters without curbs.

G. Backfilling:
1. Unless otherwise specified, backfill behind curbs, gutters, or sidewalks with soil native to area.

3.05 FIELD QUALITY CONTROL

A. Tests:
1. Curbs and Gutters:
a. Test face, top, back, and flow line with 10-foot straightedge or curve template longitudinally along surface.
b. Correct deviations in excess of 1/4 inch.
2. Gutters:
a. Frequency of Testing: When required by the Engineer, where gutters have slope of 0.8 foot per hundred feet or less, or where unusual or special conditions cast doubt on capability of gutters to drain.
b. Test Method: Establish flow in length of gutter to be tested by supplying water from hydrant, tank truck, or other source.
c. Required Results:

1) 1 hour after supply of water is shut off, inspect gutter for evidence of ponding or improper shape.
2) In event water is found ponded in gutter to depth greater than ½-inch or on adjacent asphalt pavement, correct defect or defects in manner acceptable to the Engineer without additional cost to the Contract.

3.06 ADJUSTING

A. Repair portions of concrete damaged while stripping forms or, when damage is severe, replace such work at no additional cost to the Contract. Evidence of repairs shall not be noticeable in the finished product.

B. Remove and replace sections of work deficient in depth or not conforming to requirements indicated herein at no additional cost to the Contract. Removal and replacement shall be the complete section between 2 joints.

*****END OF SECTION*****

SECTION 02830
CHAIN LINK FENCING

PART 1 GENERAL

1.01 DOCUMENTS

The General Conditions and all other Contract Documents for this project are complementary and applicable to this Section of the Specifications.

1.02 SCOPE OF WORK

A. Install new chain link fencing in the locations shown on the plans.

B. The intent of this specification is to provide for a complete installation in a workmanlike and professional manner. Not all required materials, installation procedures, or hardware may be specifically referred to.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 - Excavation and Backfill.

B. Section 03301 - Cast in Place Concrete.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. A36 – Structural Steel
2. A53 – Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated Welded and Seamless.
3. A123 – Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
4. A153 – Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. A392 – Zinc-Coated Steel Chain-Link Fence Fabric
6. A817 – Metal-Coated Steel Wire for Chain-Link Fence Fabric and Marcelled Tension Wire.
7. F567 – Installation of Chain-Link Fence.
8. F626 – Fence Fittings,
9. F900 – Industrial and Commercial Swing Gates.
10. F1043 – Strength and Protective Coating on Metal Industrial Chain-Link Fence Framework.
11. F1083 – Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

1.05 SUBMITTALS

A. Submit product data for all components and accessories.

1. Size, coatings, colors, etc.
2. Manufacturer’s Literature and Data: Chain link fencing, gates and all accessories
3. Manufacturer’s Certificates: Coating complies with specifications.

B. Submit shop drawings showing layout dimensions, spacing of components, post footing dimensions, and anchorage and installation details. Locations of post and gates shall be clearly indicated.

1.06 WARRANTY

A. Provide a 10-year warranty for factory finish against cracking, peeling, and blistering under normal use.

PART 2 PRODUCTS

2.01 MATERIALS

A. **Posts and Rails:** ASTM A53 steel hot-dipped galvanized.

B. **Fabric:** A392 knuckled top and bottom. Single width fabric to full height of fence. Nine (9) gauge finished wire size, mesh to match the existing, adjacent fence. Class 1 chain link fence fabric with 1.2 ounces of zinc coating per square foot of uncoated wire surface shall be used.

C. **Truss Rods:** 3/8" diameter, steel rod, galvanized with truss tightener.

D. **Ties:** 9 gauge galvanized wire.

E. **Bars, Band, Clips, Bolts, Fittings, and Hardware:** Galvanized.

F. **Tension Wire:** 7 gauge coil spring galvanized.

G. **Malleable Tops:** For all corner, gate and terminal posts, galvanized.

H. **Accessories and Hardware:** Galvanized.

I. Privacy Slats: Privacy slats shall be PVC or HDPE with UV inhibitors, provide 85% or greater privacy. Color shall be dark green.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to fabrication, field-verify required dimensions.

B. Fence manufacturer shall submit footing dimensions for approval.
   1. Allow 8 inches minimum post embedment.
   2. Allow 6 inches minimum concrete beneath post bottom.

C. Provide post holes to the depth and diameter shown on the manufacturer's printed installation instructions. Clear loose material from post holes.

3.02 INSTALLATION

A. Install fencing in accordance with manufacturer's installation instructions and approved shop drawings.

B. Install fence posts plumb and level by embedding post directly in concrete footing. Temporarily brace fence posts with until concrete is set.
   1. Concrete footings shall conform to Section 03301 - Cast-in-Place Concrete.
   2. Thoroughly compact concrete so it is free of voids and finished in a slope or dome to divert water running down the post away from the footing.
   3. Cure concrete a minimum of 72 hours before any further work is done on the posts.

C. Do not install bent, bowed, or otherwise damaged panels. Remove damaged components from site and replace.

D. Secure fence panels with stainless steel bolts to fence posts.

E. Securely install privacy slats to achieve 85% minimum privacy screening.

F. Do not install bent, bowed, or otherwise damaged panels. Remove damaged components from site and replace.

3.03 HANDLING

Care shall be taken in handling, transporting and placing fence materials to prevent damage. No damaged materials will be accepted until and unless the damage has been repaired to the satisfaction of the City. Damaged materials will be replaced at the City's discretion.

** END OF SECTION **

SECTION 03000
CONCRETE WORK - GENERAL

PART 1 GENERAL

1.01 APPLICABLE SECTION

A. Submit Shop Drawings, Product Data, Mill Certificates, and Samples required by other portions of Contract Documents. The requirements/provisions of the General and Supplementary Conditions shall apply to this section.

1.02 DESCRIPTION OF WORK

A. The work included under this section consists of furnishing all material, supplies, equipment, tools, transportation, and facilities, and performing all labor and services necessary for, required in connection with or properly incidental to furnishing, and installing concrete work as described in this section of the specifications, shown on the accompanying drawings, or reasonably implied therefrom, except as hereinafter specifically excluded.

B. Work Included:
1. All formwork, including any special forms necessary to produce architectural details and/or to accommodate the work of others and removal of forms.
2. All concrete reinforcement, placement, bending and forming thereof.
3. All concrete and cement finishing; all surface treatment and curing, including non-slip finishes and color work.
4. Installation of all reglets, bolts, anchors, cans, sleeves, column anchor bolts, etc., whether furnished under this section or by others (except cans and sleeves required under the Electrical and Mechanical Divisions).
5. The furnishing of all items required to be or shown on the drawings as embedded in concrete, which are not specifically required under other sections.
6. Setting headers and screeds. Curing and protecting concrete.
7. Inserts, sleeves, cans, etc. required under the Electrical and Mechanical Divisions.

PART 2 PRODUCTS

2.01 PRODUCTS

A. See specification Sections 03100, 03200, 03301, 03400, and 03600.

PART 3 EXECUTION

3.01 DEFECTIVE WORK

A. General: Work considered to be defective may be ordered by the Engineer to be replaced in which case the Contractor shall remove the defective work at his expense. Work considered to be defective shall include, but not be limited to, the following:
1. Reinforcing:

a. Kinks and bends therein which are not scheduled or indicated on the drawings; reinforcing improperly placed, or previously heated, or excessively cold worked reinforcing.

2. Concrete:
   a. Concrete in which defective or inadequate reinforcing steel has been placed.
   b. Concrete incorrectly formed or not conforming to details and dimensions on the drawings or with the intent of these documents, or concrete the surfaces of which are out of plumb or level.
   c. Concrete below specified strength.
   d. Concrete not meeting the maximum allowable drying shrinkage requirements.
   e. Concrete containing wood, cloth, or other foreign matter, rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the drawings.

3.02 CORRECTION OF DEFECTIVE WORK

A. The Contractor shall, at his expense, make all such corrections and alleviation measures as directed by the Engineer.

B. Concrete work containing rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the drawings, shall be chipped out until all unconsolidated material is removed.

C. Secure approval of chipped-out areas before patching. Patch per ACI 301-89.

END OF SECTION

SECTION 03100
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for concrete, with shoring, bracing and anchorage.

1.02 RELATED REQUIREMENTS

A. Section 03200 - Concrete Reinforcing

B. Section 03301 - Cast-in-Place Concrete

1.03 REFERENCE STANDARDS (Editions adopted by current governing California Building Code)

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.

B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute.

C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute.

D. ACI 347 - Guide to Formwork for Concrete; American Concrete Institute.

E. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

F. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

G. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).

H. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

1.04 SUBMITTALS

A. See Section 01300 – Contractor Submittals, for submittal procedures.

B. Product Data: Provide data on formwork release agent or form liner proposed for use with each formed surface.

C. Formwork Facing Materials: Data on form-facing materials proposed for smooth-form finish if different from that specified in Part 2.02.

D. Construction and Contraction Joints: Location of construction and contraction joints proposed if different from those indicated in the Contract Documents.

E. Shop Drawings
   1. All of the following shop drawings and calculations shall be prepared, stamped, and signed by a registered Civil or Structural Engineer of the State of California.
   2. Formwork
      a. Submit shop drawings for fabrication and erection of forms for portions of the concrete surfaces, as indicated below:
         1) For formwork over 12’ in height.
         2) Show general construction of forms including size of members, bracing, jointing,

special form joint or reveals, location and pattern of form tie placement, and other items that affect the structural integrity of formwork or exposed concrete visually.

3. Falsework and Shoring Shop Drawings: The Contractor shall submit shop drawings and calculations of any required falsework, shoring. Shop drawings and calculations shall be prepared in accordance with the requirements of the ACI 318 and State of California Department of Transportation Standard Specifications, Section 48-2 - Falsework.
4. Reshoring and Backshoring Plans: When reshoring or backshoring is required or permitted, submit procedures and plans of operations, before use. Indicate on shop drawings the magnitude of construction loads permitted during reshoring or back-shoring.

F. Testing for Formwork Removal: Data on method for determining strength of concrete for removal of formwork when a method other than field-cured cylinders (ASTM C31 and ASTM C39) is proposed.

G. Formwork Removal Plans: Detail plans for formwork removal operations when removal of forms at concrete strengths lower than that specified in Part 3.08 is proposed.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.
1. California Building Code, current governing edition
2. ACI 318
3. ACI 347

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Maximum deflection of facing materials reflected on concrete surfaces exposed to public view shall be 1/240 of the span between structural members of the formwork.

B. Formed Construction and Contraction Joints
1. Locate and form construction joints that least impair strength of the structure and meet the requirements of Section 03301.
2. Unless otherwise specified or permitted, locate and detail formed construction joints to the following requirements:
   a. Locate construction joints within the middle third of the spans of slabs, beams, and girders. When a beam intersects a girder within this region, offset the joint in the girder a distance equal to or greater than twice the width of the beam;
   b. Locate joints in walls and columns at the underside of slabs, beams, or girders and at the tops of footings or slabs; and
   c. Make joints perpendicular to the main reinforcement.
3. Provide keyways where indicated on Contract Documents. Unless otherwise specified, longitudinal keyways indicated on the Contract Documents, shall be a minimum of 1-1/2 in. deep in joints in walls and between walls and slabs or footings.
4. Provide construction and contraction joints where indicated on the Contract Documents. Submit for acceptance the location of construction and contraction joints differing from those indicated on the Contract Documents.

2.02 FORM MATERIALS

A. Form-facing materials: Materials for form faces in contact with concrete shall meet the requirements of "Concrete Finishing" Section 03301 - Cast-in-Place Concrete and the following

requirements unless otherwise specified in Contract Documents.

1. For smooth-form finish, use plywood, tempered concrete-form-grade hardboard, metal, plastic, paper, or other acceptable materials capable of producing the desired finish for form-facing materials. Form-facing materials shall produce a smooth, uniform texture on the concrete. Do not use form-facing materials with raised grain, torn surfaces, worn edges, dents, or other defects that will impair the texture of concrete surfaces. Facing materials shall be supported with studs or other backing capable of maintaining deflections within the tolerances specified in Part 2.01.

2.03 FORMWORK ACCESSORIES

A. Use commercially manufactured accessories for formwork accessories that are partially or wholly embedded in concrete, including ties and hangers. Do not use nonfabricated wire form ties. Where indicated in the Contract Documents, use form ties with integral water barrier plates in walls or other acceptable positive water barriers.

2.04 FORMWORK RELEASE AGENT

A. Use commercially manufactured formwork release agents that prevent formwork absorption of moisture, prevent bond with concrete, and do not stain the concrete surfaces.

2.05 EXPANSION JOINT FILLER

A. Premolded expansion joint filler shall conform to ASTM D994 or ASTM D1751.

2.06 FABRICATION AND MANUFACTURE

A. Formwork shall be tight to prevent loss of mortar from concrete.

B. Place 3/4 inch chamfer strips in the corners of formwork to produce beveled edges on permanently exposed surfaces unless otherwise specified. Do not bevel reentrant corners or edges of formed joints of concrete unless specified in the Contract Documents.

C. Inspect formwork and remove deleterious material immediately before concrete is placed. Provide temporary openings where needed at the base of column and wall formwork to facilitate cleaning and inspection.

D. Fabricate form ties so ends or end fasteners can be removed with minimum spalling at the faces of concrete.

E. Locate waterstops in joints where indicated on Contract Documents. Use pieces of premolded waterstop with a maximum practicable length to create the minimum number of end joints. Make joints in waterstops in accordance with the manufacturer's recommendations. Ensure that joints develop effective watertightness equal to the continuous waterstop material, permanently develop not less than 50% of the strength of the parent section and permanently retain flexibility.

2.07 EPOXY ANCHORING SYSTEMS

A. Refer to Section 05501.

PART 3 EXECUTION

3.01 EARTH FORMS

A. Where sides of excavations have been cut neat and accurate to size for pouring of concrete directly against the excavation, forms for footings will not be required. Remove loose soil prior to placing concrete.

3.02 CONSTRUCTION AND ERECTION OF FORMWORK

A. At construction joints, lap contact surface of the form sheathing for flush surfaces exposed to view over the hardened concrete in the previous placement. Ensure formwork is sealed against hardened concrete to prevent offsets or loss of mortar at construction joints and to maintain a true surface.

B. Provide positive means of adjustment (such as wedges or jacks) of shores and struts. Do not make adjustments in the formwork after concrete has reached its time of initial setting. Brace formwork securely against lateral deflection and lateral instability.

C. Fasten form wedges in place after final adjustment of forms and before concrete placement.

D. Anchor formwork to shores, supporting surfaces, or members to prevent upward or lateral movement of the formwork system during concrete placement. Form supports shall be placed on adequate foundations and have sufficient strength and bracing to prevent settlement or distortion from the weight of the concrete or other cause. Support shall rest on double wedged shim, or other approved means, so that the forms will be maintained at the proper grade.

E. Construct formwork for wall openings to facilitate removal and to counteract swelling of wood formwork.

F. Provide runways for moving equipment and support runways directly on the formwork or structural member without resting on the reinforcing steel.

G. All formed joints on concrete surfaces to be exposed shall be taped and shall align so joints will not be apparent on the concrete surfaces.

H. Any movement or bellying of forms during construction shall be considered just cause for their removal and, in addition, the concrete work so affected.

I. Bolts, rods, or other approved devices shall be used for internal form ties and shall be of sufficient quantities to prevent spreading of the forms. The ties shall be placed at least 1 inch away from the finished surface of the concrete. Bolts and rods that are to be completely withdrawn shall be coated with grease.

J. Boards or other form materials that have been damaged or checked or warped prior to placing of concrete shall be removed from the forms and replaced with approved materials or otherwise corrected to the satisfaction of the engineer.

K. Assign a sufficient number of men to keep watch on and maintain the forms during placing of concrete. Satisfactorily remedy any displacement or looseness of forms or reinforcement before placing of concrete. No form shall be moved or altered except as may be specifically directed.

L. Wall forms shall be set to account for movement of post-tensioned slabs that will occur due to long term shortening of slabs. The Engineer will establish the offsets at each level after the Contractor has submitted a detailed pour schedule.

3.03 APPLICATION - FORM RELEASE AGENT

A. Cover surfaces of formwork with an acceptable material that will prevent bond with the concrete. A field-applied formwork release agent or a factory-applied liner may be used. If a formwork release agent is used, apply to the surfaces of the formwork in accordance with the manufacturer's recommendations before placing reinforcing steel. Do not allow formwork release agent to puddle in the forms. Do not allow formwork release agent to contact reinforcing steel or hardened concrete against which fresh concrete is to be placed.

3.04 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Position and support expansion joint materials, waterstops, and other embedded items to prevent displacement. Fill voids in sleeves, inserts, and anchor slots temporarily with readily removable material to prevent entry of concrete into voids.

B. Place sleeves, inserts, anchors, and embedded items required for adjoining work or for support of adjoining work before concrete placement. Holes, notches, conduits, pipes, etc. are not allowed in concrete slabs, walls, members, etc. unless shown on the structural drawings or requested and specifically accepted by the Engineer.

3.05 FORM CLEANING

A. Clean surfaces of formwork and embedded materials of mortar, grout, and foreign materials before concrete is placed.

3.06 FORMWORK TOLERANCES

A. Unless otherwise specified in the Contract Documents, construct formwork so concrete surfaces conform to the tolerance limits of ACI 117. The class of surface shall conform to Part 2.02.

B. To maintain specified tolerances, camber formwork to compensate for anticipated deflections in formwork during concrete placement. Set formwork and intermediate screed strips for slabs accurately to produce designated elevations and contours of the finished surface before removal of formwork. Ensure that edge forms and screed strips are strong enough to support vibrating screeds or roller pipe screeds when the finish specified requires the use of such equipment.

C. When formwork is cambered, set screeds to the same camber to maintain specified concrete thickness.

3.07 FIELD QUALITY CONTROL

A. The Contractor shall hire the Engineer responsible for the design of formwork over 12' in height, falsework or shoring to inspect the work as detailed on the reviewed shop drawings.

B. The Contractor shall verify accuracy of items, furnished under other sections of these specifications and installed under this section.

3.08 FORM REMOVAL

A. Remove top forms on sloping surfaces of concrete as soon as removal will not allow concrete to sag. Perform needed repairs or treatment required at once and follow immediately with specified curing.

B. Do not damage concrete during removal of formwork for columns, walls, slabs, sides of beams, and other parts not supporting the weight of the concrete. Perform needed repair and treatment required on vertical surfaces at once and follow immediately with specified curing.

C. Leave formwork and shoring in place to support the weight of concrete in beams and joists for at least 14 days and in slabs for at least 10 days after the last concrete and until concrete has attained 3000 psi minimum per Part 3.08E and the Engineer responsible for design of shoring and falsework has approved removal.

D. Vertical forms shall remain on columns, walls, pilasters for at least seven 7 days after the last concrete and until concrete has attained 3000 psi minimum per Part 3.08E and the Engineer responsible for design of the formwork has approved removal.

E. Contractor shall request to have field cured compression test specimen taken where it is planned

to remove formwork and shoring sooner than indicated above and submit detailed plans for review and acceptance. Mold cylinders in accordance with ASTM C31, and cure them under the same conditions for moisture and temperature as used for the concrete they represent. Test cylinders in accordance with ASTM C39.

F. In removing plywood forms, no metal pinch bars shall be used and special care to be taken in stripping. Start at top edge or vertical corner where it is possible to insert wooden wedges. Wedging shall be done gradually and shall be accompanied by light tapping of the plywood panels to crack them loose. Do not remove forms with a single jerk after it has been started at one end.

G. Nothing herein shall be construed as relieving the contractor of any responsibility of the safety of the structure.

END OF SECTION

SECTION 03200
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for concrete, shotcrete and masonry.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03100 - Concrete Forming and Accessories.

B. Section 03301 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS (Editions adopted by current governing California Building Code)

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International.

B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.

C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International.

D. ACI SP-66 - ACI Detailing Manual; American Concrete Institute International.

E. ASTM A1064 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

F. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

G. ASTM A185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

H. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

I. ASTM A 641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

J. ASTM A706 - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.

K. ASTM A767 - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.

L. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

M. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.

N. AWS D1.4 - Structural Welding Code - Reinforcing Steel; American Welding Society.

O. CRSI (DA4) - Manual of Standard Practice; Concrete Reinforcing Steel Institute.

1.04 SUBMITTALS

A. See Section 01300 – Contractor Submittals, for submittal procedures.

B. Shop Drawings (Placing drawings)
   1. Comply with requirements of ACI SP-66. Shop drawings shall also show details for congested areas and connections. Shop drawings used in field must be reviewed copies.

C. Product Data
   1. Manufacturer's catalog sheets including instructions for use and description of application and ICC/IAPMO evaluation report shall be provided on each of the following items intended for use on project:
      a. Mechanical anchorage devices for splices.

D. Mill Certificates
   1. The Contractor shall provide Mill Certificates for each size of bar for each heat to be used on project and certify that reinforcing steel supplied for this project meet or exceed specified requirements.
   2. Mill Certificates shall include name of mill, date of rolling, date of shipping to fabricator and shall be signed by fabricator certifying that each material complies with or exceeds the specified requirements. A Mill Certificate shall be furnished with each lot of material delivered to the project and the lot shall be clearly identified in the Certificate.
   3. When Mill Certificates cannot be provided, the Contractor shall hire a professional testing laboratory to verify compliance and provide laboratory test reports. The Contractor shall pay for the cost of testing.

E. Laboratory Test Reports
   1. Laboratory test reports shall be signed by a principal of the testing agency who is a registered Civil Engineer in the State of California.
   2. When required by other portions of these specifications, laboratory test reports shall be submitted for each size of bar tested for each heat to show compliance with appropriate ASTM Standards and these specifications.

F. Welder's Certificates and WPS: Submit description of reinforcement weld locations, welding procedures, and welder certification when welding is permitted.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with the current governing edition of CBC, ACI 301, ACI SP-66, ACI 318, and AWS D1.4 except as modified by the contract documents.

B. Sampling and Testing:
   1. General
      a. If the Owner's agent, through oversight or otherwise, has accepted material or work which is defective or contrary to specifications, this material or work, regardless of state of completion, may be rejected.
      b. Testing agencies shall meet the requirements of ASTM E329. Testing agencies shall be accepted by the Engineer before performing any work.
   2. Testing responsibilities of Contractor:
      a. Submit data on qualifications of proposed testing agency for acceptance. Use of testing services will not relieve the Contractor of the responsibility to furnish materials and construction in compliance with the Contract Documents.
      b. Cooperate with and notify owner's agent at least 24 hours in advance of inspections required and shall provide samples, test pieces, and facilities for inspection at no cost to

the owner.

c. Identify each lot of fabricated reinforcing steel to be shipped to the site by assigning an individual lot number that identifies steel by heat number and shall be tagged in such a manner that each such lot can be accurately identified at the job site.

d. Remove all unidentified reinforcing steel, anchorage assemblies and bar couplers received at the site.

1.06 STORAGE OF MATERIALS

A. Store reinforcement during fabrication and at site to avoid excessive rusting or coating with grease, oil, soil, or other objectionable materials. Bundles shall not be dropped or dragged. Reinforcing steel shall be transported and stored in a manner that will not damage any applied coating.

1.07 SEQUENCING AND SCHEDULING

A. Coordinate work with all trades so as not to interfere with the work of other trades. Bring interferences between trades to Engineer's attention and resolve before any concrete is placed.

PART 2 PRODUCTS

2.01 REINFORCING BARS

A. Reinforcing Steel:

1. Bars for reinforcement shall conform to the requirements of ASTM A706 ASTM A615, Grade 60 bars may be substituted to meet a through e above if the actual yield strength based on mill tests does not exceed the specified yield strength by more than 18,000 psi, the ratio of the actual ultimate tensile stress to the actual tensile yield strength is not less than 1.25, and the minimum elongation in 8 inches shall be at least 14% for #3 through #6, 12% for #7 through #11 and 10% for #14 and #18. This substitution must be verified by the special inspector prior to bundle tag removal.
2. Bars for reinforcement not noted above shall be deformed grade steel conforming to the requirements of ASTM A706 or A615, Grade 60.
3. Uncoated steel unless noted otherwise.
4. Galvanized in accordance with ASTM A767, Class II where required by Contract Documents chromate wash treated after fabrication and bending. Repair coating damage in accordance with ASTM A780.

2.02 WIRE

A. All wire for concrete reinforcement shall conform to ASTM A1064.

2.03 WELDED WIRE REINFORCEMENT

A. All wire fabric mesh shall conform to ASTM A185, plain welded wire mesh in flat sheets (not rolls), with welded intersections spaced not farther apart than 12 in. in the direction of principal reinforcement.

B. Use wire-reinforcement supports complying with Class 1, maximum protection, or Class 2, moderate protection, as indicated in Chapter 3 of the CRSI Manual of Standard Practice.

C. Use galvanized wire-reinforcement support or wire reinforcement support coated with plastic.

2.04 WELDING ELECTRODES

A. Welding electrodes shall be per Table 5-1 of AWS D1.4.

2.05 MECHANICAL COUPLING DEVICES

A. Mechanical coupling devices shall develop 125 percent of the minimum yield strength of the bars spliced.

2.06 REINFORCEMENT ACCESSORIES

A. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement. Reinforcement supports shall conform to the requirements of ACI 301.

2.07 OTHER MATERIALS

A. All other materials, not specifically described by these specifications but required for complete and proper placement of reinforcement shall be new, first quality of their respective kinds, and subject to the approval of the Engineer.

2.08 FABRICATION

A. Welding of reinforcement is permitted only with the specific approval of Engineer. Perform welding in accordance with AWS D1.4. Do not weld crossing bars (tack welds) for assembly of reinforcement, supports, or embedded items.

PART 3 EXECUTION

3.01 EXISTING CONDITIONS

A. Prior to all work of the section, carefully inspect the installed work of other trades and verify that all work is sufficiently complete to permit the start of work under this section and that the completed work of this section will be in complete accordance with the original design and the reviewed shop drawings. In the event of discrepancy, immediately notify the Engineer in writing.

B. In the event conduits, pipes, inserts, sleeves, or any other items interfere with placing the reinforcement as indicated on the drawings or approved shop drawings, or as otherwise required, immediately notify the

Engineer and obtain approval on procedure before placement of reinforcement is started.

3.02 BENDING

A. Bends for reinforcing steel shall be made in accordance with ACI 301 and ACI 318. Bend bar sizes No. 3 through 5 cold only one time, provided reinforcing bar temperature is above 32 degree F. Do not field bend reinforcing steel in a manner that will injure material, cause the bars to be bent on too tight a radius, or that is not indicated as allowed on drawings or permitted by Engineer. Do not straighten bent or kinked bars for use on project without permission of Engineer. Replace bars with kinks or bends not shown on the drawings.

3.03 PLACING

A. All reinforcement shall be placed in strict conformance with the requirements of the Contract Drawings, both as to location, position and spacing of members. It shall be supported and secured against displacement by the use of adequate and proper wire supporting and spacing devices, tie wires, etc. so that it will remain in its proper position in the finished structure. Reinforcement may not be wet set in concrete pours.

B. Tolerances: Do not exceed the placing tolerances specified in ACI 318 and ACI 117, whichever is more stringent, before concrete is placed. Placing tolerances shall not reduce cover requirements

except as specified in ACI 117.

C. Minimum concrete cover for reinforcement and couplers shall be as indicated in the Contract Drawings. Concrete cover is measured from the theoretical excavation line, not the line of any over excavation. Where less than 3 inches cover is noted and concrete will be placed against soil, increase the section thickness to attain 3 inches cover.

D. Preserve clear space between parallel bars of not less than 1-1/2 times the nominal diameter of round bars and in no case let the clear distance be less than 1-1/2 inches nor less than 1-1/3 times the maximum size of aggregate for concrete. Bars placed in shotcrete shall have a minimum clearance between bars of 2-1/2 inches for No. 5 and smaller and 6 bar diameters for bars larger than No. 5. When two curtains of steel are provided in shotcrete wall, the curtain nearer the nozzle shall have a minimum spacing equal to 12 bar diameters and the remaining curtain shall have a minimum spacing of six bar diameters.

E. For slabs on ground, extend welded wire reinforcement to within 2 in. of the concrete edge. Reinforcement shall be lapped and tied around the perimeter of each sheet in order to maintain the proper positioning of the reinforcement. Lap splices shall have a minimum of two ties per spliced length. Do not place welded wire reinforcement on grade and subsequently raise into position in concrete.

F. Furnish and use templates for placement of column dowels unless otherwise permitted by engineer.

G. Lap splices shall be contact lap splices in accordance with ACI 318 unless noted otherwise on the Contract Drawings. Bars shall be wired together at laps. Wherever possible, stagger splices in adjacent bars. Splice bars in members such as spandrels, beams, etc, as follows: Top bars at centerline of span, bottom bars at the support. Make all splices in welded wire reinforcement at least 1-1/2 meshes wide or 12 inches, whichever is greater. When splicing in areas to receive shotcrete, lap splices shall be non-contact with at least 2 inches clearance between bars.

H. Butt splices shall be accomplished by mechanical anchorage devices. Stagger these devices 2 feet, unless noted otherwise on the Contract Documents.

I. Bars shall not be cut by gas torch.

3.04 CLEANING REINFORCEMENT

A. Take all means necessary to ensure that steel reinforcement, at the time concrete is placed around it, is completely free from rust, soil, loose mill scale, oil, paint and all coatings which will destroy or reduce the bond between steel and concrete.

END OF SECTION

SECTION 03301
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for cast-in-place concrete work.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01300 – Contractor Submittals

1.03 SUBMITTALS

A. Comply with Section 01300.

B. Shop Drawings

1. Reinforcing Steel: Prepare shop fabrication and field installation drawings in accordance with CRSI Manual of Standard Practice and ACI SP.
2. Layout drawings for construction joints.

C. Product Data: Waterstops, curing compound data.

D. Concrete Mix Design: Data on the concrete mix, including aggregate gradations and admixtures, in accordance with ASTM C94.

E. Quality Control Submittals

1. Manufacturer’s application instructions for curing compound.
2. Ready-mix delivery tickets for each truck in accordance with ASTM C94.

1.04 QUALITY ASSURANCE

A. Supplier Qualifications: A minimum of 5 years’ experience manufacturing ready-mixed concrete and that complies with ASTM C94 for production facilities and equipment.

B. Source Limitations: Use the same brand of cement from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

C. Concrete and Reinforcement: Unless otherwise specified, meet the requirements of ACI 301 and 318.

D. Hot Weather Concreting: Conform to ACI 305R.

PART 2 PRODUCTS

2.01 FORMWORK

A. Exposed Areas: Use hard plastic finished plywood.

B. Unexposed Areas: Use new ship lap or plywood.

C. Earth cuts may be used for forming footings.

2.02 CONCRETE

A. Ready-mixed meeting ASTM C94, Option A.

B. Portland Cement: ASTM C150, Type II.

C. Aggregates: Furnish from one source.

1. Natural Aggregates
    a. Free from deleterious coatings and substances in accordance with ASTM C33, except as modified herein.
    b. Free of materials and aggregate types causing pop outs, discoloration, staining, or other defects on surface of concrete.
2. Non-Potentially Reactive: In accordance with ASTM C33, Appendix XI, paragraph X1.1.
3. Aggregate Soundness: Test for fine and coarse aggregates in accordance with ASTM C33 and ASTM C88 using sodium sulfate solution.
4. Fine Aggregates
    a. Clean, sharp, natural sand.
    b. ASTM C33.
    c. Materials Passing 200 Sieve: 4 percent maximum.
    d. Limit deleterious substances in accordance with ASTM C33, Table 1 with material finer than 200 sieve limited to 3 percent, coal and lignite limited to 0.5 percent.
5. Coarse Aggregate
    a. Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).
    b. Materials Passing 200 Sieve: 0.5 percent maximum.

D. Admixtures: Do not use admixtures that contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Air-Entraining: ASTM C260.
2. Water-Reducing: ASTM C494, Type A or D.
3. Superplasticizers: ASTM C494, Type F or G.

4. Fly Ash: ASTM C618, Class C or F.

5. Color Pigments: Inert mineral or metal oxide pigments, natural or synthetic; resistant to lime and other alkalies.

E. Concrete Mix Design

1. Minimum Compressive Field Strength at 28 days when cured and tested in accordance with ASTM C31 and C39: 4,000 psi for Reinforced Concrete and 2,500 psi for Unreinforced Concrete Fill.

2. Coarse Aggregate Size: 1-1/2 inches and smaller.

3. Slump Range: 3 to 5 inches.

4. Air Entrainment: Between 1 and 3 percent by volume.

5. Water Reducers: Use in concrete without plasticizers.

F. Proportions

1. Design mix to meet aesthetic and structural concrete requirements.

2. Water-cement ratio (water-cement plus fly ash ratio) shall control amount of total water added to concrete as follows:

a. Reinforced Concrete:

Coarse Aggregate Size	W/C Ratio
1-1/2 inch	0.50
1 inch	0.45

b. Unreinforced Concrete Fill: 0.55 maximum.

3. Minimum Cement Content (Combined Cement Plus Fly Ash Content):

a. 541 pounds per cubic yard for Reinforced Concrete with 1½ inch maximum size aggregate.

b. 564 pounds per cubic yard for Reinforced Concrete with 1 inch maximum size aggregate.

c. 470 pounds per cubic yard for Unreinforced Concrete Fill.

4. Increase cement content (combined cement plus fly ash content), as required to meet strength requirements and water-cement ratio.

5. Fly Ash Content: minimum 20 percent, maximum 50 percent by weight of total cement content.

G. Mixing: Minimum 70 and maximum 270 revolutions of mixing drum. Non-agitating equipment is not allowed.

2.03 REINFORCING STEEL

A. Deformed Bars: ASTM A615, Grade 60. Reinforcing steel to be welded shall be ASTM A706, Grade 60.

B. Welded Wire Reinforcement: ASTM A1064, fabricated from as-drawn steel wire into flat sheets.

C. Bar Supports:

1. For Slab Rebar: Concrete blocks or plastic bar supports.

2. For Rebar in Walls, Beams, Columns, and Slabs Exposed to View: Galvanized steel chairs with plastic tips or plastic bar supports and side form spacers.

2.04 ANCILLARY MATERIALS

A. Curing Compound

1. Material: Water-based product in accordance with ASTM C309, Type 1, Class A.

2. Manufacturers and Products: One of the following or equal:

a. W. R. Meadows, Inc.: 1300-CLEAR

b. Euclid Chemical Co.: Kurex DR VOX

B. Epoxy Bonding Agent and Adhesives (for Binding New Concrete to Existing Concrete)

1. Epoxies: Two component material for use on dry or damp surfaces and conforming to the requirements of ASTM C881, Type II, Grade 2, Class C.

2. Apply in accordance with manufacturer's recommendations.

3. Manufacturers and Products: One of the following or equal:

a. Sika Corporation: Sikadur-2 Hi-Mod LPL

b. Euclid Chemical Co.: DURAL LPL MV

C. Waterstops

1. General: Place hydrophilic and/or rubber dumbbell type or center bulb type waterstops at construction joints and other joints as specified and indicated on the Drawings.

2. Hydrophilic Waterstops:

a. Use: For concrete repairs or when attaching new concrete to existing structures.

b. Manufacturers and Products: One of the following or equal:

1) Greenstreak, Hydrotite CJ

2) Tremco, Parastop II

c. Installation: As indicated on the Drawings and in accordance with manufacturer's instructions.

3. Rubber Waterstops

a. Use: At new construction joints where indicated on the Drawings.

b. Material: PVC or rubber waterstops manufactured by one of the following, or equal:

1) Greenstreak
2) Progress Unlimited
3) Williams Products

c. Size:
1) Construction and Contraction Joints: 6-inch flat dumbbell type.
2) Expansion Joints: 9-inch wide dumbbell with hollow center bulb.

D. Expansion Joint Filler: ASTM D994, 1/2-inch thick, or as shown.

E. Surface Hardener

1. Premixed, noncolored, nonmetallic Master Builders, Mastercron; Sonneborn, Harcol; A. C. Horn Inc., Durafax; Burke Company Non-Metallic Floor Hardner; or equal.

2. Apply in accordance with manufacturer's instructions.

F. Concrete for Electrical Conduits

1. Concrete encasement for electrical conduit shall contain 3 pounds of red oxide per sack of cement.

G. Vapor Barrier

1. Material: 15 mil, multilayer plastic, 0.01 minimum permeance rating.

2. Manufacturers and Products: One of the following or equal:

a. Stego Industries: StegoWrap

b. W. R. Meadows: Premoulded Membrane Vapor Seal with Plasmatic Core

H. Non-Shrink, Non-Metallic Grout

1. Material: Hydraulic cement-based mineral aggregate grout conforming to the requirements of ASTM C1107 and CRD-C 621.

2. Manufacturers and Products: One of the following or equal:

a. Sika Corporation: SikaGrout-928

b. Euclid Chemical Co.: Hi-Flow Grout

I. Controlled Low-Strength Material (CLSM)

1. General: Design mix in accordance with Section 19-3.02G “Controlled Low-Strength Material” of the Caltrans Standard Specifications.

2. 28-Day Compressive Strength: 50 – 100 psi

PART 3 EXECUTION

3.01 FORMWORK

A. Design, construct, erect, brace and maintain formwork in accordance with ACI 301.

B. Form Ties

1. Fixed conical or spherical type inserts that remain in contact with forming material and allow for dry packing of form tie holes.
2. Space ties to withstand pressures and to limit deflection of forms to acceptable limits.
3. Wire ties are not acceptable.

C. Construction

1. In accordance with ACI 347.
2. Make joints tight to prevent escape of mortar and to avoid formation of fins.
3. Brace as required to prevent distortion during concrete placement.
4. On exposed surfaces locate form ties in uniform pattern or as shown.
5. Construct so ties remain embedded in the wall with no metal within 1-inch of concrete surface when forms, inserts, and tie ends are removed.

D. Form Removal

1. Remove after concrete has attained 28 day strength, or approval is obtained in writing from Engineer.
2. Remove forms with care to prevent scarring and damaging the surface.

3.02 PLACING REINFORCING STEEL

A. Place reinforcing steel in accordance with CRSI Recommended Practice for Placing Reinforcing Bars.

B. Field bending or welding of reinforcing bars will not be allowed.

C. Bar Supports: Provide in sufficient quantity to prevent sagging and to support bars during concrete placement.

D. Splices and Laps

1. Top Bars: Horizontal bars placed such that 12 inches of fresh concrete is cast below in single placement.
2. Horizontal wall bars are considered top bars.
3. Bar lap splices shall conform to General Structural Notes on the Drawings.
4. Tie splices with 18-gauge annealed wire as specified in CRSI Standard.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 301.

B. Before placing concrete:

1. Check reinforcing steel for proper placement and correct discrepancies.
2. Remove excessive rust, mill scale, dirt, oil and other material from rebar that may adversely affect bonding to concrete.
3. Remove water from excavation and debris and foreign material from forms.

C. Before depositing new concrete on existing concrete, clean surface using sandblast or other mechanical means to obtain a 1/4-inch rough profile, and apply epoxy bonding agent in accordance with the manufacturer's instructions.

D. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 2 feet deep. Place within 1-1/2 hours after adding cement to mix.

E. Placement Limitations: 8 feet maximum vertical drop to final placement, when not guided with chutes or other devices to prevent segregation due to impact with reinforcing.

F. Hot Weather

1. Prepare ingredients, mix, place, cure, and protect in accordance with ACI 305R.
2. Maintain concrete temperature below 80 degrees F at time of placement, or furnish test data or provide other proof that admixtures and mix ingredients do not produce flash set plastic shrinkage, or cracking due to heat of hydration. Ingredients may be cooled before mixing to maintain fresh concrete temperatures at 80 degrees F or less.
3. Make provisions for windbreaks, shading, fog spraying, sprinkling, ice, or wet cover, or other means to provide concrete with temperature specified.
4. Maximum allowable temperature differential between reinforcing steel and concrete: Not greater than 20 degrees F at the time of concrete placement.

3.04 COMPACTION

A. Vibrate concrete as follows:

1. Apply approved vibrator at points spaced not farther apart than vibrator's effective radius.
2. Apply close enough to forms to vibrate surface effectively but not damage form surfaces.
3. Vibrate until concrete becomes uniformly plastic.
4. Vibrator must penetrate fresh placed concrete and into previous layer of fresh concrete below.

3.05 CONSTRUCTION JOINTS

A. Locate as shown or as approved.

B. Maximum Spacing Between Construction Joints: 40 feet, unless otherwise indicated.

3.06 CRACK CONTROL JOINTS

A. Provide crack control joints in concrete slabs on grade, curbs, gutters, sidewalks and other concrete flatwork as follows:

1. Install crack control joints by use of grooving tool on fresh concrete or saw-cut by use of a saw designed for crack control joints as soon as the concrete hardens sufficiently to support the saw, however, no longer than 12 hours after concrete placement.

2. Depth: 1/4 the thickness of the slab.

3. Frequency: Unless otherwise indicated,

a. Maximum spacing of 2.5 times the slab thickness in feet (6-inch slab ≤ 15 feet on center).

b. Rectangular slabs: Maximum 1½ to 1 ratio of side lengths.

3.07 SLAB FINISHES

A. General

1. The finishes specified herein include surface finishes, treatments and toppings for floors and slabs. Floors shall be sloped to drain uniformly. Unless otherwise specified, slope shall be minimum 1/8 inch per foot towards nearest drain. Where finish is not specified, floor slabs shall receive steel troweling. Dry cement shall not be used on new concrete surfaces to absorb excess moisture. Edges shall be rounded to a radius of 1/2 inch. Joints shall be grooved to a radius and depth of 1/2 inch each. Uneven-slope tolerance is 1/4-inch in 10 feet.

B. Float Finish

1. Conform to ACI 301, Section 11.7.2. Floating shall be performed with a hand or power-driven float. Floating of any one area shall be the minimum necessary to produce the finish specified. Floating shall compact and smooth the surface and close any cracks and checking of surfaces.

C. Broomed Finish

1. Conform to ACI 301, Section 11.7.4. Broomed finish shall be provided for walks, slabs on grade exposed to atmosphere, and where otherwise indicated or specified. Apply float finish, then a light broom finish to produce a profile that is parallel to the slab drainage.

D. Steel Trowel Finish

1. Conform to ACI 301, Section 11.7.3. Immediately after final troweling, the surface shall be cured and protected. Steel trowel finish shall be provided on

chemical room floor unless specified otherwise. Surface hardener shall be troweled into the finished surface.

3.08 FINISHING AND PATCHING FORMED SURFACES

A. Unexposed Surfaces: Provide rough-formed concrete texture as imparted by form-facing material, fill form tie holes with nonshrink grout and grind off projections, fins, and rough spots.

B. Exposed Surfaces: Provide smooth-formed concrete texture as imparted by form-facing material, arranged in an orderly and systematic manner with a minimum number of seams. Fill form tie holes with nonshrink grout and grind off projections, fins, and rough spots. Where scheduled, apply rubbed surface as follows:

1. Smooth Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive to produce a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes.

   a. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces.

   b. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout.

   a. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces.

   b. Compress grout into voids by grinding the concrete surface in a swirling motion, then finish the surface with a cork float.

C. Patching Defective Areas: Patch defective areas and repair rough spots resulting from form release agent failure or other reasons to provide smooth uniform appearance.

1. Cut out honeycombed and defective areas.

2. Cut edges perpendicular to surface at least 1-inch deep. Do not feather edges. Soak area with water for 24 hours.

3. Finish surfaces to match adjacent concrete.

4. Keep patches damp for minimum 7 days or spray with curing compound to minimize shrinking.

3.09 PROTECTION AND CURING

A. Protect fresh concrete from direct rays of sunlight, drying winds, and wash by rain.

B. Keep concrete slabs continuously wet for a 7 day period. Intermittent wetting is not acceptable.

C. Use curing compound only where approved by Engineer. Cure formed surfaces with curing compound applied in accordance with manufacturer's directions as soon as forms are removed and finishing is complete.

1. Do not use curing compound on concrete surfaces that will be painted.

D. Remove and replace concrete damaged by freezing.

3.10 FIELD QUALITY CONTROL

A. Concrete Samples:

1. Provide concrete for making composite samples for testing slump, air content, and for making cylinders for determination of compressive strength.

2. Prepare samples in accordance with ASTM C172. Select trucks or batches of concrete on a random basis.

3. Samples may be obtained at the discharge chute of the truck or at the point of discharge into forms.

B. Sampling Frequency: One composite sample for each 100 cubic yards of structural concrete, or fraction thereof, of each concrete mixture placed in any one day.

C. Evaluation will be in accordance with ACI 301, Chapter 17 and Specifications.

D. Slump tests and concrete cylinders will be made by the Owner. Owner will handle cured test cylinders, transport to the testing laboratory and pay testing costs.

E. Enforcement of Compressive Strength Requirements:

1. Compressive strength of concrete will be considered acceptable if the following conditions are satisfied:

a. Averages of all sets of 3 consecutive strength test results are greater or equal to the specified compressive strength.

b. No individual strength test (average of 2 cylinders) falls below specified compressive strength by more than 500 pounds per square inch.

2. Whenever one, or both, of 2 conditions stated above is not satisfied, provide additional curing of affected portion of structure, then obtain test cores from the affected area.

a. Obtain 3 test cores in accordance with ASTM C 42 and ACI 318.

b. Concrete will be considered acceptable if the average compressive strength of the 3 test cores is equal to at least 90 percent of the specified 28-day compressive strength and no single core is less than 80 percent of the specified 28-day compressive strength.

c. Concrete will be designated as defective when the specified conditions are not achieved.

d. Fill core holes with concrete.

3. Engineer may require the Contractor to strengthen defective concrete by means of additional concrete, additional reinforcing steel, or replacement of defective concrete, all of the Contractor's expense.

*****END OF SECTION*****

SECTION 03400
PRECAST CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Precast concrete manholes, wet wells, valve vaults, inlets, pull boxes, and other precast concrete structures.

B. Related Sections:
   1. Section 02200 – Excavation and Backfill
   2. Section 03301 - Cast in Place Concrete.

1.02 REFERENCE STANDARDS

A. California Building Code, latest edition.

B. American Concrete Institute (ACI), *Building Code Requirements for Reinforced Concrete*.

C. Caltrans Standard Specifications.

D. Precast Concrete Institute (PCI)

E. National Precast Concrete Association (NPCA)

F. American Society for Testing and Materials (ASTM):
   1. C150 - Portland Cement.
   2. C478 – Precast Reinforced Concrete Manhole Sections
   3. C858 - Underground Precast Concrete Utility Structures.
   4. C913 – Precast Concrete Water/Wastewater Structures

1.03 SUBMITTALS

A. Standard manufacturer’s product data where applicable.

B. Concrete design, calculations, and shop drawings for all non-standard precast structures.
   1. Concrete Mix Design
   2. Design Calculations stamped and signed by a California licensed Civil or Structural Engineer.
   3. Load Calculations stamped and signed by a California licensed Civil or Structural Engineer.
   4. Shop drawings showing reinforcement, connections, embedded items, etc.

1.04 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered to the jobsite as a complete unit, clearly labeled with the manufacturer's product identification and printed instructions.

B. All materials shall be stored in a secure location to prevent theft or damage and in accordance with the manufacturer's recommendations.

C. All materials shall be handled and installed in accordance with the manufacturer's instructions.

PART 2 PRODUCTS

2.01 PRECAST CONCRETE STRUCTURES

A. Where shown on the plans, the Contractor may use reinforced concrete structures that are cast at an off-site location. In general these structures include vaults and electrical pull boxes. Precast concrete structures shall conform to ASTM C478, C858, and C913.

B. All precast concrete structures will be manufactured in a plant especially designed for that purpose. Standard products may be used wherever feasible.

C. Design of precast concrete structures is the responsibility of the Contractor and Contractor's Engineer. Design Calculations shall be stamped and signed by a California licensed Civil or Structural Engineer. Design requirements are listed below:
   1. Structures shall be designed to resist buoyant forces from groundwater assuming a depth of groundwater at finish grade.
   2. Design loads shall consist of dead load, live load, impact load, full depth interior fluid, loads due to groundwater table at finish grade, seismic loads, and any other loads which may be imposed on the structure. Soil properties and loading values detailed in the project geotechnical report shall be used for the design of precast concrete structures.
   3. Valve Vault and Wet Well – The bottom 3 feet of the wall riser shall be cast integrally with the bottom slab to eliminate a joint at the wall to base interface.
   4. Individual riser sections shall be designed to utilize as few joints as possible. Vertical joints are not allowed.
   5. Precast structures shall be designed to be water tight and to limit movement and deflections.

D. The Contractor shall submit shop drawings showing reinforcement, connections, embedded items, etc. Pipe penetrations shall be formed or core drilled. Penetrations 4 inches in diameter or larger shall be formed at the precast concrete plant.

E. Hatches for precast structures shall be installed at the precast concrete plant. The size and position of hatches shall be as shown on the Plans. The hatches shall be as specified in Section 08310.

2.02 MATERIALS

A. Portland cement concrete shall conform to Section 03301, although concrete compressive strength and reinforcement yield strength may be at the discretion of the manufacturer. Lightweight concrete shall not be used.

B. Reinforcing steel shall conform to Section 03200.

2.03 PRECAST MANHOLES AND INLETS

A. Where shown on the Plans, Contractor may use reinforced concrete structures that are cast at an off-site location.
   1. Precast concrete manhole sections shall conform to ASTM C478, C858, and C913.
   2. Precast concrete inlets shall conform to ASTM C858 and C913.

B. All precast concrete structures shall be manufactured in a plant especially designed for that purpose. Standard Products should be used wherever feasible.

C. Precast concrete manholes, inlets, frames, and covers shall be rated for H-20 traffic loading.

2.04 JOINT SEALERS, WATER STOPS

A. All joints between precast concrete sections shall be made water-tight by using a preformed plastic material that is permanently self-adhering and flexible. Compound shall be "Ram-Nek" as manufactured by K.T. Snyder Company, Houston, Texas or approved equal. ("Ram-Nek" is distributed locally by Hanson Concrete Products of Milpitas.) Follow manufacturer's recommended installation procedures.

B. Where cast-in-place concrete is poured against an existing concrete structure, a pre-formed rubber hydrophilic water stop with adhesive back shall be installed on the precast side of the joint prior to the pour. Water stop shall be Adeka Ultra Seal MC-2010M (Gates Unlimited, Santa Clara) or equivalent. Follow manufacturer's recommended installation procedures.

C. Manhole pipe connection shall have an A-Lox X-Cel water stop or approved equal.

2.05 NON-SHRINK GROUT

A. Grout shall meet the requirements of Section 03600.

PART 3 EXECUTION

3.01 CASTING

A. No concrete shall be cast until all submittals have been favorably reviewed by the Engineer and returned to the Contractor.

B. Precast concrete structures shall be cast and cured at the plant following manufacturer's procedures.

C. Structures shall not be shipped to the job site until fully cured.

3.02 STORAGE, HANDLING AND DELIVERY

A. Precast concrete structures shall be fully braced (with temporary struts if necessary) until delivered to the project site, installed, leveled and anchored into place as shown on the Plans.

B. After cure, precast concrete structures may be stored on the project site in conformance with these specifications, at the Contractor's own risk.

C. Contractor is responsible for coordinating the delivery of precast concrete structures and all trades required for their installation and anchorage.

3.03 INSTALLATION

A. Precast concrete structures shall be installed as shown on the Plans, according to the manufacturer's recommendations.

B. Joint sealers shall be used as specified herein for a watertight installation.

3.04 TESTING

A. Manholes and wet wells shall be tested as specified in Section 02770.

3.05 DEFECTIVE CONCRETE AND REPAIRS

A. Concrete shall be considered defective for the following reasons:
   1. Failure of finished concrete profiles to conform to the plans within tolerance.
   2. Concrete showing cracks, rock pockets, voids, spalls, or defects that adversely affect the structural adequacy of the concrete.

B. Defective concrete that results from improper casting or curing shall be repaired or replaced at the plant prior to shipment; damaged concrete that results from transportation, handling, or storage after the piece leaves the plant shall be repaired or replaced at no expense to the City.

C. **Repairing and Patching:** When directed by the City, defective concrete may be repaired by chipping away the defective section and repairing it with concrete or mortar as directed by the City.

*****END OF SECTION*****

SECTION 03600
GROUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grout for uses other than masonry.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section
   1. Section 01300 – Contractor Submittals
   2. Section 03301 – Cast-In-Place Concrete

1.03 SUBMITTALS

A. Comply with Section 01300.

B. Manufacturer's Data
   1. Provided for the following:
      a. Dry pack grout
      b. Cement grout
      c. Nonshrink grout, non-metallic
      d. Nonshrink grout, metallic
      e. Pressure grout
      f. Epoxy grout
      g. Polymer concrete

C. Laboratory Test Reposts
   1. Test reports on previously tested materials shall be accompanied by the manufacturer's statement that the previously tested material is the same type, quality, manufacture, and make as that proposed for use in this project.
   2. Test reports are required for the following:
      a. Cement
      b. Aggregates
      c. Bonding compounds
      d. Admixtures

PART 2 PRODUCTS

2.01 MATERIALS

A. Cement

1. Portland cement: ASTM C150 Type II or Type V, low alkali, containing less than 0.60 percent alkalis.

B. Aggregate

1. General

a. Nonreactive and washed before use.

b. When sources of aggregate are changed, provide test reports for the new material.

c. Perform the tests specified prior to commencing grout work.

2. Fine Aggregate

a. Hard, dense, durable particles of either sand or crushed stone regularly graded from coarse to fine and shall conform to ASTM C33 as modified herein.

b. When tested in accordance with ASTM C136, gradation shall be such that 100 percent by weight will pass a standard No. 8 mesh sleeve and no less than 45 percent by weight will pass a standard No. 40 mesh sieve.

3. Variation from the specified gradations in individual tests will be acceptable if the average of three consecutive tests is within the specified limits and the variation is within the permissible variation listed below:

US standard sieve size	Permissible variation in individual tests, percent
30 or coarser	2.0
50 or finer	0.5

4. Other tests shall be in accordance with the following specifications:

Test	Test Method	Requirements
Organic Impurities	ASTM C40	Color lighter than standard
Amount of Material Passing No. 200 Sieve	ASTM C117	3% maximum by weight
Soundness	ASTM C88	10% maximum loss with sodium sulfate
Reactivity	ASTM C289	Innocuous aggregate
Sand Equivalent	ASTM D2419	Minimum 80

C. Admixtures

1. General

a. Compatible with the grout.

b. Calcium chloride or admixtures containing calcium chloride are not acceptable.

c. Used in accordance with the manufacturer's recommendations and added separately to the grout mix.

2. Water Reducing Retarder

a. ASTM C494 Type D.

b. Master Builders Pozzolith 300-R, Sika Corporation Plastiment, or equal.

3. Lubricant for Cement Pressure Grouting

a. Lubricant additive for cement pressure grouting shall be Intrusion Prepakt Intrusion Aid, Sika Intraplast N, or equal.

D. Water

1. Water for washing aggregate, for mixing and for curing shall be free from oil and deleterious amounts of acids, alkalis, and organic materials; shall not contain more than 500 mg/1 of chlorides as Cl, nor more than 800 mg/1 of sulfates as SO_4; and shall not contain an amount of impurities that may cause a change of more than 25 percent in the setting time of the cement nor a reduction of more than five percent in the compressive strength of the grout at 14 days when compared with the result obtained with distilled water.

2. Additionally, water used for curing shall not contain an amount of impurities sufficient to discolor the grout.

2.02 GROUT

A. Drypack Grout

1. A mixture of approximately one part cement, 1-1/2 to 2 parts sand, water reducing retarder, and sufficient water to make a stiff workable mix.

B. Cement Grout

1. A mixture of one part cement, two parts sand, proportioned by volume, admixtures for pressure grouting, and sufficient water to form a workable mix.

C. Nonshrink Grout, Non-Metallic

1. Nonshrink, nonmetallic aggregate grout shall be Five Star Products, Inc., Five Star Grout; Sika Corporation, SikaGrout-928; Euclid Chemical Co., Hi-Flow Grout; or equal.

D. Nonshrink grout, Metallic

1. Nonshrink, metallic grout shall be Master Builders, MasterFlow 885; Euclid Chemical Co., Hi-Flow Metallic Grout; or equal.

E. Epoxy Grout for Crack Repair

1. Except as noted below, epoxy grout shall be a high modulus, two-component, moisture insensitive, 100 percent solids, thermosetting modified polyamide epoxy compound.

    a. The consistency shall be a paste form capable of not sagging in horizontal or overhead anchoring configurations.

    b. Material shall conform to ASTM C881 Type 1, Grade 3, such as Master Builders MasterEmaco ADH 327, Sika Corporation Sikadur Hi-Mod Series, Adhesive Technology Corporation Solidbond 200 or equal, and shall have a heat deflection temperature in excess of 130 degrees F.

2. Epoxy for pressure grouting/crack injection shall be a two-component, moisture insensitive, high modulus, injection grade, 100 percent solids, blend of epoxy-resin compounds.

    a. The consistency shall be as required to achieve complete penetration in hairline cracks and larger.

    b. Material shall conform to ASTM C881 Type 1 Grade 1, such as Sika Corporation Sikadur 52, Master Builders MasterInject 1500, Adhesive Technology Corporation SLV 300 series, or equal.

F. Polymer Concrete (For Resurfacing or Patching)

1. Polymer concrete (for resurfacing or patching) shall consist of a liquid binder and dry aggregate mixed together to make a mortar or grout of a consistency as required for the application.

2. The liquid binder shall be a chemical and oil resistant, stress relieved, low modulus, moisture insensitive, two-component epoxy-resin compound.

3. The consistency shall be similar to lightweight oil for proper mixing with aggregate.

4. Material shall conform to ASTM C881 Type 3 Grade 1, such as Sika Corporation Sikadur Lo-Mod series, Master Builders MasterSeal 350, Adhesive Technology Corporation 400 series, or equal.

5. The aggregate shall be oven dry in sealed packages until time of mixing, and shall be of size and consistency compatible with recommendations of manufacturer of liquid binder for intended application.

2.03 PRESSURE GROUTING EQUIPMENT

A. Pressure grouting equipment shall include a mixer and holdover agitator tanks and shall be designed to place grout at pressures up to 50 psi.

B. Provide gages to indicate pressure used.

C. The mixer shall be provided with a meter capable of indicating to one-tenth of a cubic foot the volume of grout used.

PART 3 EXECUTION

3.01 GENERAL

A. Bonding compound for use with grout is specified in Section 03301. Primer, if required for polymer concrete, shall be provided per manufacturer's recommendation.

3.02 DRYPACK GROUT

A. Use drypack grout for built-up surfaces, setting miscellaneous metal items and minor repairs.

B. Surfaces required to be built up with drypack grout shall be roughened by brushing, cleaned, and coated with the bonding compound specified in Section 03301 before the application of the grout.

C. Apply drypack grout immediately following the application of the bonding compound in bands or strips to form a covering of the required thickness. The covering shall be smooth.

D. Construction joints in the grout shall be sloped and shall be cleaned and wetted before application is resumed.

E. Cure drypack grout in accordance with Section 03301.

F. Grout shall not be placed during freezing weather unless adequate protection is provided.

3.03 CEMENT GROUT

A. Use cement grout for filling nonbearing portions of equipment pads and pressure grouting.

B. Except for the specialized equipment for pressure grouting, mixing and placing apparatus shall be similar to that normally used for cast-in-place concrete.

C. Mix grout for a period of at least 1 minute.

D. Agitate diluted grout to keep ingredients mixed.

3.04 NONSHRINK GROUT

A. Nonshrink, metallic aggregate grout shall be used for the bearing surfaces of machinery and equipment bases, column base plates and bearing plates at dry, interior locations.

B. Nonshrink, non-metallic aggregate grout shall be used for the bearing surfaces of machinery and equipment bases, column base plates, and bearing plates at damp or exterior locations as well as for setting handrail, guardrail, or fence posts in pipe sleeves. Grout shall meet the requirements of CRD-C 621 and shall be placed in accordance with manufacturer's instructions.

3.05 EPOXY GROUT

A. Epoxy grout shall be used for repairing cracks by pressure grouting or gravity flow and for repairing structural concrete.

B. Concrete shall be primed in accordance with the grout manufacturer's instructions.

3.06 PRESSURE GROUTING

A. Prior to grouting, systems and holes to be grouted shall be washed clean.

B. Washing is not required for grouting soil voids outside pipe cylinders or casing pipes.

C. Grouting, once commenced, shall be completed without stoppage.

D. In case of breakdown of equipment, wash out the grouting system sufficiently to ensure fresh grout and adequate bond and penetration will occur upon restarting the grouting operation.

E. Maintain grout pressure until grout has set.

*****END OF SECTION*****

SECTION 04200
CONCRETE MASONRY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete masonry units, mortar, grout, and reinforced masonry construction.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01300 – Contractor Submittals
2. Section 09900 – Coating Systems

1.03 SUBMITTALS

A. Comply with Section 01300.

B. Product Data: For each type of masonry unit, masonry accessory, and admixture to be incorporated into the Work.

C. Shop Drawings: Submit reinforcement placing drawings with details of bond beams and lintels. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls with locations of control joints and wall penetrations.

D. Samples for each type and color of exposed masonry units and colored mortars.

E. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards.

F. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1.04 QUALITY ASSURANCE

A. Preconstruction Testing Service: Contractor shall engage a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services shall be made by Contractor.

1. Concrete Masonry Unit Test: For each type of unit required, per ASTM C140.
2. Mortar Test (Property Specification): For each mix required, per ASTM C780.
3. Grout Test (Compressive Strength): For each mix required, per ASTM C1019.

B. Sample Panels: Build sample panels to verify selections made under sample submittals and to demonstrate aesthetic effects. Build sample panels for typical exterior wall in sizes approximately 48 inches long by 48 inches high.

1.05 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. General

1. Modular dimensions and air, water, or steam cured.
2. Surface Texture: Provide split-face, scored split-face, or ground-face blocks where indicated on the Drawings. At other locations, provide precision masonry units with comparatively smooth and uniform surface texture.

B. Hollow Load Bearing Concrete Masonry Units

1. Provide hollow load-bearing units conforming to ASTM C90, made with lightweight aggregate.
2. Provide load-bearing units unless otherwise specified.
3. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2,000 psi.
4. Weight Classification: Light weight.

C. Special Shapes: Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

D. Size and Color: Nominal 16-inch long by 8-inch wide by 8-inch tall units arranged to form a running bond pattern as indicated on the Drawings. Color to be the Manufacturer's standard Tan color or as selected by Construction Manager from submitted color palette.

E. Water Repellent and Anti-Graffiti Coatings: As indicated in Section 09900.

2.02 MORTAR MATERIALS

A. Cementitious Materials

1. Portland Cement: Conforming to ASTM C150, Type I or II. Type III may be used for cold-weather construction upon approval of the Engineer.

2. Hydrated Lime: Conforming to ASTM C207, Type S.

3. Mortar Cement: Conforming to ASTM C1329.

B. Sand for Mortar: Conforming to ASTM C144.

1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

C. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete masonry units and formulated to minimize efflorescence while enhancing the bond between the mortar and masonry units.

1. Products: One of the following, or equal:

a. Addiment Incorporated; Mortar Tite.

b. Grace Construction Products; Dry-Block Mortar Admixture.

c. Master Builders, Inc.; Color Cure Mortar Admix or Rheomix Rheopel.

D. Water: Use potable water.

2.03 GROUT MATERIALS

A. Cementitious Materials

1. Portland Cement: Conforming to ASTM C150, Type I or II. Type III may be used for cold-weather construction upon approval of the Engineer.

2. Hydrated Lime: Conforming to ASTM C207, Type S.

B. Fine and Coarse Aggregates: Conforming to ASTM C404.

C. Water: Use potable water.

2.04 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: Comply with ASTM C270, Property Specification, Type S.

B. Grout for Unit Masonry: Proportion by volume in accordance with ASTM C476 to achieve a minimum compressive strength of 2,500 psi.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.

2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C143.

C. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's written instructions.

2.05 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: Conforming to ASTM A615, Grade 60.

B. Horizontal Joint Reinforcement

1. Cold drawn steel wire conforming to ASTM A82, hot dipped galvanized after fabrication in accordance with ASTM A153.

2. Acceptable Configurations:

   a. Truss type with two or more longitudinal wires welded to a continuous diagonal cross wire.

   b. Ladder type with perpendicular cross wires not more than 1 inch on center.

3. Dimensions:

   a. Provide in 10-foot long flat sections.

   b. Preformed Tees and Corner reinforcement: Approximately 30 inches long.

   c. Overall Width: Approximately 2 inches less than the nominal wall thickness.

2.06 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D226, Type I (No. 15 asphalt felt).

2.07 MASONRY CLEANERS

A. Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains from new masonry without damaging masonry. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

B. Manufacturers: One of the following or equal:

1. Diedrich Technologies, Inc.

2. EaCo Chem, Inc.

3. ProSoCo, Inc.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Use full-size units without cutting if possible. If cutting is required, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before

laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

C. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:

1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

3.02 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Step back unfinished walls for joining with new walls, toothing will not be permitted.

D. Built-in Work: Build in door and window frames, fan and louver openings, pipe and conduit sleeves, and other items as the masonry construction progresses. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.

F. Completely fill all cores in hollow concrete masonry units with grout.

3.03 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.

2. With webs fully bedded in mortar in grouted masonry, including starting course on footings.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.04 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with ACI 530.1/ASCE 6/TMS 602.

C. Grouting

1. Grout Types:

a. Use fine grout in grout spaces that are less than 2 inches in any horizontal dimension after deducting the thickness of horizontal reinforcement.

b. Use fine grout in grout spaces where clearance between the reinforcing bars and the masonry is less than 3/4-inch.

c. Use coarse grout in all other locations.

2. Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

3. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

4. Limit height of vertical grout pours to not more than 60 inches.

5. Place grout in a continuous pour and agitate to eliminate voids. If masonry units are dislodged or displaced by the grouting operation, remove masonry units and relay in alignment with fresh mortar.

3.05 TOLERANCES

A. Complete masonry work within the following tolerances:

1. Face of Concrete Masonry Unit: 1/16-inch from face of adjacent unit.

2. Variation from True Plane: 1/4-inch in 10 feet and 1/2-inch maximum in 20 feet or more.

3. Variation from Plumb: 1/4-inch in each story, noncumulative and 1/2-inch maximum in two stories or more.

4. Variation from Level: 1/8-inch in 3 feet, 1/4-inch in 10 feet, and 1/2-inch maximum.

5. Variation in Wall Thickness: plus or minus 1/4-inch.

3.06 FIELD QUALITY CONTROL

A. Special Inspection and Testing of masonry construction shall be performed by the Owner's Testing Laboratory. The Contractor shall allow inspectors access to scaffolding and work areas as needed to perform inspections.

B. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.

C. Masonry Work to Receive Special Inspection: All masonry work shall receive Special Inspection in accordance with the requirements of California Building Code. Bolts installed in masonry require Special Inspection. Review Inspection protocol with Construction Manager.

D. Three representative full-size sample masonry units showing full range of color, texture, finish, and dimensions are to be submitted for review.

E. Testing Frequency: One set of tests for each 5,000 sq. ft. of wall area or portion thereof.

F. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C140.

G. Mortar Test (Property Specification): For each mix provided, per ASTM C780. Test mortar for mortar air content and compressive strength.

H. Grout Test (Compressive Strength): For each mix provided, per ASTM C1019.

3.07 CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.

2. Protect adjacent surfaces from contact with cleaner.

3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.

4. Clean masonry by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.

5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

*****END OF SECTION*****

SECTION 05400
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Fabricate and erect exterior load bearing and nonload bearing steel stud wall framing including crossbridging and bracing and bracketing to the building structure, complete in all respects, including runner tracks, headers, sills, z-furring and hat channels, jack studs, anchors and fastening devices, welding supplies and accessories, and other components required, all as indicated.
2. Hot-rolled and galvanized steel clip angles and shelf an- gles and framing members required at wall openings for louvers, doors and other openings at light gauge steel framing work, except items indicated or specified to be provided by other trade(s).
3. Anchorage system for securing to building structure.
4. Strapping over framing for attachment of metal panels.
5. Shop and field welding required for proper connecting, and for securing light gauge steel framing to the surrounding construction.
6. Touch-up painting of all shop and field welds.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Sections

1. Section 05500 – Miscellaneous Metal: Provision of non-structural steel framing.
2. Section 09290 - Gypsum Board: Provision of gypsum board.
3. Section 09900 - Painting and Coating: For finish painting.

1.02 REFERENCES

A. AISC - American Institute of Steel Construction

1. Code - Code of Standard Practice for Steel Buildings and Bridges.
2. Specification - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. AISI - American Iron and Steel Institute

1. Specifications - Specification for the Design of Cold- Formed Steel Structural Members.

C. ASTM - American Society for Testing and Materials

1. A36 - Specification for Structural Steel.
2. A653 - Standard Specification for Steel Sheet, Zinc- Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. A780 - Practice for Repair of Damaged Hot-Dip Galvanized Coatings.

D. AWS - American Welding Society
1. D1.3 - Structural Welding Code - Sheet Steel.

E. CBC - California Building Code, 2025 Edition

F. FS - Federal Specifications
1. TT-P-564 - Primer Coating, Synthetic, Rust-Inhibiting, Lacquer-Resisting.

G. ICC - International Code Council
1. ES - Evaluation Service

H. SSPC - The Society for Protective Coatings

1.03 SUBMITTALS

A. Product Data: For information only, submit manufacturer's product data for all components to be used in the construction and anchoring of the light gauge steel framing. Include specifications, installation Instructions, and data substantiating that the materials comply with specified requirements.

B. Shop Drawings
1. Submit for the City's approval complete shop drawings of all work of this Section, based on, and closely following, the layouts and details on the Drawings.
2. Shop drawings shall show complete elevations, plans and sections of all installation, including complete large scale details of all typical and special conditions of construction; clearly indicating materials, sizes, shapes, sections, gauges, thicknesses and finishes of all members; and clearly indicating all materials and methods used in the connection and anchoring of the work; locations and spacing of all shop and field welds; bracing and bracketing; anchorage; support framing; installation tolerance; electrolytic isolation; and all other pertinent details.
3. The Contractor shall engage the services of a professional engineer registered in the State of California to prepare and/or review all shop drawings and structural design computations specified herein, who shall, upon completion, stamp them with his/her professional seal. The shop drawings and structural design computations, with the engineer's seal affixed thereto, shall be submitted to the City for approval.

C. Do not order materials or begin fabrication or installation until the City's approval of submittals has been obtained.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Welders

a. Qualified for the work by tests as prescribed in AWS D1.3 and shall submit certification of such qualifications to the City prior to beginning of this work.

b. Certificates of qualification of welders from a recognized agency whose test procedures and requirements are at least equal to those of AWS may be acceptable to the City.

c. Cost of certifying and/or qualifying of welders shall be borne by the Contractor.

2. Fabricator/Erector: The light gauge steel framing fabricator/erector shall have at least 3 years experience in the fabrication and erection of light gauge steel framing systems of scope and type similar to the required work.

B. Regulatory Requirements: Work shall comply with the governing laws and building code and applicable provisions of the following standards:

1. AlSC Specification.

2. AISC Manual.

3. AISC Code.

4. AWS D1.3.

5. AISI Specifications.

6. CBC Building Code, 2025 Edition.

7. SSPC Painting Manual.

C. Any material or workmanship which is rejected by the City and/or the Testing Agency in mill, shop, or field, shall be replaced promptly by the Contractor to the satisfaction of the City and/or the Testing Agency, and at the Contractor's expense.

D. Acceptance of work in shop shall not prevent the final rejection of work at the job site, even after erection, if work is found to be defective in any way.

1.05 DELIVERY, STORAGE AND HANDLING

A. Acceptance at Site:Deliver to the fabrication site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade.

B. Storage and Protection

1. Store off the ground in a dry ventilated space or protect with suitable waterproof coverings and ventilate to avoid condensation.

2. Protect metal framing units from weather and damage.

1.06 PROJECT CONDITIONS

A. Coordination: Examine all Drawings as to the requirements for accommodations and/or the installation of work of other Sections and provide holes and connections as required for such work and for site assembly of metal work. Holes shall be drilled or punched and reamed in the shop. Show sizes and locations of all such holes on the shop drawings.

1.07 WARRANTY

A. The Contractor shall obtain in the City's name the standard written manufacturer's warranty of all materials furnished under this Section where such warranties are offered in the manufacturer's published product data. All these warranties shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: CEMCO; Wheeling Steel Co.; Dietrich; Safco, or equal.

2.02 MATERIALS

A. Materials shall be new, free from defects marring strength, durability, or appearance, and of best commercial quality for the purpose used. Take necessary measurements in field to assure exact fit of all components.

B. Steel Framing System: A complete proprietary framing system, consisting of cold rolled steel studs formed from steel, of gauge(s) indicated on the approved shop drawings, and of a minimum yield stress of 50 KSI conforming to ASTM A653 for 16 gauge and heavier members and of a minimum yield stress of 33 KSI conforming to ASTM A653 for 18 gauge and lighter members. The system shall include all steel channel head and sill runner tracks, deflection tracks, steel cross bridging and bracing, steel jack studs, anchors and fastening devices, welding supplies and accessories, and other items that are required for a complete installation. All steel members shall be G60 galvanized per ASTM A653 or shop primed with 1 coat of rust-inhibitive primer, conforming to FS TT-P-664.

C. Hot Rolled Steel Members: Provide all steel clip angles, shelf angles and other support and retention members indicated on the Drawings, except items specifically indicated or specified to be provided under other Sections. Steel shall conform to ASTM A36, of sizes and configurations indicated on the Drawings. All steel shapes provided under this Section shall conform to standards set forth under Section 05500.

2.03 FASTENERS

A. Fastening of 16 Gauge or Heavier Metal: Framing components shall be fastened to each other by welding only (unless otherwise indicated on the Drawings).

1. Welding: Welding standards shall conform to standards set forth in AISC and AWS reference standards specified hereinabove.

2. Electrodes for welding shall conform to AWS requirements for welding low carbon steel. Manufacturer shall furnish instructions with each container of electrodes giving recommended voltage, amperage, polarity of direct current, for all uses and positions for which electrode is suitable.

B. Fastening of 18 Gauge Metal and Lighter: Framing components may be fastened to each other by screws.

C. Self-drilling fasteners shall be "TEKS" as manufactured by ITW Buildex, or equal. Use length and type as indicated on the Drawings or as recommended by the manufacturer for the intended use.

D. Powder actuated fasteners shall be "X-U" shot pins as manufactured by Hilti, Inc., or equal. Fastener length shall be as indicated on the Drawings or as recommended by the manufacturer for the intended use. Fasteners shall be installed in accordance with the manufacturer's recommendations and current ICC-ES evaluation reports.

2.04 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: High zinc dust content paint, with dry film containing not less than 94 percent zinc dust by weight, as manufactured by Parker Amchem, "Galvaprep SG"; Sherwin Williams, "Zinc Clad I", or equal.

B. Thermal Insulation: None required.

2.05 FABRICATION

A. Light gauge steel framing shall be shop or field assembled.

B. Prior to commencement of fabrication, subcontractor shall submit fabrication and erection drawings for the City's approval as specified.

C. Contractor shall coordinate stud locations with the following:

1. Mechanical work.

2. Coordinate interface between light gauge steel framing and gypsum board studs and to ensure proper support for gypsum board and gypsum sheathing to be installed under Section 09290.

D. Metal framing shall be fabricated in accordance with manufacturer's printed or written instructions unless otherwise indicated.

E. Framing components shall be straight and true prior to fabrication. Flattening or straightening of components shall be done by a process not injurious to materials.

F. Framing components shall be cut squarely (or on an angle as with bracing) to fit squarely against abutting members.

G. No splices will be allowed in studs. Stud tracks shall be continuous, with splices butt welded.

H. Provide lateral bracing and bridging to manufacturer's specifications and recommendations as required by CBC.

I. Provide all angles, clips, and other miscellaneous pieces necessary to attach light gauge framing panels to building structure or to attach other materials to light gauge framing panels.

J. Cut all openings in light gauge framing required for ducts, grilles, pipes, etc.

K. Components shall be set square and in line and shall be held firmly in position until properly fastened.

L. Panel components shall be joined by welding.

1. Welders shall be grade certified for the weight and type of materials and the type of equipment being used.

2. Welding shall be done in accordance with AWS D1.3.

M. Finished assemblies shall be free from twists, bends, or open joints with all members straight, square and true to line.

2.06 SOURCE QUALITY CONTROL

A. Inspection

1. Inspection and testing of welded connections will be performed by an independent testing laboratory, under a separate contract with the City. Welded connections shall be subjected to inspection and testing in shop and field by the City and/or testing laboratory. Such inspection and testing shall not relieve the Contractor of his/her responsibility to provide his/her own inspection, testing, and quality control as necessary to furnish workmanship in accordance with requirements of the Contract Documents.

2. Notify the City and testing laboratory prior to start of any fabrication, erection, or other phase of work requiring welded connections so as to afford them reasonable opportunity to inspect work.

3. Facilitate inspection and testing by testing laboratory. The Contractor shall, upon request and at his/her own expense, furnish testing laboratory with:

a. Complete sets of approved Shop Drawings and corrective work procedures at shop(s) and in field.

b. Representative sample pieces of materials requested for testing.

4. Testing laboratory will inspect welded connections for burned welds, adequate size and length of welds, and general appearance and integrity of welds as required by the City.

5. Do not remove any marks or tags applied by testing laboratory identifying rejected work.

6. Welded connections which have been rejected by the City and/or testing laboratory in shop or field shall be corrected without delay and at no expense to the City.

B. Acceptance of work in shop shall not prevent final rejection of work at job site, even after erection, if work is found to be defective in any way.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements, including installation tolerances and other conditions affecting performance of cold formed metal framing. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 ERECTION

A. Light gauge steel framing shall be erected by approved methods using equipment of adequate capacity to safely perform the work.

B. Any damage to other building materials caused by erection of light gauge steel framing shall be repaired or replaced as directed by the City at this subcontractor's expense.

C. Contractor shall be responsible for checking dimensions and assuring fit of all members and panels before erection begins.

D. Work shall be erected plumb, level and to dimensions and elevations indicated.

E. Do not install any member or panel which is bent or racked. Such panels shall be replaced.

F. During erection, install steel cables with turnbuckles in sufficient number to prevent distortion and damage to framing due to wind or erection forces until erection is complete. These cables may be used to plumb and line the work.

G. Tracks providing anchorage for studs shall be anchored to steel or concrete as required by CBC, but not over 24 inches. No piece of track shall have less than 2 anchors.

H. Where panels are attached to steel with a continuous attachment angle, the attachment angle shall be welded to each stud and shall be fastened to structural steel support as required by CBC, but not less than 24 inches on center.

I. Do not bridge building expansion and control joints with cold formed metal framing. Independently frame both sides of joints.

J. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists and double studs, inaccessible upon completion of framing work.

K. Fasten reinforcement plate over web penetrations that exceed size of manufacturer's standard punched openings.

L. Erection Tolerances: Install cold formed metal framing to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8-inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8-inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 ADJUSTING

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanizing repair paint, according to ASTM A780 and the manufacturer's instructions.

3.04 PROTECTION AND CLEANING

A. During erection of the light gauge steel framing work, protect the work of other trades against damage or staining by the exercise of reasonable care and precautions. Repair or replace any work so damaged.

1. Upon completion of this work, remove all rubbish, debris, and tools from the work area and leave the premises broom clean.

*****END OF SECTION*****

SECTION 05500
MISCELLANEOUS METAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnishing material, supplies, equipment, tools, transportation and facilities and performing labor and services necessary for, required in connection with or properly incidental to furnishing and installing miscellaneous metal, as described in this Section of the Specifications, shown on the accompanying Plans, or reasonably implied therefrom.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01300 – Contractor Submittals
2. Section 09900 – Coating Systems

1.03 SUBMITTALS

A. Comply with Section 01300.

B. Certified test reports: Before delivery of any miscellaneous metalwork, provide certificates which attest to material compliance with these specifications.

C. Layout or installation shop drawings for all miscellaneous metals, including but not limited to, seat angles, brackets, flashing, pipe supports.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural Steel Wide Flange Beams: ASTM A992.

B. Structural Steel Shapes (other than Wide Flange Beams) and Plates: ASTM A36.

C. Structural Steel Tubing (HSS): ASTM A500, Grade B.

D. Structural Steel Pipe: ASTM A53, Grade B or ASTM A501.

E. Stainless Steel Tubing (HSS): ASTM A554, Type 316, unless noted otherwise.

F. Stainless Steel Shapes and Plates: ASTM A276, Type 316, unless noted otherwise.

G. Machine Bolts, Nuts, and Washers: ASTM A307.

H. Threaded Rods: ASTM F1554, Grade 36, unless noted otherwise.

I. High Strength Bolts: ASTM A325 bearing-type connections, unless noted otherwise.

J. Hardened Steel Washers: ASTM F436.

K. Heavy Hex Nuts: ASTM A563.

L. Stainless Steel Bolts and Threaded Rods: ASTM F593, Alloy Group 2, Condition A.

M. Stainless Steel Nuts: ASTM F594, Alloy Group 2, Condition A.

N. Welded Headed Studs: ASTM A108.

O. Welding Materials: AWS D1.1, D1.3 or D1.6; type required for materials being welded.

P. Cold-Formed Steel

1. Framing including stud and track sections, clips, light gauge angles and break shapes.
2. Material shall be supplied by a manufacturer who is a member of the Steel Stud Manufacturer's Association (SSMA) and shall be ASTM A 653 Grade 33 for 18 GA and thinner material and ASTM A 653 Grade 50 for 16 GA and thicker material.
3. Wood Construction Connectors and Fasteners: Simpson Strong-Tie Company Inc. or approved equal.
4. Self-Drilling Sheet Metal Fasteners: Tek Screws by ITW Buildex or equal.
5. Powder Actuated Fasteners: 'X-U' Shot Pins by Hilti or equal.

Q. Steel Bar Grating: Steel bar grating shall be as manufactured by Grating Pacific, Inc. or approved equal. Bar depth, width and spacing shall be as shown on the Plans. All grating sections shall be banded. Steel bar grating shall be hot dip galvanized.

R. Metal Strut, Fasteners and Accessories: Cooper B-Line, Unistrut or equal.

2.02 FABRICATION

A. Fabricate structural steel members in accordance with AISC Specification.

B. Conform to Chapter 22, California Building Code (CBC), latest Edition.

C. Welding

1. Welder qualification requirements, welding procedures, etc. according to AWS D1.1 and D1.3. Employ only certified welders.
2. Butt welds: Full penetration welds unless otherwise noted.
3. Arc welding electrodes: E70 Series.
4. All welds on hand and guardrails are to be ground smooth.
5. Tie plates: Welded as shown on the Plans.

D. Holes for bolts or rivets shall be punched or drilled 1/16-inch larger than normal bolt. Holes in column base plates may be 5/16-inch larger than anchor bolt diameter only if washers field welded to the base plate are provided under the nuts.

E. Zinc coating material: As specified in ASTM A153.

F. Zinc dust-zinc oxide coating: Conform to MILLSPEC DOD-P-20135.

G. Coating: As manufactured by Z.R.C. Chemical Products Co., Galvicon Co., or equal.

2.03 MISCELLANEOUS STEEL METALWORK

A. Other miscellaneous steel metalwork including embedded and non-embedded steel metalwork, hangers, and inserts shall be as specified on the Plans and shall be hot-dip galvanized after fabrication unless otherwise specified.

2.04 COATING REQUIREMENTS

A. Hot-dip galvanize fabricated material where specified on the Plans and in this Section of the Specifications.

B. Clean, prepare and shop prime other steel work in accordance with Section 09900.

C. Do not prime surfaces to be field welded.

D. Touch-up primer in the field after welding is complete. Apply finish coats in the field in accordance with Section 09900.

E. Coatings in contact with potable water shall be NSF-61 approved for potable water applications.

PART 3 EXECUTION

3.01 STEEL ERECTION

A. Erect structural steel in accordance with AISC Specification.

B. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb and in true alignment until completion of erection and installation of permanent bracing.

C. Do not field cut or alter structural members without approval of Engineer.

D. After erection, prime welds, abrasions, and surfaces not shop primed, galvanized, except surfaces to be in contact with concrete. Use a primer consistent with shop coat. Use primer recommended for galvanized surfaces.

E. Bolting: Securely bolt or weld the work as erection progresses to provide for all dead load, lateral forces and erection stresses.

3.02 MISCELLANEOUS METALWORK

A. General

1. Fieldwork shall not be permitted on galvanized items. Drilling of bolts or enlargement of holes to correct misalignment will not be allowed.

2. Protect dissimilar metals from galvanic corrosion by means of pressure tapes, coatings or isolators. Protect aluminum in contact with concrete or grout with a heavy coat of bituminous paint.

3. Metalwork to be embedded in concrete:

   a. Placed accurately and held in correct position while the concrete is placed or, if specified, recesses or blockouts shall be formed in the concrete.

   b. The surfaces of metalwork in contact with or embedded in concrete shall be thoroughly cleaned.

   c. If accepted, recesses may be neatly cored in the concrete after it has attained its design strength and the metalwork grouted in place.

B. Seat Angles, Supports, and Guides

1. Set seat angles for grating and supports for floor plates so that they are flush with the floor and also maintain the grating and floor plates flush with the floor.

C. Fabrication

1. Holes shall be punched 1/6-inch larger than the nominal size of the bolts, unless otherwise specified. Whenever needed, because of the thickness of the metal, holes shall be subpunched and reamed or shall be drilled.

2. Fabrication including cutting, drilling, punching, threading and tapping required for miscellaneous metal or adjacent work shall be performed prior to hot-dip galvanizing.

3.03 FABRICATIONS REQUIREMENTS

A. Steel members, fabrications and assemblies: Galvanized after fabrication in accordance with ASTM A123.

B. Steel items weighing 100 pounds or less: Hot-dip zinc coated.

C. Anchor bolts and nuts 5/8 inch and larger: Hot-dip zinc coated in accordance with ASTM A153.

D. Anchor bolts and nuts smaller than 5/8-inch and all other bolts, screws, nuts, washers and other minor steel fasteners: Mechanically zinc coated.

E. Fabrication practices for products to be galvanized: In accordance with applicable portions of ASTM A143, A384 and A385.

3.04 REPAIR OF DEFECTIVE GALVANIZED COATING

A. Where zinc coating has been damaged after installation, substrate surface shall be first cleaned and then repaired with zinc dust-zinc oxide coating in accordance with ASTM A780. Application shall be as recommended by the zinc dust-zinc oxide coating manufacturer. Coating shall consist of multiple coats to dry film thickness of eight mils.

B. Remove items not physically damaged, but which have insufficient or deteriorating zinc coatings, and items damaged in shipment or prior to installation from the project site for repair by the hot-dip zinc coating method.

3.05 CLEANING

A. After installation, damaged surfaces of shop primed metals shall be cleaned and touched up with the same material used for the shop coat.

*****END OF SECTION*****

SECTION 05501
ANCHOR BOLTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Anchor bolts complete with washers and nuts. Type 316 stainless steel, unless otherwise specified.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01300 – Contractor Submittals
2. Section 03301 – Cast-In-Place Concrete
3. Section 11002 – Equipment Mounting

1.03 SUBMITTALS

A. Comply with Section 01300 and include the following information:

1. Data indicating load capacities.
2. Chemical resistance.
3. Temperature limitations.
4. Installation instructions.
5. Evaluation Report for expansion type anchors as specified in Paragraph 3.04.
6. Design calculations in accordance with Paragraph 2.03.
7. Manufacturer's data and catalog numbers.

PART 2 PRODUCTS

2.01 GENERAL

A. Anchor bolt holes in equipment support frames shall not exceed the bolt diameters by more than 25 percent up to a limiting maximum oversizing of 1/8-inch. Minimum anchor bolt diameter shall be 1/2-inch. Anchor bolts for equipment mounting shall be provided as specified in Section 11002.

B. Tapered washers shall be provided where mating surface is not square with the nut.

C. Expansion or adhesive anchors set in holes drilled in the concrete after the concrete is placed will not be permitted in substitution for anchor bolts except where otherwise specified. Upset threads shall not be acceptable.

2.02 MATERIALS

A. Anchor bolt materials: as specified below unless otherwise specified.

B. All equipment anchor bolts and anchor bolts that are submerged or above the water surface shall be Type 316 stainless steel.

Material	Specification
Carbon steel bolts:	
Structures	ASTM A307, Grade A, hot-dip galvanized
Equipment	ASTM A449, Type 1, hot-dip galvanized
Stainless steel bolts, nuts, washers	ASTM A320 Type 316
Expansion anchors (concrete)	Simpson Strong-Bolt 2, Hilti Kwik Bolt TZ2, or equal
Expansion anchors (masonry)	Simpson Strong-Bolt 2, Hilti Kwik Bolt TZ2, or equal
Adhesive anchors (concrete)	Simpson SET-3G, Hilti HIT-RE 500 V3, or equal
Adhesive anchors (masonry)	Simpson SET-3G, Hilti HIT-HY 200 V3, or equal
Screw anchors (concrete)	Simpson Titen HD, Hilti KH-EZ, or equal

2.03 DESIGN

A. Design anchor bolts for equipment frames and foundations in accordance with the CBC for Seismic Design Category F and Site Class CD.

1. This force shall be considered acting at the center of gravity of the piece under consideration.

2. A basic wind speed of 105 miles per hour, Exposure Category C, shall be used if applicable.

B. Submit calculations and shop drawings with the equipment submittal in accordance with Paragraph 1.03 and Section 01300 for all anchorage details.

1. All calculations shall be prepared and signed by a civil or structural engineer currently registered in the State of California.

PART 3 EXECUTION

3.01 GENERAL

A. Fieldwork, including cutting and threading, shall not be permitted on galvanized items.

B. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings or isolators.

C. All stainless steel anchor bolts and fasteners shall be assembled with a stainless steel anti-seize compound such as molycote.

3.02 CAST-IN-PLACE ANCHOR BOLTS

A. Anchor bolts to be embedded in concrete and concrete unit masonry shall be placed accurately and held in correct position while the concrete or grout is placed or, if specified, recesses or blockouts shall be formed in the concrete and the metalwork shall be grouted in place in accordance with Section 03301.

B. The surfaces of metalwork in contact with concrete shall be thoroughly cleaned.

3.03 ADHESIVE ANCHOR BOLTS

A. Use shall be limited to locations where exposure, on an intermittent or continuous basis, to acid concentrations higher than ten percent, to chlorine gas, or to machine or diesel oils, is extremely unlikely.

B. Use shall be limited to applications where exposure to fire or exposure to concrete or rod temperature above 120 degrees F is extremely unlikely. Overhead applications (such as pipe supports) because of the above concerns, shall be disallowed.

C. Approval from Engineer for specific application and from supplier of equipment to be anchored, if applicable.

D. Anchor diameter and grade of steel shall be per contract documents or per equipment supplier specifications. Anchor shall be threaded or deformed full length of embedment and shall be free of rust, scale, grease, and oils.

E. Embedment depth shall be as specified on the Drawings.

F. All installation recommendations by the anchor system manufacturer shall be followed carefully, including maximum hole diameter.

G. Holes shall have rough surfaces, such as can be achieved using a rotary percussion drill.

H. Holes shall be blown clean with compressed air and be free of dust or standing water prior to installation.

I. Anchor shall be left undisturbed and unloaded for full adhesive curing period.

J. Concrete temperature (not air temperature) shall be compatible with curing requirements of adhesives per adhesive manufacturer. Anchors shall not be placed in concrete below 25ºF.

3.04 EXPANSION ANCHORS

A. Use of expansion type anchors shall be subject to Conditions B-C and F-H specified in Paragraph 3.03 and approval by the Engineer.

B. The Contractor shall supply the Engineer with the current evaluation report from the International Code Council – Evaluation Service for the particular brand of expansion anchors to be used.

3.05 SCREW ANCHORS

A. Use of screw anchors shall be subject to Conditions B-C and F-H specified in Paragraph 3.03 and approval by the Engineer.

B. The Contractor shall supply the Engineer with the current evaluation report from the International Code Council – Evaluation Service for the particular brand of screw anchors to be used.

*****END OF SECTION*****

SECTION 06100
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnishing all material, supplies, equipment, tools, transportation and facilities and performing all labor and services necessary for, required in connection with or properly incidental to furnishing and installing rough carpentry, as described in this section of the specifications, shown on the accompanying drawings, or reasonably implied therefrom.

B. Work Included

1. Furnishing and installing wood framing including furring, blocking and manufactured roof trusses.

2. Furnishing and installing plywood sheathing.

3. Furnishing and installing light gage metal connectors.

4. Furnishing and installing bolts, lag screws, washers and nails necessary for connecting wood framing and sheathing.

5. Installing miscellaneous metal connectors.

1.02 REFERENCED SECTION

A. The following Section is referenced in this Section

1. Section 01300 – Contractor Submittals

1.03 QUALITY ASSURANCE

A. Codes and Standards

1. Comply with all Federal, State and Local Codes and Safety Regulations.

2. In addition, comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

a. “California Building Code”, 2025 Edition (CBC).

b. National Forest Products Association, “National Design Specification for Wood Construction”.

c. American Plywood Association, “U.S. Product Standard PS 1”.

B. Grade Marks

1. All framing lumber shall be identified by the grade stamp of the West Coast Lumber Inspection Bureau.

2. All plywood shall be identified as to species, grade, and glue type and shall bear the identification grade mark of the American Plywood Association. All glued-laminated beams shall be stamped with an AITC product quality mark.

C. Certificates of Conformance

1. The Contractor shall provide AITC Certificate of Conformance for glued-laminated beams.

1.04 SUBMITTALS

A. General Requirements

1. Comply with Section 01300.

2. Construction of wood framing and sheathing shall not begin until Contractor has received submittals reviewed by Engineer governing all aspects of the intended work.

B. Shop Drawings

1. Submit shop drawings for the wood roof trusses to be installed as shown on the Contract Drawings, including layout, size of members, and connection details.

2. Submit calculations showing all stresses and deflections caused by dead, live, and lateral loads for review.

3. Also submit shop drawings for the wood trusses to the City Building Inspection Division. Make this submittal prior to requesting a framing inspection.

4. Drawings and calculations shall be signed by a Civil Engineer currently registered in the State of California.

C. Product Data

1. Provide manufacturer's catalog sheets including instructions for use and description of application on each of the eight gage metal connectors.

1.05 DELIVERY STORAGE AND HANDLING

A. Deliver and store lumber on sleepers and cover for protection. See general conditions for additional delivery and storage requirements.

1.06 SEQUENCING AND SCHEDULING

A. Obtain information and instructions from other trades and suppliers in ample time to schedule and coordinate the installation of items furnished by them to be installed prior to or in conjunction with rough carpentry so provisions for their work can be made without delaying the project.
1. Do any cutting and repairing made necessary by failure or delay in complying with these requirements, at no cost to City.

PART 2 PRODUCTS

2.01 FRAMING

A. Framing Lumber: Douglas Fir Coast Region, conforming to West Coast Lumber Inspection Bureau Standard Grading and Dressing Rule No. 17.

B. Dressed, S4S.

C. Sizes two inches or less in nominal thickness: Seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment.

1. 2x, 3x, 4x, plates, rafters, joists, beams, blocking, outriggers, and braces, No. 1 (1,000F-b), Para. 123-b, unless noted otherwise on the drawings.

2. 2x4, 3x4, 4x4, studs, furring and blocking, construction grade, (1,000F-b), Para. 122-b.

3. 2x fascias shall be California Redwood No. 2 conforming to the Standard Specifications for grades of California Redwood lumber of the Redwood Inspection Service, as amended to date.

2.02 PLYWOOD

A. Roof Plywood

1. Conform to U.S. Product Standard PS 1-09, American Plywood Association. Each sheet shall be stamped with the PS and/or APA grade mark.

2. Five-ply exposure 1 type, CDX, Group Identification Index 32/16, Species Group 2 or better.

B. Wall Plywood

1. Conform to U.S. Product Standard PS 1-09, American Plywood Association. Each sheet shall be stamped with the PS and/or APA grade mark.

2. Four-ply exterior type, select veneer siding, Group Identification Index 24/0, Species Group 2 or better.

2.03 ROOF TRUSSES

A. Design wood roof trusses to support the following minimum loads:

1. Top Chord Dead Load: 8 psf (+ self-weight)

2. Top Chord Live Load: 20 psf

3. Bottom Chord Dead Load: 6 psf (+ self-weight)

4. Bottom Chord Live Load: 10 psf (Non-concurrent with top chord LL)

5. Wind Loads: 23 psf (vertical), 8 psf (horizontal). Apply loads concurrently and in worst-case direction.

6. Seismic Loads: as shown on the Contract Drawings.

2.04 LIGHT GAGE METAL CONNECTIONS

A. Simpson Company Strong-Tie Connectors installed per manufacturer's recommendations.

2.05 NAILS

A. Bright common wire nails, galvanized for exterior work; conform to Federal Specification FF-N-105B.

2.06 BOLTS

A. Conform to ASTM A307, Manufacturer to American Standard bolt and nut dimensions with "Free Fit – Class 2" threads.

2.07 SCREWS

A. Lag screws shall be ASTM A307 fasteners. Lead holes shall be drilled as follows: for a depth equal to the unthreaded portion of the shank, the lead hole shall be the same diameter as the shank; for the threaded portion, the diameter shall be 40% to 70% of the diameter of the shank to the specified depth of penetration. Lead holes shall be lubricated prior to installation.

B. 'SD' and 'SDS' screws by Simpson Strong-Tie. Screw size: As shown on the drawings.

2.08 WEATHER-RESISTIVE BARRIER

A. Tyvek HomeWrap by Dupont or approved equal. Install per manufacturer's recommendations.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Conform all framing operations to the requirements of the CBC.

B. Set all framing members level and true.

1. Do not notch, bore or cut members for pipes, ducts, conduits, or other reasons.

2. Make all bearings full and all blocking solid unless otherwise indicated on the drawings.

3. Finish all bearing surfaces on which structural members are to rest so as to give sure and even support.

4. Where framing members slope, cut or notch the ends as required to give uniform bearing surface.

C. Place solid blocking at ends of spans and over supports. Cross-Bridging or solid blocking in spans shall not exceed 8 feet or less if shown on structural drawings.

D. Remove all wood, including form lumber, scrap lumber, shavings and sawdust in contact with ground. Leave no wood buried in any fill or backfill.

E. Provide framing of openings through roof for roof vents. Provide 2x4 blocking around openings; no roof framing or trusses shall be cut

F. Center joints of plywood accurately over supports and nail into solid wood. Protect all plywood from moisture by use of all required waterproof covering until the plywood has in turn been covered by the next succeeding component or finish.

G. Remove lumber not grade stamped and lumber of improper grade from the job site, and immediately replace with grade stamped lumber of the proper grade.

H. Other Materials

1. All other lumber materials, not specifically described but required for the proper completion of the work, shall be new, first quality of their respective kinds and subject to the approval of the Engineer.

3.02 EXAMINATION OF SURFACE CONDITIONS

A. Prior to the work of this section, carefully inspect the installed work of other trades and verify that all such work has been so installed as to allow rough carpentry to produce surfaces to the required design.

3.03 WORKMANSHIP

A. All rough carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the drawings and with all pertinent regulations.

B. Cut all wood members to fit. Do not shim.

C. Erect all members straight, plumb and accurately located.

D. Carefully select all structural members.

1. Select individual pieces so that knots and obvious defects will not interfere with making proper connections.

2. Lumber may be rejected by the Engineer, whether or not it has been installed, for excessive warp, twist, bow, or crook, or for mildew, fungus or mold as well as for improper cutting or fitting.

3. Cut out and discard all defects which render a piece unable to serve its intended function.

3.04 ERECTION

A. Erect the wood framing true to line and grade.

B. Temporary Bracing and Shoring

1. Temporarily brace the wood framing in both directions and maintain walls, joists, beams, and other framing members plumb until the final connections of the framework and construction of diaphragms are complete.

2. Provide such temporary shoring and additional bracing of wood framing as required to adequately and safely support any or all loads imposed upon the structure during construction.

3.05 CLEAN UP

A. In addition to the requirements of General Conditions, keep premises clean and clear of debris caused from this portion of the work.

3.06 FIELD QUALITY CONTROL

A. Framing and Plywood Nailing Inspection

1. City's agent will inspect the completed framing, the plywood nailing, and connector installation to ensure that rough carpentry work is in accordance with the Contract Documents.

*****END OF SECTION*****

SECTION 08110
METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Steel doors and steel door frames.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section
   1. Section 01300 – Contractor Submittals
   2. Section 08710 – Finish Hardware

1.03 QUALITY ASSURANCE

A. Certificates of Compliance
   1. Provide manufacturer's certificates attesting that doors, frames, and accessories meet the specified requirements.
   2. Include the grade and model number of each door.

1.04 SUBMITTALS

A. Comply with Section 01300 and include the following items:
   1. Shop drawings containing the following information:
      a. Elevations of each door type
      b. Size of doors and frames
      c. Metal gages
      d. Details of door and frame construction
      e. Methods of anchorage
      f. Provisions for and location of hardware
      g. Details of installation
      h. Schedule showing location of each door, frame, and swing of door
   2. Detail specifications and instructions for installation, adjustments, cleaning, and maintenance.

1.05 DELIVERY AND STORAGE

A. Doors, frames, and accessories shall be delivered undamaged and with protective wrappings or packaging.

B. Doors and frames shall be stored on platforms under cover in clean, dry, ventilated, and accessible locations, with 1/4-inch airspace between doors.

C. Remove damp or wet packaging immediately wipe dry affected surfaces.

D. Replace damaged materials with new.

PART 2 PRODUCTS

2.01 STEEL DOORS

A. General

1. 1-3/4 inches thick, 16 gage, and conform to ANSI 100 unless otherwise specified.

2. Composite construction prepared to receive hardware specified in Section 08710.

B. The internal construction of the doors shall conform to one of the following methods, in accordance with the manufacturer's standard practice:

1. Vertical and/or horizontal steel, rigidly formed members shall have sound deadening applied to the inside to eliminate metallic sound incident to normal door operation.

2. Honeycomb, polyurethane, or solid structural mineral core bonded to the inside of both faces of the door.

3. Other methods of reinforcing may be used, provided they achieve the same degree of flatness, rigidity, sound deadening and strength as the methods listed above.

2.02 STANDARD STEEL FRAMES

A. General

1. Steel frames shall conform to ANSI 100, shall be of the sizes and shapes specified, and unless otherwise specified, shall be fully welded unit type frames. Steel frames shall be provided for doors, sidelites, and transoms.

B. Welded Frames

1. Frame faces shall be continuously welded at corner joints.

2. Stops and rabbets shall be mechanically interlocked or continuously welded.

3. All welds shall be ground smooth.

4. Frames shall be mortised and reinforced with heavy gage reinforcements for hinges and lock strikes.

5. Steel spreaders to ensure proper alignment of the frame shall be used and shall remain in place until the adjacent wall construction is complete.

C. Anchors

1. General

   a. Provide steel anchors to secure the frame to adjoining construction.

   b. Anchors shall be zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage.

2. Wall Anchors

   a. Provide a minimum of four anchors for each jamb.

   b. Locate anchors opposite top and bottom hinges and at equal spaces in between.

      1) Anchors for masonry work shall be corrugated or perforated steel straps or 3/16-inch diameter steel wire, adjustable or T-shaped.

      2) Anchors for stud partitions shall be welded or otherwise securely fastened to backs of frames.

         a) Anchors shall be designed and fastened to wood studs with nails, to closed steel studs with sheet metal screws, and to open steel studs by wiring or welding.

      3) Frames shall be secured to previously placed concrete or masonry with expansion bolts in accordance with SDI 111-F.

      4) Anchors for solid plaster partitions shall be secured solidly to back of frames and tied into the lath.

         a) Adjustable top strut anchors shall be provided on each side of frame for fastening to structural members or ceiling construction above.

         b) Size and type of strut anchors shall be as recommended by the frame manufacturer.

3. Floor Anchors

   a. Provide at bottom of each jamb member, drilled for 3/8-inch anchor bolts.

   b. Where floor fill occurs, bottom of frames shall be terminated at the indicated finished floor levels and supported by adjustable extension clips resting on and anchored to the structural slabs.

2.03 INSULATED ROLL-UP DOORS

A. General

1. Doors shall be spring loaded, hand chain operated, coiling doors with steel hood and hand chain lock.

2. Coiling doors shall be Atlas Door, Cornell Iron Works, or approved equal.

3. Provide doors, guides, and accessories from one manufacturer.

4. Provide locking slide bolts on door interior.

B. Material

1. Galvanized steel interlocked curtain with baked-on epoxy modified polyester finish. Color to be selected by the Owner.

2. Design door and structural steel angles and guides for wind load per ASCE 7-22. A basic wind speed of 105 miles per hour and Exposure Category C shall be used.

3. Spring counter balance housed in a steel pipe with 24 gauge galvanized steel hood.

C. Insulated Door Slat Material Requirements

1. Flame Spread Index of zero and a Smoke Developed Index of 10 as tested per ASTM E84.

2. Minimum Sound Transmission Class (STC) rating of 26 as tested per ASTM E90.

3. Minimum R-value of 8.0 (U-factor of 0.125) as calculated using the ASHRAE Handbook of Fundamentals.

4. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero.

D. Weather Stripping

1. Bottom Bar: Replaceable, bulb-style, compressible EDPM gasket extending into guides.

2. Hood: Neorenet/rayon baffle to impede air flow above coil.

2.04 ASTRAGALS

A. Pairs of exterior steel doors which will not have aluminum astragals or removable mullions shall have overlapping steel astragals provided with the doors.

2.05 WEATHER STRIPPING

A. As specified in Section 08710.

2.06 HARDWARE PREPARATION

A. Doors and frames to receive finish hardware shall be reinforced, drilled, and tapped for hardware in accordance with the applicable requirements of SDI 107 and ANSI A115.1 and A115.4.

B. Drilling and tapping for surface-applied hardware shall be done in the field, but additional reinforcing for surface-applied hardware shall be built into the door at the factory.

C. Hardware shall be located in accordance with the requirements of ANSI 100, as applicable.

2.07 FINISHES

A. Hot-Dip Zinc-Coated and Factory-Primed Finish

1. Doors and frames shall be fabricated from galvanized steel, ASTM A653, Coating Designation G60 or A60 (galvannealed).

2. Damaged zinc-coated surfaces shall be repaired by the application of zinc dust paint conforming to DOD-P-21035.

3. Zinc-coated surfaces shall be phosphate treated and factory primed as specified in ANSI 100.

2.08 FABRICATION AND WORKMANSHIP

A. Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle.

B. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment.

C. Exposed welded and soldered joints shall be ground smooth.

D. Door frame sections shall be designed for use with the wall construction specified.

E. Corner joints shall be well formed and in true alignment.

F. Conceal fastenings where practicable.

G. On wraparound frames for masonry partitions, a throat opening shall be provided 1/8 inch larger than the actual masonry thickness.

H. Frames in exposed masonry walls or partitions shall be designed to allow sufficient space between the inside back of trim and masonry to receive caulking compound.

2.09 PRODUCT DATA

A. Certificates of compliance specified in paragraph 1.03 shall be provided as product data in accordance with Section 01300.

PART 3 EXECUTION

3.01 INSTALLATION

A. Frames

1. Set frames in accordance with SDI 105, and plumbed, aligned, and braced securely until permanent anchors are set.

2. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners.

3. Wall anchors shall be built in or secured to adjoining construction.

4. Anchor frames to the struts or bracing where frames require ceiling struts or overhead bracing.

5. Backfill frames with mortar.

6. When an additive is provided in the mortar, inside of frames shall be coated with corrosion-inhibiting bituminous material.

7. For frames to be installed in exterior walls and to be filled with mortar or grout, the stops shall be filled with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.

B. Doors

1. Hang doors in accordance with clearances specified in ANSI 100.

2. Clean and adjust hardware after erection and glazing.

3.02 PROTECTION

A. Doors and frames shall be protected from damage, and damaged doors and frames repaired prior to completion and acceptance of the project or replaced with new, as directed.

B. Rusted frames shall be wire brushed until all rust is removed, cleaned thoroughly, and applied with an all-over coat of rust-inhibitive paint of the same type used for shop coat.

3.03 CLEANING

A. Thoroughly clean exposed surfaces of doors and frames upon completion.

B. Mastic smears and other unsightly marks shall be removed.

*****END OF SECTION*****

SECTION 08310
ACCESS DOORS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Access doors for pump station valve vault and wet well.

1.02 SUBMITTALS

A. Product Data.

B. Shop Drawings: Show the following:
   1. Access door attachment to structure in each typical condition.
   2. Locations of access doors.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Identify type and size of each door in way not to damage finish prior to delivery.

B. Deliver products only after proper facilities are available.

C. Deliver and store packaged products in original containers with seals unbroken and labels intact until time of use.

D. Handle carefully to prevent damage and store on clean concrete surface or raised platform in safe, dry area. Do not dump onto ground.

E. Protect access doors during shipment and storage to prevent warping, bending, and corrosion.

PART 2 PRODUCTS

2.01 FLOOR HATCHES

A. **H20 Unintended Traffic Rated Hatches:** Hatches rated for incidental H20 Traffic loading.
   1. H20 rated hatches shall be designed for 16,000 lb. point loads + 30% impact.
   2. Hatches shall be manufactured by EJ, USF Fabrication, or approved equal.
   3. Door leaf shall be anodized aluminum ¼” diamond pattern.
   4. Maximum deflection under the specified loading shall be 1/150th of the span.
   5. Channel frame shall be extruded aluminum, to match the hatch material, cast into the new concrete structure.
   6. **Hinges:** Heavy forged aluminum hinges, each having a minimum 1/4" (6.3 mm) diameter Type 316 stainless steel pin, shall be provided, and shall pivot so the cover does not protrude into the channel frame. Shall be specifically designed for horizontal installation and shall be through bolted to the cover with tamper-proof Type 316 stainless steel lock bolts and shall be through bolted to the frame with Type 316 stainless steel bolts and locknuts.

7. **Drain Coupling:** Provide a 1-1/2" (38mm) drain coupling located in the right front corner of the channel frame (away from the hinges). Frame shall drain to the wet well or vault.
8. **Lift Assist:** Hatch shall be supplied with heavy duty stainless steel pneu-spring for smooth, easy, and controlled door operation throughout the entire arc of opening and closing. Spring shall consist of a minimum ½" stainless steel shaft which slides into a minimum 1" stainless steel tube. Spring shall be charge with an inert gas (nitrogen). Mechanical, torsion, or coil type springs shall not be accepted as equal.
9. Hatch shall be equipped with an aluminum lift handle. Handle shall be flush with the top of the ¼" diamond plate.
10. Hatch shall be supplied with a 316 stainless steel slam lock, with key way projected by a threaded plug. Plug shall be flush with the top of the ¼" diamond plate.
11. Cover shall be equipped with a hold open arm which automatically locks the cover in the open position. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
12. Hardware shall be anticorrosion throughout.

B. Clear open spaces indicated on the drawings shall be provided for all hatches.

C. **Fall Through Protection:** Hatches shall have integral fall through protection.
1. The Safety Grate shall be made of 6061-T6 aluminum and designed per the *Specifications for Aluminum Structures* by the Aluminum Association, Inc. 5th Edition, Dec. 1986 for "Bridge Type Structures".
2. Design shall combine covering of the opening, fall through protection per OSHA Standard 1910.23 and controlled confine space entry per OSHA Standard 1910.146.
3. The grating shall be designed to withstand a minimum live load of 300 pounds per square foot using 17,300 psi as the design stress for the aluminum. Deflection shall not exceed 1/150" of the span.
4. Grate openings shall allow for visual inspection, limited maintenance and float adjustments while the safety grate fall through protection is left in place. Each grate shall be provided with a permanent hinging system, which will lock the grate in the 90° position once opened. Grates in the open position create a visual barrier around the opening, alerting passing pedestrians.
5. Each aluminum safety grate shall be coated with a safety orange color, promoting visual awareness of the hazard, by a powder coat system, applied by the electrostatic spray process. The coating is a thermosetting powder coat finish with a minimum thickness of 2 mils-4 mils and shall be baked at 350°-375°F until cured.

D. Manufacturer shall guarantee against defects in hatch material or workmanship for a period of ten years.

E. Contractor shall ensure that the fall protection grates and mounting hardware will not interfere with the placement of the pump guiderails or removal of the pumps from the pump station wet well. Access hatch hinge and mounting brackets shall not be placed above, or within 2 inches of the pump guide rails. The Contractor shall ensure that the pumps can be easily removed and replaced.

2.02 FINISHES

A. Floor Access Doors:
   1. Aluminum: Anodized finish, diamond plate for top wearing surface.
   2. Aluminum in Contact with Dissimilar Metals and Concrete: Manufacturer's standard bituminous coating.
   3. Steel: Manufacturer's standard red oxide primer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine construction to receive access door and verify correctness of dimensions and other supporting or adjoining conditions.

B. Contractor shall replace any defective or damaged equipment at no additional cost to the City.

3.02 PREPARATION

A. Coordinate details with other work supporting, adjoining, or requiring access doors.

B. Verify dimensions, profiles, and fire-resistive rating for each opening.

C. Verify that location will serve portion of work to which access is required. Where proposed functional location conflicts with other work, notify the Engineer before installation.

3.03 INSTALLATION

A. Install access doors in accordance with manufacturer's instructions.

B. Ensure correct types and adequate sizes at proper locations.

C. Securely attach frames to supporting work and ensure doors, frames and hardware operate smoothly and are free from warp, twist, and distortion.

D. See 2.01-E above.

E. Access hatches shall be cast into precast concrete structures, see Section 03400.

3.04 ADJUSTING

A. Adjust doors, frames, and hardware to operate smoothly, freely, and properly, without binding.

3.05 CLEANING

A. Thoroughly clean surfaces of grease, oil, or other impurities, touch-up abraded prime coat.

END OF SECTION

SECTION 08710
FINISH HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish and install all necessary architectural finish hardware to complete the Project. Furnish templates for door and frame preparation.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section.

1. Section 01300 – Contractor Submittals

1.03 REFERENCES

A. DHI: Door and Hardware Institute

B. NAAMM: National Association of Architectural Metal Manufacturers

C. NFPA 101: Life Safety Code

1.04 SUBMITTALS

A. Comply with Section 01300.

B. Provide product data on specified hardware. Indicate locations and mounting heights of each type of hardware.

C. Submit manufacturer's parts lists, templates, and installation instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver hardware with items packed separately, complete and ready for installation with necessary fittings, trim, fasteners, and accessories. Mark packages clearly for identification in accordance with Hardware Schedule. Deliver hardware so that work may progress without delay or interruption.

B. Upon delivery of the finish hardware to the job site, the Contractor shall be responsible for all material. Protect hardware from damage at all times prior to and after its installation.

1.06 COORDINATION

A. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.

B. Hardware shall be manufactured to template. Provide templates and, if necessary, the physical hardware to fabricator of doors and frames in ample time to facilitate the work.

1.07 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to each different or special hardware component.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Equivalent products by the other named manufacturers in the list below and within the hardware group listings are also acceptable except for locksets and cylinders.

1. Butts and Hinges: Ives, McKinney, Stanley.
2. Locksets and Latchsets: Schlage.
3. Cylinders: Schlage.
4. Panic Hardware: Von Duprin, Sargent.
5. Slide Bolts and Foot Bolts: McKinney, Stanley.
6. Weather Stripping, Thresholds and Door Bottom Sweeps: Pemko.
7. Stops/Holders: Rockwood, Quality.
8. Closers: LCN Series 4010 (pull side) or Series 4110 (push side) as required.
9. Lock Guards: Ives.
10. Silencers: Glynn-Johnson.

2.02 HINGES

A. Provide butt hinges of the five-knuckle, full mortise type, having two or four ball or oilite bearings as noted, stainless steel pins, and complying with ANSI A156.1.

B. Provide all out swinging doors to the exterior with butt hinges of the stainless steel or non-ferrous material, with non-removable pins of the set screw type. Ives 5BB1HW NRP, or equal.

C. Hinge Size:

1. Doors 1-3/4” in thickness to 37” in width shall be provided with 4-1/2” x 4-1/2” butt hinges provided with at least two ball or oilite bearings; wider and heavier doors with 5” x 5” extra heavy butt hinges provided with four ball or oilite bearings.
2. Butt hinges for doors thicker than those noted above or with unusual trim conditions which would interfere with the full opening of the door shall be provided with hinges of sufficient size to support the door weight adequately, and of sufficient width to clear adjacent trim.

D. Number of Hinges per Door Leaf:

1. Provide two hinges per door leaf for doors up to 60” high; three hinges per leaf for doors up to 90” high; one additional butt hinge for each additional 30” in height, or fraction thereof.

2.03 LATCHSETS AND CYLINDERS

A. Design: Provide Schlage Model ND94RD at exterior doors, Schlage Model ND10S at interior passage doors, and Schlage Model ND40S at interior restroom doors. All levers shall be Sparta style.

B. Provide Large Format Interchangeable Cores.

C. Strikes: Provide each lockset, latchset, or deadlock with a box strike. Provide standard type strikes with extended lips where required to protect adjacent trim from being marred by latch bolt. Verify cutout types provided in metal frames.

D. Deadbolts: Provide keyed deadbolts, double cylinder, at each exterior door, minimum 1-1/2-inch throw, Schlage B562P.

E. Panic Hardware: Exit devices shall be UL listed panic hardware with heavy-duty push pads as manufactured by Von Duprin, 98/99 Series.

2.04 DOOR BOTTOM SWEEPS, THRESHOLDS AND WEATHER STRIPPING

A. All exterior doors shall be fitted with door bottom sweep, threshold set in sealant, and weather stripping.

B. Door bottoms shall be designed to seal space below door and prevent entry of wasps and other pests.

2.05 STOPS/HOLDERS

A. Provide each door leaf with a door stop and latch holder mounted on outside concrete surface with concrete expansion anchors. Provide stops of proper size and height to prevent doors from hitting walls or fixed objects. Omit door stops and holders on fire-rated doors.

2.06 LOCK GUARDS

A. Provide lock guards on all exterior doors. Construct of stainless steel, with 626 brushed chrome finish, with no exposed fasteners on face of unit.

2.07 SILENCERS

A. Provide each door with a press-metal frame with rubber silencers. Provide each single door with three silencers, each pair of doors with four.

2.08 KEYS AND KEYING

A. Provide a construction keying system for Contractor’s and/or City’s use during construction. Contractor shall retain construction keys and inserts and turn over to the City upon completion of construction.

B. Coordinate the changeover to permanent keyways with the City at completion of station commissioning.

2.09 FINISH

A. All hardware shall have brushed chrome finish (626) for interior and exterior installations typically, unless noted otherwise.

1. Provide over steel base metal (BHMA 626), typical, where required by code.

2.10 HARDWARE SCHEDULE

A. Door hardware sets shall conform to the following schedule. Numbers and references in hardware schedule establish quality to be furnished and installed. Suitable types having similar quality and operation as finish hardware specified may be furnished when approved by the City.

1. Door Hardware Type A: Each door shall have:

3	Hinges
1	Lockset
1	Strike
1	Door Stop/Holder
1	Closer
1	Threshold
1 set	Weather Stripping
1	Door Bottom Sweep
1 set	Silencers
1	Deadbolt

2. Door Hardware Type B: Each pair of doors shall have:

6	Hinges
1	Lockset
1	Strike
2	Door Stops/Holders
2	Closers
2	Thresholds
2 sets	Weather Stripping
2	Door Bottom Sweeps
2 sets	Silencers
1	Deadbolt
1 set	Slide Bolts
1 set	Foot Bolts
1	Astragal

3. Door Hardware Type C: Each door shall have:

3	Hinges
1	Latchset

1	Strike
1	Door Stop/Holder
1 set	Silencers

PART 3 EXECUTION

3.01 PACKING AND MARKING

A. Package all items of hardware in its individual container marked with the manufacturer's name, type number, and name of item.

B. Each item shall be complete with necessary fastenings, wrenches, spanners, etc., installation instructions, and templates, indelibly, legibly, and carefully marked with an item number corresponding to the room name and hardware group number as indicated on the Plans and hardware schedule provided by supplier.

3.02 EXAMINATION

A. Inspect all doors, frames, and other surfaces to receive items or finish hardware and report all defects which might adversely affect the installation or function of the hardware. Commencement of work will imply acceptance of surfaces as being satisfactory and adequate.

B. Coordinate and be responsible for the proper fabrication of all work or material to receive hardware. No extra cost will be allowed because of changes or corrections necessary to facilitate the proper installation and operation of the hardware.

3.03 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of ANSI/NFPA 80, and DHI. Use the templates provided by the hardware item manufacturer.

B. Conform to handicap requirements for positioning requirements for the handicapped.

C. Provide architectural finish hardware with all necessary (plus prudent spares) screws, bolts, or other devices or fastenings of suitable size and type to secure the hardware in position for heavy use and long life, harmonizing as to material and finish. Secure all hardware to concrete with expansion sleeve anchors as indicated by best current practice. All screws normally exposed to view, including all screws for butt hinges, shall have "Phillips" heads, finished to match hardware.

D. Keying

1. Remove construction plugs and install permanent cylinders as required.
2. The master key chart will be provided by the City.
3. The Contractor is responsible for all keying and permanent keys.
4. Provide construction cylinders and keys as required during construction and rekey permanent locksets as directed by City.

*****END OF SECTION*****

SECTION 09290
GYPSUM BOARD

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gypsum wallboard.

1.02 REFERENCED SECTION

A. The following Section is referenced in this Section

1. Section 01300 – Contractor Submittals

1.03 SUBMITTALS

A. Comply with Section 01300.

B. Provide manufacturer's complete product data sheets.

PART 2 PRODUCTS

2.01 GYPSUM WALLBOARD

A. Gypsum wallboard shall be tapered edge sheets, fire resistant with moisture and mold resistance, conforming to ASTM C36, of 5/8-inch thickness unless otherwise shown.

1. Gypsum wallboard shall be USG Sheetrock Brand Mold Tough Panels Firecode X or approved equal.

2. The tape, adhesive and reinforcement shall be standard products recommended by the manufacturer of the gypsum wallboard used in the work.

B. Framing components shall conform to ASTM A653, Grade A, G60 galvanized roll formed channel tracks "C" type studs, flanges minimum 1-5/8" wide with rigid attachment to structure.

1. Wire ties to be 18 ga. soft annealed, galvanized. Provide gauge of studs to meet horizontal loads.

PART 3 EXECUTION

3.01 INSTALLATION

A. Wallboard

1. Except as may be modified by these specifications and by applicable laws and ordinances at the place of building, all work shall be installed to conform to the requirements of ASTM C840.
2. Space fasteners 12 inches on center in the field and eight inches on center staggered along abutting edges and at 12 inches on center for ceilings.
3. Place fasteners no closer than 3/8 inch from ends or edges of wallboard.
4. Apply a three-inch wide uniform coating of adhesive centered over the joint.
5. Center tape over the joint and embed into the adhesive.
6. When dry, sand the joint smooth.
7. Apply two coats of adhesive over the tape, extending each coat slightly beyond the preceding one.
8. Allow each coat to dry and sand smooth.
9. Treat nail dimples in a like manner.

*****END OF SECTION*****

SECTION 09800
COATING SYSTEMS

PART 1 GENERAL

1.01 DOCUMENTS

The General Conditions and all other Contract Documents for this project are complementary and applicable to this section of the Specifications.

1.02 SCOPE OF WORK

A. **Work Included**

Paint, protective coatings, and finishes for pipes, exposed metal, equipment, floors, walls, and ceilings.

B. **Related Work Specified Elsewhere**
1. Ductile Iron Pipe: Section 02720.
2. Submersible Pumps: Section 11312.
3. Valves: Section 15110.

1.03 REFERENCE STANDARDS

Standards listed below are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of listed standards, the requirements of this section shall prevail. Where two or more standards are at variance, the most restrictive requirement shall apply.

A. AWWA C105 *Polyethylene Encasement for Ductile-Iron Pipe Systems*

B. AWWA C210 *Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines*

B. AWWA C213 *Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines*

C. SSPC PA2 *Measurement of Dry Paint Thickness with Magnetic Gauges*

D. SSPC SP1 *Solvent Cleaning*

E. SSPC SP5 *White Metal Blast Cleaning*

F. SSPC SP6 *Commercial Blast Cleaning*

G. SSPC SP7 *Brush-off Blast Cleaning*

H. SSPC SP8 *Pickling*

I. SSPC SP10 *Near-white Blast Cleaning*

1.04 SUBMITTALS

A. Data Sheets:
   a. Paint System Data Sheet
   b. Technical Data Sheets:
      i. Solids Content
      ii. Ingredient Analysis
      iii. VOC Content
      iv. Chemical Resistance
      v. Temperature Resistance
      vi. Typical Exposures and limitations
   c. Manufacturer Instructions:
      i. Special requirements for transportation and storage
      ii. Mixing Instructions
      iii. Shelf Life
      iv. Pot life of materials
      v. Precautions for application free of defects.
      vi. Surface preparation.
      vii. Method of application.
      viii. Recommended number of coats.
      ix. Recommended thickness of each coat.
      x. Recommended total thickness.
      xi. Drying time for each coat, including prime coat.
      xii. Required prime coat.
      xiii. Compatible and non-compatible prime coats.
      xiv. Recommended thinners, when recommended.
      xv. Limits of ambient conditions during and after application.
      xvi. Time allowed between coats.
      xvii. Required protection from sun, wind, and other conditions.
      xviii. Touch-up requirements and limitations.
   d. Paint Colors available
   e. Maintenance and repair instructions
   f. Regulatory Requirements: VOC compound limitations, coatings containing lead compounds, abrasive, abrasive blast cleaning techniques, and disposal

B. Samples: For building floor, walls, and ceiling applications
   a. Unless otherwise specified, before painting work is started, prepare minimum 8- by 10-inch samples with type of paint and application specified on similar substrate to which paint is to be applied.
   b. Furnish additional samples as required until colors, finishes, and textures are approved.
   c. Retain approved samples to be used as the quality standard for final finishes.

C. Quality Control:
   a. Applicator's Experience: List of references substantiating the requirement as specified.

1.05 PRODUCT, DELIVERY STORAGE, AND HANDLING

A. Deliver paint to project site in unopened containers that plainly show at time of use, the designated name, date of manufacture, color, and name of manufacturer
B. Store paints in a suitable protected area that is heated or cooled as required to maintain temperatures within the range recommended by the paint manufacturer.
C. Shipping:
    a. Where pre-coated items are to be shipped to the jobsite, protect coating from damage. Batten coated items to prevent abrasion
    b. Use nonmetallic or padded slings and straps in handling
    c. Items will be rejected for excessive damage

PART 2 PRODUCTS

2.01 GENERAL

A. Primer, intermediate, and finish coats shall be of same manufacturer

B. Products shall meet federal, state, and local requirements limiting the emission of volatile organic compounds. Specific information may be secured through the office of the Bay Area Air Quality Management District (BAAQMD).

C. Coatings in contact with potable water shall be certified by the National Sanitation Foundation in accordance with ANSI/NSF Standard 61.

D. Protective interior coatings for valves and hydrants shall conform to the requirements of American Water Works Association coating standard C550.

E. Coating systems also apply to recoating of existing surfaces if specified to be recoated on the Drawings and/or in this specification.

F. Formulate with colorants free of lead, lead compounds, or other materials which might be affected by presence of hydrogen sulfide or other gases at the project site.

G. Liquid-epoxy coating for the interior and exterior of steel water pipelines shall conform to the requirements of American Water Works Association coating standard C210.

2.02 PIPE AND FITTINGS COATING SYSTEMS

A. **Pipe and Fittings:** Reference section 02720.

2.03 FERROUS METAL COATINGS FOR NON-IMMERSION SERVICE

A. **Ferrous Metals for Non-Immersion Service:** Exposed metals including steel bollards, steel air ducting, associated appurtenances, and miscellaneous ferrous metal not called out elsewhere shall be lined and/or coated with the following system, following manufacturer's recommendations:
    1. **Surface Preparation:** Sandblast to SSPC 6 (commercial blast cleaning).
    2. **Prime Coat:** Blasted surfaces shall be coated with a 2.5 to 3.5 mil d.f.t. coat of zinc-rich aromatic urethane, such as Tnemec Series 90-97 Tneme-Zinc, or approved equal.
    3. **Intermediate Coat:** Primed surfaces shall be coated with a 4 to 6 mil d.f.t. coat of polyamidoamine epoxy, such as Tnemec Series N69 High-Build Epoxoline II, or approved equal.

4. **Top Coat:** A 2 to 3 mil d.f.t. coat of semi-gloss aliphatic acrylic polyurethane such as Tnemec Series 73 Endura-Shield shall be applied.

B. All prime and intermediate coats shall be compatible. City shall select finished top coat color from manufacturer's standard colors. Prime and intermediate coat colors shall be compatible as recommended by the manufacturer.

2.04 BUILDING COATINGS

A. **Floor:** Sikagard 664 or approved equal, with silica sand anti slip aggregate applied at one pound per 1 gallon of topcoat or as recommended by the manufacturer.

B. **Masonry Walls:** 1 Coat of Loxon Acrylic Block Surfacer and 2 Coats of SuperPaint Exterior Latex or H&C COLORTOP water-based solid color concrete stain applied at 100-150 sq ft/gal or approved equal.

C. **Gypsum Ceiling and Walls:** 1 Coat of PVA Primer and 2 Coats of SuperPaint Exterior Latex or 1 Coat ProMar 200 Zero V.O.C. Primer and 1 Coat of Pro Industrial DTM Acrylic coating or approved equal.

D. **Doors and Gutters**: 2 Coats of Superpaint Exterior Latex or approved Equal.

E. Colors and Shein:
1. **Floor:** Grey.
2. **Walls and Ceiling:** Tan Eg-Shel or Flat
3. **Trim and Doors:** Brown Flat or Semi-Gloss

PART 3 EXECUTION

3.01 GENERAL

A. All materials shall be delivered to the site in the manufacturer's sealed containers. Each container shall be labeled by the manufacturer, and the label shall be intact upon delivery. Labels shall give the manufacturer's name, brand, type of paint, batch number, color of paint and instructions for reducing. Materials shall not be delivered until the Engineer's written approval has been received.

B. Each coat of paint shall be of the consistency as supplied by the manufacturer, or thinned if necessary, and applied in accordance with the manufacturer's written instructions. Work shall be free from "runs", "bridges", "shiners", or other imperfections due to faulty intervals. Care shall be taken to obtain a uniform, unbroken coating over all bolts, threads, nuts, welds, edges, and corners. Further, all weld splatter shall be removed and all welds neutralized with thinner.

C. Care shall be exercised not to damage adjacent work during sandblasting operations. Stainless steel need not be sandblasted. Blasted surfaces shall be coated within four hours of being sandblasted. All dust shall be removed from the surfaces prior to painting.

3.02 ENVIRONMENTAL CONDITIONS

A. Paint shall not be applied in extreme heat, nor in dust or smoke laden air, nor in damp or humid weather, nor when the air temperature and/or the temperature of the surface to be painted is below 50° F or within 10° F of the dew point. The Contractor shall provide temporary heat as required to maintain 50° F temperature and 10° F above the dew point day and night until painting is complete and the paint is dry.

B. Paint shall not be applied to surfaces hotter than 120° F.

3.03 GENERAL SURFACE PREPARATION

A. All surfaces to be coated or painted shall be in the specified condition to receive the material before any coating or painting is performed. No more sandblasting or surface preparation than can be coated or painted in a normal working day will be permitted. All sharp edges, burrs, and weld spatter shall be removed.
   1. **White Metal Blast Cleaning (SSPC SP5):** Removal of all visible rust, mill scale, paint, and foreign matter by blast cleaning by wheel or nozzle using sand, grit, or shot.
   2. **Near-White Blast Cleaning (SSPC SP10):** Blast cleaning nearly to White Metal Cleanliness, until at least 95% of each element of surface area is free of all visible residues.
   3. **Commercial Blast (SSPC SP6):** Blast cleaning until at least 67% of each element of surface area is free of all visible residues.
   4. **Brush-off Blast Cleaning (SSPC SP7):** Blast cleaning of all except tightly adhering residues of mill scale, rust and coatings, exposing numerous evenly distributed flecks of underlying metal.
   5. **Solvent Cleaning (SSPC SP1):** Removal of all grease, oil, and dirt.

3.04 INSPECTION AND GUARANTEE

A. During and after final application of protective coatings, all metal surfaces shall be checked mechanically with an Elcometer, Mikrotest or other approved dry film thickness gage to insure that the specified dry film thickness has been attained.

B. Coating testing and repair of damages, flawed areas, holidays, or mishaps shall conform to applicable AWWA standards.

C. The Contractor shall guarantee all coating work for a period of one year following the date of final acceptance by the City and is hereby notified that the City will inspect the project prior to the expiration of the guarantee period. The Contractor will be notified of the eleventh month inspection by certified letter and asked to attend. Defects in workmanship and materials shall be repaired by the Contractor at no cost to the City.

3.05 PAINT SCHEDULE

A. **Items for Coating:** Items shall be coated as specified herein.

B. **Factory Painted Equipment:** Except as otherwise noted in the specifications, the following shall receive final finish coats at the factory. Paint shall conform to these specifications for appropriate service. Any areas damaged during shipment, installation, or initial testing shall be refinished as the original at no extra cost to the City. Factory painted items shall be of a color approved by the City.

- Pump Station Control Panels
- Pump Termination Cabinet

C. **Items Field Painted:** Following shall be painted in the Field

- Ground level floors
- Above ground level walls and foundation
- Ceilings
- Soffit
- Exposed conduits and piping
- Doors
- Gutters and downspouts

C. **Items Not Painted:** Unless otherwise specified, the following items shall not be painted:

- Encased piping or conduit
- Plastic pipe and conduit
- Galvanized and Stainless steel framing and plates
- Nameplates
- Serial numbers
- Warning or operating instruction labels
- Gages
- Steel encased in concrete or masonry

** END OF SECTION **

SECTION 09900
WASTEWATER STRUCTURES COATING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Coating of sanitary sewer manholes, wet wells, and valve vaults as indicated on the contract drawings.

B. Related Sections
   1. Section 03301 - Cast In Place Concrete.
   2. Section 03400 - Precast Concrete.
   3. Section 03600 - Grouts

1.02 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)
   1. D570 - Standard Test Method for Water Absorption of Plastics
   2. D638 - Standard Test Method for Tensile Properties of Plastics
   3. D695 - Standard Test Method for Compressive Properties of Rigid Plastics
   4. D790 - Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
   5. D4258 - Standard Practice for Surface Cleaning Concrete for Coating
   6. D4259 - Standard Practice for Abrading Concrete
   7. D7234 - Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers

B. National Association of Corrosion Engineers (NACE)

C. Society for Protective Coatings (SSPC):
   1. SP1 - Solvent Cleaning
   2. SP13 - Surface Preparation of Concrete

D. American Concrete Institute (ACI)
   1. RAP-3 – Spall Repair by Low Pressure Spraying
   2. 546R – Concrete Repair Guide

1.03 SUBMITTALS

A. The Contractor shall furnish detailed data pertaining to the surfaces of the structure(s) to be rehabilitated, the rehabilitation product, surface preparation, and installation for review.

B. Letter from the Coatings Manufacturer certifying the Coatings Installer as factory trained and qualified.

C. Test reports from an independent testing laboratory confirming chemical resistance of coating for chemicals common to wastewater facilities.

PART 2 PRODUCTS

2.01 CEMENTITIOUS COATING

A. Both a cementitious and epoxy coating system shall be applied to manholes, wetwells, and valve vault as indicated to be coated on the project plans. Cementitious coating shall be compatible with the epoxy coating.

B. Products:
1. Parson Environmental: Parson MH Liner or Parson CA Liner 100
2. Raven Lining System: Raven 705CA or Raven 755
3. Madewell: Mainstay ML-72 or ML-CA
4. Or Approved Equal

2.02 EPOXY COATINGS

A. Epoxy Coatings shall be used on all manholes, wet well, and valve vault where indicated to be coated on the project plans.

B. Epoxy coatings shall meet the following physical properties:
1. Compressive strength: > 16,000 psi per ASTM D695
2. Flexural strength: > 12,000 psi per ASTM D790
3. Tensile strength: > 7,500 psi per ASTM D638

C. Products:
1. Parson Environmental: Parsonpoxy SEL-80
2. Raven Lining Systems: Raven 405
3. Madewell: Mainstay DS-5
4. Or Approved Equal

PART 3 EXECUTION

3.01 GENERAL

A. All materials shall be delivered to the site in the manufacturer's sealed containers. Each container shall be labeled by the manufacturer, and the label shall be intact upon delivery.

B. Installation shall be in conformance with the manufacturer’s recommendations unless otherwise noted herein.

C. All protective coating materials shall be used within the manufacturer's recommended shelf life.

D. Storage: Coating materials shall be protected from exposure to inclement weather, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application.

E. Mixing:
   1. Coatings of different manufacturers shall not be mixed together.
   2. Mixing of multi-component coating systems shall be performed in accordance with Manufacturer's recommendations. Components must be mixed in complete batches only and used immediately.

3.02 SURFACE PREPARATION

A. Remove roots.

B. All oil, grease, and form release and curing compounds shall be removed by detergent cleaning in accordance with SSPC-SP1 before abrasive blast cleaning. Surface preparation shall be performed in accordance with the latest editions of the following standards:
   1. ASTM D4258: Standard Practice for Surface Cleaning Concrete for Coating
   2. ASTM D4259: Standard Practice for Abrading Concrete

C. Concrete surfaces and deteriorated concrete surfaces to be coated or lined shall be abrasive blast cleaned in accordance with SSPC-SP13 to remove existing coatings, laitance, deteriorated concrete, and to roughen the surface equivalent to the surface of the No. 60 grit flint sandpaper (surface profile of 2.5 to 4 mils).

D. Repair any cracks, bug holes, spalled areas, holes, leaks, or evidence of leaks with mortar or grout as recommended by the epoxy coating manufacturer.

E. Unless required for proper adhesion, surfaces shall be dry prior to coating. The presence of moisture shall be determined with a moisture detection device such as Delmhorst Model DB, or equal.

F. All surfaces to be coated shall be completely dry, clean, and contaminant-free prior to application.

G. Additional surface preparation per the epoxy coating manufacturer's recommendations.

3.03 APPLICATION OF MATERIALS

A. Coating shall be applied by a Manufacturer approved installer.

B. Coating shall be applied by spray methods in accordance with the manufacturer requirements and as follows:
   1. Material shall not be applied to frozen surfaces or surfaces that may freeze within 24 hours of application
   2. Application shall be at an angle as near perpendicular to the sub-surface as practicable with the application nozzle held 1 foot from the sub-surface. If nozzle flow is non-uniform and slugs, sand spots and wet sloughs result, the nozzle shall be directed away from the work area until the faulty conditions are corrected.

C. Coatings shall be applied to all walls, benches, and inverts.

3.04 Field Testing

A. Proper, safe access shall be provided in locations where requested by the Engineer to facilitate inspection. Additional illumination shall be furnished when the Engineer requests. Proper ventilation and atmospheric monitoring shall be provided as well as all other safety equipment and precautions required by OSHA for a safe inspection in all areas.

B. The Engineer will conduct wet-film thickness testing. Contractor shall recoat any areas found deficient in thickness.

C. Holiday Testing:
   1. Engineer will visually inspect coverage for blisters, sags, and holidays. Contractor shall repair areas identified by this inspection prior to conducting holiday test.
   2. Contractor shall holiday test, in the presence of the Engineer, all coated surfaces.
      a. Holiday testing equipment and procedures shall be done in strict accordance with the latest edition of the NACE "Discontinuity (Holiday) Testing of Protective Coatings."
      b. Areas that contain holidays shall be marked and repaired or recoated in accordance with the coating manufacturer's printed instructions and then retested.
   3. Holiday detectors shall be of the following type:
      a. High voltage pulse-type holiday detector such as Tinker & Rasor Model AP-W, D.E. Stearns Co. Model 14/20, or equal shall be used. The unit shall be adjusted to operate at a voltage of at least 110 volts/mil desired thickness.

D. Adhesion Testing:
   1. Adhesion testing will be performed by an independent inspector hired and paid for by the City as deemed necessary by the City. The adhesion testing will be conducted after the coating system has cured per manufacturer instruction and in accordance with ASTM D7234.
   2. The Contractor shall schedule adhesion testing with the City a minimum of one week prior to the desired testing date. The pull tests shall meet or exceed 200 psi and shall include subbase adhered to the back of the dolly or no visual signs of coating material in the test hole.
   3. Pull tests with the results between a minimum 150 psi and 200 psi shall be acceptable if more than 50% of the subsurface adhered to the back of the dolly. If any test fails, a minimum of three additional locations in the section of the failure will be tested.
   4. If any of the retests fail, all loosely adhered or unadhered liner in the failed area, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. The costs for testing all reapplied coatings shall be paid for by the Contractor.
   5. Adhesion testing is destructive and removes lining material. The Contractor shall repair all disturbed and removed areas of the lining material per the manufacturer's recommendations after testing is complete.

E. Any damaged areas, faulty areas, or discontinuities (pinholes) found during quality control inspection shall be repaired in accordance with the Manufacturer's recommendations.

** END OF SECTION **

SECTION 11002
EQUIPMENT MOUNTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Equipment mounting requirements, including fabricated steel equipment bases, concrete equipment pads, supports, anchorage, and accessories.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01300 – Contractor Submittals
2. Section 01611 – Seismic Design Requirements
3. Section 05501 – Anchor Bolts
4. Section 09800 – Coating Systems

1.03 QUALITY ASSURANCE

A. Provide supports, anchorage, and equipment mounts that are sized and designed to resist the calculated forces and that are in accordance with the manufacturer's recommendations, the current California Building Code (CBC), and industry standards requirements.

1.04 DESIGN REQUIREMENTS

A. Design equipment mounts and anchorages to resist the minimum lateral force required by Section 01611 and the latest edition of the CBC.

B. Equipment anchor bolt sizes shown on the Drawings are the minimum required size.

C. Equipment anchorage design and calculations shall be prepared and signed by a civil or structural engineer currently registered in the state where equipment is installed.

1.05 MOUNTING REQUIREMENTS

A. Mount equipment and driver on a common fabricated steel baseplate with ample rigidity to support equipment and maintain shaft alignment without excessive deflection.

B. Mount equipment baseplates on concrete equipment pads.

1.06 SUBMITTALS

A. Comply with Section 01300.

B. Shop Drawings: Provide drawings of equipment bases and anchorage details.

C. Anchorage Calculations: Submit stamped and signed anchor bolt sizing calculations.

PART 2 PRODUCTS

2.01 ANCHOR BOLTS AND CONCRETE ANCHORS

A. Provide anchor bolts and concrete anchors in accordance with Section 05501.

2.02 CONCRETE EQUIPMENT PADS

A. Construct concrete pedestals at least 6 inches wider and longer than the steel or cast base so that the distance between the anchor bolts and the edge of concrete is at least 3 inches.

B. Unless otherwise shown or specified, all conduits, piping connections, drains, etc. shall be enclosed by the concrete base.

C. Shape concrete pedestals to drain away from the base.

D. Allow concrete to cure 21 days or until the concrete has cured to 75 percent of its specified compressive strength before placing equipment on the concrete pedestal.

E. Do not start equipment placed on the concrete pedestal until the concrete has cured for 28 days or to 100 percent of its specified compressive strength.

2.03 STRUCTURAL STEEL EQUIPMENT BASES

A. Provide structural steel bases with thickened steel pads for doweling.

1. Fabricate equipment base using continuous welds to seal seams and contact edges between steel members.

2. Grind welds smooth.

B. Design equipment bases with perimeter steel beams, intermediate stiffeners and baseplate.

1. Provide perimeter steel beams with minimum depth equal to 1/10th of the longest dimension of the base.

2. Beam depth need not exceed 14 inches provided that the baseplate deflection is kept within acceptable limits to minimize misalignment, as determined by the manufacturer.

C. Provide grout holes for the bases of equipment where vibration isolation is not specified.

D. Provide minimum 1-inch thick steel mounting baseplate for equipment with drivers 20 horsepower and larger.

E. Shop-apply prime coat prepared in accordance with the requirements of Section 09900 and compatible with the finish coatings.

PART 3 EXECUTION

3.01 GENERAL

A. Connect piping to equipment with flexible connections and/or expansion joints such that the intended uses of these joints is maintained in the piping system.

B. Coordinate the location of electrical conduit and piping penetrations within the concrete pad and equipment base.

1. Stub-up penetrations on the same side of the equipment as required for connection to the equipment.

2. Locate equipment drains for proper drainage away from equipment.

3.02 EQUIPMENT MOUNTING

A. Mount equipment on equipment baseplates using stainless steel shims so that equipment and driver are level in both directions and mounted within machined areas on baseplate. Do not use wedges to obtain level and alignment.

B. Utilize templates for placement of anchor bolts prior to placing concrete for equipment pad.

C. Apply a non-seize or non-galling compound on the threads of anchor bolts and concrete anchors.

3.03 SHAFT ALIGNMENT

A. After the complete unit has been installed on the equipment pad and leveled, check the factory shaft alignment by disassembling coupling and measuring angular and parallel orientations.

B. Use reverse-indicator dial or laser type alignment equipment to align shafts to within the manufacturer's required tolerance. Allow for thermal expansion, spacer coupling length and other factors that affect proper shaft alignment.

3.04 GROUTING EQUIPMENT BASES

A. After alignment has been completed, tighten anchor bolts and grout between equipment base and equipment pad. Use non-shrink and non-ferrous grout no less than 7/8 inch and no more than 1-5/8 inches thick unless otherwise shown.

B. Allow 48 hours for grout to harden and then remove jacking screws. Re-check torque on anchor bolts and re-check shaft alignment, making corrections as necessary.

*****END OF SECTION*****

SECTION 11220
SUBMERSIBLE DIRECT DRIVE MIXER

PART 1 GENERAL

1.01 SCOPE

A. Furnish and install a heavy duty, direct drive submersible mixer for use within sanitary sewer wetwells as specified herein.

1.02 QUALITY ASSURANCE

A. The equipment specified in this Section shall be furnished, coordinated, serviced, and guaranteed by a supplier experienced in the design, manufacture, coordination, installation, and servicing of equipment of the type, size, and complexity specified in this Section. The supplier shall be capable of providing fully knowledgeable, experienced service personnel and replacement parts at the Project site not later than 24 hours after telephone notification by the Owner.

1.03 SUBMITTALS

A. Materials and Shop Drawings: Copies of all materials required to establish compliance with these specifications shall be submitted in accordance with the provisions of the Section 01300: Submittals, and the General Conditions. Submittals shall include at least the following:
   1. Equipment catalog cut sheets.
   2. Outline dimensions of all equipment.
   3. Cross sectional drawings of all equipment with parts identification and materials specifications.
   4. Fabrication and erection drawings.
   5. Motor nameplate data and specifications sheet for all electric motors.
   6. Bill of material.
   7. List of spare parts.
   8. Electrical schematics and interconnecting wiring diagrams showing extent of factory prewiring and details of control panels.
   9. Manufacturer's drawings with parts list for all accessory equipment.
   10. Shop painting specification(s) for ferrous surfaces.
   11. Test data for equipment as specified herein.
   12. Handling and storage instructions.
   13. Operation and maintenance manuals.
   14. A complete set of reproducible as-built Shop Drawings for all equipment furnished.
   15. Certification by the manufacturer of the output rating of the rotor-impeller mixer selected, including all ratings for the gear drive and the mechanical adjustable speed drive unit.

B. Operating Instructions:
   1. Six (6) copies of an operating and maintenance manual shall be furnished. The manual shall be prepared specifically for this installation and shall include all required catalog cuts, drawings, equipment lists, descriptions, and necessary

information that are required to instruct operating and maintenance personnel unfamiliar with all of the equipment specified herein. A complete, corrected and approved copy of the shop drawing submittal shall be included with each manual provided.

2. A factory representative who has a complete knowledge of proper operation and maintenance requirements for the equipment shall be provided for a minimum of one (1) eight-hour working day to instruct representatives of the Owner on proper operation and maintenance of the equipment. Provide at least ten (10) days advance notice to the Owner before scheduling the instruction day. The operation and maintenance manuals shall be provided at a time in advance of the instruction/training period that is approved by the Owner.

C. Equipment Certification:

1. The Contractor shall submit to the Engineer six (6) copies of a certified report from the factory service representative certifying that the submersible mixer equipment has been properly installed and operates satisfactorily under the specified operating conditions.

1.04 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A 36 – Standard Specification for Carbon Structural Steel
2. A48 - Standard Specification for Gray Iron Castings.
3. A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. A 320 – Standard Practice for Preparation of Iron Casting for Electroplating
5. A 666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
6. B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
7. B 221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
8. B 308 – Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles
9. F 593 – Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
10. F 594 – Standard Specification for Stainless Steel Nuts

1.05 WARRANTY AND GUARANTEES

A. All equipment supplied under this Section shall be warranted for a period of two (2) years by the manufacturer and Contractor. The warranty period shall commence upon Owner acceptance as outlined in the General and Supplementary Conditions.

B. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced at no expense to the Owner.

C. The manufacturer's warranty period shall run concurrently with the Contractor's warranty period. No exception to this provision shall be allowed.

1.06 SHIPPING REQUIREMENTS

A. All fabricated steel assemblies shall be shipped in convenient sections, or as specified herein and permitted by carrier regulations, properly match-marked and identified for ease of field erection.

B. All equipment shall be handled during delivery, storage, and installation in a manner to prevent damage of any nature in accordance with the manufacturer's approved instructions.

C. All electrical controls and equipment shall be stored in a clean, dry, weather-tight building upon delivery to the Project site.

1.07 MANUFACTURER REQUIREMENTS

A. The mixer shall be Flygt Model 4620 having the characteristics specified herein. The Contractor shall furnish Flygt mixers; no other manufacturers will be accepted.

PART 2 PRODUCTS

2.01 GENERAL

A. The mixer(s) shall be capable of handling raw sewage. The mixer(s) shall be able to be raised and lowered and shall be easily removed for inspection or service without the need for personnel to enter the wetwell.

B. The mixer shall operate with the starting and stopping of the pumps. A disconnect switch shall be included in the motor control center to manually turn off the mixer.

C. The mixer shall be mounted on a square guide bar system. A sliding guide bracket shall be an integral part of the mixer unit. The entire weight of the mixer unit shall be guided by a single bracket which must be able to handle all thrust created by the mixer. The standard mixer, with its appurtenances and cable, shall be capable of continuous submergence under water, without loss of watertight integrity, to a depth of 130 ft. Guide bar, bracket, hardware, and appurtenances shall be 316 Stainless Steel.

1. Each unit shall be fitted with at least 25 ft. of stainless steel lifting cable of adequate strength to permit raising and lowering the mixer.

D. The unit provided shall be manufactured to the dimensions shown on the Drawings and as specified herein. Each mixer shall be of the integral design, close coupled, submersible type. All components of the mixer, including motor, shall be capable of continuous underwater operation. Major mixer components shall be of 316L Stainless Steel construction. The oil housing cover plate shall be of corrosion resistant composite (4610/20 utilize a vinyl ester composite motor cover). All exposed fasteners shall be of stainless steel. The motor housing exterior shall be made of 316 Stainless Steel. All metal surfaces coming into contact with the mixed media, other than stainless steel, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with an epoxy finish coat on the exterior of the mixer.

E. The unit shall be furnished and installed complete with all mechanical equipment required for proper operation, including complete drive units, mounting brackets, hardware, guide rail

system, and other metal construction indicated by the Drawings, and any additional materials or construction required by the manufacturer's design.

2.02 MATERIALS

A. Structural Steel: ASTM A36

B. Steel Galvanizing: ASTM A123

C. Structural Aluminum: ASTM B209, ASTM B221, ASTM B308, Alloy 6061-T6

D. Structural Stainless Steel: Type 316

E. Castings: ASTM A48, gray iron having a minimum tensile strength of 20,000 pounds per square inch (psi)

F. Bolting Materials:
   1. Anchor Bolts or High Strength Bolting Requirements; ASTM A320, B8M, Class 2, Type 316 stainless steel, high strength bolts.
   2. Commercial Strength Bolting Requirements: ASTM F593, Type 316 stainless steel bolts and ASTM F594, Type 316 stainless steel nuts
   3. Washers: Type 316 stainless steel
   4. All nuts and bolts shall be coated with Xylan Fluoropolymer coating.

G. Elastomers
   1. All mating surfaces where watertight sealing is required shall be machined and fitted with a double set of Nitrile rubber or Viton O-rings. Fitting shall be such that sealing is accomplished by metal-to-metal contact between machined surfaces. This will result in controlled compression of the O-rings without requiring a specific torque limit. No secondary sealing compounds, rectangular gaskets, elliptical O-rings, grease or other devices shall be used.

H. Mixer & Propeller
   1. The propeller shall be of 316 stainless steel dynamically balanced, non-clogging backward curved design. Each blade shall be laser cut and welded to the hub to ensure that the propeller is properly balanced.
   2. The propeller shall be capable of handling solids, fibrous materials, heavy sludge, and other matter found in normal sewage applications.
   3. The propeller shall be Flygt propeller code 042113SJ and be capable of a nominal thrust of 295 N with a propeller speed 1675 rpm and propeller diameter 8-9/32 inches and a shaft horsepower not to exceed 2.3 BHP in clear water.
   4. The mixer shall draw 18 Amps maximum when operating at the specified BHP. Total input power shall not exceed 1.55 kW. The mixer shall be designed for continuous duty in handling mixed media of a maximum temperature of 311℉.

I. Jet Ring Assembly
   1. The mixer assembly shall incorporate a jet ring a full 360 degrees around the propeller.

J. Cable Entry
   1. The cable entry housing shall consist of a compressible rubber bushing to seal off motor area and relieve strain on the cable. Cable entry housing shall be constructed of vinylester for shock and chemical resistance.

K. Bearings
   1. All bearings shall have a minimum B-10 or L-10aa rated life of 100,000 hours and shall have inner and outer races of metal construction. The shaft shall be supported by a single row angular contact ball bearings and single row cylindrical roller bearing, plus a heavy duty single row angular contact ball bearing on the propeller side.

L. Oil Housing
   1. The oil housing shall contain two compartments consisting of an inner and an outer section with four ports to connect and facilitate oil flow. In the event that the mixed media bypasses the other seal, this design will allow the outer compartment to collect the heavier (denser) fluids by means of a simple gravity process.

M. Mechanical Seals
   1. Each mixer shall be provided with two sets of lapped end face type mechanical seals running in oil reservoirs for cooling and lubrication.
   2. The standard inner mechanical seal is corrosion resistant Tungsten Carbide/Aluminum Oxide.
   3. The outer seal faces are Tungsten Carbide/Tungsten Carbide. One face of the inner seal ring pair shall have spiral grooves laser etched in it, to provide a pumping action to move leakage from the stator housing back into the oil chamber. In order to avoid seal failure due to sticking, clogging, and misalignment from elements contained in the mixed media, only the seal faces of the outer seal assembly and its retaining clips shall be exposed to the mixed media.

N. Spare Parts
   1. A selection of spare parts shall be included with each mixer. The minimum spare parts included shall be bearings, seals, and o-rings.

2.03 ELECTRIC MOTOR

A. Mixer and motor shall be explosion-proof and rated for Class I, Division 1 hazardous locations.

B. The motor shall be directly connected to the propeller (gearbox designs are not acceptable) to produce a propeller speed of 1675 RPM. The mixer motor shall be squirrel cage, induction, shell type design, housed in an air filled, watertight chamber. The stator winding shall be insulated with moisture resistant Class F insulation which will resist a temperature of 155°C (311°F). The stator shall be insulated by the trickle impregnation method resulting in a winding fill factor of at least 95%. The motor shall be designed for continuous duty, capable of sustaining a maximum of at least thirty (30) evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum.

C. Thermal sensors shall be used to monitor stator temperatures. The stator shall be equipped with three (3) thermal switches embedded in the end coils of the stator winding and set for 284°F (140°C).

1. The thermal switch and leakage sensor shall be connected to a Flygt Mini CAS control and status monitoring unit. The Flygt Mini CAS unit shall be designed to be mounted within the pump station motor control center.

D. Performance Requirements:
   1. Motors shall be rated for operation on 3 phase, 240-volt power supply.
   2. Motor shall be 2.3 HP, LSPM (line-started permanent-magnet) submersible electric motor connected for operation on 230 Volts, 3 Phase, 60 Hertz service.
   3. Each motor shall have a 1.15 service factor and a 1.0 service factor for inverter duty rated motors.
   4. Motors shall be free of objectionable noise and vibration. Units shall operate with a maximum sound level not to exceed 85 dBA as measured 5 feet from any surface.
   5. The mixer- motor shall be inverter duty rated for a 4 to 1 turndown and shall be compatible with the VFD unit provided by the Contractor to drive the mixer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation shall be as shown on the Drawings and in accordance with the manufacturer's recommendations and erection drawings. Erection drawings shall be submitted and approved prior to shipment of equipment. Mechanism parts shall be securely anchored to the wet well and grout filled by stainless steel fastening hardware furnished by the manufacturer, as shown on the Drawings.

B. All necessary bolts, nuts, washers, hanger rods, clips, and other hardware items for the anchoring and erection of the units shall be included. The manufacturer shall ship anchor bolts, bolting template drawings, and accurate bolt setting patterns to the Contractor in advance of shipping fabricated items and other equipment.

C. Edge Grinding. Sharp corners of cut or sheared edges and corners shall be rounded to a smooth contour by grinding.

D. Fabrication. All welds shall be continuous seal welds. All welds shall be in accordance with current AWS Standards.

3.02 INSPECTION AND TESTING

A. The submersible mixer supplier’s bid shall include the furnishing of the services of a fully qualified and experienced manufacturer’s representative to provide all specified services for inspection and testing of the completed mixer unit. Upon completion of installation, the Contractor, in the presence of the Owner and a qualified manufacturer's representative, shall perform a preliminary test on the submersible mixer to ensure the functioning of all component parts to the satisfaction of the Owner. The Contractor shall furnish all labor, equipment, water, and power required to perform each test.

B. Approval of the preliminary test by the Owner shall not constitute final acceptance of the equipment furnished.

C. Upon approval of the preliminary test, the Contractor, in the presence of the Owner and a qualified manufacturer's representative, shall perform a field test to demonstrate the ability to meet or exceed the specified design criteria and proper function for the purpose intended.

D. The field tests on the submersible mixer shall be undertaken with water in the wet well filled up to the lead pump on water elevation shown on the Drawings. The Contractor shall be responsible for providing sufficient water for filling the wet well for the test runs. The test runs on the unit shall determine acceptable normal running noise, vibration, speed, and direction.

E. In the event of improper installation, the Contractor and the submersible mixer manufacturer shall be responsible for supervising the correction of the work and performing subsequent field tests until all defects are corrected.

3.03 MIXER TEST

A. The mixer manufacturer shall perform the following inspections and tests on each mixer before shipment from the factory:
   1. Propeller, motor rating, and electrical connections shall first be checked for compliance to the customer's purchase order.
   2. A dielectric test shall be carried out in accordance to IEC 60034-1 (two times rated voltage plus 1000 V). This test shall be done after assembly but before any performance tests. No records shall normally be provided.
   3. Prior to shipment, the mixer shall be run dry to establish correct rotation and mechanical integrity.

B. A written report stating the foregoing steps have been done may be supplied with each mixer at the time of shipment (upon request).

END OF SECTION

SECTION 11312
SUBMERSIBLE PUMPS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for provision of pump systems including submersible non-clog motor-driven pumps for service in raw sewage.

B. Related Sections:
   1. Section 15050 – Basic Mechanical Materials and Methods.

1.02 REFERENCES

A. American Bearing Manufacturers Association (ABMA):
   1. 9 - Load Ratings and Fatigue Life for Ball Bearings.
   2. 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. American Society for Testing and Materials (ASTM):
   1. A 48 - Standard Specification for Gray Iron Castings.
   2. A 108 - Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.
   3. A 167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
   4. A 176 - Standard Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet and Strip.
   5. A 276 - Specification for Stainless Steel Bars and Shapes.
   6. A 283 - Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
   7. A 532 - Specification for Abrasion-Resistant Cast Irons.
   8. A 576 - Specification for Steel Bars, Carbon, Hot Wrought, Special Quality.
   9. A 582 - Specification for Free-Machining Stainless and Heat-Resisting Steel Bars.
   10. A 743 - Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion-Resistant, for General Application.
   11. B 148 - Specification for Aluminum-Bronze Sand Castings.
   12. B 505 - Specification for Copper-Base Alloy Continuous Castings.
   13. B 584 - Specification for Copper Alloy Sand Castings for General Applications.
   14. E 10 - Test Method for Brinell Hardness of Metallic Materials.
   15. E 18 - Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials.
   16. F 593 - Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
   17. F 594 - Specification for Stainless Steel Nuts.

C. American National Standards Institute/Hydraulic Institute (ANSI/HI):
   1. 1.1-1.5 - Centrifugal Pumps - Nomenclature, Definitions, Application, and Operation.
   2. 1.6 - Centrifugal Pump Tests.

3. 9.1-9.5 - General Pump Standards for Types, Definitions, Application, and Sound Measurements.
4. 9.6.4 – Rotodynamic Pumps for Vibration Measurements and Allowable Values

1.03 DEFINITIONS

A. Pump head (Total Dynamic Head, TDH), flow capacity, pump efficiency, net positive suction head available (NPSHa), and net positive suction head required (NPSHr): As defined in ANSI/HI 1.1-1.5, 1.6 and 9.1-9.5 and as modified in the Specifications.

B. Suction Head: Gauge pressure available at pump intake flange or bell in feet of fluid above atmospheric; average when using multiple suction pressure taps, regardless of variation in individual taps.

C. Tolerances: As defined in ANSI/HI 1.6 and 2.6, or more restrictive tolerances specified herein.

1.04 SYSTEM DESCRIPTION

A. Submersible Pumps with Components: Submersible pump, motor driver, bearings, seals, supports, electrical cable, necessary controls and instrumentation, taps, lifting eyes, lifting chain and similar type items as specified and as required for complete operational units ready for use as specified and installed as indicated on the Drawings.

B. Pump Types: Pumps supplied and installed shall be, rail-mounted submersible, centrifugal, Flygt pumps having the general characteristics as tabulated below. The Contractor shall furnish Flygt pumps; no other pump manufacturers will be accepted.

1. Flygt Model NP3315 HT

a.	Maximum Rotative Speed (rpm)	1775
b.	Shutoff Head (feet)	217
c.	Max. Motor Horse Power	130
d.	Motor Voltage (3 phase)	460
e.	Rated Current (Amperes)	152
f.	Starting Current (Amperes)	260
g.	Power Factor at Full Load	0.89
h.	Discharge Size (inches)	6
i.	Impeller (in)	15.35 (390 mm)
j.	Pump Curve:	

0	gpm	292 ft.
115	gpm	290 ft.
230	gpm	284 ft.
345	gpm	278 ft.
460	gpm	273 ft.
575	gpm	268 ft.
690	gpm	263 ft.
805	gpm	257 ft.
920	gpm	252 ft.
1035	gpm	247 ft.
1150	gpm	242 ft.
1265	gpm	236 ft.
1380	gpm	231 ft.
1495	gpm	226 ft.

1.05 SUBMITTALS

A. The manufacturer shall submit to the Engineer for approval, certified performance curves, and shop and assembly drawings. The drawings shall show the dimensions, ratings, component parts, arrangements, and materials of construction for all items covered under this section. The performance curves shall be based on data secured during actual tests run at the factory on the pump model proposed for installation, and signed by a responsible manufacturer's representative. The curves shall show the make, model, size, and trim of the impeller, the developed head, brake horse power, $NPSH_{re}$, and efficiency at intervals of 50 gpm in capacity for the model operating at the specified rotative speed over the operating range of the pump.

B. Manufacturer shall supply six (6) sets of its standard submittals which shall contain the following:
   1. Pump Outline Drawings
   2. Motor Performance Data
   3. Cable and Protective Device Data
   4. Typical Installation Guides
   5. Certified Pump Performance Curves
   6. Detailed Description and Dimensions of All Accessories
   7. Detailed Electrical Data
   8. Control Drawings and Data
   9. Technical Manuals
   10. Parts Lists
   11. Printed Warranty

1.06 QUALITY ASSURANCE

A. **General:** Pumps shall be suitable for pumping municipal wastewater and shall be designed and fully guaranteed for this use. Motors supplied with submersible pumps under this specification shall be suitable for continuous operation under submerged, partially submerged, or dry conditions. Motors shall be non-overloading throughout the full range of pump operation, as established by the pump model performance curve.

B. **Standards:** Equipment furnished and installed by the contractor shall be in full conformity and harmony with the intent to secure the best standard of construction and equipment as a whole or in part. Pumps shall be installed in strict accordance with manufacturer specifications, standard drawings, and installation instructions.

C. **Submittals:** Submittal data provided shall be of sufficient depth to illustrate compliance with these specifications, the plans, and other specifications that may influence the proper operation of this pump. No pump equipment shall be shipped until the required drawings and curves have been submitted to and acknowledged by the Engineer as being of general compliance and conformance with the information in the contract documents.

D. **Testing:** Model pumps shall be factory tested to determine head versus capacity, efficiencies, and kilowatt draw required for the operating points specified. All tests shall be run in accordance with the latest edition of the American Hydraulic Institute Standards. The actual pumps furnished shall also be tested for:
   1. Impeller, propeller, motor rating, and electrical connections tests shall be run for compliance with specification requirements.

2. Motor and cable insulation test for moisture content or insulation defects shall be performed with a 500 volt DC megger.
3. After a submerged test run of 30 minutes under 6 feet of water, Test 2 shall be repeated.
4. If any deviation of the above tests is found, that pump shall be rejected.

E. **Operation and Maintenance Manuals:** The pump supplier shall provide operation and maintenance manuals for all equipment and accessories furnished. The manuals shall be original (no photocopies) and contain at least the following:
1. Identification stating the general nature of the manual, which appears on or is readable through the front cover.
2. Neatly typewritten index near the front of the manual, furnishing immediate information as to location in the manual of all emergency data regarding the equipment.
3. Complete and detailed instructions regarding operation and maintenance of all equipment involved.
4. Complete nomenclature of all replaceable parts, their part numbers, current cost, list of recommended spare parts to be kept on hand, and name, address and telephone number of nearest vendor of parts.
5. Copies of all guaranties and warranties issued.
6. Copies of the favorably reviewed shop drawings with all data concerning changes made during construction.
7. Where content of manuals includes manufacturers' catalog pages, clearly indicate the precise items included in this installation.

F. **Guarantee:** Products furnished and installed under this section shall be guaranteed for a minimum period of five (5) years. Parts and labor for the first year of this guaranty period shall be provided in full, at no additional cost.

1.07 DELIVERY, STORAGE, AND HANDLING

A. As specified in Section 15050.

1.08 PROJECT CONDITIONS

A. Install pumps as indicated on the drawings.

1.09 SEQUENCING AND SCHEDULING

A. The specified pumps may have significantly long lead times. Contractor is responsible for expediting the submittal and material procurement process as necessary to complete the work within the contract time provided.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Pump: Named manufacturer only. No other manufacturer is acceptable for City maintenance standardization:
1. ITT Flygt, NP series as specified herein.

2.02 SUBMERSIBLE PUMPS AND MOTORS

A. Pumps shall be designed for municipal wastewater. Pump characteristics shall be such that the motor nameplate rating is not exceeded at any point on the operating curve.

B. Pumps shall have a discharge suitable for wet-pit installation. Pump and motor shall be explosion-proof (X Designation).

C. Pump and motor characteristics; including pump design and construction, cable seal, cooling system, wear rings, seals, impellers, bearings and motors; shall strictly meet Flygt's published Performance Specification (latest release).

D. Pump motors shall be the squirrel-cage induction type, housed in a NEMA B air filled, watertight chamber, rated for continuous full load operation. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. Motors shall be capable of withstanding up to 15 starts per hour and shall have a minimum 1.15 service factor.

E. The impeller shall be of ASTM A-532 (Alloy III A) 25% chrome cast iron dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray iron impeller shall be hardened to Rc 60 and shall be capable of handling solids, fibrous materials, heavy sludge, and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

F. The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of ASTM A-532 (Alloy III A) 25% chrome cast iron and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

G. **Nameplates:** Motors shall have a stainless steel plate showing the motor connection diagram and a stainless steel nameplate indicating type, frame, insulation class, full load current, horsepower, full load minimum guaranteed efficiency and nominal power factor, rpm, degree rise in Celsius, maximum ambient temperature rating in degrees Celsius, manufacturer's name, serial number, model, voltages, locked motor Kva code and bearing numbers.

2.03 ACCESSORIES

A. Pump accessories shall be furnished as required and be compatible with each of the submersible pumps and the conditions of their installation.

B. All accessory hardware including anchor bolts, lifting chain and cable brackets shall be Type 316 stainless steel.

C. Accessories for each submersible pump and motor to be installed at the Pump Station:
   1. Self-aligning discharge connection.
   2. Stainless steel guide rails and mounting accessories as recommended by the pump manufacturer for pump removal and installation without the need to enter the wet well.
   3. Intermediate guide bar brackets for guide rails.
   4. Discharge Elbow.
   5. At least 40 LF of submersible motor cable or as necessary to complete the installation.
   6. Cable holder.
   7. At least 25 LF of stainless steel lifting chain.
   8. Lifting eye compatible with the pump.
   9. Dual moisture sensing probe system to detect the entrance of moisture and provide an alarm. The moisture detection system shall be designed to detect the entrance of moisture in the high heat transfer fluid reservoir and the air-filled motor stator housing.
   10. A316 stainless steel anchor bolts as recommended by the pump supplier and any other miscellaneous supplies required to complete the installation.
   11. Contractor shall provide spare parts as recommended by the manufacturer. The minimum spare parts included shall be bearings, mechanical seals, o-rings, and wear rings.

2.04 COATINGS

A. Equipment shall receive final finish coats at the factory. Each coat of paint shall be of the consistency as supplied by the paint manufacturer, or thinned if necessary, and applied in accordance with the manufacturer's written instructions. Work shall be free from “runs”, “bridges”, “shiners”, or other imperfections. Care shall be taken to obtain a uniform, unbroken coating over welds, edges, and corners. Weld splatter shall be removed and all welds neutralized with thinner. Blasted surfaces shall be coated within four hours of being sandblasted. All dust shall be removed from surfaces prior to coating.

B. All surfaces to be coated or painted shall be in the specified condition to receive the material before any coating or painting is performed. Follow manufacturer's instructions. During and after final application of protective coatings, all metal surfaces shall be checked mechanically with an Elcometer, Mikrotest, or other approved dry film thickness gage to insure that the specified dry film thickness has been attained. Coating testing and repair of damages, flawed areas, holidays, or mishaps shall conform to applicable AWWA standards.

C. Care shall be taken to prevent damage to coated surfaces during shipment. Any coatings damaged during shipment shall be refinished as the original at no extra cost to the City.

D. Coatings shall be guaranteed for a period of one year following the date of final acceptance.

2.05 PROTECTIONS

A. Provide normally closed thermal switch in stator housing for thermal protection.

B. Provide leakage sensor in stator housing for moisture protection.

C. The thermal switch and leakage sensor shall be connected to a Flygt Mini CAS control and status monitoring unit. The Flygt Mini CAS unit shall be designed to be mounted within the pump station motor control center.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pumps shall be installed in strict accordance with the manufacturer's requirements

B. Anchor bolts for the pump pedestals shall be drilled and epoxied into place after the pumps and discharge piping are set.

3.02 FIELD QUALITY CONTROL

A. Witnessing: All field testing shall be witnessed by the Engineer. Contractor shall notify the City a minimum of 48-hours prior to field testing.

B. Inspection and Check-out: As specified in Section 15050.

C. Equipment Performance Test: Test pump operations using automatic level controls as scheduled with the City and described herein.

D. All water and electricity required for field testing shall be provided at Contractor's sole expense.

E. Operational Testing:
   1. After installation, equipment shall be tested in the presence of the Engineer by an authorized pump manufacturer representative who shall certify, in writing, that the pumps are operating in compliance with these specifications and are free from binding, scraping, overloading, vibration or other defects.
      a. Vibration at any point of pump operation shall not exceed the upper limits of the Hydraulic Institute Standards. Vibration testing is only required if noticeable vibration occurs during pump operation. If necessary, vibration testing shall be completed per ANSI/HI 9.6.4.
   2. Each pumping unit shall be run and monitored for a minimum duration of one (1) hour during the test period. A minimum of 6 pump cycles shall occur during pump testing. Motor running current readings shall be taken for each phase. Coordinate testing with the City.
   3. The manufacturer's representative shall perform the following:
      a. Check motor stator and power cables.
      b. Check seal lubrication.
      c. Check for proper rotation.
      d. Check power supply voltage.
      e. Measure motor operating load and no load current for each phase.
      f. Check level control operation and sequence.

3.03 MANUFACTURER'S FIELD SERVICES

A. Require manufacturer to inspect system before initial start-up and certify that system has been correctly installed and prepared for start-up as specified in this section and Section 15050.

B. The manufacturer’s service representative shall review recommended operation and maintenance procedures with City personnel.

END OF SECTION

SECTION 11424
PRESSURE FIELD INSTRUMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Permanently installed field pressure indicators with integral instrumentation devices.

B. Related Sections:
   1. Section 02720 - Ductile Iron Pipe and Fittings.

1.02 SUBMITTALS

A. Product Data.

B. Shop Drawings:
   1. Connection diagram.
   2. Factory calibration data sheets for instruments and devices requiring set-up and calibration.

C. Manufacturer's Installation Instructions: Include mounting details.

D. Field Calibration Data Sheets: Include for instruments and devices requiring set-up and calibration.

1.03 MAINTENANCE

Not Used.

PART 2 PRODUCTS

2.01 PRESSURE SENSORS

A. Provide flanged bolt-through pressure sensors at the locations shown on the Drawings. Flanges shall be Type 316 stainless steel. Pressure shall be sensed using a captive fluid displaced through a flexible Buna-N sleeve to the instrument’s Bourdon tube.

B. Pressure sensors shall be Ashcroft Series 80, or approved equal.

C. The pressure-sensing ring shall measure pressure for 360 degrees around the full inside circumference of the pipeline. The sensing ring shall also be clamped into the body for the full radial width of the sensor. Pressure shall be transmitted to the gauge by a locked in and sealed fluid such as ethylene glycol or silicone oil.

2.02 PRESSURE GAUGES

A. Pressure gauges shall be Ashcroft 1279, Ametek Solfrunt Series 1900, or Equal.

B. Pressure range shall be 0 to 160 psi.

C. Sensing element shall be bourdon tube with welded, stress-relieved joints. Sensing element material shall be as recommended by the manufacturer and as indicated in the data sheet. Gauges shall have an accuracy of plus and minus 1/2-percent of full scale.

D. Body material shall be as recommended by the manufacture and as indicated in the data sheet.

E. Gauge shall be either dry or liquid-filled.

F. Gauges shall be provided with a 316 stainless steel pulsation dampener (snubber), unless otherwise noted in the data sheet. The pulsating dampener shall absorb system pressure pulses.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install instruments in accordance with manufacturer's instructions.

3.02 TESTING

A. Contractor shall hydrostatically pressure test the gauge prior to installation. Pressure test to 120 psi and maintain pressure for at least 5 minutes. Record pressure of the gauge and a separate gauge. Notify Engineer if difference in pressure measured is 5 psi or greater.

END OF SECTION

SECTION 13421
MAGNETIC FLOW METERS

PART 1 GENERAL

1.01 DESCRIPTION

Work under this Section includes all labor and materials which are required to furnish and install magnetic flow meters as indicated and as specified. Work includes flow meters, appurtenant hardware, and accessories as necessary to furnish and install functioning flow meters.

1.02 RELATED SECTIONS

A. Section 15052 Basic Piping and Methods

1.03 REFERENCE STANDARDS

A. Design, fabricate and test flow meters and materials in accordance with manufacturer's recommended procedures and the following codes and standards:

1. ASTM A105 – Standard Specification for Carbon Steel Forgings in Piping Applications
2. ASTM A193 – Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
3. ASTM A194 – Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both

1.04 SUBMITTALS

A. Comply with requirements of Section 01300, Contractor Submittals.

B. Submit the following for review:

1. Technical data and shop drawings
   a. Showing all critical dimensions.
   b. Showing principal parts and materials.
2. Materials lists
3. Installation guides
4. Operation and maintenance instructions
5. Detailed description and dimensions of all accessories
6. Anchor Bolts and Nuts

C. Submittal data provided shall be of sufficient depth to illustrate compliance with these Specifications, the plans and other Specifications that may influence the proper operation of the flow meters.

D. Contractor shall submit to the Engineer for review, certified shop, and assembly plans. The plans shall show the dimensions, ratings, component parts, arrangements, and materials of construction for all items covered under this Section. Such review does not relieve the Contractor from responsibility for executing the work in accordance with the Contract

Documents.

E. No equipment shall be ordered until the required data have been submitted to and acknowledged by the Engineer as being of general compliance and conformance with the information in the Contract Documents.

F. Operation and Maintenance Manuals: Provide operation and maintenance manuals for all equipment and accessories furnished. Clearly indicate the precise items included in this installation where the content of the manual includes manufacturers' catalog pages. The manuals shall be original (no photocopies) and contain at least the following:

1. Identification stating the general nature of the manual, which appears on or is readable through the front cover.
2. Neatly typewritten index near the front of the manual, furnishing immediate information as to location in the manual of all emergency data regarding the equipment.
3. Detailed instructions regarding operation and maintenance of all equipment.
4. Complete nomenclature of all replaceable parts, their part numbers, current cost, list of recommended spare parts to be kept on hand, and name, address and telephone number of nearest vendor of parts.
5. Copies of all guarantees and warranties issued.
6. Copies of the favorably reviewed shop plans with all data concerning changes made during construction.
7. Factory calibration report
8. Field calibration report

1.05 DELIVERY, STORAGE, AND HANDLING

A. Ship all flow meters with suitable packaging to protect products form damage.

B. Protect threads, flanges, stems and meters from damage.

1.06 QUALITY ASSURANCE

A. General: Flow meters shall be suitable for use with raw sanitary sewage force mains located within underground vaults as shown on the plans, and shall be designed and fully guaranteed for this use.

B. Standards: Equipment furnished shall be in full conformity and harmony with the intent to secure the best standard of construction and equipment as a whole or in part. This Specification shall be regarded as a minimum standard for design and fabrication of equipment.

1.07 GUARANTEE

Parts and labor for the first two years of this guarantee period shall be provided by Manufacturer in full, at no cost to the Owner.

PART 2 PRODUCTS

2.01 MAGNETIC FLOWMETER

A. The magnetic flowmeter shall be of the electromagnetic design and shall produce a DC voltage signal that is linear with the liquid flow rate. Meter accuracy shall be ±0.5 percent of the actual rate of flow from 0.2 to 32 feet per second.

B. Changes in conductivity, density, viscosity, temperature, and/or pressure shall not affect the accuracy of the flowmeter.
   1. Limits for accuracy shall be at least:
      a. Operating Temperature: -4° F to 140 °F
      b. Operating Pressure: 0.15 to 232 psi

C. The liner shall be neoprene. The liner shall be compatible with the chemical, temperature, and abrasion characteristics of the municipal raw sewage and sludge solutions.

D. The electrodes shall be made of Type 316 stainless steel and shall be of the self-cleaning type. The electrodes shall be of the high impedance type to aid in prevention of errors due to coatings.

E. The meter enclosure shall be a NEMA 4X design and suitable for Class 1, Division 2, Groups C, and D classified (hazardous) areas.

F. The meter shall be rated for continuous submergence to 30 feet. The conduit entries of the sensor remote junction box shall be properly sealed to prevent water ingress. The use of sealed IP68 approved cable glands, conduit connections and/or conduit plugs shall be used to create a water tight installation.

G. The meter tube shall be made of Type 304 stainless steel with 150 lbs. ANSI flanges.

H. The sensing head must be completely interchangeable with any magnetic flowmeter transmitter without losing stated accuracy and without having to recalibrate. Clam shell design type will not be acceptable.

I. Electronic components, magnetic driver, or any part requiring field adjustments and calibration shall not be mounted on the flowmeter.

J. The magnetic flowmeter shall be furnished with a built-in grounding rings and straps which are constructed from Type 316 stainless steel. The grounding of the flowmeter shall be provided as required by the flowmeter manufacturer. All cables required to connect the flowmeter to the transmitter shall be furnished by the manufacturer.

K. The magnetic flowmeter shall be suitable for raw sewage and sludge applications.

L. The magnetic flowmeter and transmitter shall operate satisfactorily when located near electric motors controlled by variable frequency drive systems. A certificate documenting a list of successful installations and operation of the proposed magnetic flowmeter in high electromagnetic field and radio frequency interference (EMF & RFI) environment shall be submitted to the Engineer. If the proposed magnetic flowmeter has any case of operational problems in the sewage solution application and EMF RFI environments, the meter will not be acceptable.

M. The magnetic flowmeter shall be a Siemens Sitrans F M MAG 5100 DN300 electromagnetic flowmeter with a Siemens Sitrans F M MAG 5000 transmitter. The Contractor shall furnish the make and model specified; no other pump manufacturers will be accepted.

2.02 MAGNETIC FLOWMETER TRANSMITTER

A. The transmitter shall energize the coils in the primary head of the magnetic flowmeter with a pulsed DC current and convert the low level high impedance DC signal from the flowmeter to a proportional 4-20 ma DC signal for transmission.

B. The transmitter shall be of all microprocessor based, solid-state construction employing electromagnetic and electrostatic shielding techniques. The transmitter shall be capable of automatic range change, automatically switched as a function of flow rate with programmable range ratio. The transmitter shall have data retention for a minimum of ten (10) years, galvanic isolation between all output circuits and between these and the input circuit (electrodes), active status indication output to signal directions automatic or trip point.

C. Span shall be continuously adjustable between 1 to 40 feet per second flow velocity by means of pushbuttons. The transmitter accuracy shall be included in the overall system accuracy of at least plus or minus 0.2 percent. The repeatability shall be plus or minus 0.02 percent of full scale. The signal output shall be 4-20 ma DC into 1,000 ohms. No nulling or pre-calibrated adjustments shall be necessary. The transmitter shall be furnished with a digital readout which shows flow rate or totalized value in engineering units. The transmitter shall be capable of monitoring forward or reverse flow condition. The transmitter shall operate on 120 volt, 60 Hertz power source.

D. The transmitter shall operate at 30 Hertz for high stability and fast response. The transmitter shall have programmable digital filter to eliminate automatically noise spikes for both amplitude and time domain duration.

E. The transmitter shall have the ability to adjust the gain automatically as the flow rate varies. It shall also be capable of manually setting the gain at low flow, medium flow and high flow.

F. The transmitter shall have adjustable features for both damping and rate limiting functions. The transmitter shall have a self-diagnostic feature to monitor continuously for abnormal conditions and provide alarm annunciation and contact output.

G. The transmitter shall have a low flow cutout feature and shall lock the transmitter output signal at minimum value adjustable from 0 to 20 percent when the flow drops below an adjustable minimum value. The transmitter shall also be able to zero-clamp or signal lock with a contact input.

H. The transmitter shall have communication capabilities for HART.

I. The transmitter shall be housed in a NEMA 4X enclosure suitable for surface mounting. A small type enclosure type, similar to the meter mounted type, will not be acceptable. The conduit entries of the sensor remote junction box shall be properly sealed to prevent water ingress. The use of sealed IP68 approved cable glands, conduit connections and/or conduit plugs shall be used to create a water tight installation.

J. The transmitter shall be as manufactured by the same company as the magnetic flowmeter. Substitutions will not be allowed to standardize on equipment and to maintain interchangeability of parts at the City's pump stations.

2.03 SPARE PARTS

A. Contractor shall provide spare parts as recommended by the manufacturer. The minimum spare parts included shall be cable glands, sealing screw, terminal box, and terminal box lid.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Comply with manufacturer's product data, including technical bulletins, catalog installation instructions, and product carton instructions for installation.

3.02 PREPARATION

A. Verify that dimensions are correct for device installation, including dimensions and connection to the force main.

B. Verify that conditions are acceptable for product installation in accordance with the manufacturer's recommended installation procedures.

C. The Contractor shall review the proposed installation and conditions and verify the manufacturers' details for accuracy to fit the application and dimensions prior to ordering.

3.03 INSTALLATION

A. Coordinate the installation of equipment with other related and adjacent work. Installation shall not start until construction has progressed to a point where remaining construction operations will not damage new equipment.

B. Thoroughly clean and remove all shipping materials prior to setting.

C. Protect metal, painted, and rubber finish surfaces from damage during construction.

D. Comply with manufacturers' installation instructions.

E. If the location of the flow meter is adjusted in the field during construction it is the Contractor's responsibility to ensure that the flow meter is located a minimum of 5 pipe diameters downstream and 3 pipe diameters upstream of the nearest bend, valve, or fitting.

3.04 CLEANING

A. Repair or replace damaged installed products. Clean installed products in accordance with the manufacturer's instructions.

B. Remove construction debris from site and legally dispose of the debris in conformance with Specifications.

3.05 TESTING AND CALIBRATION

A. Flow meter sensors shall be wet calibrated at the factory. The factory calibration report shall be shipped with the flow meter, and submitted to the City.

B. Contractor shall complete all installation, testing, and calibration procedures recommended by the flow meter manufacturer.

3.06 FIELD CALIBRATION

A. Once the flow meter has been installed and the pipe is returned to service the Contractor shall perform all field testing and calibration per the manufacturer's instructions for testing and calibration. Testing and calibration procedures and results shall be submitted to the City in writing upon completion.

END OF SECTION

SECTION 15050
BASIC MECHANICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Basic design and performance requirements for mechanical equipment.

1.02 REFERENCES

A. American Society of Mechanical Engineers (ASME):
   1. ASME PTC 8.2 - Performance Test Code for Centrifugal Pumps.
   2. ANSI/ASME PTC 10 - Performance Test Code - Compressors and Exhausters.
   3. ANSI/ASME PTC 17 - Performance Test Code - Reciprocating Internal-Combustion Engines.
   4. ANSI/ASME PTC 11 - Performance Test Code - Measurement of Shaft Horsepower - Instruments and Apparatus.

B. American Bearing Manufactures Association (ABMA) Standards:
   1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
   2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

C. American Society for Testing and Materials (ASTM):
   1. A 36 - Standard Specification for Structural Steel.
   2. A 48 - Standard Specification for Gray Iron Castings.
   3. A 526 - Standard Specification for Steel Sheet, Zinc Coated by the Hot Dip Process, Commercial Quality.
   4. B-61 - Standard Specification for Steam or Valve Bronze Castings.
   5. B 62 - Standard specification for Composition Bronze or Ounce Metal Castings.
   6. E 527 - Standard Practice for Numbering Alloys and Metals (UNS).

D. American National Standards Institute/Hydraulic Institute Standards (ANSI/HI):
   1. ANSI/HI 1.1-1.5 - Centrifugal Pumps - Nomenclature, Definitions, Application, and Operation.
   2. ANSI/HI 1.6 - Centrifugal Pump Tests.

1.03 DEFINITIONS

A. Special Tools: Tools that have been specifically made for use on unit of equipment for assembly, disassembly, repair, or maintenance.

B. Resonant Frequency: That frequency at which a small driving force produces an ever-larger vibration if no dampening exists.

C. Rotational Frequency: The revolutions per unit of time usually expressed as revolutions per minute.

D. Critical Frequency: Same as resonant frequency for the rotating elements or the installed machine and base.

E. Peak Vibration Velocity: The root mean square average of the peak velocity of the vibrational movement times the square root of 2 in inches per second.

F. Rotational Speed: Same as rotational frequency.

G. Maximum Excitation Frequency: The excitation frequency with the highest vibration velocity of several excitation frequencies that are a function of the design of a particular machine.

H. Critical Speed: Same as critical frequency.

I. Free Field Noise Level: Noise measured without any reflective surfaces (an idealized situation); sound pressure levels at 3 feet from the source unless specified otherwise.

1.04 SYSTEM DESCRIPTION

A. General:
   1. Provisions specified under each technical equipment specification prevail over and supersede conflicting provisions as specified in this Section.
   2. Provide equipment and parts that are suitable for stresses which may occur during fabrication, transportation, erection, and operation.
   3. Provide equipment that has not been in service prior to delivery, except as required by tests.
   4. Like parts of duplicate units are to be interchangeable.
   5. When two or more units of equipment for the same purpose are required, provide products of same manufacturer.
   6. Equipment manufacturer's responsibility extends to selection and mounting of gear drive units, motors or other prime movers, accessories, and auxiliaries required for proper operation.
   7. When necessary, modify manufacturer's standard product to conform to specified requirements or requirements indicated on the Drawings and contained in Laws and Regulations.

B. Material Requirements:
   1. Materials: Suitable for superior corrosion resistance and for services under conditions normally encountered in similar installations.
   2. Dissimilar Metals: Separate contacting surfaces with dielectric material.

C. Vibration:
   1. Resonant Frequency: Ensure there are no natural resonant torsional, radial, or axial frequencies within 25 percent above or below the operating rotational frequencies or multiples of the operating rotational frequencies that may be excited by the equipment design.

D. Equipment Mounting and Anchoring:
   1. Mount equipment on cast iron or welded steel bases with structural steel support frames. Utilize continuous welds to seal seams and contact edges between steel members. Grind welds smooth.
   2. Provide bases and supports with machined support pads, dowels for alignment or mating of adjacent items, adequate openings to facilitate grouting, and openings for electrical conduits.
   3. Provide jacking screws in bases and supports for equipment weighing over 1,000 pounds.

4. Anchor equipment base to concrete pad. Determine number, size, type, and location of bolts, anchor bolts, or other connections.
5. Provide bolt sleeves for anchor bolts for heavy equipment. Adjust bolts to final location and fill sleeve with non-shrink grout.

E. Structural Design:
1. For equipment with operating weight of 400 pounds or more provide calculations for:
a. Determination of operating weight and centroid of equipment.
1) Operating weight is to be weight of unit plus weight of fluids or solids normally contained in unit during operation.
b. Determination of seismic forces and overturning moments.
c. Determination of shear and tension forces in connections.
d. Design of connection details based on calculated shear and tension forces.

F. Equipment Units Weighing 50 Pounds or More: Provide with lifting lugs or eyes to allow removal with hoist or other lifting device.

1.05 SUBMITTALS

A. Product Data:
1. For each item of Equipment:
a. Design features.
b. Load capacities.
c. Efficiency ratings.
d. Material designations by UNS alloy number or ASTM Specification and Grade.
e. Data needed to verify compliance with the Specifications.
f. Catalog data.
g. Name plate data.
h. Clearly mark submittal information to show specific items, materials and accessories or options being furnished.

B. Shop Drawings:
1. Drawings for Equipment:
a. Drawings that include outline drawings, cut-away drawings, parts lists, material specification lists, and other information required to substantiate that proposed equipment complies with specified requirements.
2. Outline drawings showing equipment, driver, driven equipment, pumps, seal, motor(s) or other specified drivers, variable frequency drive, shafting, U-joints, couplings, drive arrangement, gears, baseplate or support dimensions, anchor bolt sizes and locations, bearings, and other furnished components.
3. Installation and checkout instructions including leveling and alignment tolerances, grouting, lubrication requirements, and initial start-up procedures.
4. Wiring, control schematics, control logic diagrams and ladder logic or similar for computer based controls.
5. Recommended or normal operating parameters such as temperatures and pressures.
6. Alarm and shutdown set points for all controls furnished.

C. Calculations:
   1. Calculations and other information to substantiate base plates, supports, and anchor bolts meet minimum design strength requirements and seismic design.
   2. Calculations and other information to substantiate that operating rotational frequencies meet the requirements of this Section.
   3. Torsional Analysis of Power Transmission Systems: When torsional analysis specified in the equipment Sections, provide:
      a. Sketch of system components identifying physical characteristics including mass, diameter, thickness, and stiffness.
      b. Results of analysis including first and second critical frequencies of system components and complete system.

D. Quality Control Submittals:
   1. Source quality control reports and certified test data.
   2. Submit factory test reports before shipment.
   3. Certified static and dynamic balancing reports for rotating equipment.
   4. Field quality control reports and test data.
   5. Submit material test reports a specified in the equipment sections.

E. Operation and Maintenance Manuals:
   1. Submit prior to training of City's personnel.
   2. Make available at project site complete copy of manuals for use by field personnel and Engineer during start-up and testing of equipment.
   3. Include manufacturer and model number of every bearing; include calculated ball pass frequencies of the installed equipment for both the inner and outer raceways.
   4. Include motor rotor bar pass frequencies.

1.06 QUALITY ASSURANCE

A. Qualifications: Equipment manufacturer and system component manufacturers to have a minimum of 5 years experience in the design, manufacture, and assembly of the specified equipment and components with an established record of successful operation of such equipment and components.

B. References: Provide references from a minimum of 3 installations currently operating the same model equipment in continuous service for a minimum of 2 years under similar operating conditions. Reference information shall include location, service, contact person, and contact phone number.

C. Manufacturer's Field Service:
   1. Furnish services of authorized representative specially trained in installation of equipment.
      a. Visit project site and perform tasks necessary to certify installation.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:
   1. Equipment: Pack in boxes, crates, or otherwise protect from damage and moisture, dust, or dirt during shipment, handling, and storage.
   2. Bearings: Separately pack or otherwise suitably protect during transport.
   3. Spare Parts: Deliver in boxes labeled with contents, equipment to which spare parts belong, and name of Contractor.

B. Storage:
   1. Equipment Having Bearings: Store in enclosed facilities. Rotate units at least once per month or more often as recommended by the manufacture to protect rotating elements and bearings.
   2. Gear Boxes: Oil filled or sprayed with rust preventive protective coating.

C. Protection:
   1. Equipment: Protect equipment from deleterious exposure.
   2. Painted Surfaces: Protect against impact, abrasion, discoloration, and other damage.

1.08 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Equipment for project is to be suitable for performance in a wastewater pumping plant environment and under following conditions:
      a. Ambient Temperatures: freezing to 95 degrees Fahrenheit.
      b. Relative Humidities: 60 to 100 percent.
      c. Other: Coastal fog.

1.09 SEQUENCING AND SCHEDULING

A. Equipment Anchoring: Obtain from equipment manufacturers' anchoring material and templates or setting drawings in time for anchors to be cast-in-place when concrete is placed.

B. Coordinate details of equipment with other related parts of the Work, including verification that structures, piping, wiring, and equipment components are compatible.

C. General Start-up and Testing of Equipment:
   1. Perform general start-up and testing procedures after operation and maintenance manuals for equipment have been received.
   2. Conduct functional testing of mechanical or electrical systems when each system is substantially complete and after general start-up and testing procedures have been successfully completed.

1.10 WARRANTY

A. Warranty: Where no specific term of warranty is provided in a technical specification, warrant equipment free of defects in material and workmanship for one year from the date of acceptance or date of first beneficial use of the equipment by the City; cover parts and labor.

B. Where a warranty exceeds one year, manufacturer’s warranty shall be issued in the City’s name.

1.11 MAINTENANCE

A. Special Tools:
   1. When specified, provide special tools required for operation and maintenance.
   2. Mark or tag and list such tools in maintenance and operations instructions. Describe use of each tool.

B. Spare Belts:
   1. When spare belts are specified, furnish 1 spare belt for every different type and size of belt-driven unit.
      a. Where 2 or more belts are involved, furnish matched sets.
      b. Identify as to equipment, design, horsepower, speed, length, sheave size, and use.
      c. Package in boxes labeled with identification of contents.

C. Spare Parts:
   1. Assume responsibility until turned over to City.
   2. Store in enclosed facilities.
   3. Furnish itemized list and match identification tag attached to every part.
   4. List parts by generic title and identification number.
   5. Furnish name, address, and telephone number of supplier and spare parts warehouse.

PART 2 PRODUCTS

2.01 MATERIALS

A. Ferrous Materials:
   1. Steel for Members used in Fabrication of Assemblies: ASTM A 36.
   2. Iron Castings: ASTM A 48, tough, close-grained gray iron, free from blowholes, flaws, and other imperfections.
   3. Galvanized Steel Sheet: ASTM A 526, minimum 0.0635 inch (16 gauge).
   4. Expanded Metal: ASTM A 36, 13-gauge, 1/2-inch flat pattern expanded metal.

B. Nonferrous Materials:
   1. Stainless Steel: Type 304 or 316 as specified; provide L grade where welding required.
   2. Bronze in Contact with Liquid: Composition of not more than 2 percent aluminum nor more than 6 percent zinc; UNS Alloy C83600, C92200, or C92700 in accordance with ASTM B 62, B-61, B-505, or B-584, when not specified otherwise.

C. Dielectric Materials for Separation of Dissimilar Metals:
   1. Neoprene, bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other materials.

D. Non-Shrink Grout: As specified in Section 03600.

2.02 BEARINGS

A. Type: Oil or grease lubricated, ball or roller antifriction type, of standard manufacture.

B. Oil Lubricated Bearings: Provide either pressure lubricating system or separate oil reservoir splash type system.
   1. Oil Lubrication Systems: Sized to safely absorb heat energy normally generated in bearings under maximum ambient temperature of 15-degree Fahrenheit above the specified maximum ambient temperature specified under article, Project Conditions; provide external cooler when required, air cooled if water cooling

source not indicated on the Drawings. Equip with filler pipe and external level gauge.

C. Grease Lubricated Bearings, Except Those Specified to Be Factory Sealed: Fit with easily accessible grease supply, flush, drain, and relief fittings.
   1. Lubrication Lines and Fittings:
      a. Lines: Minimum 1/4-inch diameter stainless steel tubing.
      b. Multiple Fitting Assemblies: Mount fittings together in easily accessible location.
      c. Use standard hydraulic type grease supply fittings.
         1) Manufacturers: One of the following or equal:
            a) Alenite
            b) Zurk.

D. Ratings: Rated in accordance with ABMA 9 or ABMA 11 for L_{10} rating life of not less than 50,000 hours.
   1. Higher ratings, when specified in other Sections, supersede preceding requirement.

2.03 FABRICATION

A. Nameplates: Engraved or stamped on Type 304 stainless steel and fastened to equipment at factory in an accessible and visible location.
   1. Indicate Following Information as Applicable:
      a. Manufacturer's name.
      b. Equipment model number and serial number.
      c. Maximum and Normal rotating speed.
      d. Horsepower.
      e. Rated capacity.
      f. Service class per applicable standards.
   2. Nameplates for Pumps: Include:
      a. Rated total dynamic head in feet of fluid.
      b. Rated flow in gallons per minute.
      c. Impeller, gear, screw, diaphragm, or piston size.
   3. Gear Reduction Units: Include:
      a. AGMA Class of service.
      b. Service factor.
      c. Input and output speeds.

B. Bolt Holes in Equipment Support Frames: Do not exceed bolt diameter by more than 25 percent, up to limiting maximum diameter oversize of 1/4 inch.

C. Shop Finishing:
   1. Provide factory and field coating.
      a. Bases and Support Frames in Contact with Concrete or Other Material: Paint contacting surfaces with minimum of 2 coats of zinc chromate primer before installation or grouting.
      b. Shop Primer for Steel and Iron Surfaces, Unless Specified Otherwise:
         1) Manufacturers: One of the following or equal:
            a) Ameron, Amercoat 185 Universal Primer.
            b) Cook, 391-N-167 Barrier Coat.
            c) Kop-Coat, Pug Primer.

d) Tnemec, 37-77 Chem-Prime.
e) Valspar, 13-R-28 Chromox Primer.

c. Coat machined, polished, and nonferrous surfaces which are not to be painted with rust-preventive compounds.
1) Manufacturers: One of the following or equal:
a) Houghton, Rust Veto 344.
b) Rust-Oleum, R-9.

d. Coating for Ferrous Metal Surfaces, Except Stainless Steel: High solids polyamine epoxy.

e. Finish Painting of Motors: Shop finish paint with manufacturer's standard coating, unless otherwise specified.

2.04 SOURCE QUALITY CONTROL

A. As specified in the individual equipment sections of the Specifications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect all components for shipping damage, conformance to specifications, and proper torques and tightness of fasteners.

3.02 PREPARATION

A. Metal Work Embedded in Concrete:
1. Accurately place and hold in correct position while concrete is being placed.
2. Clean surface of metal in contact with concrete immediately before concrete is placed.

B. Concrete Surfaces Designated to Receive Grout:
1. Give surfaces heavy sandblasting treatment.
2. Clean surfaces of sandblasting sand, grease, oil, dirt, and other foreign material that may reduce bonding of grout.
3. Concrete Saturation: Saturate concrete with water. Concrete surface shall be damp concrete at time grout is placed.

C. Field Measurements:
1. Prior to fabrication of equipment, take measurements for installation of equipment and verify dimensions indicated on the Drawings. Ensure equipment and ancillary appurtenances fit within available space.

3.03 INSTALLATION

A. Install equipment in accordance with manufacturer's installation instructions and recommendations.

B. Lubrication Lines and Fittings:
1. Lines from Fittings to Point of Use: Support and protect.
2. Fittings:

a. Bring fittings to outside of equipment in manner such that they are readily accessible from outside without necessity of removing covers, plates, housings, or guards.
b. Mount fittings together wherever possible using factory-mounted multiple fitting assemblies securely mounted, parallel with equipment lines, and protected from damage.
c. Fittings for Underwater Bearings: Bring fittings above water surface and mount on edge of structure above.

C. Alignment of Drivers and Equipment:
1. Where drive motors or other drivers are connected to driven equipment by flexible coupling, disconnect coupling halves and align driver and equipment after complete unit has been leveled on its foundation.
2. Comply with procedures of appropriate Hydraulic Institute Standards, AGMA Standards, alignment tolerances of equipment manufacturers and the following requirements to bring components into angular and parallel alignment:
a. Maximum Total Coupling Offset (not the per plane offset): Not to exceed 0.5 mils per inch of coupling length for spacer couplings based on coupling length (not dial separation).
b. Utilize jacking screws, wedges, or shims as recommended by the equipment manufacturer and as specified in the equipment sections.
3. Use Reverse-indicator Arrangement Dial Type or Laser Type Alignment Indicators: Mount indicators on the driver/coupling flange and equipment/coupling flange. Alignment instrumentation accuracy to be sufficient to read angular and radial misalignment at 10 percent or less of the manufacturer's recommended acceptable misalignment.
4. Alignment and calculations to include measurement and allowance for thermal growth, spacer coupling length, indicator separation, and axial spacing tolerances of the coupling.
5. When alignment satisfies most stringent tolerance of system components, tighten anchor bolts and grout between base and foundation. Allow minimum 48 hours for grout to harden. After grout hardens, remove jacking screws, fully tighten anchor bolts, and recheck alignment. Correct alignment as required.
6. After operational testing is complete, dowel motor or drivers and driven equipment. Comply with manufacturer's instructions.

D. Grouting Equipment Bases:
1. Comply with manufacturer's installation instructions for grouting spaces, type of grout, and tolerances for level and alignments, both vertical and horizontal.
2. Grout base when piping connections are complete and in alignment with no strain transmitted to equipment.
3. Grout base when equipment is leveled and in alignment.
4. Place grout, filling voids under equipment bases including recesses between anchor bolts and sleeves.
a. Extend grout to edge of bases or bedplates and bevel at 45 degrees around units.
b. Finish surfaces with slope that prevents ponding water within grouted areas.

E. Special Techniques: Use applicable special tools and equipment, including precision machinist levels, dial indicators, and gauges as required in equipment installations.

F. Completed Equipment Installations: Comply with requirements for intended use and specified vibration and noise tolerances.

G. Warning Signs: Mount securely with stainless fasteners at equipment which can be started automatically or from remote locations.

3.04 FIELD QUALITY CONTROL

A. Test equipment as required by product manufacturer.

3.05 MANUFACTURER'S REPRESENTATIVE

A. Field Checkout: Before field testing and start-up, provide services of factory-trained field service representative to certify the equipment has been installed, aligned and checked in accordance with the manufacturers instructions and the Specifications.

B. Testing: Provide services of factory trained representative to observe and advise the Contractor during field quality control testing.

C. Training: When training is specified, provide services of factory-trained representative to perform training.

END OF SECTION

SECTION 15052
BASIC PIPING MATERIALS AND METHODS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Basic piping materials and methods.

B. Related Sections:
   1. Section 02700 – Polyvinyl Chloride (PVC) Pipe and Fittings
   2. Section 02710 – High Density Polyethylene (HDPE) Pipe
   3. Section 02720 – Ductile Iron Pipe
   4. Section 02770 – Sanitary Sewer Testing.

1.02 REFERENCES

A. American National Standards Institute
   1. B 1.20.1 - Specifications of International Thread Standards

B. American Society of Testing and Materials (ASTM):
   1. A 53 - Standard Specification for Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated Welded and Seamless.
   2. A 106 - Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
   3. A 262 – Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels
   4. A 351 - Standard Specification for Castings, Austenitic, for Pressure-Containing Parts
   5. B 62 - Standard Specification for Composition Bronze or Ounce Metal Castings
   6. D 1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
   7. D 1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
   8. D 2240 - Test Method for Rubber Property - Durometer Hardness.
   9. D 2564 - Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
   10. D 2672 - Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement
   11. B 42 - Standard Specification for Seamless Copper Pipe, Standard Sizes

12. B 88 - Standard Specification for Seamless Copper Pipe Water Tube

C. American Water Works Association
   1. AWWA C115 - Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges
   2. AWWA C116 - Protective Fusion-bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile Iron and Gray Iron Fittings
   3. AWWA C207 - Steel Pipe Flanges for Waterworks Service

1.03 DEFINITIONS

A. Aboveground Piping: Piping within buildings, tunnels, or other structures without regard to elevation of piping, or exposed piping outside buildings and structures.

B. Underground Piping: Piping buried in soil or cast in concrete.

C. Underwater Piping: Piping below tops of walls in basins or concrete tanks containing water.

D. Wet Wall: Wall with water on at least one side.

1.04 SYSTEM DESCRIPTION

A. Piping Drawings:
   1. Except in details, piping is indicated diagrammatically. Not every offset and fitting, or structural difficulty that may be encountered has been indicated on the Drawings. Sizes and locations are indicated on the Drawings.
   2. Perform minor modifications to piping alignment where necessary to avoid structural, mechanical, or other type of obstructions that cannot be removed or changed.
      a. Modifications are intended to be of minor scope, not involving a change to the design concept or a change to the Contract Price or Contract Times.

B. Performance Requirements:
   1. Restraining Piping:
      a. Restrain piping at valves and at fittings where piping changes direction, changes sizes, and at ends.
         1) When piping is underground use mechanical restraints.
         2) When piping is aboveground or under water, use mechanical or structural restraints.
         3) Determine thrust forces by multiplying the nominal cross sectional area of the piping by 2.5 times the pump shutoff head.

b. Provide underground mechanical restraints at all valves, fittings, and where specified in the Piping Schedule or shown on the Drawings.

C. Connections to Existing Piping:
1. Expose existing piping to which connections are to be made with sufficient time to permit, where necessary, field adjustments in line, grade, or fittings.
a. Provide sleeves, flanges, nipples, couplings, adapters, and other fittings needed to install or attach new fittings to existing piping and to make connections to existing piping.

D. Connections at Dissimilar Metals:
1. Connect ferrous and nonferrous metal piping, tubing, and fittings with dielectric couplings especially designed for the prevention of chemical reactions between dissimilar metals.
2. Nonferrous metals include aluminum, copper, and copper alloys.

E. Piping Alternatives:
1. Provide piping in accordance with this Section, unless indicated on the Drawings or specified otherwise.
2. Alternative Pipe Ratings: Piping with greater pressure rating than specified may be substituted in lieu of specified piping without changes to the Contract Price. Piping of different material may not be substituted in lieu of specified piping.
3. Valves in Piping Sections: Valves shall have the same pressure rating as the adjacent piping.
4. For flanged joints, where one of the joining flanges is raised face type, provide a matching raised face type flange for the other joining flange.

PART 2 PRODUCTS

2.01 LINK TYPE SEALS

A. Manufacturers: One of the following or equal:
1. Calpico, Inc.
2. Thunderline Corporation, Link-Seal.

B. Characteristics:
1. Modular mechanical type, consisting of interlocking neoprene or synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening.
2. Assemble links solely with stainless steel bolts and nuts to form a continuous rubber belt around the pipe.

3. Provide a stainless steel or glass reinforced nylon pressure plate under each bolt head and nut. Isolate pressure plate from contact with wall sleeve.

2.02 GASKETS

A. Gaskets for Steel Piping:
   1. Suitable for pressures equal to and less than 150 pounds per square inch gauge, temperatures equal to and less than 250 degrees Fahrenheit, and raw sewage service.
   2. Gasket Material:
      a. Neoprene elastomer with minimum Shore A hardness value of 70.
      b. Reinforcement: Inserted 13 ounce nylon fabric cloth for pipes 20 inch or larger.
      c. Thickness: Minimum 3/32 inch thick for less than 10 inch pipe; minimum 1/8 inch thick for 10 inch and larger pipe.
   3. Manufacturers: One of the following or equal:
   4. Pipe 20 inches in Diameter and Larger:
      a. Garlock, Style 8798.
      b. John Crane, similar product.
   5. Pipe less than 20 inches in Diameter:
      a. Garlock, Style 7797.
      b. John Crane, similar product.

B. Gaskets for Flanged Joints in Polyvinyl Chloride and Polyethylene Piping:
   1. Suitable for pressures equal and less than 150 pounds per square inch gauge, with low flange bolt loadings, temperatures equal and less than 120 degrees Fahrenheit, polymer, chlorine, caustic solutions, and other chemicals, except chemicals which liberate free fluorine including fluorochemicals and gaseous fluorine.
   2. Material: Viton Rubber; 0.125 inch thick.
   3. Manufacturers: One of the following or equal:
      a. Garlock.
      b. John Crane, similar product.

2.03 PIPE AND FITTINGS

A. Sewer PVC Pipe and Fittings: Refer to Section 02700.

B. Ductile Iron Pipe and Fittings: Refer to Section 02720

C. Water service piping:
   1. Copper tubing Type K, soft, conforming to ASTM B88.

D. Stainless steel pipe shall be seamless conforming to ASTM A262. Stainless steel shall be 316 unless otherwise noted.

E. Ball Valve: Refer to Section 15110.

F. Cam-lock Fitting:
   1. Stainless steel 316 manufactured by Dixon or approved equal.
   2. Metal coupling shall be able to withstand 75 psi minimum of working pressure
   3. The body of the fitting shall meet material requirements included in ASTM A351.
   4. Fitting shall be electrical isolated from dissimilar material by use of Nitrile (NBR) gasket or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Existing Conditions:
   1. Locate and expose existing structures, piping, conduits, and other facilities and obstructions that may affect construction of underground piping before starting excavation for new underground piping and appurtenances.
   2. Verify sizes, elevations, locations, and other relevant features of existing facilities and obstructions. Determine conflicts for the construction of the new underground piping and appurtenances.
   3. Make piping location and grade adjustments to resolve conflicts between new piping and existing facilities and obstructions.

3.02 WALL AND SLAB PENETRATIONS

A. Provide sleeves for piping penetrations through concrete walls, floors, ceilings, roofs, pilasters, columns, piers, and beams unless specified or otherwise indicated on the Drawings.

B. For piping 1 inch in nominal diameter and larger, provide sleeves with minimum inside diameters of 1 inch plus outside diameter of piping. For piping smaller than 1 inch in nominal diameter, provide sleeve of minimum twice the outside diameter of piping.
   1. Arrange sleeves and adjacent joints so piping can be pulled out of sleeves and replaced without disturbing the structure.
   2. Cut ends of sleeves flush with surfaces of concrete, masonry, or plaster.

3. Conceal ends of sleeves with escutcheons where piping runs through floors, walls, or ceilings of finished spaces within buildings.
4. Seal spaces between pipes and sleeves with link-type seals when not otherwise specified or indicated on the Drawings.

C. Cast couplings or wall pieces in walls for penetrations of buried rigid piping including steel and vitrified clay through structures.
1. Provide couplings or wall pieces with mechanical push-ons, or similar flexible joints at outside faces of walls.
2. Provide additional similar joints in piping at transition points between trenches and structure excavations.
3. For steel piping, single joints may be used in lieu of 2 joints. Locate single joints outside within 2 feet from outside faces of walls. Link Seal: Use 2 link seals where seal is used to seal at wet wall sleeves. Mount one seal on the inside face of the wall and the other on the outside face of the wall. Coordinate the inside diameter of the wall sleeve with the size of the seal to provide watertight sealing.

D. Where not indicated on the Drawings, penetrations for conditions other than those specified under the preceding subparagraphs shall be 1 of the 3 types specified in such subparagraphs found by Engineer to be the most suitable for the particular conditions.

3.03 EXPOSED PIPING

A. Install exposed piping in straight runs parallel to the axes of structures, unless indicated otherwise.
1. Install piping runs plumb and level, unless otherwise indicated on the Drawings. Slope plumbing drain piping with 1/8 inch per foot downward in the direction of flow. Slope digester gas piping to drip traps or low-point drains at minimum 1/2 inch per foot where condensate flows against the gas, or 1/4 inch per foot where condensate flows with gas.

B. Install exposed piping after installing equipment and after piping and fitting locations have been determined.

C. Do not transfer pipe loads and strain to equipment.

D. In addition to the joints indicated on the Drawings, provide unions, flexible couplings, flanged joints, and other types of joints or means which are compatible with and suitable for the piping system, and necessary to allow ready assembly and disassembly of the piping.

E. Assemble piping without distortion or stresses caused by misalignment.
   1. Match and properly orient flanges, unions, flexible couplings, and other connections.
   2. Do not subject piping to bending or other undue stresses when fitting piping. Do not correct defective orientation or alignment by distorting flanged joints or subjecting flange bolts to bending or other undue stresses.
   3. Flange bolts, union halves, flexible connectors, and other connection elements shall slip freely into place.
   4. Alter piping assembly to fit when proper fit is not obtained.
   5. Install eccentric reducers or increasers with the top horizontal for pump suction piping.

3.04 BURIED PIPING

A. Bury piping with minimum 3-foot cover without air traps, unless otherwise indicated on the Drawings.

B. Where 2 similar services run parallel to each other, piping for such services may be laid in the same trench. Lay piping with sufficient room for assembly and disassembly of joints, for thrust blocks, for other structures, and to meet separation requirements of public health authorities having jurisdiction.

C. Laying Piping:
   1. Lay piping in finished trenches free from water or debris. Begin at the lowest point with bell ends up slope.
   2. Place piping with top or bottom markings with markings in proper position.
   3. Lay piping on an unyielding foundation with uniform bearing under the full length of barrels.
   4. Where joints require external grouting, banding, or pointing, provide space under and immediately in front of the bell end of each section laid with sufficient shape and size for grouting, banding, or pointing of joints.
   5. At the end of each day's construction, plug open ends of piping temporarily to prevent entrance of debris or animals.

D. Buried metallic pipe, fittings, and valves shall be wrapped with polyethylene as specified in Section 02720.

3.05 CLEANING

A. Piping Cleaning:
   1. Upon completion of installation, clean piping interior of foreign matter and debris. Perform special cleaning when required by the Contract Documents.

3.06 PIPING SCHEDULE

A. Abbreviations:

1. Abbreviations to designate piping include the following:

BF	Butt fusion
BS	Bell and spigot
CI	Cast iron
CL	Class, followed by the designation
DIP	Ductile iron piping
FL	Flanged
Ga	Gauge, preceded by the designation
GE	Grooved end joint
HDPE	High Density Polyethylene
NPS	Nominal pipe size, followed by the number in inches, pounds per square inch, or pounds per square inch, gauge.
PEE	Polyethylene encasement
PVC	Polyvinyl Chloride
SCH	Schedule, followed by the designation
SCRD	Screwed
SS	Stainless steel, Sanitary Sewer
SSFM	Sanitary Sewer Force Main
STL	Steel
SW	Solvent Weld
VCP	Vitrified clay piping
WLD	Weld

END OF SECTION

SECTION 15061
PIPE SUPPORTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Supports for pipe, fittings, valves, and appurtenances.

B. Related Sections:
1. Section 05501 – Anchor Bolts
2. Section 05505 – Miscellaneous Metals.
3. Section 09800 – Coating Systems.
4. Section 15052 - Basic Piping Materials and Methods.

1.02 REFERENCES

A. American National Standard Institute or Manufacturer's Standardization Society (ANSI/MSS):
1. SP-58 - Standard for Pipe Hangers and Supports - Materials, Design, and Manufacture.
2. SP-69 - Standard for Pipe Hangers and Supports - Selection and Application.

1.03 SUBMITTALS

A. Shop Drawings: Include schedule, indicating where supports will be installed, and drawings of pipe support system components.

PART 2 PRODUCTS

2.01 PIPE SUPPORTS

A. Standard U-bolt: ANSI/MSS SP-69 Type 24.
1. Manufacturers: One of the following or equal:
a. Anvil, Figure 137.
b. Bergen-Paterson, Part 6510.
c. B-Line Systems, Inc., Figure B3188.

B. Pipe Clamps: ANSI/MSS SP 69 Type 4.
1. Manufacturers: One of the following or equal:
a. Anvil, Figure 212.
b. Bergen-Paterson, Part 6100.
c. B-Line Systems, Inc., Figure B3140.
d. Unistrut.

C. Clevis Hangers: ANSI/MSSS SP 69 Type 1
1. Manufacturers: one of the following or equal:
a. Anvil, Figure 590.

D. Anchor Bolts, Flush Shells, Powder Actuated Fasteners, and Concrete Anchors: As specified in Section 05501.

2.02 MATERIALS

A. Pipe Supports:
   1. Stainless Steel (Type 316): Use in all submerged locations, above water level but below top of wall inside water bearing structures and where specifically indicated on the Drawings.
   2. Hot-dip Galvanized Steel: Use in areas other than above and where specifically indicated on the Drawings. Hot-dip galvanize pipe support after fabrication.
   3. Plastic, Aluminum, FRP and Other Miscellaneous Materials: Use where specifically indicated on the Drawings.

B. Fasteners:
   1. As specified

PART 3 EXECUTION

3.01 INSTALLATION

A. Properly support, suspend, or anchor exposed pipe, fittings, valves, and appurtenances to prevent sagging, overstressing, or movement of piping; and to prevent thrusts or loads on or against connected pumps, blowers, and other equipment.

B. Carefully determine locations of inserts. Anchor to formwork prior to placing concrete.

C. Use flush shells only where indicated on the Drawings.

D. Do not use anchors relying on deformation of lead alloy.

E. Do not use stud type powder actuated fasteners for securing metallic conduit or steel pipe larger than 1 inch to concrete, masonry, or wood.

F. Suspend pipe hangers from hanger rods. Secured with double nuts.

G. Install continuously threaded hanger rods only where indicated on the Drawings.

H. Use adjustable ring hangers; or adjustable clevis hangers, for 6 inch and smaller diameter pipe.

I. Use adjustable clevis hangers for pipe larger than 6 inches in diameter.

J. Secure pipes with galvanized double nutted U-bolts or suspend pipes from hanger rods and hangers.

K. Support Spacing:
   1. Support 2 inch and smaller piping on horizontal and vertical runs at maximum 4 feet on center, unless otherwise specified.
   2. Support larger than 2 inch piping on horizontal and vertical runs at maximum 6 feet on center, unless otherwise specified.

3. Support exposed polyvinyl chloride and other plastic pipes at maximum 5 feet on center, regardless of size.

L. Install Supports at:
   1. Horizontal bends.
   2. Both sides of flexible pipe connections.
   3. Base of risers.
   4. Floor penetrations.
   5. Connections to pumps, blowers and other equipment.
   6. Valves and appurtenances.

M. Securely anchor plastic pipe, valves, and headers to prevent movement during operation of valves.

N. Anchor plastic pipe between expansion loops and direction changes to prevent axial movement through anchors.

O. Support base fittings with metal supports or when indicated on the Drawings, concrete piers.

P. Size hanger rods, supports, clamps, anchors, brackets, and guides in accordance with ANSI/MSS SP 58 and SP 69.

Q. Do not use chains, plumbers' straps, wire, or similar devices for permanently suspending, supporting, or restraining pipes.

R. Support plumbing drainage and vents in accordance with California Plumbing Code.

S. Supports, Clamps, Brackets, and Portions of Support System Bearing Against Copper Pipe: Copper plated, copper throughout, or isolated with neoprene or polyvinyl chloride tape.

T. Where pipe is insulated, install over-sized supports and hangers.

U. Install insulation shield in accordance with ANSI/MSS SP 69, Type 40. Shield shall be galvanized steel unless specified elsewhere.

V. Install riser clamps at floor penetrations and where indicated on the Drawings.

W. Provide dielectric protection whenever fastening dissimilar metals.

X. Paint or Coat support system components as specified in Sections 09800.

END OF SECTION

SECTION 15110
VALVES

PART 1 - GENERAL

1.01 DOCUMENTS

The General Conditions and all other Contract Documents for this project are complementary and applicable to this section of the Specifications.

1.02 SCOPE OF WORK

A. **Work Included:** All work necessary to furnish and install all valves as shown on the drawings and specified herein.

B. **Related Work Specified Elsewhere**
1. Ductile Iron Pipe: Section 02720.
2. Sanitary Sewer Testing: Section 02770.
3. Coating Systems: Section 09800.
4. Basic Piping Materials and Methods: Section 15052.

1.03 REFERENCE STANDARDS

Standards listed below are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of listed standards, the requirements of this section shall prevail. Where two or more standards are at variance, the most restrictive requirement shall apply.

A. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings

B. ASTM A536 - Specification for Ductile Iron Castings

C. AWWA C110 - Ductile Iron and Gray Iron Fittings, 3-inch through 48-inch

D. AWWA C509 - Resilient-Seated Gate Valves for Water and Sewerage Systems

E. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants

1.04 QUALITY ASSURANCE

A. **Acceptable Manufacturers:** The Contractor shall provide valves with the manufacturer's name and pressure rating clearly marked on the outside of the body of the same manufacturer where possible.

B. **Valve Connections:** Suitable valves shall be provided to connect to adjoining piping as specified for pipe joints.

1.05 SUBMITTALS

A. **Product Data**: The Contractor shall submit shop plans, manufacturer's product data, and installation instructions demonstrating that the proposed valves are in compliance with the referenced standards as well as the intended service. If plans are returned disapproved or not stamped, they shall be revised or corrected as necessary and resubmitted for review, approval, and stamping.

B. **Operation and Maintenance Data:** Furnish bound sets of installation, operation, and maintenance instructions for each type of valve 4 inch in nominal size and larger. Include information on valve operators in operation and maintenance instruction manual.

C. **Certification**: Certified test reports with each delivery that the valve(s) comply with this specification.

PART 2 - PRODUCTS

2.01 GATE VALVES

A. Gate valves shall be non-rising stem resilient wedge gate valves meeting AWWA C509 standards with flanged ends drilled to ANSI B16.1 Class 125 standards.

B. Provide a removable hand wheel for each non-buried gate valve.

C. Resilient wedge gate valves shall have a cast iron wedge fully encapsulated in molded rubber complying with ASTM D2000, with extended wedge guides molded as part of the wedge. Resilient seat shall affect a bubble-tight seal across the wedge at a full differential of 200 psi. The wedge shall be designed to minimize solids build-up and stem binding. Internal working parts shall be corrosion resistant and accessible without removing the main body from the discharge line.

D. Valves shall be epoxy lined and coated per Section 09800 and in conformance with AWWA C550. Lining materials shall not be applied to valve stems, wedges or wedge seats; nor build up in thickness to interfere with joint assembly or with the operation of the lined unit.

E. Buried valves shall be wrapped with polyethylene per Section 02720.

F. Valve, Gate, and Operator Bolts and Nuts:
   1. Fabricated of Type 316 stainless steel for the following installation conditions:
      a. Submerged in sewage or water.
      b. In an enclosed space above sewage or water.
      c. In structures containing sewage or water, below top of walls.
      d. At openings in concrete or metal decks.
      e. Buried.
   2. Where dissimilar metals are being bolted, use stainless steel bolts with isolation bushings and washers.

2.02 CHECK VALVES

A. Where check valves are indicated on the contract drawings, ball type check valves shall be used.

B. Valves shall be designed for horizontal installation with a sinking ball.

C. Ball shall be aluminum core with vulcanized Nitrile rubber covering.

D. Valves shall be flanged.

E. Valves shall be epoxy lined and coated per Section 09800 and in conformance with AWWA C550. Lining materials shall not be applied to ball; nor build up in thickness to interfere with joint assembly or with the operation of the lined unit.

F. Ball check valves shall be Flygt Type 5087 or approved equal.

2.03 UNDERGROUND VALVES

A. Provide underground valves with flanged, mechanical, or other type of joint required for the type of pipe to which the valve is to be connected.

B. Coating and Wrapping:
   1. After installation, wrap valves with polyethylene as specified for ductile iron piping in Section 02720.
      a. Contractor shall ensure and confirm that polyethylene wrapping does not affect operation of valve.

2.04 BALL VALVES

A. Where indicated on the plans, new ball valves shall be used.
   1. Ball valves shall conform to ASTM A351.
   2. Type 316 stainless steel
   3. NPT Female Threaded end
   4. Locking handle
   5. Full port
   6. 1,000 psi minimum pressure rating
   7. Sharpe Series 5303 or approved equal

PART 3 - EXECUTION

3.01 PREPARATION

Foreign material, scale, and dirt, inside and outside, shall be removed from valve materials before assembly.

3.02 CONNECTIONS

A. Valve connections shall be made in accordance with applicable standards and manufacturer's recommendations.

B. Non-conducting connections shall be provided wherever jointing dissimilar metals.

3.03 INSTALLATION

A. **General**: Valves shall be installed in accordance with good trade practice to insure that after installation and testing they are in good condition. Should damage occur to pipe, valves, fittings, or equipment, repairs satisfactory to the City shall be made prior to final acceptance at no additional cost to the City.

B. **Handling and Storage of Valves**: During loading, transportation, and unloading, every precaution shall be taken to prevent valve damage. Any damaged valves shall be replaced or repaired to the satisfaction of the City.

C. Provide incidental work and materials necessary for installation of valves including flange gaskets, flange bolts and nuts, valve boxes and covers, concrete bases, blocking, and protective coating.

D. Where needed, furnish and install additional valves for proper operation and maintenance of equipment and plant facilities under the following circumstances:
   1. Where such additional valves are required for operation and maintenance of the particular equipment furnished by CONTRACTOR.
   2. Where such additional valves are required as a result of a substitution or change initiated by CONTRACTOR.

E. Install Valves with their stems in vertical position above the pipe, except as follows:
   1. Butterfly valves, gate valves aboveground, globe valves, ball valves, and angle valves may be installed with their stems in the horizontal position.
   2. Buried plug valves with geared operators shall be installed with their stems in a horizontal position.

F. Install valves so that handles clear obstructions when the valves are operated from fully open to fully closed.

G. Place top of valve boxes flush with finish grade or as otherwise indicated on the Drawings.

H. Valves with Threaded Connections:
   1. Install valves by applying wrench on end of valve nearest the joint to prevent distortion of the valve body.
   2. Apply pipe joint compound and Teflon tape on external (male) threads to prevent forcing compound into valve seat area.

I. Valves with Flanged Connections:
   1. Align flanges and gasket carefully before tightening flange bolts.
   2. When flanges are aligned, install bolts and hand tighten.
   3. Tighten nuts opposite each other with equal tension before moving to next pair of nuts.

J. Valves with Soldered Connections:
   1. Do not overheat connection to prevent damage to resilient seats and metal seat rings.
   2. Position valves in full open position before starting soldering procedure.
   3. Apply heat to piping rather than to valve body.

3.04 TESTING

A. Valves shall be tested at the same time that the adjacent pipeline is tested. Joints shall show no visible leakage under test. Joints that show signs of leakage shall be repaired prior to final acceptance. If there are any special parts of control systems or operators that might be damaged by the pipeline test, they shall be properly protected. The Contractor shall be held responsible for any damage caused by the testing.

B. If requested by the City, the valve manufacturer shall furnish an affidavit stating that the materials and options furnished comply with these specifications.

** END OF SECTION **

SECTION 16010
ELECTRICAL GENERAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The following list of components and areas of work is a summary of the work required in the electrical and controls portion of the Drawings and Specifications. The list is not comprehensive of the total work required nor is it in any specific order. It is merely being provided as an aid to the bidder. Work not listed herein, but described in the plans or Specifications, is also part of the overall scope of work.

1. Power Distribution Equipment
   a. Utility Metering Switchboard with main disconnect
   b. ATS (4 pole) and Distribution Switchboard (3ph, 4w)
   c. Low voltage panelboard, and transformer.
2. Motor Controls:
   a. Systems Integrator to provide detailed shop-level design submittal, furnish equipment, assemble, wire, test, and complete all test forms pertaining to motor controls as part of their scope of work.
   b. Pump control panels with solid state starters.
   c. Mixer Control Panel.
3. Control panel(s):
   a. Systems Integrator to provide detailed shop-level design submittal, furnish equipment, assemble, wire, test, and complete all test forms pertaining to control panels as part of their scope of work.
   b. System Integrator to perform factory and field testing as required for this project. Instrumentation calibrations and I/O checkout must be complete prior to Operational Testing.
   c. System Integrator to coordinate, configure, and place communications system(s) into operation during pre-operational testing of system hardware.
4. PLC, OI, and SCADA Applications Programming.
   a. Customized Nexicon PLC software code
   b. Flygt Cloud SCADA
5. Instrumentation
   a. Systems Integrator to select, furnish, configure, test, and complete test forms pertaining to instrumentation as part of their scope of work.
   b. Furnish NSF/ANSI 61 certified products that have undergone testing for any device, valve, instrument, or assembly that will come into contact with drinking water.
   c. Furnish mounting supports or other accessories as detailed and as recommended by the instrument manufacturer for the application.
6. Conduit, junction boxes, pull boxes, wire, and grounding system, for equipment interconnection, and operation.
   a. Contractor to perform termination of all field wiring and internal wiring for equipment that required dis-assembly for shipping.
   b. Contractor to label conduits, wire, and equipment per specifications.

7. Furnish and install process piping, shut off, sample and calibration valves, drains, pressure reducers and calibration equipment for connection of instrumentation as defined in manufacturer installation instructions or as indicated.
8. Trenching, backfilling, compaction and resurfacing for all new underground conduit routes, concrete pads, and pull boxes.
9. Coordination and equipment for connection of power utility and telephone services per utility Drawings and standards.
10. Site electrical devices, lights and receptacles.
11. Seismic Anchorage Design Calculations and conforming installation.
12. System startup, calibration, testing and documentation.
13. Demolition of existing equipment as noted in the drawings.

B. Electro-mechanical equipment to be installed in this project may be specified in other divisions but will interface to equipment provided under Electrical Specifications. Obtain submittals for those devices, review, coordinate and provide all interfacing equipment, software, communications, I/O, and testing to integrate the equipment to the extent possible and as intended.

C. Install electrical and control portion of electro-mechanical equipment specified in other sections. Reference those Specifications, pertinent details, and follow all manufacturer instructions to erect, install and commission equipment. Furnish all electrical equipment, interconnecting wire, and make connections to place equipment in operation.

D. All electrical equipment and materials, and methods - including installation, calibration, and testing - shall conform to the applicable codes and standards listed in this and other Sections. All electrical materials and work shall conform to published standards of the National Electric Code (NEC) current issue, Institute of Electrical and Electronic Engineers (IEEE), and Underwriters Laboratories Inc (UL).

1.02 RELATED SPECIFICATIONS

A. The following specification sections are part of the [Electrical Specifications].

Section	Description
16110	Conduit and Boxes
16120	Low Voltage Wire and Data Cable
16250	Automatic Transfer Switch
16430	Low Voltage Switchboard
16450	Grounding
16470	Panelboard and Power Transformer
16482	Solid State Soft Starter
16600	Factory and Field Testing
16905	Control Panels
16910	PLC & OI Hardware
16915	PLC & OI Applications Programming
16940	Instrumentation

B. Owner, Engineer, Construction Manager, and City are used within Electrical Specifications and are interchangeable. They are all representatives of the Owner, in this case, the City of Belmont.

1.03 QUALIFICATIONS AND REQUIRED WORK SCOPE

A. Electrical Contractor / Certified Electrician

1. Management and installation of the entire electrical and control system required for this project shall be by an Electrical Contractor or Certified Electrician (EC/CE) meeting qualifications as defined herein.
2. EC/CE shall select, furnish, and install all commodity electrical materials (conduit, wire, supports, fittings, ductbanks, etc) that are generally not "custom" or uniquely manufactured for this project. Custom electrical panels, controls, and instrumentation shall be furnished by Systems Integrator but installed by EC/CE.
3. The EC/CE shall meet the following minimum qualifications:
    a. Has a current C10 Electrical Contractor's License and/or project Foreman who is a California Certified Electrician issued by the State of California Department of Industrial Relations.
    b. EC/CE shall comply with State law which requires that all personnel installing electrical components are certified by the State of California as "Electrician" or "Electrician Trainee." Trainees may install electrical components only under direct supervision of a certified Electrician.
    c. EC/CE shall have sufficient qualified personnel to staff the project and meet the construction schedule as defined by the Contract requirements or as approved during the submittal process.
    d. EC/CE shall be regularly engaged in similar industrial power and controls electrical work.
    e. EC/CE shall have successfully performed work of similar or greater complexity (as measured in contract value on industrial power and controls projects) on at least three (3) previous projects.
    f. EC/CE must be competent in performance, supervision and coordination of work required and performed by equipment suppliers or other specialty subcontractors.
    g. EC/CE shall be capable of looking at electrical equipment submittals, prior to installation, comparing hookup requirements to the Drawings, and notifying Engineer of any deficiencies.
    h. EC/CE shall be competent in methods and materials execution and selection associated in the type of electrical and instrumentation work indicated in Drawings and specified in this Division.
    i. EC/CE shall be familiar with and understand codes and requirements from NFPA70, NFPA110, and all other governing national or local codes.
    j. EC/CE shall know and understand common terms and abbreviations used in this Industry. Not all terms and abbreviations will be defined in the Drawings and Specifications.
4. If the EC/CE does not meet the qualifications, the EC/CE may be stopped from doing further work, rejected, removed, and/or required to meet qualifications prior to the resumption of work.

B. System Integrator

1. Systems Integrator shall be a supplier to the Electrical Contractor or Certified Electrician and must be competent in performance, supervision and coordination of work required in this contract.
2. This includes, but is not limited to, all work necessary to finish design, select, furnish, construct, supervise installation, configure, calibrate, test, and place into operation all transmitters, instruments, programmable controllers, control panels, motor controls, alarm equipment, communications, monitoring equipment, and accessories.
3. The System Integrator shall provide a Project Engineer with one year (minimum) prior experience on similar sized projects. This Project Engineer shall coordinate the technical aspects of this project and prepare the shop level equipment design submittals and drawings. The Project Engineer shall attend coordination meetings when specifically requested by the Engineer.
4. The System Integrator (SI) shall meet the following minimum qualifications:
    a. SI shall be regularly engaged providing electrical and control systems for industrial projects.
    b. Manufacturing facility within 200 road miles of project location.
    c. SI shall be capable of labeling all electrical panels as manufactured or customized by the System Integrator with appropriate Underwriters Laboratories (UL) label prior to factory testing or shipment to project site.
    d. SI shall have successfully completed work of similar or greater complexity and on similar facilities on at least 5 previous projects under the present company name.
    e. SI shall be actively engaged in the following disciplines for the last 5 consecutive years.
        1) Design and manufacturing of custom Control Panels, Motor Controls, and associated devices and equipment as specified in this division.
        2) Programming and commissioning of SCADA, PLC and Operator Interface hardware.
        3) Instrumentation - selection, purchase, calibration, start-up and commissioning.
        4) Testing, calibration, start-up, and commissioning of control systems.
    f. SI shall have a staffed and equipped service facility with personnel and equipment required to provide on-site field service to troubleshoot, diagnose, and repair the control system.

C. Application Programmer
1. The Applications Programmer will be furnished by System Integrator or by Contractor.
2. Applications Programmer must be competent in performance, supervision, and coordination of work required in this contract in order to facilitate construction and not cause delays to the main construction contract.
3. This includes, but is not limited to, all work necessary to configure, test, troubleshoot, and place into operation SCADA system, Operator Interface, and programmable controller.
    a. Nexicon PLC custom programming for site I/O, function, alarms, communications, and interface to SCADA.
    b. Flygt Cloud SCADA system to coordinate and interface to the site PLC.

4. The Application Programmer shall have on staff a PLC Programmer with no less than seven (7) years prior experience performing new installation PLC programming on water and wastewater projects.
5. The Application Programmer shall have on staff a SCADA Programmer with no less than five (5) years prior experience performing new installation SCADA configuration and programming on water and wastewater projects.
6. The Application Programmer (AP) shall meet the following minimum qualifications:
    a. AP shall be regularly engaged providing electrical and control systems for the Municipal Water and Wastewater Industry.
    b. AP shall be registered in the State of California as a Professional Electrical Engineer.
    c. AP shall have successfully completed work of similar or greater complexity and on similar facilities. Project References may be requested prior to starting work.
    d. AP shall be actively engaged in the following disciplines:
        1) Programming and commissioning of SCADA, PLC and Operator Interface hardware.
        2) Testing, calibration, start-up, and commissioning of control systems as applied to the Water and Wastewater industry.
    e. AP project staff shall be based from a location within 300 miles of the project site with personnel and equipment required to maintain, repair and calibrate the PLC, OI, and SCADA system.
7. If the Applications Programmer does not meet the requirements above and cannot demonstrate through submittal process that he is (they are) qualified, then the Application Programmer will be rejected and a replacement Application Programmer must be submitted.

1.04 CONTRACT DOCUMENTS

A. The resolution of conflicting information within the contract electrical documents shall put precedence on electrical Drawings over that of electrical Specifications.

B. The Drawings and Specifications are intended to be descriptive of the type of electrical system to be provided with sufficient detail to construct. Minor omission of detail shall not relieve a qualified contractor from the obligation to provide a complete operational system if it can be determined that the particular detail is usual and customary for similar systems.

C. The following Specifications may incorporate specific equipment or materials that do not have equal equipment listed. These items are standards because of their familiarity, serviceability, and/or spare parts inventory. However, equal alternate equipment or materials (noted in the submittal cover letter) will be considered for use on this project if submitted. The Engineer may reject said equipment for the purpose of adherence to standards.

D. Contract Drawings are diagrammatic and indicate general arrangement of systems and equipment.
    1. Exact locations and layouts of electrical products shall be defined during submittal, assembly, or field fit during construction. Field measurements take precedence over dimensioned drawings. Drawing intent is to show initial size,

capacity, approximate location, orientation, and general relationship of equipment in area shown but may not show exact detail or arrangement.

2. However, when materials, locations, sizes, or methods are specifically dimensioned, detailed or noted, the Drawings shall take precedence over electrical Specifications in the event of conflict. In no case, is NEC, UL, or other applicable governing standards to be overridden.

E. The Contractor shall examine the architectural, mechanical, structural, and electrical and instrumentation submittals and equipment furnished under other Specifications divisions in order to determine conduit routing, stub-up locations, and final terminations for all conduits and cables. Conduits shall be stubbed up as near as possible to equipment electrical terminals. The exact locations and routing of cables and conduits shall be governed by structural conditions, physical interferences, and the physical location of wire terminations on equipment.

F. All equipment shall be installed and located so that it can be readily accessed for operation and maintenance. If accessibility appears to be compromised, the location of equipment or stub ups shall be modified to the extent possible.

G. Where conduits are shown on the Drawings, or stated to be furnished but not explicitly shown, as part of the scope of work; the Contractor shall provide all fittings, boxes, wiring, etc. as required for completion of the raceway system in compliance with the NEC and the applicable Specifications in this Section.

H. No changes from the Drawings or Specifications shall be made without written approval of the Engineer. Should there be a need to deviate from the Contract documents, submit written details and reasons for all changes to the Engineer for review.

I. The Contractor shall maintain a neatly and accurately marked full size set of Contract Drawings recording the as built locations and layout of all electrical and instrumentation equipment, routing of raceways, junction and pull boxes, and other diagram or drawing changes. Drawings shall be kept current weekly, with all "change orders", submittal modifications, and construction changes shown. Drawings shall be subject to the inspection by the Engineer at all times, progress payments or portions thereof may be withheld if Drawings are not accurate or current.

J. When documents are changed, they shall be marked with erasable colored pencils or PDF markup tools using the following coloring scheme:
   1. Additions - Blue
   2. Deletions - red

K. Prior to acceptance of the work, the Contractor shall deliver to the Engineer one set of record full size drawings neatly marked accurately showing the information required above.

1.05 UTILITY COORDINATION AND FEES

A. All fees and charges of the Power Utility, Pacific Gas & Electric (PG&E), for design and final connection will be paid by others.

B. Coordinate all work with the Utility for the work shown on Contract Drawings.

1. Unless already completed, apply for electric service within 10 working days from Notice to Proceed.
2. Coordinate and meet with the Utility's Representative at the project site(s) within 30 days after award of contract.
3. Discuss specific installation and comply with Utility requirements. Contact Engineer in the event that Utility requirements far exceed allowances in the plans and Specifications. Provide an itemized list of deviations and potential costs or credits.
4. Contractor may be required to be certified by the Utility prior to installation. Check Utility website and obtain certification as required.
5. Coordinate and obtain required inspections prior to backfill. Make corrections to installation as required by Utility.
6. Coordinate connection and date of service with Utility. Utility back-charges due to mis-coordination or installation problems will be Contractor responsibility to pay and correct.

C. Furnish and install electric service in accordance with the serving Utility's requirements.
1. The contract plans show the preliminary design for the Utility installation. Slight changes required by the Utility do not constitute extra work unless cost impacts in material and labor exceed $5000. In that event, the agreed excess amount will be allowed as a change order.
2. The Contractor shall provide and install service entrance equipment, all material, conduits, wiring, pull ropes, pole risers, transformer pads, bollards, etc. as shown on Utility design drawings and standards for new power service. Utility standards are available upon request from the Utility or for download from the Utility's website.
3. The Utility will furnish primary wire, transformer, meter, and connections.

D. Following award of Contract, schedule all service installations and connections with utilities. Construction or start-up delays as a consequence to lack of documented effort by the Contractor which delay the project completion due to lack of Utility services will not be considered valid and Contract liquidated damages may be assessed.

1.06 PROJECT COORDINATION

A. Prior to submittal, the Electrical Contractor shall coordinate with equipment suppliers to verify sizes, mounting, connections, storage, and delivery of equipment. If there are any issues whereby the solution will be in conflict with plans and Specifications, or that are undefined and need direction, they shall be brought to the attention of the Engineer or Construction Manager via the RFI process.

1.07 SUPERVISION

A. The Contractor shall schedule all activities, manage all technical aspects of the project, coordinate submittals and drawings, and attend all project meetings associated with this Section. The Contractor shall coordinate and confirm that the project schedule is being adhered to and all work is being completed within the scheduled time frames.

B. The Contractor shall supervise all work in this Section, including the electrical system general construction work, from the beginning to completion and final acceptance.

C. The Contractor shall coordinate, obtain, prepare, and/or complete the documentation required within this division. All documentation shall be complete and delivered prior to final acceptance.

1.08 INSPECTIONS

A. General

1. Contract work or materials shall be subject to inspection at any time by the Engineer. If equipment, material, or installation method does not conform to the Contract documents, or does not have a favorably reviewed submittal status and has been determined to be unsatisfactory by the Engineer, then the Contractor shall remove said material from the premises; and if said material has been installed, the entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the Contractor.
2. The Engineer may inspect and test the fabricated equipment at the factory before shipment to job site. See Electrical Specifications [Factory and Field Testing] for requirements.
3. Work shall not be closed in or covered over before inspection and approval by the Engineer. All costs associated with uncovering and making repairs where non-inspected work has been performed shall be borne by the Contractor.
4. The Contractor shall cooperate with the Engineer and provide assistance at all times for the inspection of the electrical system under this Contract. The Contractor shall remove covers, provide access, operate equipment, and perform other reasonable work which, in the opinion of the Engineer, will be necessary to determine the quality of the work.

B. Milestones requiring inspection and signoff.

1. Underground conduit and grounding system complete. Do not cover any portion of conduit prior to inspection. Conduits must be labeled with temporary tags per Electrical Specifications [Conduit and Boxes] and [Grounding].
2. Factory testing. Coordinate test date with Engineer 2 weeks prior to test scheduled date.
3. Installation of electrical equipment. Equipment is anchored in place, conduit connections are complete, no wire is yet pulled into conduit. Permanent conduit tags must be in place per Electrical Specifications [Conduit and Boxes] and [Grounding].
4. Wire termination complete. Do not energize equipment. All wire tags must be installed and wires terminated per Electrical Specifications [Low Voltage Wire and Data Cable]. Pre-energization testing to commence after inspection.
5. Testing per Electrical Specifications [Factory and Field Testing]. All testing per Electrical Specifications [Factory and Field Testing] shall be witnessed unless specifically declined by the Engineer. Schedule tests with Engineer 2 weeks prior to test date.
6. Start-up per Electrical Specifications [Factory and Field Testing]. Schedule tests with Engineer 2 weeks prior to test date.
7. Punch list – final inspection. Schedule final walkthrough with Engineer one week prior to intended project completion date. All items on punchlist must be complete prior to scheduling walk-through.

1.09 JOB CONDITIONS

A. Construction Power and Telephone Service
   1. The Contractor shall coordinate, furnish and install, temporary utility services required during construction of the project, such as temporary electrical power and telephone service. Temporary services shall be installed in accordance with the applicable codes and regulations of the serving utilities.
   2. Upon completion of the project, remove temporary services. All equipment and material shall be the property of the Contractor.

B. Equipment Storage
   1. The Contractor shall provide adequate protection for all equipment and materials during shipment, storage and construction.
   2. Equipment and materials shall be completely and sufficiently sealed and covered and set on a pallet above grade so that they are protected from weather, wind, dust, water, or construction operations.
   3. Equipment shall not be stored outdoors. Where equipment is stored or installed in an area with susceptibility to moisture, such as unheated buildings, untested piping, etc., provide an acceptable means to prevent moisture damage, such as plastic cover and a uniformly distributed heat source to prevent condensation.

C. The project site is located where outside temperatures vary between 10 deg F. to 110 deg F. Humidity in this area will range from 10% to 100%.

1.10 AREA CLASSIFICATIONS

A. Area classifications are shown on the site electrical plans. The area enclosed by walls or the entire drawing area shall be classified as shown unless otherwise described in notes.

B. All electrical equipment, enclosures, conduit, and supports shall be formally rated for or, at minimum, meet the intent of the rating as interpreted by Engineer.

C. If no area classification rating is shown on the Drawings, classification shall default to a NEMA 12 rating for indoors, and NEMA 4 rating for outdoors (non corrosive) and NEMA 4X for corrosive areas both indoors and outdoors.

1.11 SUBMITTAL REQUIREMENTS

A. General
   1. Requirements described herein are specific to electrical submittals and are secondary to those described in other general Specifications sections. Any additional requirements described here that are beyond those described in those sections shall be provided as described. Conflicts shall be resolved by giving priority to general Specifications.
   2. Contractor and System Integrator to complete application engineering, confirmation of products and associated applications, provide detailed shop-level design submittal, furnish equipment, assemble, wire, test, and complete all test forms pertaining to motor controls as part of their scope of work.
   3. The Contractor shall ensure that the System Integrator and/or equipment suppliers provide the submittal documentation required in this section. Submittals shall be neat, orderly, complete (without un-needed parsing), and indexed.

a. Like equipment shall be submitted complete in a single submittal. For instance, all general electrical materials shall be in a single submittal. All instrumentation, all control panels, or all MCCs and so on shall be submitted complete where possible.
b. Submittals that are broken down without sufficient cause will be rejected for future inclusion into a combined submittal.
c. Do not separate submittals by area.
d. Do not separate submittals by specification division unless agreed to in advance.
e. Submittals for work scope covered in this contract are expected to be as follows. This list is intended to be a guideline and not to be specific of all submittals required. Project circumstances or leadtimes or availability will each impact the order and division of submittals.
    1) General electrical materials – conduit, wire, labels, etc.
    2) Power Distribution and Motor Controls
    3) PLC and Control Panels
    4) Seismic Calculations
    5) Instrumentation
    6) PLC Programming
    7) SCADA Application Programming
    8) Factory and Field Testing forms and procedures
    9) Interconnection Diagrams
    10) O&M Manuals

4. The Contractor shall coordinate submittals with the work so that project will not be delayed. This coordination shall include scheduling the different categories of submittals, so that one will not be delayed for lack of coordination with another. Time extensions will not be allowed due to failure to properly schedule submittals.
5. No material or equipment shall be delivered to the job site until the submittal for such items has been reviewed by the Engineer and marked "no exceptions noted" or "make corrections noted".
6. The equipment Specifications have been prepared on the basis of the equipment first named in the Specifications. The Contractor shall note that the second named equipment, if given, is considered acceptable and equal equipment, but in some cases additional design, options, or modifications may be required to meet Specifications or functional installation.
7. Exceptions to the Specifications or Drawings or equipment or procedures submitted as “equal” to specified equipment shall be clearly identified in a letter at the front of the submittal. Submittal data for “equal” equipment or procedures shall contain sufficient details so a proper evaluation may be made by the Engineer. The Contractor is responsible for verifying proper application/operation of substituted equipment.
8. The opinion of the Engineer will be the final determination whether a substitution request meets the design intent.
9. Deviations from the Contract documents shall not be incorporated into the work without prior written approval of the Engineer. A "Change Order" directive from the Engineer is required prior to incorporating any deviation from the Contract documents that has costs associated. The cost differential associated with this change order must be negotiated with the Owner to amend the Contract to reflect the costs or savings.

B. Submittal Procedures

1. Identify all submittals by submittal number on letter of transmittal. Submittals shall be numbered consecutively and resubmittals shall have a letter suffix. For example:
   a. 1st submittal: 1
   b. 1st resubmittal: 1A
   c. 2nd resubmittal: 1B, etc.
2. The reviewed submittals will be annotated "Make Corrections Noted", "No Exceptions Noted", "Revise and Resubmit Noted Items", or "Rejected without Review." The following actions shall then be taken by the Contractor:
   a. "No Exceptions Noted" - The Contractor may proceed with the work covered in this submittal. No resubmission is necessary.
   b. “Make Corrections Noted” - The Contractor may proceed with the work covered in this submittal incorporating the changes noted. However, the Contractor shall revise the submittal in accord with the changes noted and resubmit six (6) copies of drawings, bill of materials, and catalog data denoting changes within 14 calendar days when requested by the Engineer for record keeping purposes.
   c. "Revise and Resubmit Noted Items" - The Contractor shall not proceed with the work covered in this submittal. The Contractor shall revise and correct the submittal in accordance with the comments and resubmit six (6) copies within 14 calendar days for approval.
   d. "Rejected without Review" submittal - The Contractor shall not proceed with the work covered in this submittal. The submittal did not address the work scope as defined by the submittal’s title or the previous submittal comments have not been addressed in full. The Contractor shall revise and correct the submittal in accordance with the Specifications, and resubmit six (6) copies within calendar 14 days for approval.
3. Resubmittals shall address all comments by the Engineer. A submittal response letter shall be submitted that addresses each comment by the Engineer with a standardized response of “revised” or with a written explanation. Partial re-submittals (that do not address all comments) may be returned without review at the discretion of the Engineer.
4. The Contractor shall be responsible for the Engineer's review cost for each resubmittal in excess of the second resubmittal. These costs will be back-charged to the Contractor and will be deducted from his progress payments.

C. Electrical Equipment -- Submittal data shall be grouped by equipment type. Each submittal shall be as complete as possible covering the entire project and scope of supply. Drawings or equipment submitted individually that are not on the critical path will not be accepted for individual review. The electrical submittals shall include (as a minimum):

1. Table of Contents
2. Comment Letter: The Project Engineer of the System Integrator shall note all deviations from Contract Documents and the reason(s) for the deviation. They may use this forum to inform the Engineer or installing Contractor of important information related to the project. RFIs must be submitted separately. Re-submittals shall include written responses to every comment provided by the Engineer during the previous review.
3. Bill of Materials: The Contractor and System Integrator each shall provide Bill of Material for electrical components formatted as shown below. Generic names

or part numbers as defined by a distributor or Integrator are not acceptable. Only the originating manufacturer's name and part number shall be listed. Provide separate bill of materials for each panel, MCC, instrument list, etc.

Bill of Material

Item #	Qty	Tag#	Description	Manufacturer	Part #

4. Catalog Data shall include the following: (features and options shall be highlighted, circled, or "arrowed.")
   a. Instrumentation data summary sheets (by Contractor)
   b. Manufacturer's technical information brochure
   c. Physical size and mounting details and illustrations
   d. Calibration Range
   e. Input/output signals
   f. Electric power, air, and/or water supply requirements.
   g. Options selected and available (Cross out items not included)
   h. Materials of construction of components
5. Program Software Documentation
   a. Programming documentation
   b. Programming code native files

D. Shop Drawings Shop drawings shall be furnished for each electrical panel even if one was not shown explicitly on the Drawings. Shop drawings shall be numbered in sequence. Blank drawings or drawings that contain no specific project data will not be accepted for review.

1. Shop Drawings shall be generated with a computer utilizing AutoCAD or similar drafting program. Drawings shall be no smaller than 11" x 17". The lettering shall be legible and no smaller than 0.75 inch in height.
2. Shop Drawings shall be custom prepared for this project and shall have borders and a title block identifying the project, manufacturer, system or location, drawing number, drawing title, AutoCAD file name, project engineer, date, revisions, and type of drawing. Diagrams shall carry a uniform and coordinated set of wire colors, wire numbers, and terminal block numbers. The shop drawings shall include the following as a minimum:
3. Electrical one-line diagrams detailing all devices associated with the power distribution system. The following applicable information or data shall be shown on the one- or three- line diagram: location, size and amperage rating of bus; size and amperage rating of wire or cable; breaker ratings, number of poles, and frame sizes; power fail and other protective devices; fuse size and type.
4. Detailed analog and digital I/O diagrams showing the wiring requirements for each instrument or device connection. Reference the Drawings for an example of each I/O card drawing requirements. If one is not included in the Drawings, then one may be obtained from the Engineer upon request.
5. Elementary (wiring) diagrams shall be provided for all relay logic, programmable logic controls, motor controls, power supplies, and other wiring. All elementary (wiring) diagrams shall be drawn in JIC EMP/EGP format and standards showing ladder rung numbers and coil and contact cross referencing numbers.
6. Equipment exterior and interior scaled drawings of front, side, elevation, deadfront, front panel devices, and backpan components. Show fabrication

methods and details; including material of construction, paint color, door latch and lock, and ventilation system. Show shipping split locations and offloading information. Submit base plan showing allowed conduit entrance areas and bolt hole locations.

7. Drawings shall show UL required information as needed to UL label the equipment in accordance with UL procedures for label applied.
8. Submit full size drawing of all nameplates and tags, as specified herein, to be used on project. Submittal to include the following:
   a. Dimensions of nameplate.
   b. Exact lettering and font for each nameplate.
   c. Color of nameplate.
   d. Color of lettering.
   e. Materials of construction.
   f. Method and materials for attachment.
   g. Drawing showing location of nameplates on each, panel and enclosure.

E. Interconnection Diagrams Interconnection diagrams shall be furnished for each electrical and instrumentation system, even if one was not shown explicitly on the Drawings. Reference the Drawings for an example of interconnection drawing requirements. If one is not included in the Drawings, then one may be obtained from the Engineer upon request. Each interconnection diagram shall include the following as a minimum:

1. The diagrams shall show connection point descriptions and field routing only. This includes, but is not limited to, terminal blocks, field wiring with numbers, junction boxes, conduit material with sizes, and conduit numbers.
2. Each conduit in the Conduit and Wire Schedule shall be shown on at least one interconnection diagram. Multiple conduits may be shown on a single interconnect and a conduit may appear on multiple interconnects.
3. Interconnect diagrams shall be based on connected equipment, ie. Interconnection diagram for Pump 1. All components connected to the MCC cubicle for Pump 1 shall be shown on a single interconnect.
4. All terminations points on the diagram shall be shown with the actual equipment identification terminal number or letter.
5. Interconnections between equipment shall be shown terminal to terminal with conduit lines in between. Wires within the same conduit shall be bundled and shown as a single line and labeled with the conduit name and wire fill. If not all wires within a conduit are used on a particular interconnection diagram, then the fill shall be noted as XX of XXX wires.
6. Conduit shall be shown as routed through junction boxes and pull boxes. Wire fill leading into a pull box shall be equal to the combined outgoing conduit wire fill.
7. Each wire and color code shall be shown connected to a terminal block. Spare wires may be shown as a list of wire numbers located near the end point of the wire.
8. Schematic symbols shall be used for field devices showing electrical contacts. Circuit polarities shall be shown where applicable.
9. The diagrams shall show all other Contract and shop drawing numbers, for reference, that are associated with each device that is interconnected. Attached with each interconnect, a copy of all the support documents used in preparing interconnects. This includes current issues of panel schematics, connection diagrams, terminal block diagrams, submittals, contract Drawings, vendor

drawings and all other data used to develop the interconnection diagram as noted in the "Reference Documents" corner of interconnect drawings.

10. Provide a notes section on each interconnect drawing. In the note section list any variances from the Contract conduit schedule necessary for completing the interconnections. Change orders regarding wire fill, conduit schedule and errors in plans regarding conduits and wires may not be processed until interconnect drawings have been received for such work.
11. The interconnection drawings shall be As-Built by the Contractor after start-up and prior to project completion. All deletions and additions of equipment, wire and cables shall be clearly shown. Interconnects shall include list of all applicable field instructions and change orders.
12. The diagrams shall be utilized by the electrician during all phases installation and connection of all conductors to ensure coordination of equipment interconnect.
13. Field wiring shall not start before the interconnection drawing have been submitted by the Contractor and approved by the Engineer.
14. The Contractor shall not pull in any wires into conduits that do not have approved interconnects. If the Contractor pulls and/or terminates wire without approved interconnect drawings, the Contractor will not be reimbursed for labor for re-pulling/replacing wires even if there was an error in wire fill or sizing in the "Wire and Conduit Schedule". If the Contractor pulls and/or terminates wire without approved associated interconnect drawings, then all progress payments for that particular area of work will be withheld until approved interconnect drawings are in use.

F. Seismic Anchor Design Calculations

1. All switchgear, motor controls centers, transformers, cabinets, raceways, supports, and electrical materials shall be so installed as to remain in a secure and captive position when subjected to a horizontal force in accordance with the current, applicable, and more stringent of current California Building Code (CBC) or International Building Code (IBC) requirements. Method of securing shall constrain equipment against both vertical and horizontal forces and overturning forces.
2. Calculations as prepared by a civil engineer registered in the State of California shall be submitted in accordance with current code requirements for earthquakes forces on all specified equipment. Calculations shall include wind loading forces for equipment installed outdoors. Use seismic and wind factors based on the project location and exposure. The risk Category is IV.
3. Provide a submittal, minimum 3 weeks prior to equipment installation, of calculations, materials needed, and supporting drawings and details for installation by Contractor.

1.12 OPERATING AND MAINTENANCE INFORMATION

A. Operational Training

1. At time of completion, the Contractor shall provide a period of not less than 6 hours training for instruction of operation and maintenance personnel in the use of systems. Instruct all personnel at one time in one session. Make necessary arrangements with manufacturer's representative. Provide product literature and application guides for user's reference during instruction.

B. Operations and Maintenance Manuals

1. Provide Operation and Maintenance manuals per Specifications as described in "Submittal Requirements" in this section with the following additional requirements:
    a. A comprehensive index.
    b. A complete "Record" set of favorably reviewed electrical submittals as provided under subsection "Submittal Requirements" illustrating all components, piping, and electrical connections.
    c. A complete list of the equipment supplied, including serial numbers, ranges, catalog cuts, and pertinent data.
    d. Full Specifications on each item.
    e. Detailed service, maintenance and operation instructions for each item supplied. Schematic diagrams of all electronic devices shall be included. A complete parts list with stock numbers shall be provided for the components that make up the assembly. All of these shall be originals, no copies.
    f. Special maintenance requirements particular to this system shall be clearly defined, along with special calibration and test procedures.
    g. Shop drawings in native file format and updated to reflect as-built conditions.
    h. Application programs, configurations, calculations, documents or other computer electronic files prepared for this project. Provide all files in native file format such as .dwg, .rss, .xls, .doc, etc.
2. Submit electronic readable PDF file format (email with attachments or download links) of the proposed O&M manuals for review by the Engineer. Submittals shall be delivered timely to the Engineer to allow for review period, corrections, and re-submissions as necessary.
    a. General Contractor supervision must not be circumvented by sending submittals direct to Engineer.

C. At the end of the project hard copy and soft copy electronic PDF files, shall be updated to "as-built" conditions.

PART 2 PRODUCTS

2.01 QUALITY

A. All equipment and materials shall be new, in current production, and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product.

B. Products specified that have become obsolete (out of current manufacturing, or have been superseded by another product) shall be cross-referenced to a replacement product(s) and provided in lieu of the specified product(s) for no additional cost. Under no conditions, shall products be submitted or furnished that are known (on manufacturer's list of obsolescence) and expected to be removed from current production within 12 months after project submittal. Products found to have been furnished this way will be removed and replaced at Contractor's expense.

C. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses which may occur during fabrication,

transportation, erection, and continuous or intermittent operation. All equipment shall be adequately braced and anchored and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble free service. Light duty, fragile and competitive grade devices of questionable durability shall not be used.

D. The Contractor should expect that there will be occasional freezing conditions at the project site in outdoor locations. Instrument valves, tubing, instrumentation, and other components which are outdoors and susceptible to damage if frozen, must be provided with internal or external protection. Freeze protection can consist of internal or external active heaters with thermostats and/or passive insulation systems. Active systems can be powered from a nearby receptacle or via the conduit intended for the device.

E. Products that are specified and include a manufacturer, trade name or catalog number are intended to establish a standard of quality, performance, warranty and service. Products that are specified "or equal," do not prohibit the use of equal products of other manufacturers provided they are submitted, identified and promoted as equal, and favorably reviewed by the Engineer prior to procurement and installation.

F. Products submitted as "equal" to the named products will be reviewed for conformance with the Specifications and in comparison with the first named product. If the equal product meets Specifications, but does not have a feature or performance characteristic that is available with the first named product, and that feature or performance is required for this project, then the submitted equal product may be rejected on those grounds.

G. In the event that some claims of the manufacturer of submitted "equal" product are called into question by the Engineer, the Contractor, may be required to prove those claims either prior to installation or during startup of product. If the product does not meet the claims made or Specifications, the product may be rejected by the Engineer and a replacement product must be submitted by the Contractor in its place. All cost for the rejected product, installation, testing, and removal will be the responsibility of the Contractor.

H. Underwriters Laboratories (UL) listing is required for all substituted equipment when such a listing is available for the first named equipment. Extra parts, labor, panel space, power supplies, circuit breakers, and/or GFIC devices shall be provided as necessary for incorporation of specified non-UL components.

I. When required herein or requested by the Engineer, the Contractor shall submit equipment or material samples for test or evaluation. The samples shall be furnished with information as to their source and prepared in such quantities and sizes as may be required for proper examination and tests, with all freight and charges prepaid. All samples shall be submitted before shipment of the equipment or material to the job site and in ample time to permit the making of proper tests, analyses, examinations, rejections, and resubmissions before incorporated into the work.

2.02 NAMEPLATES & TAGS

A. Equipment exterior nameplates Nameplate material shall be rigid laminated black plastic with beveled edges and white lettering; except for caution, warning, and danger nameplates the color shall be red with white lettering. The size of the nameplate shall be as shown on the Drawings. No letters are allowed smaller than 3/16". All nameplates located outdoors shall be UV resistant. Securely fasten nameplates in place using two stainless steel screws, type 316L, if the nameplate is not an integral part of the device. Epoxy cement or glued on nameplates will not be acceptable. Engrave the nameplates with the inscriptions as approved by the Engineer in the submittal.

1. For each major piece of electrical equipment provide a manufacturer's nameplate showing the Contract specified name and number designation, and pertinent ratings such as voltage, # of phases, ratings, etc.
2. For each device with a specific identity (pushbutton, indicator, instrument, etc.) mounted on the exterior or deadfront of a piece of equipment provide a nameplate with the inscription as shown on the Drawings and described herein.
3. Where required by code, provide nameplates denoting information required. For example:
    a. Transformers not in sight of disconnect, furnish nameplate denoting location of feeding circuit breaker or disconnect.
    b. Motor controls without door interlock or disconnecting circuit breaker; furnish nameplate denoting location or feeding circuit breaker or disconnect.
4. Where no inscription is indicated on the Drawings or described herein, furnish nameplates with an appropriate inscription providing the name and number of device.
5. Install Safety Signs in accordance with the latest OSHA requirements.
    a. Entrances to electrical rooms and stations: Danger Sign requirements, ELECTRICAL ROOM, HIGH VOLTAGE (define voltage, example 480 VAC) KEEP OUT, AUTHORIZED PERSONNEL ONLY.
    b. Equipment enclosures, cable tray and wireway where 120 VAC or higher and 50 V DC and higher exist: Danger Sign requirements, HIGH VOLTAGE (define voltage, example 480 VAC) AUTHORIZED PERSONNEL ONLY.
    c. Equipment such as motor control centers, control panels, etc., where more than one source may be present in an enclosure or cubicle: Danger Sign requirements, VOLTAGE (define voltage, example 120 VAC control voltage or 480 VAC power) FROM MULTIPLE SOURCES IN THIS ENCLOSURE.
    d. Equipment such as switchboards, switchgear, panelboards and motor control centers: Warning Sign requirements, WARNING, SERVICE ENTRANCE DISCONNECT FOR 1 OF ___ (define quantity) SERVICES TO THIS BUILDING. OTHER SERVICE ENTRANCE DISCONNECTS ARE LOCATED AT (define locations).
6. Caution, warning and danger nameplates shall be red with white lettering

B. Equipment Interior Nameplates Nameplate material shall be clear plastic with black machine printed lettering as produced by a KROY or similar machine; except caution, warning, and danger nameplates shall have red lettering. The size of the nameplate tape shall be no smaller than 1/2” in height with 3/8" lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on a clean surface using the adhesion

of the tape. For each device with a specific identity (relay, module, power supply, fuse, terminal block, etc.) mounted in the interior of a piece of equipment provide a nameplate with the inscription as shown on the Drawings and described herein. Where no inscription is indicated on the Drawings or described herein, furnish nameplates with an appropriate inscription providing the name and number of device used on the submittal drawings. Stamp the nameplates with the inscriptions as approved by the Engineer in the submittal.

C. Equipment Tags When there is no space or it is impractical to attach an engraved plastic nameplate with screws, as is the case with most field devices and instruments, the Contractor shall attach a tag to the equipment with the same inscriptions as specified above in paragraph A. The tag shall be made from stainless steel material and the size of the nameplate shall be no smaller than 3/8"h x 2"w with 3/16" machine printed or engraved lettering unless otherwise approved by the Engineer. The tag shall be attached to the equipment with stainless steel wire of the type normally used for this purpose.

2.03 FASTENERS

A. Fasteners for securing equipment to walls, floors, or ceilings, shall be stainless steel. The minimum size fastener shall be 3/8 inch diameter.

B. Voltage Monitor Relay (VMR)
1. The voltage monitor relay (VMR) shall continuously monitor the three phases for power loss, low voltage, phase loss, and phase reversal. The VMR shall interface to the control circuit with DPDT contacts rated for 4 Amps at 120 VAC. The VMR shall have a drop out voltage adjustment, time delay adjustment, and status indicating LEDs. Voltage monitor relay shall be Time Mark 2652, or equal.

2.04 MOTOR CONTROL ACCESSORIES

A. Control Power Transformer:
1. Control power transformer shall be epoxy encapsulated for dust and moisture protection. The internal wiring shall be copper and have 105 deg. C insulation rating. The unit shall feature barriered screw terminals for connection to electrical circuits. Provide with time-delay, slow-blow secondary fuse rated to protect the transformer and interrupt 10,000 amperes at 120VAC. Two primary fuses rated for 480 VAC and AIC as shown in the Drawings shall be provided. Transformer minimum size and voltage ratings shall be as shown on Contract Drawings. Control power transformer shall be Micron Impervitran, Cutler Hammer MTE or equal.

B. Moisture Over-temp Relay:
1. Provide new MiniCAS-120 relay, no equal. Provide Omron P3GA-11 reverse relay socket no equal. This item may be furnished with the pump. Coordinate with Contractors/suppliers.

2.05 DEVICES

A. Switches
1. General purpose commercial grade switches shall be manufactured in accordance with UL 20. Switches shall be one pole, brown, 20 amps at 277 VAC, 1HP at 120

VAC, 2 HP at 240 VAC. Switches shall have copper alloy contact arm with silver cadmium oxide contacts. Switches shall have slotted terminal screws and a separate green grounding screw. Provide Leviton, Hubbel, or equal.

B. Receptacles

1. General purpose receptacles shall be commercial grade, duplex and rated 20 amps, 120 VAC, 2 pole, 3 wire grounding, NEMA 5-20R configuration, specification grade, and side wired to screw terminals. Face color shall be brown when paired with stainless steel covers. General purpose receptacles shall be specification grade Leviton, Hubbel, or equal.
2. GFI receptacles shall be commercial grade, duplex, brown, 20A, 120V, back and side wired, with "test" and "reset" buttons. “Daisy Chain” connecting multiple receptacles from one GFI unit is not acceptable. GFI receptacles shall be Leviton, Hubbel, or equal.
3. Boxes shown in NEMA 3R environments and outdoor locations shall be weatherproof while in-use. Furnish in-use weatherproof covers and weatherproof boxes for these areas. Receptacles, plugs, and housings shall be fabricated of impact resistant plastic with o-rings and gaskets to prevent the entrance or water, vapors, and chemicals when unplugged or plugged.

2.06 POWER MONITORING

A. Power Monitor

1. General:
   a. Microprocessor based multifunction power and energy meter
   b. Designed for multifunction electrical power, voltage, and current measurement on 3 phase power systems.
   c. Measured parameters: voltage, current, frequency, unbalance, kW, KVAR, KVA, power factor, kWh.
   d. Support for 3-Element Wye, 2.5 Element Wye, 2 Element Delta, 4 wire Delta systems.
   e. 200 ms update for power measurement, 100ms update for voltage, current, Hz.
   f. Din rail mounting
   g. 85 to 264 VAC control power, 5W.
2. Voltage Inputs
   a. Configurable to potential transformer ratio.
   b. Input impedance of 1 Mega Ohm, 0.014W at 120 Volts.
   c. Direct voltage input range
      1) 347 Volts Line to Neutral
      2) 600 Volts Line to Line.
   d. 2500V withstand.
3. Current Inputs:
   a. Configurable to current transformer (CT) ratio 1A or 5A input.
   b. Burden 0.05VA, Impedance 0.002 ohms
   c. Meter shall have a maximum burden of 0.005VA per phase, at the maximum of 15 Amperes continuous input.
   d. Fault current withstand shall be 200 Amps for 1/2 second.
4. Digital I/O:
   a. Two status inputs 24VDC dry contact.
   b. Two assignable digital relay outputs

5. Accuracy
    a. Revenue meter accuracy
    b. +/- 1% or better for volts and amps
    c. +/- 1% for power and energy functions.
    d. True RMS measurements
6. Communications
    a. Ethernet - 100BaseT Ethernet IP Allen Bradley protocol
    b. Modbus TCP
7. Display:
    a. 4 Line backlit LCD display to display real time measured parameters including voltage, current, power, and power factor.
8. Acceptable Products
    a. Electro Industries Shark 200 with Ethernet
    b. Or Equal

B. CT Shorting Terminal Block
1. Panel mount inside control equipment with front screw terminal connections. Inserting a thumb screw shall short terminals to a top mounted ground bar. Provide quantity of terminal poles as required for function and as shown in Drawings. Furnish Flex Core 170xSC or equal.

C. Current Transformers
1. Furnish mounted (preferable) or unmounted current transformers based on space allocated and installation requirements. The current transformer shall have wire leads or binding posts and ratio as shown on the Drawings. The accuracy shall be metering accuracy class 0.6 at a minimum burden at 60 hz shall be 2.5 VA and as required to meet specified accuracy of device(s) fed.

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

A. Equipment shall be assembled and wired by the manufacturer prior to shipment. Field modifications or changes are not allowed without a written "change order" to the Contract. Field changes, however large or small, shall be executed using the components, materials, wiring, labeling, and assembly methods identical to that of the original supplied equipment.

B. Factory as-built Drawings for each custom manufactured control panel or MCC shall be shipped with the equipment and placed inside in waterproof envelopes.

3.02 EQUIPMENT FABRICATION

A. All electrical equipment, including custom manufactured equipment, shall meet the requirements of Underwriters Laboratories (UL) and bear the appropriate label. Panels shall be affixed with UL label prior to shipment and be built in accordance with the UL guidelines and procedure that corresponds to the UL label. Custom control panels shall bear a UL-508A label for general use, minimum, with additional UL labels as required per intended service.

1. Design and furnish a Low Voltage Limited Energy Circuit for any device(s) not bearing a UL listing or registration that are required to be installed into a UL labeled panel.
2. Revise voltages for any electrical parts and equipment that are specified that do not bear the UL listing or registration.

B. Panel cutouts for devices (i.e. indicating lights, switches) shall be cut, punched, or drilled and smoothly finished with rounded edges. Exposed metal from cutouts that are made after the final paint finish has been applied shall be touched up with a matching paint prior to installing device.

C. Equipment doors shall swing freely and close and latch with proper alignment.

D. Component within the electrical equipment shall be securely mounted on an interior subpanel or backpan and arranged for easy servicing. Mounting bolts and screws shall be front mounted for device removal without special tools or removal of entire mounting panel.

E. A ground bus shall be provided in each enclosure or cabinet. It shall have provisions for connecting a minimum of ten grounding conductors. Screw type lugs shall be provided for connection of grounding conductors. All grounding conductors shall be sized as shown on plans or in accordance with NEC Table 250 95, whichever is larger.

F. Bolts and screws for mounting devices on doors shall have a flush head which blends into the device or door surface. No fastening devices shall project through the outer surfaces of equipment.

3.03 WORKMANSHIP

A. All work in this division shall conform to the codes and standards outlined herein.

B. Installation shall be performed by qualified personnel providing first class workmanship per Electrical Specifications [Electrical General, Qualifications].

C. Maintain equipment installed (or to be installed) in new condition. Protect equipment from damage while in Contractor care from dust, water, or mishaps that are typical to construction sites

D. Confirm that equipment and materials are correct for their intended duty and will be installed per manufacturer guidelines. Equipment and components found to be installed inconsistent with manufacturer guidelines and/or these Specifications will not be acceptable and subject to removal and replacement.

E. Upon completion of daily work, remove excess materials, scraps, and debris from the work area and from the inside of equipment.

F. Upon notification, stop work on any portion of the installation that is determined to be non-compliant with contract or being installed by unqualified personnel.

G. Perform all work to correct improper installations at no additional cost to the owner.

H. Equipment furnished under this contract or provided to Contractor for installation shall be installed in accordance with manufacturer's instructions, installation calculations, and contract documents.

3.04 EQUIPMENT SHIPMENT AND STORAGE

A. Shipment -- Any equipment whose destination (jobsite) is more than 25 miles from the factory shall be carefully protected for shipping. All openings shall be protected by plywood securely fastened to the framework of the equipment. Equipment shall be adequately covered during local delivery.

B. Storage -- From the time of receipt until the equipment is installed and energized, the equipment shall be considered in storage. While in storage, a 120V, 1 phase source of power shall be made available and connected to space heaters in all items of equipment so equipped. Equipment not provided with space heaters shall be provided with a light bulb or electric heater while in storage to prevent moisture condensation. Unless stored indoors, it shall be a least 1 foot above grade covered with at least 2 layers of heavy polyethylene plastic sheets and anchored to prevent damage by high winds. All equipment shall be protected from dust and moisture prior to and during construction.

3.05 DAMAGED PRODUCTS

A. Damaged products that cannot be repaired to new condition shall be replaced with new products. All equipment and materials shall be in like-new condition at start-up and commissioning.

B. Existing equipment to be reused shall be repaired or replaced if damaged while in the Contractor’s care. The Contractor shall pay for the parts and/or services of the original equipment manufacturer (OEM) to troubleshoot, asses, and repair damaged equipment.

C. Minor cosmetic damage shall be repaired by spray painting, after properly preparing the surface, all scratches or defects in the finish of the equipment. Only identical paint furnished by the equipment manufacturer shall be used for such purposes.

3.06 INSTALLATION

A. General
1. Install all products per manufacturer's recommendations and the Drawings.
2. Provide all necessary hardware, conduit, wiring, fittings, and devices to connect the electrical equipment provided under other Sections.
3. Furnish and install wiring between adjacent equipment sections that are not completed at factory. Install 1-1/2” minimum diameter insulated chase nipples with lock rings and insulated bushings for thru wiring.
4. Protect wiring insulation from wear by installing rubber cushions, bushings, or strip insulation, or by fastening the wiring to a rigid surface with zip ties and anchors.
5. Provide additional devices, wiring, conduits, relays, signal converters, isolators to complete interfaces of the electrical and instrumentation system.
6. Changing normally open contacts to normally closed contacts or vice versa
7. Adding additional relays to provide more contacts as necessary.

8. All programmable devices (not specifically excluded herein) shall be programmed, set-up and tested by the Contractor prior to startup. Programming and set-up parameters shall be adjusted or changed as directed by the Engineer during start-up and throughout the warranty period.
9. Coordinate with the Engineer and setup all alarm, process, and operation setpoints.
10. Keep a copy of the manufacturer's installation instructions on the jobsite available for review at all times prior to and during the installation of the associated equipment.

B. Panels and enclosures:
1. Install panels and enclosures at the location shown on the Plans or approved by the Engineer.
2. Install level and plumb.
3. Anchored to pad or wall as defined herein or as defined in approved seismic calculations. Assumes 4500 psi strength concrete and 3" minimum from edge of 6" depth concrete pad.
   a. Pad mounted equipment up to 90" height: minimum1/2" 316SS concrete anchors with 5" minimum embedment into 4000 psi concrete. Locate anchors at each of 4 corners per equipment section.
   b. Wall mounted equipment up to 400 lbs and mounted into reinforced concrete filled cinder block walls: minimum 3/8" 316SS concrete anchors with 3.5" minimum embedment. Locate anchors at each of 4 corners per panel.
4. Seal all enclosure openings to prevent entrance of insects and rodents.
5. Clearance about electrical equipment shall meet the minimum requirements of NEC 110.26

C. Electrical receptacles, plugs, and switches
1. Electrical plugs, receptacles, cords, and connectors required to power or interface the equipment and panels shall be furnished and installed by the Contractor.
2. Ground fault circuit interrupter receptacles shall be used where noted as GFI on plan or where in outdoor NEMA 3R locations, or in areas that are indoor and in same room as water pipe.
3. Boxes shown in NEMA 3R environments and outdoor locations shall be weatherproof while in-use. Furnish in-use weatherproof covers and weatherproof boxes for these areas.
4. Definite purpose receptacles and plugs in NEMA 4 or 4X environments where a receptacle is shown and a device is to be connected continuously, shall be listed as UL type 4, 4X, (Plug) and NEMA 3R (flip cover).

D. Conduits and Ducts:
1. Install all conduits and ducts per Electrical Specifications [Conduit and Boxes] and [Grounding].
2. Minimum wire bending space at terminals and minimum width of wiring gutters shall comply with NEC tables 312-6 (a) & (b).

E. Wiring, Grounding, and Shielding:
1. Observe proper grounding and shielding practices as this application environment is generally noisy. The shield of shielded cables shall be terminated

to ground at one end only, the origination end. The shield at the other end shall be encased in an insulated material to isolate it from ground.

F. Cutting and Patching:
   1. The Contractor shall do all cutting and patching required for installing his work. Any cutting which may impair the structure shall require prior approval by the Engineer. Cutting and patching shall be done only by skilled labor of the respective trades. All surfaces shall be restored to their original condition after cutting and patching.

G. Cleaning and Touch up:
   1. At the completion of the work, all parts of the installation, including all equipment, exposed conduit, and fittings, shall be thoroughly cleaned of grease and metal cuttings. Any discoloration or other damage to parts of the building, the finish, or the furnishings, due to the Contractor's failure to properly clean the system, shall be repaired by the Contractor.
   2. The Contractor shall thoroughly clean any of his exposed work requiring same.
   3. Vacuum and clean the inside of all electrical and instrumentation enclosures prior to applying power.
   4. The Contractor shall paint scratched or blemished surfaces with the necessary coats of quick drying paint to match existing color, texture and thickness. This shall include all prime painted electrical equipment including but not limited to enclosures, poles, boxes, devices etc.

3.07 APPLICATION OF POWER

A. The Engineer will direct the energization and de-energization of all existing and new equipment. The Contractor is not authorized to energize or de-energize any equipment unless they have been given written permission to do so or while in the presence of the Engineer.
   1. Any equipment that is under repair, demolition or installation shall be locked off and tagged out of service with Contractor supplied padlocks and tags.
   2. The Contractor is required to comply with NFPA 70E and specifically in regards to safety when working on live equipment. Obtain work permits when needed to do live work.

B. The Contractor is responsible for grounding of high and medium voltage cabling and/or bus during installation and removal of equipment. The contractor is responsible for complying with all California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA) safety requirements and procedures while working in or near medium voltage equipment.

3.08 WARRANTY

A. The Contractor shall warrant all electrical and instrumentation equipment & software for a period of 1 year from date of final acceptance. Standard published warranties of equipment which exceed the preceding specified length of time shall be honored by the manufacturer or supplier.

B. The Contractor shall have a staff of experienced personnel available to provide on-site warranty service on 2 working days notice during the warranty period. Such personnel

shall be capable of fully testing and diagnosing hardware & software and implementing corrective measures.

3.09 FINAL ACCEPTANCE

A. Final acceptance will be given by the Engineer after the equipment testing is complete, each deficiency has been corrected, final documentation has been provided, and all the requirements of Contract documents have been fulfilled.

B. At the end of the project, following the completion of the field tests, and prior to final acceptance, the Contractor shall provide the following:
   1. Each "operation and maintenance" manual shall be modified or supplemented to reflect all field changes and as built conditions.
   2. Two (2) disk copies of all final documentation to reflect as-built conditions.

C. Keys: Submit two sets of all keys for locks supplied on this project. Wire all keys for each lock securely together. Tag and plainly mark with lock number or equipment identification, and indicate physical location, such as panel or switch number.

END OF SECTION

SECTION 16110
CONDUIT AND BOXES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Labor, materials, equipment, tools, safety gear, test equipment, incidentals, services, and transportation for a complete electro-mechanical installation as shown on the Drawings, included in these Specifications, or as can be reasonably implied from project descriptions.

B. The scope of work includes:
1. Furnish and install conduits, wireways, raceways, cable trays, junction boxes, pull boxes, and associated hardware. Provide conduit, fittings, hardware, hangars, mounting channel, and other parts for a complete raceway installation.
2. Replacement of liquid tight flex conduit that is sun exposed for any conduit that is getting new conductors.
3. Demolishing conduit and conductors for demolished equipment.
4. Furnish and install grounding system required by drawings, or if not shown or defined, as required by Article 250 of the NEC.
5. Installations shall be designed and installed with components meeting the NEMA area designation.

C. Work includes that specified in Electrical Specifications [Electrical General].

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Low Voltage Wire & Data Cable]

C. Electrical Specifications [Grounding]

D. Project Drawings

1.03 QUALIFICATIONS

A. Material furnished under this specification shall be installed by qualified installers meeting requirements specified in Electrical Specifications [Electrical General, Qualifications].

1.04 SUBMITTAL REQUIREMENTS

A. Provide submittals and drawings as specified in Electrical Specifications [Electrical General, Submittal Requirements].

PART 2 PRODUCTS

2.01 CONDUIT, RACEWAYS AND WIREWAYS

A. GENERAL - Conduit, raceways, and wireways, wiring methods, materials, installation shall meet all requirements of the NEC, be UL labeled for the application, and meet the minimum following specifications.

1. All wiring shall be installed in conduits, raceways, or wireways when interconnecting equipment and devices.
   a. The minimum size conduit shall be 3/4-inch unless indicated otherwise on the Drawings or for special connections to equipment.
   b. Provide cords and cord seals for devices or instrumentation requiring waterproof seal to maintain NEMA 4 or 4X ratings. Example devices include lighting and pipe mounted instruments that are located below grade.
2. Conduits may connect into junction boxes or wireways as shown in the drawings or as requested by Contractor and approved by Engineer. Junction boxes (circle with J in drawings) can be as simple as a condulet or JIC box, or larger box as determined by contractor and needed for the installation. Drawing may or may not depict junction box requirements that may be required by code. Wireways or junction boxes shall be rated for area (as noted in the Drawings), or furnish minimum NEMA 4 if not noted.
3. The Contractor shall use conduit material types (SPEC per conduit schedule) as defined below or as otherwise shown in the contract drawings or as specifically called out in the conduit schedule.
   a. Non-exposed underground portions of conduit run shall be PVC-40 for all signals and voltages unless otherwise shown in the conduit schedule.
   b. Exposed conduit material (not underground and beyond transition) shall be per the following table unless specifically noted otherwise in the plan drawings. The conduit schedule denotes the conduit type for non-exposed (under-ground, in-concrete, etc.) and does not apply or coordinate with this table. Exposed condulets, elbows, fittings, device boxes, and hardware shall be of the same material and finish as the adjacent conduit.

Location	Material
NEMA 1 or 12	Galvanized rigid steel (GRS)
NEMA 3R	Galvanized rigid steel (GRS)
NEMA 4	PVC-Coated Steel (GRS-PVC)
NEMA4X	PVC-Coated Steel (GRS-PVC)
Class 1 Div 1 or 2 hazardous	PVC-Coated Steel (GRS-PVC)

4. Conduit stubs and transitions:
   a. Conduit transitions shall be GRS-PVC for 6” on either side of the mtransition point (minimum) or as shown in drawing details. Conduit transition is defined as conduit sections emerging from or through concrete or earth or from below to above grade or through walls or vaults, non-exposed to exposed.
   b. Beneath pad mounted electrical equipment, where not exposed, shall be installed or trimmed to 2” or less above slab and have bushing or end bell

installed. Overall height of conduit entering into the base of equipment shall be enough for bushings/bells to be installed but be high enough for conduit tags to be installed.

c. Uniform in height for each panel or section. Conduits end bushings/bells shall not vary in height above slab more than ½" from lowest to highest.

d. Conduits shall be spaced apart such that bushings and end bells may be installed without interfering with the adjacent conduits.

e. Transitions to PVC shall include PVC coated locknuts to shield exposed steel pipe threads.

f. Through walls – shall protrude approximately 2" and include end bell or bushing. Pack space around conduit with non-shrink grout if the thru-hole was core drilled.

g. From hazardous locations – shall include seal off and/or conduit cable seals as required per NEC.

h. Conduits for future use shall be capped with coupling and plug. Identify each end with conduit labels.

i. Existing conduits that are no longer able to be used due to removal of equipment or shown demolished, shall have flexible conduit removed, wires removed or pulled back to the nearest pullbox, coiled and labeled at each end. Disconnect wires at each end.

5. Conduit Tags

a. All conduits listed in the "Conduit and Wire Routing Schedule" shall have conduit tags at both ends of each conduit run with tag number from schedule identified. This shall include ends within underground pull boxes.

b. All underground conduits shall have conduit tags at both ends of each conduit run. This shall include ends within underground pull boxes.

c. Tags on each conduit shall denote destination of conduit (acronym) and a unique number. Use tags such as 01 and RTU, 02 and MCC, 03 and LP, 05 and P1, 06 and PIT-61, etc. Tag destination acronym shall reverse at the other end of conduit but the number shall stay the same. Two tags may be used if placed back-to-back.

d. All conduits shall have temporary tags during construction. Temporary tags may be made from duct tape with hand written ink marking or suitable equivalent. Temporary tags shall be removed by Contractor at time of installation of permanent tags.

e. Tag material shall be rigid laminated red plastic with white lettering. The size of the tag shall be ¼" thick by 1" round or ¾" x 1" rectangle minimum.

f. Letter height shall be 3/8" minimum. Engrave the tags with the conduit number or acronym. Labeling shall be neatly installed for visibility and shall be clearly legible. Securely fasten tags in place using 20ga stainless steel tie wire through a pilot hole on the tag.

g. Conduit tags shall be Custom manufactured per specification.

6. Supports

a. Cross section of a single channel shall be 1-5/8" x 1-5/8" and cross-section of a double channel shall be 1-5/8" x 3-1/4". The channel wall thickness shall be 12 gauge as applicable.

b. One-Hole clamps shall be intended for pipe mounting on support channels and equipped with clamp-backs. The clamps shall be Efcor, Thomas and Betts, Appleton or equal

c. Spacers, provided to support underground conduits in concrete encasements, shall be plastic. The spacers shall be Carlon, Johns-Manville, Underground Products or equal

d. Anchors shall be expansion type for securing equipment to concrete foundations, floors and walls. Anchors shall have length identification mark on the exposed end of the bolt. Provide Hilti Kwik Bolt TZ, or equal.

e. Stanchions shall be provided as needed to mount equipment and electrical components. Stanchions shall be shop fabricated from welded 4" c-channel, 12" x 12" x ¼" steel base plate, coated with a rust inhibiting primer and top coat of gray polyurethane gloss paint. Attach equipment to the stanchion direct or on a ¼" aluminum sheet sized for the equipment supported.

f. Conduit Hangers shall be trapeze construction, with double channel, 3/8-inch rods and nuts. Suspend from suitable structural support.

g. Support material and finish shall be per the following table unless otherwise noted in the drawings. Brackets, fittings and hardware shall be of the same material and finish.

Location	Material
Indoors NEMA 12	Galvanized steel
Outdoors NEMA 3R	Galvanized steel
Outdoors NEMA 4	Stainless Steel type 316
Corrosive areas NEMA4X	PVC bonded, 40 mil, factory applied

h. Equipment mounting racks shall be designed by installer for rigid equipment and conduit mounting. Racks shall be bolted or welded construction and sized for equipment or as shown on the drawings.

i. Strut channels shall be used for mounting equipment to walls and for supporting conduit runs. Double strut channel type shall be used for fabricating equipment mounting racks as required and/or as detailed on the drawings. Add additional supports to rigid mounting locations as needed to prevent wobbling and to meet seismic requirements. All field cut surfaces of the strut channels shall be deburred and coated to prevent rust.

B. Galvanized Rigid Steel Conduit - (GRS)

1. Manufactured from high-strength steel and hot dipped zinc galvanized inside and out. Conduit and fittings shall meet UL 514B, UL 6, and conform to NEMA RN 2. Conduit shall be capable of being used as an equipment grounding conductor per NEC 250.
2. Provide factory radius elbows where 90 degree bends are required within a GRS conduit run.
3. Cast fittings and device boxes shall be malleable iron or aluminum. Appleton type FS/FD or equal.
4. In hazardous locations, fittings shall meet and be listed UL 886.
5. All fittings, hubs, couplings, pulling elbows and connectors shall be threaded-type. Set-screw type and compression-type are not acceptable. All thread conduit is not allowed over 1/2" exposed length. Cover plates shall be cast iron with sealing gasket in NEMA 3R locations.

6. Conduits entering enclosures shall be fitted with insulated grounding bushing; O-Z "HBLG", Appleton "GIB", or approved equal. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
7. Combination expansion-deflection fittings installed exposed shall be Type XD as manufactured by Crouse-Hinds Co.; Type DX as manufactured by O.Z. Gedney Co.; Type DF as manufactured by Appleton Electric Co., or equal

C. Galvanized Rigid and Coated Steel Conduit (GRS-PVC)
1. Galvanized Rigid Steel conduit with a 40-mil thick polyvinylchloride exterior coating and a 2-mil urethane interior coating meeting NEMA RN-1, UL-6 and ETL PVC-001. The bond of the PVC to the zinc coated pipe must be stronger than the tensile strength of the PVC.
2. Provide factory radius elbows where 90 degree bends are required within a GRS-PVC conduit run.
3. Cast fittings and device boxes shall be malleable iron or aluminum with a 40-mil thick PVC coating meeting the same.
4. In hazardous locations, fittings shall meet and be listed UL 886.
5. Provide PVC coated threaded-type fittings, hubs, pulling elbows, couplings, and connectors; set-screw type and compression-type are not acceptable. Form 8 conduit fittings, ½" through 4", must have a tongue-in-groove gasket to effectively seal out the corrosive elements. Covers shall be supplied with plastic encapsulated stainless steel cover screws. Form 8 fittings shall be UL and type 4X and IP69 listed.
6. A PVC Coated Sealing Locknut shall be used on all exposed male threads transitioning into female NPT threads which do not have sealing sleeves, including transitions from PVC couplings/female adapters to PVC Coated GRC elbows in direct burial applications. "PVC Coated Sealing Locknuts" are not to be used in place of a Myers hub
7. A PVC sleeve extending one pipe diameter or two inches, whichever is less, shall be formed at every female fitting opening except unions. The inside sleeve diameter shall be matched to the outside diameter of the conduit.
8. All junction and metal pull boxes shall be galvanized with exterior surfaces PVC coated to 40 mils thickness.
9. Unistrut, strut clamps, pipe straps, and clamp back spacers, shall have 40 mil thick PVC coating. All mounting anchors shall be stainless steel.
10. Conduits entering enclosures shall be fitted with insulated grounding bushing. All grounding bushings shall be tied to the grounding system with properly sized bonding conductors per the NEC code.
11. GRS-PVC conduit to be Robroy Plasti-bond, Perma-Cote, KorKap, T&B OCAL or equal.

D. PVC Conduit, Schedule 40 or 80 (PVC-40, PVC-80)
1. Shall be high impact schedule 40 or 80 polyvinylchloride suitable for use underground, direct burial and for use with 90 C wires, and shall conform to UL 651. Shall be UL listed and labeled for "direct" burial.
2. Elbows, and risers shall be per exposed conduit transition detail. PVC conduit is not allowed above ground or in exposed locations except where specifically indicated.

3. Custom bends (44 deg maximum) shall only be allowed in horizontal underground locations. Custom bends shall be neat, orderly, full diameter, and parallel with other conduits.
4. PVC fittings shall have solvent-weld-type conduit connections. Fittings and device boxes shall be PVC with factory fabricated conduit connections. Provide Carlon or equal.
5. Conduits entering enclosures shall be fitted with a glued male adapter, lock ring and bushing to prevent wire chafing. Conduits entering panels through concrete to an open bottom or entering a pull box shall have a glued end bell fitting.
6. PVC conduit shall be stored on a flat surface and shielded from the sun.

E. Liquid Tight Flexible Metal Conduit (above 2-1/2") - (FLEX)
1. Liquid Tight Flexible Metal conduit shall be moisture and oil-proof with PVC jacket extruded over a galvanized flexible steel conduit.
2. Liquid Tight Flexible Metallic Conduit shall be sunlight, oil, and flame resistant and approved for the installation of electrical conductors in indoor and outdoor applications.
3. Liquid Tight Flexible Nonmetallic Conduit shall be listed to UL standard UL 360.
4. Liquid Tight flexible metallic conduit shall be installed in accordance with Article 350 of the National Electrical Code (NEC) and other applicable sections of the NEC and/or local electrical codes.
5. Liquid Tight Fittings shall be listed for the use with Liquid tight Flexible Metallic Conduit and conform to UL514B.
   a. Outdoors when extension of GRS-PVC: PVC coated galvanized steel with insulated bushings.
   b. Outdoors when extension of GRS: Galvanized steel with insulated bushings.
   c. Indoors or outdoors when extension of stainless steel: 316 stainless steel with sealing ring and insulated bushing.
   d. Indoors: Galvanized steel with insulated bushings.
6. Flexible Metallic Conduit shall be Electri-Flex Liquatite type LA or equal.

2.02 CONDUIT SEALING BUSHINGS

A. Conduit Sealing Bushings shall provide a positive gas and fluid seal for all styles of conduits, including aluminum, galvanized rigid steel, and PVC.

B. Sizes available range from 3/4" thru 6" in both solid and split styles and available as blank, single, two and three conductors.

C. Seal conduits where indicated within underground pullboxes with conduit cable seals to prevent gasses or liquids from entering pullboxes.

D. Furnish Roxtec RS UG, Crouse Hinds, OZ Gedney, or equal.

2.03 DEVICE BOXES

A. Boxes
1. Device boxes shall be of zinc-galvanized malleable iron or cast aluminum with shape and size best suited for the particular application, rated for the location

installed, and shall be supported directly to structure by means of screws, anchors, or bolts.

2. Box dimensions shall be in accordance with size, quantity of conductors, and conduit clearances per NEC articles 314 requirements.
3. Boxes exposed to the weather or in moist locations shall be weatherproof (WP) by means of gasketing under a weatherproof cover.
4. Boxes connected to GRS-PVC conduit runs shall be PVC coated with 40 mil coating.

B. Device Plates and Covers

1. Indoor general purpose device plates and covers shall be stainless steel. Plates or covers shall be attached with stainless steel screws. An engraved plastic label denoting circuit breaker number and panelboard name shall be affixed to each cover with #4 stainless steel screws.
2. Weatherproof switch, outlet, and receptacle boxes shall be fitted with gasketed covers rated for wet locations. Each access cover shall have a padlockable cover to maintain security and weatherproof integrity even when a plug is connected to the receptacle. Screws and hinge springs shall be stainless steel. Weatherproof access covers shall be Leviton 5977-CL, Cooper 4966, or equal.

2.04 PULL BOXES

A. Junction Boxes

1. Where required for best installation or where specifically called out in the Drawings, junction boxes shall have JIC type construction with hinged door, type NEMA 4X type 304 stainless steel, or as otherwise shown and compliant with the indicated NEMA area rating. Door shall be fastened with clamps and stainless steel screws. No devices, screws, rivets, or bolts shall protrude through the exterior surface unless specifically shown on the Drawings. Boxes shall be Hoffman, Circle AW, or equal.

B. Underground Boxes

1. Underground pull boxes shall be prefabricated “Christy Box” size and type as noted in the Drawings or equal. Size shall be as shown or dimensioned on the Drawings. Provide larger boxes as needed to meet code or as determined in field to allow for adequate pull area at Contractor discretion. Extension sections shall be provided as necessary to reach the depth of underground conduits with maximum depth of 48”. All boxes shall have galvanized steel hold down bolts and hardware. Boxes shall be H/20 loading rated and have traffic rated covers. Steel covers or lids shall be galvanized and grounded with bonding jumper to the local grounding circuit per NEC. Pull box covers shall be labeled electrical, signal, utility, and telephone, whichever applies. Pull boxes shall be Christy Concrete Products, Brooks or equal.

C. Pull Box and Vault Identification

1. Engrave or bead weld box covers with minimum thickness of ¼” x 1” lettering with pullbox name (i.e. PBX-XXX) and purpose (electrical, signal, fiber, telephone, etc.). Provide an additional identifier “high voltage” for boxes with 600 volts or higher.
2. Utility pull boxes shall be labeled per Utility Company standards.

2.05 HOLE PLUGS

A. General
   1. Designed to seal unused pushbutton holes, conduit openings and knockout holes against dust, oil and water when modifying existing enclosures.
   2. Hammond Manufacturing, or equal

B. Steel Hole Plug
   1. 2 color options - ANSI 61 gray or RAL7035 Light Gray
   2. Oil resistant gasket.
   3. Secured with an 10-24 x 0.55" threaded stud and plated wing nut.
   4. Suitable for Type 1, 3, 3R, 4, 12, painted steel or non-metallic.

C. Stainless Steel Hole Plugs
   1. Cupped cap to protect rubber gasket and seal.
   2. Finished in brushed natural 304 stainless steel finish.
   3. Oil resistant gasket.
   4. Secured with an 10-24 x 0.55" threaded stud and plated wing nut.
   5. Suitable for 4X and stainless steel panels.

2.06 BACKFILL MATERIAL

A. Controlled Low Strength Material:
   1. Backfill material shall be CLSM (Controlled low strength material) or sand slurry cement mix with 1000 to 1200 psi compressive strength.
   2. Colored red with fifteen (15) pounds of red iron oxide No. 188 per cubic yard of concrete.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in Electrical Specifications [Electrical General, Workmanship].

3.02 INSTALLATION

A. System:
   1. Install all products per Electrical Specifications [Electrical General, Installation].

B. Rigid Conduits and Ducts:
   1. Exposed conduits shall be neatly arranged with runs perpendicular or level and parallel to walls. Bends shall be concentric.
   2. Except as expressly indicated or approved, all conduits shall be surface mount on block walls, concealed behind gypsum walls, and buried to required depth below floor slabs.
   3. Pipe threads shall be treated with conductive thread compound.
   4. Installation of the GRS-PVC conduits must be in accordance with the manufacturer's installation procedures using recommended tools.

a. Apply touch up compound at each fitting sealing sleeve edge to improve watertight seal.
b. To ensure compliance, the installer(s) must be "manufacturer certified" before installation can proceed.
c. Certification available by contacting manufacturer's representative and attending a brief instructional course. Valid and unexpired certification card shall be available for review per installer.

5. Repair GRS-PVC coating utilizing a touch-up compound as provided by the manufacturer of the conduit of the same material as the coating. Overlap beyond the damaged area to cover the PVC coating. Contact from touchup compound to PVC is required to maintain integrity. The entire conduit shall be replaced if the repair exceeds 1" combined length.
6. A maximum of three equivalent 90 degree elbows are allowed in any continuous run. Install pull boxes where required to limit bends in conduit runs to not more than 270 degrees or where pulling tension would exceed the maximum allowable for the cable.
7. Route all above grade conduits parallel or perpendicular to structure lines and/or piping. Conduits installed above grade shall be braced in place with stanchions. Expansion joints shall be installed every 100 feet. Bends shall be concentric.
   a. Combination expansion-deflection fittings installed exposed shall be Type XD as manufactured by Crouse-Hinds Co.; Type DX as manufactured by O.Z. Gedney Co.; Type DF as manufactured by Appleton Electric Co., or equal
   b. Conduit unions shall be provided in GRS-PVC and GRS runs to enable conduit assembly and disassembly.
8. Care shall be exercised to avoid interference with the work of other trades. This work shall be planned and coordinated with the other trades to prevent such interference. Process Pipe, mechanical and HVAC shall have precedence over conduits for routing and space requirements.
9. Seal each bottom entrance conduit into the MCC and other electrical enclosures with pliable plugging compound sealant to prevent the entrance of gasses, insects and rodents. Plugging compound sealant shall be Gardner Bender Duct Seal or equal.
10. Seal conduits where indicated from sewer wetwells in underground pullboxes with conduit cable seals. Furnish Roxtec RS UG, Crouse Hinds, or equal.
11. Exposed conduit stubs for future use shall be capped with coupling and plugged. Drill hole in plug for pull rope as necessary.
12. Explosion proof seal-off fittings shall be provided on all conduits that enter or leave hazardous areas per requirements of the National Electrical Code, Chapter 5 and UL 886. The seal-off fitting shall prevent hazardous gases and/or flames from passing from one type area to another through the conduit system. Ceramic or other non-asbestos fiber material and sealing compound shall be placed in the fitting to complete the seal.
13. Hazardous location conduit outlet boxes shall be used in hazardous locations for change in direction, access to conductors and as pull and splice boxes.
14. All spare conduits shall have 1/8" nylon pull ropes installed.

C. Flexible Conduit and Cords
1. Final connections to vibrating equipment such as motors, heaters and fans shall be made with liquid tight flexible conduit.

2. Flexible conduit lengths shall not be greater than 36 inches for sizes up to 2 ½" and 48 inches for 3" and larger conduit.
3. Flexible conduit shall include a ground conductor for equipment bonding in circuits over 30 VDC or as shown in the conduit schedule.
4. Flexible conduit shall only be installed in exposed or accessible locations.
5. Where equipment is cord connected, submersible rated, and conduit connections are not possible without modification, devices and equipment may be free-air cord connected in lieu of flexible conduit. Connection to adjacent rigid conduit shall be through liquid-tight cord connector fitting specifically designed for the purpose and sized appropriately for the cord. Cord connectors shall be rated similar to the adjacent conduit they are connected to: Stainless steel, galvanized or plastic.

D. Excavation and Layout:
1. Trenches for conduit below floor slabs and other underground electrical conduit shall be excavated to the required depths per utility requirements or specific detail. Conduits under floor slabs shall have minimum trench depth to contain bends without any portion of the radius visible at finished grade.
2. Provide minimum 1" space between conduits and lay conduits parallel to each other to the extent possible unless otherwise indicated in drawings and details.
3. Install spacers to support underground conduits. Horizontal and vertical separation shall be maintained by plastic spacers set every four feet. Spacers shall be Carlon Snap-Loc or equal.
4. Underground conduits outside of structures, excluding utility conduits, shall have a minimum cover of 24 inches except under roadways where minimum cover shall be 30 inches or as otherwise shown in the Contract Drawings. Back filling shall be done only after conduits have been inspected.
5. Excavation and back fill of conduits shall conform to the requirements herein and as indicated in drawing details unless otherwise noted. Conduits for other entities (Utilities, etc.) shall be as required and inspected by the governing entity.
6. At all times during the installation of the electrical system, the Contractor shall provide barricades, fences, guard rails, etc., to safeguard all personnel, including small children, from excavated trenches.

E. Backfill Material:
1. Backfill material shall be free of rocks greater than 1" in diameter and as noted in the drawing details or notes as indicated. If no backfill requirements are noted, then backfill shall be CLSM (Controlled low strength material) or sand slurry cement mix with 1000 to 1200 psi compressive strength.
2. Colored red with fifteen (15) pounds of red iron oxide No. 188 per cubic yard of concrete.

F. Underground pullboxes:
1. Pullboxes shall be located in areas that will experience the least traffic loading and in the general vicinity as shown in the Drawings. Boxes in pavement shall be set at final grade and boxes in planter areas shall be set 1" above final grade. Boxes shall not be buried by landscape material.
2. Steel pull box lids shall be grounded per NEC 250.4(A)(5) and 314.4.
3. Boxes shall be set on compacted base and base rock to minimize settling of the box over time. If the box is located in a paved traffic area, a 6" x 6" concrete ring shall be poured around the box below the pavement.

G. Device Mounting Heights:

1. Mounting heights of fixtures and devices shall be as follows unless otherwise indicated or when height has to be adjusted to be over or under counter tops.

a.	Wall switches	=>	48 inches
b.	Convenience outlets	=>	18 inches
c.	Telephone outlets	=>	18 inches
d.	Bracket fixtures	=>	7 feet 6 inches

H. Cutting, Coring, Patching and Repairing:

1. The Contractor shall do all cutting and patching required to install his work. Any cutting which may impair the structure will require prior approval. Cutting and patching shall be done only by skilled labor of the respective trades. Where it is becomes necessary to cut into existing work for the purpose of making electrical installations, locate existing post tension cables, rebar and electrical services prior to core drilling using ground penetrating radar or similar technologies. All surfaces shall be restored to their original condition after cutting and patching.

3.03 FIELD ASSISTANCE

A. General: Provide all equipment and supplies necessary to perform all testing. The Owner shall have the option to witness and participate in the on-site tests performed by the installer.

B. Per Electrical Specifications [Factory and Field Testing].

3.04 WARRANTY

A. Provide warranty as specified in Electrical Specifications [Electrical General, Warranty].

END OF SECTION

SECTION 16120
LOW VOLTAGE WIRE & DATA CABLE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Labor, materials, equipment, tools, safety gear, test equipment, incidentals, services, and transportation for a complete electro-mechanical installation as shown on the Drawings, included in these Specifications, or as can be reasonably implied from project descriptions.

B. The scope of work includes:
   1. Furnish and install wire, splices, lugs, or other miscellaneous devices as defined in this specification.
   2. End to end wiring and terminations for each system, device, instrument, and piece of equipment shown in the Drawings as new, or rehabilitated, or reconnected.
   3. Testing of conductors and completed wired systems.
   4. Installations shall be designed and installed with components meeting the NEMA area designation.

C. Work includes that specified in Electrical Specifications [Electrical General].

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Conduit and Boxes]

C. Electrical Specifications [Grounding]

D. Project Drawings

1.03 QUALIFICATIONS

A. Material furnished under this specification shall be installed by qualified installers meeting requirements specified in Electrical Specifications [Electrical General, Qualifications].

1.04 SUBMITTALS AND DRAWINGS

A. Provide submittals and drawings as specified in Electrical Specifications [Electrical General, Submittal Requirements].

PART 2 PRODUCTS

2.01 WIRING AND ELECTRICAL DEVICES

A. General
   1. General
      a. Provide wiring and electrical devices specified herein and install field and internal panel wiring as shown on the Contract Drawings.
      b. This section applies to all wires or conductors used internal (non-field) to electrical equipment or external for field wiring.
      c. Field wire quantity and size shall be per "Conduit and Wire Routing Schedule."
   2. Analog Signals
      a. Analog signal transmission between electric or electronic instruments shall be 4-20 milliamperes and shall operate at 24 volts DC unless otherwise specified. Milliampere signals shall be current regulated and shall not be affected by changes in load resistance within the unit's rating.
      b. Provide powered current isolators wherever the loops' load resistance exceeds the originating current signal transmitter's rating. Associated shunt resistors shall be located on rail-mounted terminal blocks. Exposed resistor leads shall be insulated with heat-shrink tubing.

B. Low Voltage Wire and Cable (through 600V except instrument signals)
   1. General: Low voltage conductors shall be used for power, control, lighting and miscellaneous circuits. This Section applies to all wires or conductors used internal for all electrical equipment or external for field wiring. Wire shall be new, plainly marked with UL label, gauge, voltage, type of insulation, and manufacturer's name.
      a. Conductors shall be copper with a minimum of 98% conductivity.
      b. Control and instrument wiring shall have tinned copper conductors.
      c. Class C stranding. Solid conductors may be used for lighting and receptacle circuits.
      d. Wire shall be rated 600 volt (min).
      e. Size all conductors per NEC minimum and as shown on the drawings.
         1) Minimum #12 AWG for wires used in power transmission circuits or as defined on the drawings.
         2) Minimum #14 AWG for wires used in signal transmission circuits or as defined on the drawings.
   2. Wire colors and sizes shall not change within the circuit.
   3. Wire shall be properly fused or breaker protected at or below the maximum amperage rating allowed by the NEC.
   4. Control and Power Wiring:
      a. Field wire in conduit:
         1) Type XHHW-2, XLPE insulation, color coded, rated 90 °C in wet or dry locations, oil resistant, UL44.
            a) Use for power circuits carrying voltages higher than 200 volts phase to ground.
            b) Color coded by phase and voltage per NEC and table herein.

2) Type THHN / THWN, nylon insulation with thermoplastic jackets, rated 90 °C in dry locations and 75 °C in wet locations, oil resistant, UL83 and UL1063.
   a) Use for power circuits with voltages below 200 volts phase to ground, or control circuits.
   b) Color coded by phase and voltage per NEC and table herein.
3) Minimum #12 AWG for wires used in power transmission circuits or as defined on the drawings.
4) Minimum #14 AWG for wires used in signal transmission circuits or as defined on the drawings.

b. Non-field control panel or factory installed equipment internal wiring:
1) Insulation - PVC jacket, type TEW, MTW, color coded, UL1015 with tinned copper.
2) Option: Insulation – Nylon (polyamide) with thermoplastic cover, color coded, type THHN, THWN, MTW, UL 1063
3) Minimum #14 AWG for wires used for individual conductor circuits 100 volts and above.
4) Minimum #18 AWG for wires used for individual conductor circuits below 100 volts.

c. Field wire in tray (Tray Cable type TC):
1) Individual cables - Insulation type THHN/THWN, rated 90 °C in dry locations and 75 °C in wet locations, oil resistant, UL83.
2) 3 or more conductor plus ground wire in a single cable.
3) UL Listed as sunlight resistant, direct burial, and open wiring.
4) Conductor sizing per ICEA Publication P-54-440 for cable tray and ICEA P-46-426 for conduit
5) Minimum #12 AWG for wires used in power transmission circuits or as defined on the drawings.
6) Minimum #14 AWG for wires used in signal or control transmission circuits or as defined on the drawings.

d. Power cord
1) Flexible wire cord shall be type SOW, SOOW, or G and be provided in 2, 3, or 4 conductor plus ground as required for connected load.
2) EPR insulation, 90 deg C rating, oil and abrasion resistant., overall jacket plus individual conductor jackets. 600V rated
3) Conductors shall be stranded copper.
4) Cord shall be installed with cord grips on each end where it enters termination enclosures.

5. Instrument wiring:
a. Field: Instrument cables shall have 600V tray cable rated insulation and 100% individual shielded twisted pair #18 (or #16 conductors) with drain wire. Single twisted shielded pair (TSPR) cables shall be Belden 9341 (or 9342), or approved equal. Three wire twisted shielded cables (#18 TS3W) shall be Belden 1036A, 1119A, or equal. See drawings for cable size required.
b. Non-Field: Instrument cables shall have 300V rated insulation and 100% individual shielded twisted pair #18 conductors with drain wire. Single twisted shielded pair (TSPR.) cables shall be Belden 8760, or approved equal. Three wire shielded cable shall be Belden 8770 or equal.

c. Field multi-pair instrument cable as required per conduit schedule shall have 300V rated insulation and 100% individual shielded twisted pair #18 conductors with drain wire. Multiple twisted shielded pair (T.S.PR.) cables shall be Belden 9773 thru 9777, or equal.

d. Multi-pair cable is not allowed (unless specifically called out in conduit schedule or on plans) for use in field or non-field applications. One T.S.PR cable is required for each signal.

6. Manufacturer Supplied Cables
   a. Cables and wiring for special systems provided by the manufacturer with the equipment shall be installed per the manufacturer's recommendations.
7. Data Cable
   a. Data network category 6 cable (indoor) shall consist of 4 pair unshielded twisted pair #23 awg solid copper conductors. The cable shall be rated by IEEE for service intended – plenum and dry.
      1) Cable: IEEE Category 6, various manufacturers.
      2) Connectors: Standard RJ-45 with boot.
   b. Data network cable (outdoor) shall consist of 4 pair foil and braid shielded twisted pair #24 awg solid copper conductors with anti-crosstalk divider, and drain wire. Rated Level 2 Category 6+ Outdoor Carrier by IEEE for use in plenum, conduit, wet or dry.
      1) Cable: IEEE Category 6, Belden 2149a, or equal
      2) Connectors: Grounded RJ-45 with drain wire crimp.
8. Temporary motor or panel hook-up
   a. Temporary cable may be cord without conduit or PVC conduit with wiring. In either case, the cabling must be protected from damage during construction. Sections may be located out of harms way, buried, or sleeved in steel conduit as needed.
   b. Power Circuits: Provide 2, 3, or 4 conductor plus ground power supply cable(s) for temporary pump connections or electrical power circuits. Cables shall be sized for breaker rating amperage, (minimum).
   c. Provide multi-conductor (TC) cables for digital control circuits. Provide quantity of conductors as needed.
   d. Provide instrument wiring for 4-20 ma instrumentation.
   e. Voltage drop in power circuits shall not exceed 15% during motor start and 5% during operation.

C. Color Code
1. All wires #8 and below shall have wire insulation the color specified. Wires #6 and larger may be black with color electrical tape at termination points.
2. No other colors shall be used without prior approval.
3. Color code color code of all wire shall conform with the following table:

WIRE COLOR CODE TABLE

Description	**Phase/Code Letter**	**Field wire or tape color**	**Non-Field Wire Color**
480V, 3 Ph	A	Brown	Brown
	B	Orange	Orange

	C	Yellow	Yellow
240V or 208V, 3 Ph	A	Black	-
	B	Red (Orange if high leg)	-
	C	Blue	-
	Neutral	White	White
240 / 120 V, 1 Ph	L1	Black	Black
	L2	Red	-
24V Positive	24+	Blue	Pink
24V Negative	24-	Gray	Gray
12V Positive	12+	Blue	Red
12V Negative	12-	Black	Black
AC Control		Red	Red (Yellow for foreign circuits)
DC Control		Blue	Blue
Ground	G	Green	Green
Shielded Pair	+	Red, Clear, or White	Clear or White
	-	Black	Black

2.02 WIRE MARKING

A. All panel, enclosure and field wiring shall have wire labels on both ends of each wire. Labeling shall be neatly installed for visibility and shall be clearly legible. Each conductor of instrument shielded signal wiring shall be labeled. Wire labels shall be machine printed with on white heat shrinkable tubing. Each label shall fit a minimum 23 characters, 3/16" in height before shrink. Tubing shall be oversized for the wire and shrunk into place using an electric heat gun. The "shrunk" label shall have just enough give to allow the label to be rotated. Hand lettered wire labels are not acceptable and shall be replaced at the Contractor's expense. Provide Brady "PermaSleeve" or equal.

1. Node Style Wire Identification All wires that are electrically the same (connected to common termination points) and do not pass through a contact or other switching device shall have the same wire identification. The wire labeling code for each end of the same wire shall be identical.
   a. The wire identification code for internal panel wiring shall be the number/letter as designated on the Drawing elementary and/or approved shop drawings.
   b. Wire labeling for field wiring shall contain the field equipment name/tag as a prefix and the pupose. (I.E. FIT071-+ and FIT071-- or P10-124) where + or 124 are the field device terminal block name or purpose. The hierarchy of prefix label names is 1) Instrument Tag, 2) Electrical panel or equipment name, and 3) Equipment name. Therefore, wires from MCC50 P10 cubicle to PLC10 will be labeled MCC50-P10-xx where xx is the terminal number or the purpose. Wires from field pressure switch

PSH10 to MCC50 P10 will be labeled PSH-10-xx where xx is the PSH terminal block name.

c. Wire labels shall be per control panel submittal and/or interconnection submittal drawings using rules described above – Wire labels must be documented prior to printing and before they are applied. Abbreviations may be used in the wire label as long as they are consistent and understandable.

d. Wire labels for lighting and receptacle circuits shall consist of the panel board and circuit number and a unique node number. (I.E. LP#3-A, LP#3-B, LP#3-N)

e. Wire labels may be omitted on "neutral jumpers" less than 8" in length.

f. Wire labelling shall be documented and revised on drawings to as-built conditions.

2.03 ELECTRICAL TAPE / SHRINKABLE INSULATORS

A. Vinyl tape shall be 7 mil, 600 volt rated, flame retardant, hot and cold weather resistant conforming to UL510. Provide 3M Scotch Super 33+ vinyl tape or equal

1. Vinyl tape for color coding shall be 7 mil, ¾" width, vinyl tape conforming to UL 510. Provide 3M Scotch 35 vinyl tape or equal.

B. Rubber Tape: EPR rubber, 90 deg C continuous rated. Provide 3M 130C rubber tape or equal.

C. Varnished Cambric Tape: Adhesive backed, 7 mil, bias cut cotton tape, coated with yellow insulating varnish. Provide 3M Scotch 2510 or equal.

D. Shrinkable insulators shall be heat shrinkable, polyolefin thick wall sleeves, end caps and cable repair sleeves are designed for use in splicing, sealing and re-jacketing of direct bury secondary cables. The insulators shall comply with UL 486D and be rated up to 1000 Volts. They shall provide long-term reliable performance overhead, underground or submerged with mechanical and environmental protection. Shrinkable insulators shall be 3M ITCSN or 3M IMCSN per manufacturer instructions for the application or equal.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in Electrical Specifications [Electrical General, Workmanship].

B. Perform work to remedy non-compliant installations after inspection.

C. Upon notification, stop work on any portion of the installation that is determined to be substandard or being installed by unqualified personnel.

3.02 FABRICATION AND INSTALLATION

A. System:

1. Install all products specified in Electrical Specifications [Electrical General, Installation].
2. Panels shall be completely factory wired and tested before shipment.
3. All spare PLC input / output points shall be wired to terminal blocks.
4. A minimum of 20% spare unwired terminals shall be provided in each panel.

B. Wiring Methods:
1. Wiring Separation: Wires carrying 100 volts and above shall be physically separated from lower voltage wiring by using separate bundles or wire ways with sufficient distance to minimize the introduction of noise, crossing only at 90 degree angles.
2. Harness: All wiring shall be neatly bundled and laced with plastic tie wraps, anchored in place by screw attached retainer. Where space is available, wiring shall be run in slotted plastic wireways with dust covers. Wireways shall be sized such that the wire fill does not exceed 60%. Tie wraps shall be T&B TY RAP or equal.
3. Retainers: Wireways, retainers, and other devices shall be screw mounted with round head 316 stainless steel screws or mechanically mounted by push in or snap in attachments. Glue or sticky back attachment of any type or style shall not be used. Retainers shall be T&B TC series or equal.
4. Hinge Loops: Where wiring crosses hinged surfaces, provide a "U" shaped hinge loop protected by clear nylon spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections. Spiral wrap shall be Graybar T25N or equal.
5. Routing: Wires and cable shall be routed such as to maintain separation between 100 Volt or higher from 100 volt or lower wiring being run in the same duct or bundle. Wires and cables shall have sufficient length to allow slack and to avoid any strain or tension in the wire or cable.
    a. Wires shall be routed in slotted plastic wireways with snap covers. Wires carrying 120 VAC shall be separated as much as possible from other wires and signal cables, and shall be routed only in ducts for 120 VAC. If the power wiring has to cross the signal wiring, the crossing shall be as close to a right angle as possible. Wireways for 24 VDC wiring shall be used for all other wires and cables. Routing of 120 VAC in combined wireways shall be minimized. Wires and cables shall be placed in the wireways in a straight, neat and organized fashion and shall not be kinked, tangled or twisted together. Additional wire ducting shall be provided for use by the electrical subcontractor for routing field wires to their landing points in the each electrical and instrumentation panel.
    b. Provide 2” minimum separation between wireway and terminal blocks.
    c. Wiring not routed in wireways shall be neatly bundled, treed, and laced with plastic ties.

C. Wire Terminations
1. Single wire and cable conductors shall be terminated according to the requirements of the terminal device as follows:
    a. Crimp-on terminals: shall be UL listed, self-insulating sleeve type, with ring or rectangular type tongue, suitable for the size and material of the wire to be terminated, and for use with either solid or stranded conductors.

b. Terminal Blocks: Remove the last +/- 0.25 inches insulation from of the conductor and insert it under the pressure plate to full length of the bare portion of the conductor. Tighten the screw to close the pressure plate onto the conductor. No more than two conductors shall be installed in a single terminal. All strands of the conductor shall be captured under the pressure plate.

c. Screw-less terminals: wire shall be stripped back and inserted per the terminal manufacturer's instructions.

2. When stripping insulation from conductors, do not score or damage conductor.

3. The drain wire and stripped end of outer jacket of shielded cables shall be covered with heat shrink insulating tubing. The drain wire shall be covered along its full bare length between the cable jacket cover and the terminal lug and placed on end outer jacket to cover foil.

4. Condulets with wire nut connections shall be supplied for wire termination to devices with leads instead of terminals (i.e. solenoid valves, level probe, etc.).

D. Wire Splicing

1. No wires shall be spliced without prior approval.

2. Where splices are allowed or approved they shall conform to the following:

a. Wire splicing devices shall be sized according to manufacturer's recommendations.

b. Splices of #10 and smaller, including fixture taps, shall be made with nylon self insulated twist on wire nuts; T & B "Piggys", Ideal "Wing Nut" or equal.

c. Splices of #8 and larger shall be hex key screw, two way connectors, insulated with molded high-dielectric strength plastic; NSI Polaris IPL or IPLD Series terminal blocks or equal.

d. Non-Motor Splices #10 and smaller in underground pullboxes shall have wire-nut connections inside and insulator tube which are sealed with non-hardening silicone based sealant that protects the connection from moisture and corrosion. The wire nut shall be pushed to the bottom of the tube and a locking cap closed to prevent moisture and dirt from entering the tube. The tube is factory filled with sealant and UL listed for waterproof connections. Provide 3M DBY-6 or DBR-6 or equal.

E. Wire Installation

1. Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, stressing the cables, or damaging the insulation. Use a UL listed pulling compound for lubrication within conduits as necessary. The raceway construction shall be complete and protected from weather before cable is pulled in. Swab conduits before installing cables and exercise care in pulling, to avoid damage to the insulation or conductors.

2. All wire and cables (with the exception of coaxial antenna cable) shall be installed within UL listed raceways or enclosures. Install all wires and cables in one continuous length unless splices are per Contract Drawings, required to connect equipment or submitted and favorably reviewed.

3. Bundle incoming wire and cables in panels. Zip-tie at intervals of 2” and neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Do not bundle, tape or tie wires within conduits.

3.03 WARRANTY

A. Provide warranty as specified in Electrical Specifications [Electrical General, Warranty].

END OF SECTION

SECTION 16250
AUTOMATIC TRANSFER SWITCH

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall supply the automatic transfer switch (ATS) as specified herein.

B. The ATS scope of work includes:
1. Providing and installing one automatic transfer switch of rating shown on Contract Drawings.
2. Submittal data and drawings.
3. Startup assistance.
4. Factory and field testing.
5. Operation and maintenance manuals.
6. Warranty of all components.

C. Startup and configuration of ATS with installed voltages and loads.

D. As required under Electrical Specifications [Factory and Field Testing], furnish all required labor, materials, safety equipment, transportation, test equipment, incidentals and services to perform factory and/or field testing.

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Factory and Field Testing]

C. Project Drawings

1.03 SUBMITTALS REQUIREMENTS

A. Provide Submittals as specified in Electrical Specifications [Electrical General, Submittal Requirements].

B. Include a record of each parameter available to be changed by the user. The list shall include factory defaults and space for entered values.

1.04 OPERATION AND MAINTENANCE INFORMATION

A. Provide operation and maintenance information as specified in Electrical Specifications [Electrical General, Operating and Maintenance Information].

B. Include a record of each ATS parameter setup during startup and testing and place a copy of setting in each O & M manual.

PART 2 PRODUCTS

2.01 AUTOMATIC TRANSFER SWITCH

A. General:

1. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 1½ and 3 cycle, long-time ratings. ATSs which are not tested and labeled with 1½ and 3 cycle (any breaker) ratings and have series, or specific breaker ratings only, are not acceptable.
2. The ATS shall be rated to close on and withstand 42,000 RMS symmetrical short circuit amperes at the ATS terminals or otherwise shown. Provide overcurrent protection as shown on the Contract drawings.
3. The ATS manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001.
4. ATS types utilizing components of molded case circuit breakers, contactors, or parts thereof, are not acceptable.
5. The switch assembly shall be installed in a NEMA enclosure located as shown on Contract drawings.
6. The automatic transfer switch shall be an ASCO Model 7000, Zenith ZTSD, each with options to meet specified requirements, or equal.

B. Switch Unit:

1. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be solenoid operated and only momentarily energized to minimize power consumption and heat generation.
2. The transfer switch shall feature a delayed transition mode. The switch shall remain in the neutral position (neither emergency nor normal) until the associated time delays have expired and allow the switch to complete the transfer.
3. The switch shall be 4 pole double throw with inherently interlocked construction. A switched neutral shall be provided for all systems unless specifically noted otherwise on the drawings.
4. Wide contact gaps shall be provided to insure positive isolation of the normal and emergency power sources.
5. The switch shall be fully rated for amperage shown on Contract Drawings, for switching all types of loads including induction motors. The ratings shall apply to the voltage and mounting arrangement as shown in the drawings.
6. The main power contacts shall have silver alloy contact construction featuring a wiping action each time the switch is operated. Arc chutes shall be utilized to contain the inherent spark created when switching under load.
7. The main contact design shall allow repeated making and breaking of rated full load current, with a combination of motor and other loads and without damage or undue wear to the contacts.
8. All main power contacts and auxiliary contacts shall be mechanically driven from a common actuator shaft.
9. The bus shall be constructed of silver plated copper.
10. Inspection of all contacts, linkages and moving parts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors.

11. All switch and relay contacts, coils, mechanical linkages, and control elements shall be serviceable or removable from the front of the mounted switch or accessory assembly without removal of the switch or assembly from the compartment and without disconnection of the power cables or control wiring.
12. The switch shall have a manual operating handle for maintenance purposes.
13. Compression screw type solder-less terminals or lugs shall be provided for connecting all external line & load power cables and control wiring. All connections shall be accessible from the front without removal of internal components.
14. A terminal strip shall be provided for terminating all control wiring. All terminals shall be numbered with machine printed lettering matching the wire number of the terminated wire.
15. All control wiring shall have permanent identification at each point of connection. Wire identification shall be by machine printed numbered wiring sleeves. Electrically common wires shall have the same wire number. Electrically different wiring shall have unique wire numbers.
16. Control wiring shall be neatly bundled and secured in place by plastic cable ties. Wiring shall be protected with plastic spiral wrap where it crosses over a hinge to the door.

C. ATS CONTROL PANEL

1. A control panel shall be provided to direct the operation of the transfer switch. The modules sensing and logic shall be a controlled by a built in microprocessor. Control panels that do not utilize microprocessor electronics to control the operation of the switch are not acceptable.
2. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port.
3. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.
    a. Sensing and control logic shall be provided on multi-layer printed circuit boards.
    b. The panel shall be enclosed with a protective cover and be outer door or deadfront mounted such that it may be operated with the door closed for safety and ease of maintenance.
4. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to 1% of nominal voltage. Frequency sensing shall be accurate to 0.2%.
    a. The under-voltage of each phase of the normal source shall be monitored, with pickup adjustable from 85% to 100% of nominal and the dropout adjustable from 75% to 98% of pickup setting, both in increments of 1%. These adjustments shall be factory set at 85% dropout, and 90% pickup.
    b. The voltage of each phase of the emergency source shall be monitored, with pickup adjustable from 85% to 100% of nominal. This adjustment shall be factory set at 95% pickup.

c. Frequency sensing of the emergency source shall be provided, with pickup adjustable from 90% to 100% of nominal. This adjustment shall be factory set at 97% pickup.

d. The control panel shall meet or exceed the voltage surge withstand capability in accordance with IEEE Standard 472 1974 (ANSI C37.90a 1974) and the withstand voltage test in accordance with the proposed NEMA Standard ICS1 109.21.

5. The transfer switch control panel shall be capable of operating over a temperature range of -20 to +60 degrees C.

6. The control panel shall include the following field adjustable time delays:

a. Time delay to override momentary normal source outages, adjustable from 0 to 5 minutes. This adjustment shall be field set to place emergency generator on-line in 1 minute.

b. Transfer to emergency time delay for controlled timing of load transfer to emergency, adjustable from 0 to 5 minutes. This adjustment shall be field set switch position in 5 seconds after power has stabilized.

c. Emergency source failure time delay to ignore momentary transients during initial generator set loading, adjustable from 0 to 6 seconds. Set at 2 seconds.

d. Retransfer to normal time delay, adjustable 0 to 60 minutes. This adjustment shall be factory set at 5 minutes. The time delay is automatically bypassed if the emergency source fails and normal source is acceptable.

e. Unloaded running time delay for emergency engine generator cooldown, adjustable from 0 to 60 minutes. This adjustment shall be factory set at 5 minutes.

f. Delayed transition time delay for setting the dead time when all power is removed from the load side of ATS, adjustable 0 to 5 minutes. Set at 1 minute.

g. Generator Exercise Timer: Timer provided for operator adjustment of day of week, time of day and run duration for exercising the generator under operating loads by activating the automatic transfer switch. . Timer shall be mounted on the ATS outer deadfront door.

h. The controller shall provide an integral engine exerciser. The timer shall be field set by the Contractor with date and time during training. The engine exerciser shall allow the user to program up to seven different exercise routines. For each routine, the user shall be able to:

1) Enable or disable the routine.

2) Enable or disable transfer of the load during routine.

3) Set the start time of day, day of week, week of month, alternate or every time start, duration of run.

4) At the end of the specified duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. A 10-year life battery that supplies power to the real time clock in the event of a power loss will maintain all time and date information.

7. The controller shall commit to start engine which requires the engine to reach proper output and run at least the duration of the cooldown setting, regardless of whether the load is transferred.

8. Provide interface relays or main switch follower contacts to comply with I/O interface requirements as defined in the P&ID diagram. Interfacing relays shall

be industrial grade plug-in type with dust covers. Interface connections shall be wired to backpan terminal blocks. At minimum, the switch shall have the following unused I/O contacts available:

a. Switch in Normal – SPDT rated 10 amps, 120 VAC
b. Switch in Emergency – SPDT rated 10 amps, 120 VAC
c. Engine starting contact -- DPDT gold-flashed contacts rated 10 amps, 32 VDC
d. Emergency Power available – SPDT rated 10 amps, 120 VAC
e. Normal Power available – SPDT rated 10 amps, 120 VAC

9. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal.
10. Provide separate LED signal lights with nameplates indicating the following:
    a. Utility power is available (green)
    b. Generator power is available (red)
    c. ATS is connected to Utility source (green)
    d. ATS is connected to the Generator source (red)
    e. ATS in neutral position (wht)
11. A three position momentary-type test switch shall be provided for the test / automatic / reset modes:
    a. Test: simulate normal source failure
    b. Automatic: normal operation
    c. Reset: bypass the time delays on either transfer to emergency or retransfer to normal.
12. All adjustments shall be field adjustable without the use of tools, meters, power supplies, or special test equipment and can be made safely without personal exposure to live parts
13. Each adjustment resolution shall be settable within minimum increments of 1%.
14. Repetitive accuracy of timer, voltage and frequency settings over a temperature range of –20° C to 70° C shall be within +/ 2%.
15. The control panel programming shall be lockable via password protection.
16. The wire harness for connection of the control panel to the transfer switch shall have sufficient length to reach between the mounting locations shown on the Contract drawings.
17. Provide the following displays on the controller:
    a. Event log to display 99 logged events with the time and date of the event, event type and event reason.
    b. Total number of ATS transfers.
    c. Number of ATS transfers caused by power source failures.
    d. Total number of days ATS has been in operation.
    e. Total number of hours that the normal and emergency sources have been available.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in Electrical Specifications [Electrical General, Workmanship].

3.02 FIELD ASSISTANCE

A. Testing, checkout and start-up of the ATS equipment shall be performed under the technical direction of a factory trained authorized manufacturer representative.
   1. The setup and programming of the ATS shall be provided by a factory-trained representative who is authorized by the ATS manufacturer to perform the startup. This setup and programming shall be done prior to and during the first application of power.
   2. Provide testing as specified in Electrical Specifications [Factory and Field Testing].

B. Provide 1 hour of "ATS Setup" Training on operating and maintenance procedures.

3.03 WARRANTY

A. Provide warranty as specified in Electrical Specifications [Electrical General, Warranty].

END OF SECTION

SECTION 16430
LOW VOLTAGE SWITCHBOARD

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This section applies to specifies switchboards rated 600 volts and below.

B. Provide Switchboard(s) (SWBD) as specified herein and shown on the Drawings.
   1. The System Integrator shall perform and be responsible for procurement, submittals, shop drawings, interconnection drawings, factory testing, and all control wiring for the SWBD. System Integrator is defined in Electrical Specifications [Electrical General].

C. All wiring, wire color codes, wire labeling and terminal blocks within SWBD shall be as specified in Electrical Specifications [Low Voltage Wire & Data Cable].

D. The SWBD scope of work includes:
   1. Providing SWBD structure and all internal components.
   2. Installation of the SWBD on concrete pad per details.
   3. Submittal data and drawings.
   4. Startup and configuration of SWBD internal components.
   5. Factory and field testing.
   6. Operation and maintenance manuals.
   7. Warranty of all components.
   8. Seismic Anchorage Design Calculations and conforming installation.
   9. Conduit – support systems, wire, and grounding system, for equipment interconnection, and operation.
   10. System calibration, testing and documentation.

E. Electrical Specifications [Factory and Field Testing]. Furnish all required labor, materials, safety equipment, transportation, test equipment, incidentals and services to perform factory and/or field testing.

F. All electrical equipment and materials, and methods - including installation, calibration, and testing - shall conform to the applicable codes and standards listed in this and other Sections. All electrical materials and work shall conform to published standards of the National Electric Code (NEC), Institute of Electrical and Electronic Engineers (IEEE), and Underwriters Laboratories Inc (UL).

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Low Voltage Wire & Data Cable]

C. Electrical Specifications [Automatic Transfer Switch]

D. Electrical Specifications [Panelboard and Power Transformer]

E. Electrical Specifications [Factory and Field Testing]

1.03 SUBMITTALS REQUIREMENTS

A. Provide Submittals as specified in Electrical Specifications [Electrical General, Submittal Requirements].

B. Include a record of each configurable parameter available to be changed by the user for internal components. The list shall include factory defaults and space for entered values for each configurable component.

1.04 OPERATION AND MAINTENANCE INFORMATION

A. Provide operation and maintenance instructions as specified in Electrical Specifications [Electrical General].

PART 2 PRODUCTS

2.01 SWITCHBOARD

A. General:
1. The Switchboard shall be Eaton Pow-R-Line, Square D, or approved equal.
2. The Switchboard (SWBD) shall be built and tested in accordance with:
   a. NEMA Standards
   b. ANSI
   c. Underwriters Laboratories, Inc.
3. Switchboard enclosure shall be NEMA rated as shown in the drawings.

B. Metering Panel:
1. Provide metal enclosed, front accessible, self contained utility metering panel. Voltage, phase, AIC and continuous amperage rating shall be as shown on Contract Drawings. Panel will include meter socket, factory installed main breaker(s) and test by-pass facility.
2. Design utility entrance and termination and other features per NEC, local codes, and serving Utility requirements.
3. Enclosure shall be NEMA 3R construction for underground utility service. Enclosure shall be manufactured from 316 stainless steel 14 ga. (min) sheet steel. Provide pad mount, surface mount or flush mount cabinet per installation detail.

C. Switchboard:
1. Switchboard shall be front accessible with group mounted, buss connected circuit protective devices. Where provisions for future circuit protective devices are required, space for the device, corresponding vertical buss, device connectors and the necessary mounting hardware shall be supplied.
2. Distribution section shall meet all requirements per NEC, local codes, and as defined in the drawings.

3. Buss shall be copper. Aluminum buss is not equal to copper buss. Furnish buss mounted cable lugs sized for cabling that is required to be directly buss connected.
4. Buss shall, 3 phase, 4 wire, 480 volt, 65,000 AIC minimum symmetrical (or as shown otherwise in the drawings).
5. Power buss:
    a. Continuous amperage rating at least equal to the main circuit breaker or the power source and shall be braced to withstand stresses resulting from the maximum short-circuit current available.
    b. Horizontal bus shall extend through all sections of the switchgear unless shown otherwise in the drawings with vertical connections to circuit breakers in each section.
    c. Buss shall be mounted on heavy-duty insulated glass polyester supports, and main bus joints shall be bolted using a minimum of two bolts.
    d. Shipping splits and provisions for future bus extensions shall have tin-plated bolted connections.
6. Neutral bus, when specified or required, shall have the same capacity as the main bus.
7. Ground buss shall be rated per NEC relative to the power buss amperage rating and shall extend the entire length of the switchboard.

2.02 MOLDED CASE CIRCUIT BREAKERS

A. General
1. Circuit breakers and motor circuit protectors shall be manufactured by Eaton Cutler-Hammer, Square D, G.E., Siemens, or equal.
2. Circuit breakers shall be the bolt-on type.
3. Multiple pole circuit breakers shall be designed so that an overload on one pole automatically causes all poles to open. The use of tandem or dual circuit breakers in a normal single pole space to provide the number of poles or spaces specified are not acceptable.
4. Molded case circuit breakers shall be operated by a single toggle-type handle and shall have a quick-make, quick-break switching mechanism. An automatic trip of the breaker shall be clearly indicated by the handle position. Contacts shall be non-welding silver alloy and have flash reduction arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.
5. Minimum interrupting capacity:
    a. 480 volt circuit breaker shall have a minimum interrupting capacity of 42,000 amperes.
    b. 120 or 208 or 240 volt breaker shall have a minimum interrupting capacity of 22,000 amperes
6. Circuit Breakers protecting full voltage combination motor starters shall be motor circuit protector (MCP) breakers with adjustable magnetic trip unless otherwise noted on the drawings.
7. Circuit breakers shall be UL listed for series application.
8. Where indicated circuit breakers shall be current limiting.
9. Where indicated on Drawings, provide UL listed circuit breakers for continuous duty at 100% of their ampere rating in the intended enclosure.
10. Furnish add-on features such as auxiliary position status contacts, trip indication contacts, zone interlocking, shunt trip coils, etc, as shown in the drawings.

B. Trip Unit – Molded Case Circuit Breakers

1. Circuit Breakers over 400 volt and over 90A trip units as defined herein. All other circuit breakers shall have shall have non-electronic thermal-magnetic (TM) trip units with inverse time-current characteristics.
2. The trip unit shall be Eaton type Power Expert Release (PXR) or equal.
    a. Each circuit breaker trip unit shall have three (3) current sensors, voltage sensors, microprocessor, and flux transfer trip solenoid at minimum.
    b. Trip units shall be continuously self-checking and provide a visual indication that the internal circuitry is being monitored and is fully operational.
    c. Trip units shall be powered from the primary voltage connected to the circuit breaker. Current flow shall not be required for settings functions. Circuit breaker trip units shall be operable and adjustable with zero current flowing through the circuit breaker.
    d. True RMS sensing circuit protection shall be achieved by analyzing the secondary current signals received from the circuit breaker current and voltage sensors, and initiating trip signals to the circuit breaker trip actuators when predetermined trip levels and time-delay settings are reached.
    e. Trip units shall be provided with a display panel. Trip units shall have an information system that provides LEDs to indicate mode of trip following an automatic trip operation. The indication of the mode of trip shall be retained after an automatic trip. A reset button shall be provided to turn off the LED indication after an automatic trip
    f. Programming may be done via a keypad at the faceplate of the unit. Programming via the communication network if or as shown in drawings.
    g. The trip unit shall offer a three-event trip log that will store the trip data, and shall time and date stamp the event.
    h. The trip unit shall have the following advanced protective features integral to the trip unit:
        1) Adjustable undervoltage release (defeatable)
        2) Adjustable overvoltage release (defeatable)
        3) Reverse power and fault current
        4) Reverse sequence voltage
        5) Under-frequency
        6) Over-frequency
        7) Voltage phase unbalance and phase loss during current detection.
    i. Although not preferred but if needed, furnish 24VDC redundant power supply with terminal blocks and 0.5A miniature circuit breakers to distribute control power to each circuit breaker trip unit that requires it for settings. The power supply shall be connected below the main breaker and transfer switch but above any feeder circuit breakers. Provide option for external power supply input.
3. System coordination shall be provided by the following microprocessor-based time-current curve shaping adjustments:
    a. Adjustable long-time setting (set by adjusting the trip setting dial to an amount not to exceed rating plug)
    b. Adjustable short-time setting and delay with selective flat or I2t curve shaping,
    c. Adjustable instantaneous setting

d. Adjustable ground fault setting and delay with selective flat or I2t curve shaping.

4. The microprocessor-based trip unit shall have both powered and unpowered thermal memory to provide protection against cumulative overheating should a number of overload conditions occur in quick succession.
5. Furnish internal ground fault protection with adjustable settings. Provide neutral ground fault sensor for four-wire loads. Bypass neutral sensor for 3 wire loads.
6. Include ARMS technology for all circuit breakers 400A and above or where shown on drawings.
   a. Activation and deactivation of the ARMS technology and local indication shall be accessible from the face of the trip unit without opening the circuit breaker door or cover and exposing operators to energized parts.
   b. Recalibration or adjustment of trip unit parameters shall not be required when enabling / disabling the ARMS technology.
7. Breakers shall have built-in test points for testing the long-time delay, instantaneous, and ground fault functions of the breaker by means of a test set.

C. Manual operators
1. Furnish door interlocked manual operators for mains and selected feeder circuit breakers as shown in the drawings.
2. Manually operated mechanisms designed to open, close and reset circuit breakers.
3. Operators shall be available in three basic configurations— flange mounted, through-the door rotating and direct handle through door to provide a variety of options for different applications and enclosure ratings.

2.03 ACCESSORIES

A. Space Heaters:
1. Outdoor rated switchgear shall be provided with 120 volts AC thermostatically controlled space heaters. Heater wiring shall be to terminal blocks for connection to external power source. One heater shall be provided in each vertical breaker section. Heaters shall have guards to prevent accidental contact with power or control wiring.

B. Key Interlocks:
1. Key interlocks shall be provided as shown on the drawings. The switchgear manufacturer shall be responsible for coordinating interlocks for switchgear main circuit breakers interlocked with generator circuit breakers. Key interlocks shall be as manufactured by Kirk Key Interlock Company, or equal.

C. Surge Protective Device (SPD)
1. SPD shall be suitable Service entrance location per ANSI/IEEE C62.41, IEEE C62.45, and UL1449 3rd edition and tested according to IEEE C62.44 as Secondary Surge Arrestor.
2. Unit shall be sealed and not allow vapors from entering the switchboard enclosure after a voltage surge event.
3. Modes of protection – Line to Line, Line to Ground, Line to Neutral (as applicable). Voltage, phase and neutral connections per one-line diagram.

Current surge capacity shall be as shown in the drawings or, if not shown, 100,000 amps per mode minimum

4. The SPD shall be factory installed inside the switchboard during assembly by the original equipment manufacturer. The OEM design shall be integral to the design of the switchgear with special paneling and cutouts specifically designed for unit mounting.
5. The SPD connections shall be located as close as possible to the load side of main disconnect device and ground/neutral bar.
6. The SPD shall have integral 30-amp disconnect and fuses. Service of the SPD assembly, fuses or other serviceable components shall be from front access of the switchboard and shall not require disassembly of switchboard panels to repair or replace parts.
7. SPD shall be Cutler-Hammer Clipper, Current Technology TransGuard or equal.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in Electrical Specifications [Electrical General, Workmanship] and as specified herein.

3.02 INSTALLATION

A. Vertical sections shall be mounted on steel channel sills continuous on two sides. The steel channel sills shall be heavy duty to meet the specific seismic requirements of this project location. These sills shall be mounted on the concrete pad to be installed per the Contract Drawings.

B. Conduit entering Switchboard shall be stubbed up 1" into the bottom horizontal wireway (typically) directly below the vertical section in which the conductors are to be terminated.

C. Base of Switchboard shall be adequately grouted, caulked or sealed to prevent the entry of insects and rodents.

3.03 FIELD ASSISTANCE

A. Provide field testing as specified in Electrical Specifications [Electrical General, Testing].

3.04 WARRANTY

A. Provide warranty as specified in Electrical Specifications [Electrical General, Warranty].

END OF SECTION

SECTION 16450
GROUNDING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Labor, materials, equipment, tools, safety gear, test equipment, incidentals, services, and transportation for a complete electro-mechanical installation as shown on the Drawings, included in these Specifications, or as can be reasonably implied from project descriptions.

B. The scope of work includes:
   1. Furnish and install grounding system required by Drawings, or if not shown or defined, as required by Article 250 of the NEC. Ground conductors shall be sized for the protective device, minimum.
   2. Furnish and install conduits, junction boxes, underground boxes, and associated hardware. Provide hardware, conduit, fittings, and other parts for a complete grounding installation.
   3. Installations shall be designed and installed with components meeting the NEMA area designation.

C. Work includes that specified in Electrical Specifications [Electrical General].

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Low Voltage Wire & Data Cable]

C. Project Drawings

1.03 QUALIFICATIONS

A. Material furnished under this specification shall be installed by qualified installers meeting requirements specified in Electrical Specifications [Electrical General, Qualifications].

1.04 SUBMITTAL REQUIREMENTS

A. Provide submittals and Drawings as specified in Electrical Specifications [Electrical General, Submittal Requirements].

B. Submit manufacturer's product information for connections, clamps, rods, terminals, and grounding system components.

PART 2 PRODUCTS

2.01 GROUNDING SYSTEM

A. General
1. Grounding conductors shall be sized as shown on the Drawings or in accordance with NEC article 250, whichever is larger.
2. Components of the grounding electrode system shall be manufactured in accordance with UL 467 - Standard for Safety Grounding and Bonding Equipment.

B. Grounding System
1. The utility service ground shall be tied to a building ground grid consisting of a "UFER" and/or ground rod type grounding system.
2. Electrical Contractor shall design layout of ground system if one is not shown on drawings per requirements herein.
3. The UFER shall consist of minimum 25 feet minimum of code sized bare copper wire conductor laid at 3 foot minimum depth encased with ground enhancement material or as detailed on the Contract Drawings. UFER ground shall be located where soil moisture content will be maximized. Terminate UFER ground at ground rod in inspection box.
4. Ground enhancement material shall be permanent and be designed to lower earth resistance in all soil conditions. Once set, material shall have resistivity of not more than 20 ohm-cm resistance. Material shall be set by mixing it with water to form a slurry and shall not dissolve or decompose once cured. Ground enhancement material shall be Erico Ground Enhancement Material (GEM), Lyncole XIT, or equal.
5. Utility services - 600A to 800A: Provide 3 ground rods 8 feet apart, connected together, and to UFER ground, and to the service panel with #1/0 bare copper ground wire. Connect ground system to switchboard ground bus in two places from ground rods.
6. The ground bonding wire(s) from the ground rod(s) shall extend through and appropriately sized conduit into the electrical panel. Connect the ground wire(s) to the ground bus with readily visible UL approved "ground clamp" attached to the ground bus.
7. Install bare copper ground bond wires from the UFER ground to the various locations shown on the Drawings.

C. Raceway Grounds
1. Metallic conduits shall be assembled to provide a continuous ground path. Metallic conduits shall be bonded using insulated grounding bushings.
2. Provide separate code size wire ground conductor for all conduit types.

D. Equipment and Enclosure Grounds
1. Electrical and distribution equipment shall be connected to the grounding system. Cables shall be sized as specified.

E. Components
1. Ground rod shall be copper-clad steel, ¾” x 10 ft length. Rods shall have minimum copper thickness of 10-mils. Provide threaded, sectional type with coupling and driving stud so that extension rods of same diameter and length

may be added where necessary to obtain necessary ground resistance improvements. Couplings and driving studs shall be by the same manufacturer as the rod. Rods shall be Joslyn; Thomas & Betts; or equal.

2. Provide ground well enclosures for all outdoor ground rods. Furnish Christy type F8, Christy N9, or Christy B1017 (traffic areas), marked "GROUND" or equal unless otherwise shown on the Drawings.
3. Ground rod clamps shall be bolt-on type as manufactured by O-Z Gedney type GRC, or equal.
4. Exothermic weld connections shall form a permanent, low resistance, molecular bond between two copper conductors and be rated for the same or higher current capacity as the conductor. Furnish Nvent Erico Cadweld or equal.
5. Every piece of equipment shall be grounded per NEC.
6. Each electrical enclosure shall have a copper ground bus. Screw type fasteners shall be provided on all ground busses for connection of grounding conductors. Ground bus shall be a Challenger GB series, ILSCO CAN series or equal.

F. Ground Enhancement Material (GEM)

1. GEM is a low-resistance, non-corrosive, carbon-based, superior conductive material that improves grounding effectiveness, especially in areas of poor conductivity such as rocky ground, mountain tops and sandy soil.
2. GEM contains portland cement, which sets within 3 days and fully cures within 28 days, to become a highly conductive concrete that performs in all soil conditions irrespective of the presence of water.
3. Furnish Nvent Erico GEM25A or equal.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in specified in Electrical Specifications [Electrical General, Workmanship].

3.02 INSTALLATION

A. Grounding System:

1. Install all products per Electrical Specifications [Electrical General, Installation].
2. Install ground rods to full depth with 3" maximum exposed above pads and 9" maximum exposed in underground boxes.
3. Each nonmetallic conduit shall contain a code sized grounding conductor.
4. The system neutral conductor and all equipment and devices required to be grounded by the National Electrical Code shall be grounded in a manner that satisfies the requirements of the National Code.
5. The system neutral (grounded conductor) shall be connected to the system's grounding conductor at only a single point in the system. This connection shall be made by a removable bonding jumper sized in accordance with the applicable provisions of the National Electrical Code if the size is not shown on the Drawings. The grounding of the system neutral shall be in the enclosure that houses the service entrance main overcurrent protection.
6. Utilize mechanical connections in accessible locations and exothermic connections in non-accessible or buried locations.

7. The secondary on all transformers shall be grounded.
8. All raceway systems, supports, enclosures, panels, motor frames, and equipment housings shall be permanently and effectively grounded.
9. Install insulated grounding conductor with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits by means of grounding bushings on terminations at panelboards and distribution panels with 12ga. conductor to grounding bus
10. All receptacles shall have their grounding contact connected to a grounding conductor.
11. Branch circuit grounding conductors for receptacles or other electrical loads shall be arranged such that the removal of a lighting fixture, receptacle, or other load does not interrupt the ground continuity to any other part of the circuit.
12. Attachment of the grounding conductor to equipment or enclosures shall be by connectors specifically provided for grounding. Mounting, support, or bracing bolts shall not be used as an attachment point for ground conductors.
13. Install grounding electrode conductor and connect to reinforcing steel in foundation footing. Electrically bond building steel to ground system. Bond metal siding not attached to grounded structure.
14. Furnish exothermic grounding connections for all underground connections to wire, rebar, or other steel components required to be grounded.

B. Ufer Ground
1. Furnish and install grounding electrode bare copper wire as shown in drawings or, at a minimum, NEC minimum size based on Utility service amperage, 25 ft minimum length.
2. Dig trench minimum 12” wide x 25 ft long x 36” deep.
3. Place mixed slurry GEM material on bottom of trench to 2” thickness.
4. Place ground conductor on top of GEM slurry.
5. Place mixed slurry GEM material over conductor to 2” thickness.
6. Allow 3 days to cure and bury completed Ufer with native soil.

3.03 FIELD QUALITY CONTROL

A. Inspections:
1. Ground system shall be inspected prior to cover.

B. Testing:
1. Complete applicable test forms if provided in testing specifications [Factory and Field Testing]. If form is not provided, furnish results on a vendor standard form.
2. Test each grounding connection to determine the ground resistance. The grounding test shall be IEEE 81.2 and NETA 7.13. The current reference rod shall be driven at least 100 feet from the ground rod or grid under test. The measurements shall be made at 10-foot intervals beginning 20 feet from the test electrode and ending 80 feet from it, in direct line between the ground rod or center of grid and the current reference electrode. Investigate ground resistance in excess of 1 ohm and revise or install new or additional ground electrodes as needed to reduce point to point resistance to less than 1 ohm.

END OF SECTION

SECTION 16470
PANELBOARD AND POWER TRANSFORMER

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall supply panelboards and power transformers as specified herein and as shown in the Contract Drawings.

B. The Contractor shall perform complete startup and testing services for the panelboard and power transformer per Electrical Specifications [Factory and Field Testing].

C. Work includes that specified in Electrical Specifications [Electrical General].

D. Reference drawings for panelboard and transformer location – electrical structures or stand-alone. If within electrical structures, the Contractor shall supply the electrical section with factory installed panelboard and transformer. If stand-alone, the Contractor shall install individual components with enclosures as specified herein.
   1. The quantity of breakers with size and number of poles as shown on panelboard schedules.
   2. Submittal data and drawings.
   3. Nameplates (denoting name/tag and as required by code)
   4. Startup assistance.
   5. Panelboard testing.
   6. Operation and maintenance manuals.
   7. Warranty of all components of the panelboard and power transformer.

1.02 SUBMITTAL REQUIREMENTS

A. Provide submittals and drawings as specified in Electrical Specifications [Electrical General, Submittal Requirements].

B. Provide ratings and characteristics including voltage, temperature rise, KVA, efficiency, materials of construction, NEMA enclosure rating, voltage taps, and impedance.

C. Provide catalog cuts for circuit breakers and devices.

D. Submit panelboard schedule for approval.

1.03 OPERATION AND MAINTENANCE INFORMATION

A. Provide operating instructions as specified in Electrical Specifications [Electrical General, Operating and Maintenance Instructions].

PART 2 – PRODUCTS

2.01 PANELBOARDS

A. General
1. The Contractor shall furnish panelboards of a type indicated on the one-line Contract drawings and specified herein.
2. Furnish and install padlock lock-off attachment for each circuit breaker.
3. Panelboards shall comply with the applicable sections of UL, NEC, and NEMA and shall be Cutler Hammer Pow-R-Line, Square D, ITT or equal.
4. A machine-typed circuit directory with clear plastic cover shall be supplied mounted on the inside of door in a frame when equipment is shipped. Circuit directory shall be as approved in the Submittal.

B. Interiors
1. Interiors shall be completely factory assembled with bolt-on devices.
2. Main and feeder breakers shall include lockout padlock hasp suitable for frame size. Provide Cutler Hammer QLPB123PL, PLK1, or similar.
3. Full size insulated neutral bars shall be included. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection.
4. Main bus bars shall be plated copper sized in accordance with UL standards to limit temperature rise on any current carrying part to a maximum of 50 degrees C above an ambient 40 degrees C maximum.
5. A copper ground and neutral bus shall be included in all panelboards with terminal screws.

C. Boxes
1. Provide minimum gutter space in accordance with the National Electric Code. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space. At least four interior mounting studs with adjustable nuts shall be provided.

D. Trims
1. Provide a hinged door over all circuit breaker handles. Doors in panelboard trims shall not uncover any live parts. Doors shall have a catch, lock and trim.
2. Surfaces of the trim assembly shall be properly cleaned, primed and a finish coat of gray ANSI 61 or 49 or to Switchboards and MCCs.
3. Surface trims shall be same height and width as box for surface mount, and ¾" (min) beyond box on all sides for flush mount.

E. Panelboard Ratings
1. Panelboards shall have voltage, phase and short circuit (AIC) ratings as shown on the drawings.
2. Breakers shall be a minimum of 100 ampere frame. Breakers 15 through 100 amperes trip size shall take up the same pole spacing.
3. Panelboards shall be labeled with a UL short circuit rating. When series ratings are applied with integral or remote upstream devices, a label shall be provided. Series ratings shall cover all trip ratings of installed frames. It shall state the conditions of the UL series ratings including:
   a. Size and type of upstream device

b. Branch devices that can be used
c. UL series short circuit rating

2.02 POWER TRANSFORMER

A. The power transformer shall be ventilated dry type. Voltage and KVA ratings shall be as shown on the Contract Drawings. The transformer shall be as manufactured by Cutler Hammer, Jefferson, ACME, Square D, G.E., or equal.

B. Transformer shall meet latest DOE 2016 minimum efficiency standards.

C. Coils shall be manufactured of electrical grade aluminum (if stand-alone) or copper (if within a MCC or Switchboard) and shall be adequately braced for short circuit ratings and defined in ANSI and NEMA standards.

D. Transformers rated 31KVA and above shall have two 2½ percent taps above and below normal full capacity (ANFC and BNFC).

E. The transformer shall carry full load continuously at rated voltage and frequency without exceeding the average temperature rise of 115°C above an ambient temperature of 40°C. Insulation shall be rated for 220°C (UL class 220°C).

F. Impedance (Z): 4.0% +/- 0.3% or above to keep downstream fault currents to a minimum.

G. Low noise. For transformers installed within electrical equipment, vibration isolators shall be installed between the transformer and its mounting surface to reduce case vibration and associated noise.

H. For stand alone transformers, the transformer housing shall be securely fastened to the mounting surface with bolted connections sized appropriately to withstand seismic zone 4 forces.

I. The transformer shall be finished with two coats of enamel to resist rust and corrosion.

J. Transformers located inside electrical structures or enclosures shall be provided with adequate ventilation for heat removal as required.

K. Transformers located outdoors shall include a weathershield cover, or weatherproof ventilated enclosure.

L. Transformer neutral shall be grounded in accordance with Article 250-26 and 450-10 of NEC and any applicable local ordinances. Installation and protection of the transformer grounding conductors and attachments shall be per NEC 250-24.

PART 3 – EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in Electrical Specifications [Electrical General, Workmanship].

B. Perform work to remedy non-compliant installations after inspection.

3.02 INSTALLATION

A. Provide installation as recommended by the manufacturer and as specified in Electrical Specifications [Electrical General, Installation].

3.03 FIELD ASSISTANCE

A. Provide testing as specified in Electrical Specifications [Factory and Field Testing].

3.04 WARRANTY

A. Provide warranty as specified in Electrical Specifications [Electrical General, Warranty].

END OF SECTION

SECTION 16482
SOLID STATE SOFT STARTER

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Provide each Solid State Starter (SSS) drive as shown on elementary and one-line drawings. All SSSs shall be of the same manufacturer.

B. Provide enclosure (and wire chase as required) for top or bottom feed conduit connection as shown in the drawings. Enclosure size shall not exceed the space allocated in the drawings for such use.

C. Provide cooling/ventilation system, mounting hardware, associated components, devices, and field control stations. Some components may be specified in other Electrical Specifications such as terminal blocks, wire, buttons, etc.

D. The SSS scope of work includes:
1. Providing and installing SSS(s) of rating shown on Contract Drawings.
2. Submittal data and drawings.
3. Startup assistance.
4. Factory and field testing.
5. Operation and maintenance manuals.
6. Warranty of all components.

E. Startup and configuration of SSS with actual motor load.

F. Electrical Specifications [Factory and Field Testing]. Furnish all required labor, materials, safety equipment, transportation, test equipment, incidentals and services to perform factory and/or field testing.

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Low Voltage Wire & Data Cable]

C. Electrical Specifications [Factory and Field Testing]

1.03 SUBMITTALS REQUIREMENTS

A. Provide Submittals as specified in Electrical Specifications [Electrical General, Submittal Requirements].

B. Include a record of each SSS parameter available to be changed by the user. The list shall include factory defaults and space for entered values.

1.04 OPERATION AND MAINTENANCE INFORMATION

A. Provide operation and maintenance instructions as specified in Electrical Specifications [Electrical General].

B. Include a record of each SSS parameter setup during startup and testing and place a copy of setting in each O & M manual.

PART 2 PRODUCTS

2.01 QUALITY

A. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately stayed and braced and anchored and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble-free service. Light duty, fragile, and competitive grade devices of questionable durability shall not be used.

2.02 SOLID STATE SOFT STARTER

A. This specification is based on Allen-Bradley SMC-50 with pump control option and protective module, Motortronics VMX-synergy with external protective module, or equal.

B. General:

1. Each solid state soft starter (SSS) shall be provided as a standalone system as an integral unit. The SSS shall be of the latest technology used exclusively for starting motors of the voltage and horsepower shown in the drawings by limiting the voltage and/or current provided to the motor. The SSS shall be available from a single manufacturer in the horsepower range of 1 to 500. The SSS shall be microprocessor controlled and use high efficiency gated power Silicon Controlled Rectifiers (SCRs).
2. The SSS shall feature the following selectable motor starting/stopping modes:
    a. Internal bypass contactor - The SSS shall have an internal running load rated full voltage contactor. The contactor shall automatically engage when the SSS has completed the ramp start of the motor. The bypass contactor shall automatically disengage at the beginning of the ramp stop of the motor. The voltage across the bypass contactor while engaged shall be less than 0.1 volts.
    b. Soft Start – The motor shall be raised to an initial torque value that is programmable from 0-90% of locked rotor torque. The motor voltage is gradually increased during the acceleration ramp time, which is adjustable from 0-30 seconds.
    c. Soft Start with Selectable Kickstart – The kickstart, or voltage boost, is in addition to the normal soft start as described above. The soft starter

shall provide a 0-2 second (selectable) current pulse equal to 550% of the motors full load current.

d. Current Limit Start – This starting mode will limit the maximum starting current supplied to the motor during starting. The user shall be able to adjust the current limit from 50% to 600% of full load current.

e. Full voltage Start- This mode will provide full voltage and current to the motor with a 1/4 second ramp.

f. Soft Stop – This feature will linearly ramp down the voltage over a time interval of 0-60 seconds (selectable)

g. Pump Control – This optional mode (required as specified herein) provides non-linear voltage ramp starting and stopping to smoothly accelerate and decelerate the motor. The starting time shall be programmable from 0-30 seconds and the stopping time programmable from 0-120 seconds.

C. Load The SSS shall be designed to continuously operate the following motor/pump load:

1. Motor, squirrel-cage induction.
2. Pump, per Mechanical Division Specification.
3. Horsepower, at Full speed R.P.M. of supplied motor.
4. Voltage, 460 VAC, three phase, 60 cycle.
5. Service factor, 1.15 S.F.

D. Input Power The SSS shall be rated to continuously operate under the following input power conditions:

1. Voltage, VAC indicated on one-line diagram, +10%, 10%.
2. Frequency, 60 Hz.
3. Three phase.

E. Output Power The SSS shall be rated to continuously operate while providing the following output power conditions:

1. Voltage, 0 to 460 VAC.
2. Frequency, 60 Hz.
3. SSS amp size (minimum) as indicated on one-line drawing.
4. Continuous motor horsepower.
5. Continuous current, 125% of rated motor nameplate Amps.

F. Environmental The SSS shall be rated to continuously operate under the following environmental conditions:

1. Ambient temperature, 32°F to 122°F (0°C to 50°C).
2. Altitude, no derating below 3,300 ft.
3. Relative humidity, 95% non condensing.

G. Digital programmer/controller –The SSS shall be provided with a door mounted alpha-numeric human interface module (HIM) digital display with keypad to view and adjust the following diagnostic and status registers:

1. Volts AC per phase.
2. Current per phase.
3. Watts.
4. KWH.
5. Power Factor.

H. Adjustments The following setting ranges shall be provided and made independently accessible for operator adjustment:
1. Overvoltage level/delay.
2. Undervoltage level/delay.
3. Current unbalance level/delay.
4. Underload level/delay
5. Phase reversal
6. Jam level/delay.
7. Starts per hour.
8. Backspin delay.
9. Ramp times (start and stop).
10. Motor code letter
11. Overload class
12. Motor FLA
13. Motor Service Factor.

I. Input and Output Terminations The SSS assembly shall have terminals for input and output cabling as indicated.

J. Communications – The SSS shall include an Ethernet TCP/IP communications module for interface to the PLC. All settable parameters and instantaneous operational registers shall be accessible from the communications port. The VFD supplier shall assist the Operator Station Programmer in configuration and commissioning of communications.
1. Protocol:
   a. Modbus TCP.
2. Metering registers to include:
   a. 3 phase voltage and current.
   b. Power in KW, KWH and Power factor.
   c. Run Status.
   d. Elapsed motor run time.
   e. Alarms.
   f. Thermal Capacity.

K. Features The SSS assembly shall have the following features:
1. Bypass Contactor Control - The SSS shall be capable of controlling a bypass motor contactor to allow motor current to flow around the soft starter, through the contactor, and to the motor. Once the motor is up to speed, the contactor shall be closed and held until a fault or stop command. In this mode, no current will flow through the soft starter power terminals but shall remain in the "on" state. An external current sensing module shall monitor the motor current to maintain the diagnostic, fault and control functions. Upon shutdown, the bypass contactor shall open and allow the soft starter to ramp down the motor. Provide sensing module as required per one-line or elementary diagram.
2. Phase rebalance – If enabled, the soft starter shall monitor the incoming three-phase line voltage and automatically adjust the output voltage to balance the three phase currents drawn by the motor.
3. Connection of the three incoming line leads and three-motor leads shall be the only connections necessary for manual operation of the SSS unit. All other wiring shall be prewired at the factory and self contained within the SSS unit. A 120 VAC control power transformer and other auxiliary power supplies shall be provided with the SSS assembly for power to pilot lights, meters, relays, and

miscellaneous devices specified to be supplied with the SSS. Lugs shall be provided for connection of all power leads; terminal blocks shall be provided for all other wiring.

4. The SSS shall be protected by a circuit breaker disconnect. The disconnect shall be externally operated and shall have an operator mechanism that is an integral part of the enclosure. An operator mechanism shall be provided to allow padlocking the disconnect in the "off" position with up to two padlocks.
5. AC input fuses shall be provided on the line and/or load side of the SSS (if required by the manufacturer) to isolate the SSS power circuitry upon a fault condition.
6. A internal voltage surge protective voltage power line input protection system shall be provided for the SSS through use of metal oxide varistors (MOVs), surge protective module, or other approved equal methods. Transient protection integral to the SSS shall be provided to a minimum of 1,600 volts, 220 joules. The transient protection shall meet or exceed ANSI C7, 90 1971 and IEEE 472 1974 Standards without failure. Failure is defined as loss of components in the SSS including power SCRs and fuses. The SSS shall be protected from the following, as a minimum, power line transients and recover to automatically restart and resume normal operation without posting a fault:
   a. Switching the primary of a power transformer.
   b. Switching power factor correction capacitors “ON” and “OFF” line.
   c. De energization or energization of contactors, relays, and other power equipment from the power line.
   d. Starting and stopping of other motors when powered from Utility.
7. Opening of the SSS’s input switches, or breakers while the SSS is operating under load shall not result in damage to the SSS power or control circuit components.
8. The SSS shall be capable of starting and operating without a motor load connected.
9. Phase loss, reversal, undervoltage, overvoltage, and unbalance motor protection shall be provided built in to the SSS.
10. Any configuration of adjustments or controls not set by a switch or potentiometer shall be stored in nonvolatile memory. No configuration information shall be lost due to power failures of any duration.
11. The SSS shall be capable of starting into a rotating motor without tripping out on a fault.
12. Digital Programmer/Controller (HIM) shall be provided and remote door mounted. Remote serial interface shall be suitable for communication via Allen-Bradley standard protocol. Cable for remote digital programmer/controller shall be supplied. The remote controller shall be mounted and housed to maintain the NEMA 12 door rating.
13. Laptop programming connectivity shall be provided to access the drives internal parameters. Provide a USB or RS232 serial converter device and cable for connection to the laptop. Provide programming software as necessary to allow upload/download of data parameters and view current drive status.

L. Enclosure The enclosure shall be free standing, motor control center relay section. All components shall be accessible from the front of the enclosure. Rear or side access shall not be required in order to remove or service any component. The enclosure shall include the following in its construction:

1. The SSS shall incorporate fans as needed for cooling of unit assuming full sun on enclosure. The air flow through the SSS enclosure shall provide proper cooling of the operating SSS at an ambient temperature of 104° F. Provide additional internal fans blowing on the SSS heatsink as necessary to maintain SSS equipment ratings. The thermostat shall be monitor and regulate air temperature in the SSS enclosure. Thermostat shall have bi-metallic adjustable set point range of 30 to 140° F. Thermostat shall have a switching capacity of 10A at 120 VAC. Provide Hoffman A-TEMNO temperature switch or approved equal to operate fans.
2. The complete SSS unit, including the enclosure assembly, shall be UL listed for a minimum of 42,000 RMS symmetrical ampere fault withstand capability or as otherwise shown on the drawings. SSS assemblies consisting of the SSS, enclosure and all accessories that are not UL listed will not be approved.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in Electrical Specifications [Electrical General, Workmanship].

B. Requirements of Related Electrical Sections apply to design, documentation construction and assembly of Solid State Soft Starters.

C. Perform work to remedy non-compliant installations after inspection.

3.02 FIELD ASSISTANCE

A. Testing, checkout and start-up of the solid state starter equipment shall be performed under the technical direction of a factory trained authorized representative.
1. The setup and programming of the SSS shall be provided by a factory-trained representative who is authorized by the SSS manufacturer to perform the startup. This setup and programming shall be done prior to and during the first application of power to the motor. The SSS electronic motor overload protection shall be set to meet the motor nameplate and NEC Code requirements.
2. Provide testing as specified in Electrical Specifications [Factory and Field Testing].

B. Provide 1 hour of “SSS Setup” Training on operating and maintenance procedures.

3.03 WARRANTY

A. Provide warranty as specified in Electrical Specifications [Electrical General, Warranty].

END OF SECTION

SECTION 16600
FACTORY AND FIELD TESTING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section defines factory and field testing requirements of electrical and instrumentation equipment and as specified in this section and in Electrical Specifications. All equipment provided under Electrical Specifications and electrical equipment provided under other sections shall be tested as specified herein.

B. The Electrical Contractor shall coordinate at no additional cost to the Owner, the services of an approved qualified third party independent testing company for the purpose of performing specific tests as outlined in EXECUTION, Field Test of this section.

C. The System Integrator, Testing Company and/or Electrical Contractor shall provide all labor, tools, material, power, and technical supervision to perform the specified tests and inspections.

D. The Electrical Contractor shall be present during field testing and assist the System Integrator and/or Testing Company in testing all equipment. The Electrical Contractor shall be ready to correct any wiring problems found during testing.

E. The Application Programmer (defined in Electrical Specifications [Electrical General].) and/or Construction Manager will be actively engaged in Operational Testing and Commissioning. These efforts shall be combined efforts of the Application-Programmer/Construction-Manager/Engineer and Contractor. The Contractor shall facilitate test as outlined herein such that hardware, software and application programming are tested completely and all applicable test documentation is completed.
   1. Expect that field operational testing (SCADA and PLC automated controls checkout) is going to require 2 weeks after pre-operational tests are done. Contractor and System Integrator shall assist in this start-up. Coordinate with Owner Representative to schedule this start-up period.

F. It is the intent of these tests to ensure that all equipment is operational within industry and manufacturer's tolerances and is assembled in accordance with design plans and Specifications.

G. The Owner and/or Construction Manager may witness testing in effort to insure quality and verify results. The Contractor is required to provide notification 2 weeks prior to any test that are intended to be documented and submitted for approval or are final tests. The Owner and Construction Manager must specifically decline witness of each test to be performed, and the test must be successful, and it must be documented on the day of test, in order for it to not have to be repeated in the presence of an authorized witness. Only the Owner or Construction Manager may assign an authorized witness.

H. All tests shall be documented in writing by the person performing the test on the test forms submitted (and similar to those shown at the end of this section) and signed by the

Engineer as satisfactorily completed. The Testing Company, Electrical Contractor or System Integrator performing tests shall keep a detailed log of all tests that failed or did not meet Specifications, including date of occurrence and correction.

I. The Contractor shall perform all applicable testing of Owner supplied or existing equipment as a unit and as part of a system. Testing shall include documentation and witness sign-off.
   1. Existing Diesel Generator and fuel system
   2. Existing communications systems.

J. The communications equipment shall be completely configured by the Contractor for permanent operation. Radio diagnostics, addresses, and configuration shall be recorded and provided with testing submittals. Provide data in tabular format on Excel spreadsheet. Contractor is required to test every path, link, repeater until optimum results are obtained. Test form example is not provided for this purpose and must be generated by the Contractor.

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Project Drawings

C. Additional testing may be specified in other Electrical Specifications.

1.03 FACTORY AND FIELD GENERAL REQUIREMENTS

A. Testing General
   1. Prior to any field testing Operation & Maintenance Manuals shall have been submitted and approved.
   2. The test forms shall be completed by the contractor during testing and calibration of all equipment. All tests shall be witnessed by the Owner's Representative. Completed test forms shall be given to the Owner's Representative the day of the test. Complete two sets of test forms if Contractor wants to keep a copy.
   3. The Contractor shall give the Engineer 10 working days notice of the dates and time for inspections and testing.
   4. Include test results in the Maintenance and Operational Manual.
   5. As a minimum, all the tests indicated/specified on the test forms shall be performed and test forms filled out by the Contractor.
   6. Prepare and submit formal test procedures and forms at least two weeks prior to the start of testing. Testing shall not commence until the test procedures have been reviewed and approved. Submit a combined test procedure submittal with separate sections for factory and field tests.
   7. If the results of any of tests are unacceptable, the Contractor shall make corrections and perform the tests again until they are acceptable; these tests shall be done at no additional cost.

B. Failure to Meet Test
   1. Any system, material or workmanship which is found defective on the basis of these tests shall be reported immediately following the test. The Contractor shall replace the defective material or equipment and have tests repeated.

C. Safety

1. Testing shall conform to the respective manufacturer's recommendations. All manufacturers' safety precautions shall be followed.
2. Safety, as shown herein and in other divisions, shall be a combination of all methods and practices described. Safety practices may not be determined based on the least restrictive requirement, but instead, on the most restrictive requirement. Obtain clarification if there is any question prior to performing tests.
3. The procedures stated herein are guidelines for the intended tests, the Contractor shall be responsible to modify these tests to fit the particular application and ensure personnel safety. Absolutely no tests shall be performed in such a fashion that personnel safety is jeopardized.
4. The Contractor shall have two or more personnel present at all tests.
5. Two non-licensed portable radios shall be provided by the Contractor for use during testing.
6. Contractor shall comply with California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA): All test and procedures shall comply with ESO and OSHA as to safety, protective clothing, clearances, padlocks and barriers around electrical equipment energized during testing.
7. The first set of tests to be performed (pre-energization) shall determine the suitability for energization and shall be completed with all power turned off.

1.04 QUALIFICATIONS

A. Testing Company

1. Testing company shall have been actively engaged in the type of electrical testing specified in this Division for the past three years (minimum). The Testing Company representative shall have two years experience in field testing of equipment working for the Testing Company or equivalent. The following Electrical Testing Companies are pre-approved.
   a. EETS (916) 339-9691
   b. Industrial Test (888)-809-8550
   c. Emerson Electrical Reliability Services
   d. Apparatus Testing and Engineering (916) 853-6280
   e. Apparatus Testing and Engineering (925) 454-1363
   f. Power Systems Testing (925) 583-2361
2. Testing Companies not listed are required to submit company and individual representative resumes for review and approval.

B. System Integrator Representative

1. The system integrator representative shall have 1 year experience in field testing of equipment working for the System Integrator or equivalent. If the representative does not demonstrate necessary experience or competence during testing or start-up, the System Integrator shall provide a representative meeting the required competence and experience.

C. Electrical Contractor Representative

1. The Electrician shall have 5 years minimum experience working with industrial control systems and have a Journeyman level experience rating.

1.05 SUBMITTAL REQUIREMENTS

A. The Contractor shall ensure that the Testing Company, System Integrator, and all equipment suppliers provide the submittal documentation required in this section. Submittals shall be complete, neat, orderly, and indexed. The Contractor shall check all submittals required under this Division for the correct number of copies, adequate identification, correctness, and compliance with the Contract Specifications and Drawings, and initial all copies certifying compliance.

B. The System Integrator shall assemble and submit for approval complete testing procedures and forms at least two weeks prior to the start of testing. Contractor is responsible for compiling testing procedures and forms from multiple sub-contractors as required.

C. Test submittal shall include: (as applicable)
   1. Proposed procedure for operational testing whether it is performed in the factory or field. Procedure shall include method, simulated I/O requirements, bypass piping, telemetry, and necessary materials and equipment to conduct test.
   2. Test forms (for all tests, factory and field, and regardless of who performs tests). Test forms shall be electronically completed prior to submittal with entry spaces filled to the extent possible. The only remaining data that shall require completion during the test is the test data itself. Test forms shall be provided as illustrated at the end of this section or equal.
   3. Approved shop one-line, elementary diagrams and PLC I/O drawings.
   4. Control strategies photocopied at 75% reduction with room at the side of page for comments on each paragraph or control strategy.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Test equipment required to perform testing and document results shall be provided by Contractor, Testing Company or System Integrator.

B. Test instruments shall be calibrated to references traceable to the National Institute of Standards and Technology. Instrument calibration shall be current to one year from date of start-up. Test equipment accuracy shall be at least twice the accuracy of instrument being calibrated. Test instrument certificates of calibration shall be on-hand and provided prior to testing.

All test equipment to be used as part of the testing shall be listed in the submitted testing sheets. Contractor supplying the component or system to be tested shall provide all necessary test equipment.

C. The overall accuracy of each input and output loop shall be checked to ensure that it is within manufacturer's Specification tolerances. In no case shall the error exceed 0.25% or 0.04 mA.

PART 3 EXECUTION

3.01 FACTORY TESTING

A. General Requirements

1. The System Integrator shall conduct a thorough and complete factory test witnessed by Engineer per the criteria specified herein. Factory test shall be held within 150 miles of project location.
2. Temporary wiring and equipment shall be provided and connected during these tests to simulate the complete assembled system.
3. The testing shall not be started until the manufacturer has completed fabrication, wiring, setup, programming; quality control testing; and can demonstrate the system is complete and operational.
4. The equipment required for factory testing shall consist of, but is not limited to, control panels, MCCs, and/or miscellaneous electrical panels as provided under this contract.
5. Two digital multimeters/signal generators (minimum +/- 0.1% accuracy) with clip on leads shall be supplied and utilized during testing for measurement of digital and analog outputs.
6. All factory tests shall be conducted at the System Iwntegrator's facility. All factory tests shall be completed prior to shipment to the jobsite. The equipment shall be fully assembled, and connected (and programmed) similar to as it will be installed.
7. The length of the factory testing shall be a minimum of one (1) working day(s) (8 hours per day).
8. If the equipment is not ready for factory testing, the test will be cancelled and rescheduled for a later date. The Contractor shall be responsible for paying liquidated damages for expenses incurred by the Owner Representative to come to a cancelled test. One thousand dollars ($1000.00) in liquidated damages shall be deducted from his contract each occurrence.
9. Faulty and/or incorrect hardware or software operation of major portions of the system may, at the discretion of the Engineer, be cause for suspension, cancellation, or restarting of the factory test, at no additional cost to the Owner or extension in Contract time.
10. The factory test will be considered complete only when the integrated system has successfully passed all tests. No electrical equipment shall be shipped to jobsite without completed test documentation.
11. During the testing period, under the supervision of the System Integrator, the Owner's Representative shall have unlimited and unrestricted access to the usage and testing of system hardware, configuration, software, meters and tools.
12. The System Integrator shall pay all expenses incurred by his personnel including labor, material, transportation, lodging, daily subsistence, and other associated incidental costs during the factory testing.
13. Acceptance and witnessing of the factory tests does not relieve or exclude the Contractor from conforming to the requirements of the Contract Documents.
14. Upon conclusion of factory testing, and at the request of the Application Programmer, the System integrator shall remove the PLC, OI, and communication equipment for Application Programmer's use and programming. The System Integrator shall provide equipment to Application Programmer immediately or ship unit within 2 working days. The System Integrator shall not be responsible for equipment while in Application Programmer's care.

15. All modifications to documentation as a result of the factory tests shall be corrected and completed before the submittal and delivery of "Operation and Maintenance" Manuals.
16. Copies of the completed and witnessed factory testing forms shall be included in the Operation and Maintenance Manual.

B. Factory Tests
1. Structured Factory Tests: The associated factory tests are to be performed by the System Integrator and witnessed by the Owner's Representative. The associated test forms shall be completed during each stage of the test.
   a. Visual and Mechanical Inspection Tests
   b. Wiring Tests
      1) Contractor shall confirm correct panel wiring per System Integrator panel shop drawings. Panel shop drawings shall be compared with Contract P&IDs and other Drawings to verify all hardwire logic are accounted for. Panel drawings used in factory tests shall be redlined and inserted into Factory Testing Results submittal.
   c. MCC and Control Panel Pre-Operational Tests
   d. Logic Controller I/O Point to Point Tests
   e. Simulated Alarm Tests
      1) Simulate the digital and/or analog signals at the terminals to verify that each PLC I/O point is functional and properly programmed. Verify that all parameters (i.e., setpoints, enable/disable toggle bits, timers, etc.) for the alarms operate according to the Specifications. Multiple alarm states (i.e., LO, LO LO, HI, HI HI, etc.) shall be checked.
   f. Simulated Operational Control Tests
      1) Simulate the digital and/or analog signals at the field terminals to verify that each control system is functional and properly configured and programmed.
      2) Each line of control logic in the Control Strategies section shall be checked. When the complete control strategy has been checked, it shall be signed and dated by testing person and person witnessing test.
      3) Verify that all parameters (i.e., setpoints, runtimers, totalization, etc.) operate according to the Specifications.
2. Unstructured Factory Tests: The various unstructured tests shall include, but are not limited to, the following.
   a. Simulate the equipment failure and power fail/restart of PLC. Check the effects of each failure on maintaining operations with the remaining equipment.
   b. The factory tests, as a minimum, shall simulate all normal and abnormal operating conditions including steady state, change of state, variable changes, fluctuations, transients, upsets, start up, shutdown, power failure, and equipment failure conditions.
   c. Communications test to devices located within control panel and/or in MCCs.
   d. Simulation of PLC communication error. Demonstrate error detection, alarming, and recovery.

e. Measure and test all power supplies for correct voltage. Operate rechargeable devices under battery power to test run duration, alarms and automatic recovery.

3.02 FIELD TESTING

A. General Requirements

1. Field testing is broken down into 4 components
   a. Pre-Energization testing
   b. Pre-Operational Testing
   c. Operational Testing
   d. Trial Period/Commissioning
2. Project wide, all Pre-Energization testing must be completed prior to Pre-Operational testing, all Pre-Operational testing must be completed prior to Operational Testing, and all Operational Testing must be completed prior to Commissioning.
   a. Any deviation of this order, whether on a component level or larger scale, must be approved.
   b. Out of order testing, if allowed, will be evaluated on a case-by-case basis when brought to the attention of the Owner's Representative. The Owner's Representative may require that the entire system, or portions thereof, be retested once the missing component(s) are installed and functional.
3. All equipment supplied by the Contractor or others shall be tested by Contractor per these specifications.
4. Two digital multimeters/signal generators (minimum +/ 0.1% accuracy) , AC current meters, torque wrench, and other specialized test equipment shall be provided by the Contractor for use during testing.
5. If the equipment is determined not to be ready for testing, the test will be cancelled and rescheduled for a later date.
6. Faulty and/or incorrect hardware or software operation of major portions of the system may be cause for suspension, cancellation, or restarting of the area of testing, at no additional cost or extension in Contract time.
7. During the Operational testing period, under the supervision of the System Integrator, the Owner's Representative shall have unlimited and unrestricted access to the usage and testing of all hardware and software in the system.
8. The System Integrator shall pay all expenses incurred by his personnel including labor, material, transportation, lodging, daily subsistence, and other associated incidental costs during field testing.
9. Acceptance and witnessing of the tests does not relieve or exclude the Contractor from conforming to the requirements of the Contract Documents.
10. All modifications to documentation as a result of the tests shall be corrected and completed before the delivery of "as-built" documentation.
11. Copies of the completed and witnessed field testing forms shall be included in the Operation and Maintenance Manual.
12. The various contractors on this project (General Contractor, Electrical Contractor, Testing Company, and System Integrator) shall assume the lead role in testing activities as listed below. The Contractor shall obtain assistance of suppliers and/or manufacturers representatives for any major equipment testing.
    a. Electrical Contractor:
       1) Pre Energization Tests

a) Visual Mechanical Tests
b) Wire Insulation and Continuity Tests.
c) Panelboard Tests
d) Breaker Tests

2) Operational Tests.
a) Generator Tests

3) Trial Period
4) Commissioning.

b. System Integrator:
1) Pre-Operational Tests
a) Visual Mechanical Tests
b) Control panel pre-operational test
c) MCC pre-operational test
d) Motor Tests.
e) PLC I/O point to point tests.
f) Instrumentation switch tests
g) Instrumentation transmitter tests.

2) Operational Tests.
3) Trial Period
4) Commissioning

c. Testing Company
1) Grounding System Tests
2) Breaker Device Tests

d. General Contractor
1) Test Scheduling
2) Operational Tests.
3) Trial Period
4) Commissioning.

e. Application Programmer (software systems)
1) Operational Tests.
2) Trial Period
3) Commissioning.

B. Electrical Field Tests – The following test shall be performed within each test category. Complete test forms for each electrical panel, instrument, and/or device. Provide separate form for each component to be tested.

1. Pre-Energization Inspections and Tests:
a. Visual and Mechanical Inspection Tests
b. Wire Insulation and Continuity Tests
c. Grounding System Tests
d. Panelboard Tests
e. Breaker Tests

2. Pre-Operational Tests:
a. MCC Pre-operational Tests:
b. Control Panel Pre-operational Tests:
c. Motor Testing:
d. Instrumentation Switch Calibration Tests
e. Instrument Transmitter Calibration Tests
f. PLC I/O point tests.
g. Communication Tests

1) The Contractor shall verify that all communications via radio, telephone, wireline, fiber optic, or other are functional and ready for operational testing. Revise all configurable parameters without additional cost to the Owner as required for an optimally functional system.
2) Verify that all components of the communication system operate together under all operating and power restart conditions. If faults occur, investigate source of problem and correct. Revise all configurable parameters without additional cost to the Owner.
3) Change setpoints from SCADA and confirm that corresponding field setpoint changes correctly. Check every I/O point on every screen, trend, and database.

h. Pump Performance Tests

3. Operational Tests:

a. After all the previous tests in this subsection are complete, the test forms are completed and signed-off, the Contractor shall conduct operational testing.

b. Representatives from the General Contractor, Electrical Contractor, System Integrator, and Owner's Representative shall be present during testing. Operational testing shall be performed by Contractor in the presence of the Owner's Representative.

c. During operational testing the Contractor shall follow the instructions of the Owner. The Owner may place restrictions on operation that must be followed by the Contractor during testing. Any accidents or fines caused by actions of the Contractor where warnings or restrictions were placed, shall be remedied or paid by the Contractor.

d. Alarm Tests

1) Generate the digital and/or analog signals at the primary device to verify that each PLC I/O point is functional and properly programmed. Verify that all parameters (i.e., setpoints, enable/disable toggle bits, timers, etc.) for the alarms operate according to the Specifications. Multiple alarm states (i.e., LO, LO LO, HI, HI HI, etc.) shall be checked.

e. Operational Control Tests

1) Generate the digital and/or analog signals at the primary device by raising or lowering the actual measured process. Inject signal into the terminals or utilize a "force" function within the device only as necessary. Verify that each control system is functional and properly configured and programmed.
2) Each line of control logic in the Control Strategies section shall be checked. When the complete control strategy has been checked, it shall be signed and dated by testing person and person witnessing test.
3) Verify that all parameters (i.e., setpoints, runtimers, totalization, etc.) operate according to the Specifications.
4) Verify that all data, setpoints, alarms are being received at SCADA correctly and that all I/O points on screen are true and accurate representations of field information.

f. Other Tests

1) Force a power failure and power fail/restart of PLC and all other systems. Check the effects of each failure on each piece of equipment and automatic recovery.
2) Force a PLC communication error. Demonstrate error detection, alarming, and recovery.
3) Perform additional operational testing that has not already been witnessed.
4) Perform any additional operational testing as necessary to confirm robust and error free operation under all operational conditions.

4. Trial Period
   a. Station/Equipment shall be activated to automatically run for 5 days, 24 hours per day Monday through Friday.
   b. During the trial period the Owner's Representative will test all modes of operation and will look for errors and malfunctions. A punchlist will be generated to be completed by Contractor and re-tested prior to Commissioning.
   c. If equipment failure occurs during the trial period, the Contractor shall repair or replace the defective equipment and shall begin another trial period, Monday through Friday.
   d. This test shall be repeated until all new equipment functions acceptably and without failure for consecutive days.

C. Commissioning:
1. Commissioning shall not commence until Operational testing and System Training are complete with documentation submitted and with prior approval.
2. Commissioning period
   a. The new equipment shall be activated by the Contractor to operate in full automatic for 10 consecutive days, 24 hours per day. Commissioning shall only start on Mondays or Tuesdays.
   b. During Commissioning, the Owner will monitor and run the station in normal automatic mode. If equipment failure occurs during Commissioning, the Contractor shall repair or replace the defective equipment and shall begin another commissioning period after repairs are complete.
   c. Parallel, existing and/or back-up systems shall remain in place and functional during commissioning period. Demolition of parallel, existing or back-up systems shall not begin until commissioning is completed.
   d. This test shall be repeated until the new equipment functions acceptably for a consecutive commissioning period.
   e. Warranty will begin at the start of a successful commissioning period. However, if major hardware failure occurs during commissioning, the warranty and commissioning will restart once the problem has been identified and repaired.

3.03 WARRANTY:

A. Provide warranty per Electrical Specifications [Electrical General, Warranty].
1. The completion of the above tests does not relieve the Contractor from any warranties specified in the Electrical Specifications or other sections.
2. Warranty shall begin on the start date of a successful Commissioning period.

3.04 FINAL ACCEPTANCE:

A. Final Acceptance per Electrical Specifications [Electrical General].

TEST FORMS

Index of Forms:

PC	Power Conductor Test Form
CC	Control Conductor Test Form
IC	Instrumentation Conductor Test Form
VM	Electrical Equipment Visual and Mechanical Inspection Form
PB	Panelboard Test Form
MCO	Motor Control Operational Test Form
CPO	Control Panel Operational Test Form
BD	Breaker Device Test Form
GCL	Generator Field Check List
GPT	Generator Performance Test Form
GSLD	Generator Sound Level Data Form
MOTOR	Motor Test Form
HM	Harmonic Measurement Test Form
IOP	Programmable Logic Controller I/O Point-to-Point Test Form
ISC	Instrumentation Switch Calibration Test Form
ITC	Instrumentation Transmitter Calibration Test Form
PPT	Pump Performance Test Form

END OF SECTION

POWER CONDUCTOR TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

EQUIPMENT #: _____

INSULATION TESTS						
CONDUIT	PHASE TO GROUND			PHASE TO PHASE		
#	A	B	C	AB	BC	CA

NOTES:

1) Use single form for up to 25 power conduits. Use additional forms as necessary.

2) Disconnect both ends of wiring prior to megger tests.

3) Megger insulation resistances of all 600 volt insulated conductors using a 500 volt megger for 10 seconds minimum (30 seconds minimum for motor leads). Make tests with circuits installed in conduit and isolated from source and load. Each conductor shall be meggered conductor-to-conductor and conductor-to-ground. These tests shall be made on cable after installation with all splices made up and terminations installed but not connected to the equipment.

4) Each megger reading shall not be less than 22 Meg-ohms resistive. Corrective action shall be taken if values are recorded less than 10 Meg-ohms. Conductors with low ohm values, that do not match similar lengths of conductors the same size, shall be replaced at no additional cost to the Owner.

5) Values of different phases of conductors in the same conduit run showing substantially different Meg-ohm values, even if showing above 22 Meg-ohms shall be replaced.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

CONTROL CONDUCTOR TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

INSULATION TESTS											
COND. # OF #	COND. TO GROUND	CONDUCTOR TO CONDUCTOR									
1		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X									
2		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X								
3		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X							
4		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X	X						
5		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X	X	X					
6		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X	X	X	X				
7		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X	X	X	X	X			
8		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X	X	X	X	X	X		
9		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X	X	X	X	X	X	X	
10		1 TO #	2 TO #	3 TO #	4 TO #	5 TO #	6 TO #	7 TO #	8 TO #	9 TO #	10 TO #
		X	X	X	X	X	X	X	X	X	X

NOTES:

1) Use single form for each conduit.

2) Disconnect both ends of wiring prior to megger tests.

3) Megger insulation resistances of all 600 volt insulated conductors using a 500 volt megger for 10 seconds. Make tests with circuits installed in conduit and isolated from source and load. Each conductor shall be meggered conductor-to-conductor and conductor-to-ground. These tests shall be made on cable after installation with all splices made up and terminations installed but not connected to the equipment.

4) Each megger reading shall not be less than 22 Meg-ohms resistive. Corrective action shall be taken if values are recorded less than 10 Meg-ohms. Conductors with low ohm values, that do not match similar lengths of conductors the same size, shall be replaced at no additional cost to the Owner.

5) Values of different phases of conductors in the same conduit run showing substantially different Meg-ohm values, even if showing above 22 Meg-ohms shall be replaced.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

INSTRUMENTATION CONDUCTOR TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

CONDUIT NUMBER: _____ EQUIPMENT #: _____

CONTINUITY TESTS			INSULATION TESTS	
CONDUCTOR PAIR # OF #	CONDUCTOR TO CONDUCTOR	CONDUCTOR TO SHIELD	CONDUCTOR TO CONDUCTOR	SHIELD TO GROUND

NOTES:

1) Disconnect both ends of wiring prior to megger tests.

2) Megger insulation resistances of all 600 volt insulated conductors using a 500 volt megger for ten seconds. Make tests with circuits installed in conduit and isolated from source and load. Each conductor shall be meggered conductor-to-conductor and conductor-to-ground. These tests shall be made on cable after installation with all splices made up and terminators installed but not connected to the equipment.

3) Each megger reading shall not be less than 10 Meg-ohms resistive. Corrective action shall be taken if values are recorded less than 10 Meg-ohms. Conductors with low ohm values, that do not match similar lengths of conductors the same size, shall be replaced at no additional cost to the Owner.

4) Continuity Tests: Each instrumentation conductor twisted shielded pair shall have the conductor and shield continuity measured with an ohmmeter. Conductors with high ohm values, that do not match similar lengths of conductors the same size, shall be replaced at no additional cost to the Owner.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

GROUNDING SYSTEM TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

TECHNICIAN: _____ TEST LOCATION: _____

EQUIPMENT NAME: _____

SOIL CONDITION: circle one WET DRY MOIST DAYS SINCE LAST RAIN # _____ OVER 7 _____

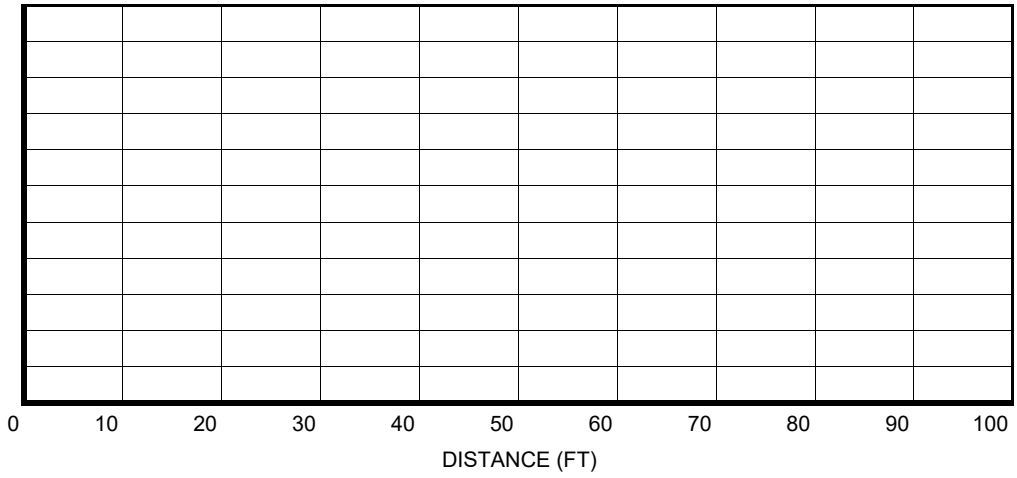
TEST ROD LOCATION RELATIVE TO SYSTEM GROUND UNDER TEST (DISTANCE AND DIRECTION) _____

COMMENTS:

FALL OF POTENTIAL TEST

MEASURED VOLTAGE PROBE	
DIST.	RESIST.
20	
30	
40	
50	
60	
70	
80	
90	

GRAPH OF MEASURED RESISTANCE VS. DISTANCE FROM TEST PROBE



NOTES:

1) Use ground resistance test meter and perform separate ground test for each building or independently derived grounding system.

2) Verify ground system is in compliance with drawings and specifications.

3) Perform the test not less than two days after the most recent rainfall and in the afternoon after any ground condensation (dew) has evaporated.

4) Investigate point-to-point resistance values which exceed 1.0 ohm. Correct (by adding additional grounding systems as necessary) and re-test. Consult design engineer if for direction on additional grounding materials and methods.

5) Connect all ground electrodes and/or UFER ground together and perform fall of potential test.

6) Perform fall-of-potential test in accordance with IEEE Standard 81 and NETA 7.13 on the main grounding electrode or system. Install reference electrode(s) a minimum of 100 feet from system under test. Connect power supply. Install/test/record/remove the potential test electrode every 10 feet during test.

7) Test measurements shall be made at 10 feet intervals in a straight line beginning at 90 feet and ending 10 feet from the system being tested. Plot resistance readings on graphical chart above.

8) Perform point-to-point resistance tests to verify low resistance between the main grounding system and all electrical equipment connected to the grounding system. Document results graphically from rod to rod and rod to equipment. Purpose is to check Cad-Weld connections and continuity point to point.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

ELECTRICAL EQUIPMENT
VISUAL AND MECHANICAL INSPECTION FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

EQUIPMENT NAME: _____ EQUIPMENT #: _____

NAMEPLATE DATA (complete as applicable)

MANUFACTURER: _____ ENCLOSURE: _____

MODEL #: _____ U.L. #: _____

VOLTAGE: _____ PHASE: _____

BUS AMPERAGE: _____ SERVICE: _____

BUS TYPE: _____ BUS BRACING: _____

VERTICAL BUS: _____ HORIZONTAL BUS: _____

GROUND BUS: _____ NEUTRAL BUS: _____

SERIES #:

PHYSICAL INSPECTION CHECKLIST

ENTER A-ACCEPTABLE R-NEEDS REPAIR OR REPLACEMENT NA-NOT APPLICABLE

ITEM	CHECK	NOTES
CHECK NON-ELECTRICAL FASTENERS FOR TIGHTNESS		
TORQUE TEST ALL WIRING AND BUS CONNECTIONS		
VERIFY ANCHORAGE IS PER SPECS AND/OR CALCS		
CHECK BUS BRACING AND CLEARANCE		
CHECK MAIN GROUNDING CONNECTION AND SIZE		
VERIFY GROUND BUS BONDING		
VERIFY EQUIPMENT GROUNDS		
VERIFY CONDUIT GROUNDS AND BUSHINGS		
CHECK NEUTRAL BUS AND CONNECTIONS		
VERIFY ALL BREAKERS AND FUSES ARE RATED PROPERLY		
INSPECT FOR BROKEN OR DAMAGED EQUIPMENT		
INSPECT ALIGNMENT OF PANEL AND DOOR		
VERIFY REMOVAL OF ALL DEBRIS AND DUST		
VERIFY WIRE LABELS ARE INSTALLED		
VERIFY ALL WIRE TERMINATIONS		
CHECK FOR PROPER WIRE SIZES		
CHECK FOR PROPER WIRE COLOR CODES		
VERIFY ALL NAMEPLATES		
CHECK FOR PROPER CLEARANCES AND WORKING SPACE		
INSPECT ALL PAINT SURFACES		
CHECK HEATERS AND THERMOSTATS		
CHECK VENTILATION AND FILTERS		
CHECK IF DRAWINGS MATCH EQUIPMENT		
CHECK ACCURACY OF OPERATION & MAINTENANCE		

NOTES:

1) Complete checklist above. Note any items that were found out of compliance.

2) Torque all electrical connections to values defined by equipment manufacturer or per NEC 110-14.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

PANEL BOARD TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

PANEL NAME: _____ PANEL TAG #: _____

PANELBOARD NAMEPLATE DATA

UL #: _____ MANUFACTURE: _____

MAIN BREAKER RATING: _____ MODEL #: _____

PHASE: _____ VOLTAGE: _____

VERTICAL BUS RATING: _____ BUS AMPERAGE: _____

NEUTRAL BUS RATING: _____ BUS TYPE: _____

GROUND BUS RATING: _____ ENCLOSURE: _____

ENTRY LOCATION: _____ SERIES: _____

PHYSICAL INSPECTION CHECKLIST

ITEM	CHECK	NOTES
TIGHTEN ALL BOLTS AND SCREWS		
TIGHTEN ALL WIRING AND BUS CONNECTIONS		
VERIFY ALL BREAKERS AND FUSES ARE RATED PROPERLY		
CHECK BUS BRACING AND CLEARANCE		
CHECK MAIN GROUNDING CONNECTION AND SIZE		
VERIFY GROUND BUS BONDING		
VERIFY EQUIPMENT GROUNDS		
VERIFY CONDUIT GROUNDS AND BUSHINGS		
CHECK NEUTRAL BUS AND CONNECTIONS		
INSPECT FOR BROKEN OR DAMAGED EQUIPMENT		
INSPECT ALIGNMENT OF PANEL AND DOOR		
VERIFY ANCHORAGE		
VERIFY REMOVAL OF ALL DEBRIS AND DUST		
VERIFY CIRCUIT BREAKER LEGEND PER CONTRACT		
INSPECT ALL PAINT SURFACES		
VERIFY WIRE LABELS ARE INSTALLED		
VERIFY ALL WIRE TERMINATIONS		
VERIFY PANEL SCHEDULE WITH TERMINATIONS		
VERIFY PROPER WIRE SIZE		

NOTES:

1) Complete checklist above by entering a checkmark for acceptable, R for needs repair or attention

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

MOTOR CONTROL PRE-OPERATIONAL TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

MCC NAME: _____ MCC MANUFACTURE _____

MCC TYPE: _____ MCC LOCATION: _____

EQUIPMENT NAME	EQUIPMENT TAG #	CUBICLE #	LOCAL DEVICE CHECKS AND TESTS						REMOTE DEVICE CHECKS AND TESTS		
			CONTROL SWITCH	TIME RELAY SETTINGS	METERING & INDICATIONS	OVERLOAD RESET	INTERLOCKS & CONTROL	ALARM & STATUS	CONTROL SWITCH	PUSHBUTTON LOCKOUT & STOP	METERING INDICATIONS

NOTES:

1) Verify equipment powers up and operates correctly in hand.

2) Perform trip functions and verify equipment returns to normal operation with only necessary operator intervention.

3) Enter data for each piece of equipment being served from MCC or Control Panel.

4) Enter NA - for non applicable entries.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

CONTROL PANEL PRE-OPERATIONAL TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

CONTROL PANEL NAME: _____ CONTROL PANEL TAG #: _____

CONTROL PANEL MANUFACTURER: _____ CONTROL PANEL TYPE: _____

CATEGORY	EQUIPMENT TAG #	DEVICE CHECKS AND TEST								
		CONTROL SWITCHES	OPERATOR INTERFACE	PANEL METERS	PANEL LIGHTS	PANEL NAMEPLATES	PLC POWER SUPPLY	I/O CARDS		
Height										
Voltage										
Function										
CATEGORY	EQUIPMENT TAG #	POWER SUPPLY 1 (V)	POWER SUPPLY 2 (V)	POWER SUPPLY 3 (V)	UPS	PANEL LIGHTS				
Function										
Voltage										

NOTES:

1) Set configurable parameters and verify voltage input prior to applying power.

2) Verify equipment powers up and operates correctly.

3) Perform trip functions and verify equipment returns to normal operation with only necessary operator intervention.

4) Complete checklist above by entering a checkmark (CM) for acceptable, or R for needs repair or attention, or NA for not applicable

Attention Requied:

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

BREAKER DEVICE TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

PANEL NAME: _____ PANEL TAG #: _____

PANEL TYPE: _____

EQUIPMENT INFORMATION

EQUIPMENT NAME: _____ EQUIPMENT H.P.: _____

EQUIPMENT TAG#: _____ EQUIPMENT KVA: _____

BREAKER INFORMATION

MANUFACTURE: _____ VOLTAGE: _____ CHARACTER: _____

PART #: _____ INTERRUPT: _____ CURVE: _____

FRAME #: _____ RATING: _____ LOCATION: _____

BREAKER TESTS

MFGR TRIP TIME @300% MIN: _____ BREAKER RATING/ RANGE: _____

MFGR TRIP TIME @300% MAX: _____ FINAL BREAKER SETTING: _____

MFGR INST. PICKUP AMPS: _____

CONTACT RESISTANCE TESTS - OHMS / INSULATION RESISTANCE TESTS - MEGOHMS

PHASE A	PHASE B	PHASE C	A-GND	B-GND	C-GND

CURRENT TESTS
TRIP TIME IN SECONDS @ 300% AMPS / INSTANTANEOUS CURRENT TRIP TESTS
AMPS

PHASE A	PHASE B	PHASE C	PHASE A	PHASE B	PHASE C

ADDITIONAL TESTS AND SETTING AS APPLICABLE

	PICK UP		DELAY-TIME		
FUNCTION	RANGE	SETTING	RANGE	SETTING	
LONG TIME					
SHORT TIME					
GROUND FLT.					

NOTES:

1) All breakers shall be checked for proper mounting, conductor size, and feeder designation. Operate circuit breaker to ensure smooth operation. Inspect case for cracks or other defects. Check tightness of connection with torque wrench in accordance with manufacturer's recommendations.

2) Thermal magnetic breakers, 100 amps and above, shall be test pet NETA specification 7.6.1.1. Time current characteristic tests shall be performed bypassing 300% rated current through each pole separately. Trip time shall be noted. Instantaneous pickup current shall be determined by run up or pulse method. Clearing times should be within 4 cycles or less. At end of test, the thermal breakers shall be set by Contractor. Test Ground-Fault Protection per NEC 230.95.

3) Magnetic breakers (MCP), regardless of amperage rating, shall be tested. Instantaneous pickup current shall be determined by run up or pulse method. Clearing time should be within 4 cycles or less. At end of test the breaker trip setting shall be set by Contractor based on the motor locked rotor current.

4) Contact resistance shall be measured and be compared to adjacent poles and similar breaker. Deviations of more than 50% shall be reported to Engineer. Insulation resistance shall be measured and shall not be less than 50 megaohms. All trip times shall fall within NETA Table values. Instantaneous pickup current levels should be within 20% of manufacturer's published values.

CERTIFIED BY: _____ SIGNATURE _____ COMPANY _____ DATE

WITNESSED BY: _____ SIGNATURE _____ COMPANY _____ DATE

GENERATOR FIELD CHECK LIST

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

No.	Check box	Description
1		Equipment installed in suitable location?
2		Adequate clearance on all sides to allow ease of maintenance?
3		Proper construction and leveling of mounting base?
4		Anchorage installed per seismic calculations?
5		Adequate heating for equipment room?
6		Battery-powered emergency lighting installed in equipment room?
7		Adequate incoming and outgoing air (louver motors adjusted, tested and of proper voltage)?
8		Radiator duct properly sized and connected?
9		Cooling system properly filled?
10		Proper level of specified oil in crankcase?
11		Adequate fuel supply for test?
12		Flexible sections installed in cooling water lines?
13		Manually-operable fuel and cooling water valves open and ready for operation?
14		Flexible fuel lines installed between engine and fuel piping?
15		Fuel tanks and piping installed in accordance with applicable codes and standards?
16		Adequate fuel transfer tank pump lift and pump motor properly wired?
17		Proper size exhaust line and flexible connector(s)? Flexible connector(s) should not be bent.
18		Exhaust line condensate trap with drain installed?
19		Exhaust line installed with proper downward outgoing incline?
20		Proper-specified muffler installed with hangers and mounts tight?
21		Battery(ies) of proper size and voltage?
22		Battery(ies) filled with electrolyte and properly connected to charger?
23		Battery charger AC circuit properly connected and charger operational?
24		Battery(ies) properly mounted with adequate ventilation?
25		Starting cables of proper length and gauge?
26		Starting cables properly connected to battery(ies)?
27		Generator load conductors of proper ampacity, and properly connected to the correct location?
28		Load conductors, engine start leads, battery and heater power source leads installed and in correct conduits?
29		All other wiring, including customer added options, connected properly?
30		Nameplate voltage and frequency of both generator set and transfer switch matching normal/utility source ratings?
31		Has generator phase rotation been checked versus utility?
32		Transfer switch AC conductors properly connected?
33		Transfer switch switching mechanism free from binding? NOTE: Disconnect all AC sources, and operate manually to check.
34		Generator room clean of all loose material not related to Generator?
35		Exhaust stack protected from entry by rain, snow, and animals?
36		Approved heat-isolating thimble(s) installed at points where exhaust line passes through combustible wall(s) or partition(s)?
37		Exhaust system termination located to prevent entry of exhaust gases into structures?
38		Exhaust line free of excessive bends and restrictions? Back pressure under specified limit?
39		Have all manufacturers' start-up instructions been completed?

NOTES: Before start-up, the Contractor and Generator Supplier must make the following installation checks in addition to those recommended by Generator Manufacturer. Some checks may require a running generator and should be checked immediately during first generator run

This form is intended to be used as a general guide. Use the manufacturer's Operations and Maintenance manual for reference in performing each of the following checks

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

GENERATOR PERFORMANCE TEST REPORT

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

NAMEPLATE DATA

MANUFACTURER:		S/N:		KW:		KVA:	
GENERATOR MODEL		S/N:		VOLTS:		PH:	
ENGINE MODEL:		S/N:					
ALTERNATOR MODEL:		S/N:					

PRELOAD TESTS VOLTAGE MEASUREMENTS

L1 TO L2:		L1 TO N:		BLOCK HEATER VOLTAGE	
L2 TO L3:		L2 TO N:		BLOCK HEATER WATTAGE	
L3 TO L1:		L3 TO N:		BATTERY VOLTAGE	

PRELOAD TESTS AND SHUTDOWNS

PRE-ALARMS	INDICATOR LIGHT	SHUTDOWNS	INDICATOR LIGHT	SHUTDOWN FUNCTION
GENERATOR RUN LIGHT		OVERSPEED		
ALARM HORN & SILENCE		OVERCRANK		
SWITCH NOT IN AUTO		EMERGENCY STOP		
PRE LOW OIL PRESSURE		LOW OIL PRESSURE		
PRE HIGH ENGINE TEMPERATURE		HIGH ENGINE TEMPERATURE		
PRE LOW COOLANT LEVEL		LOW COOLANT LEVEL		
PRE LOW FUEL LEVEL		LOW FUEL LEVEL		
LOW COOLANT TEMP WARNING				
LOW/HIGH BATTERY VOLTAGE				
AUXILLIARY FAULT		AUXILLIARY		

PERFORMANCE TESTS / LOAD ACCEPTANCE

FULL LOAD	VOLTAGE DIP	%	FREQUENCY DIP	%	
	RECOVERY TIME	SEC	RECOVERY TIME	SEC	
WITH SPECIFIED	VOLTAGE DIP	%	FREQUENCY DIP	%	
MOTOR LOAD	RECOVERY TIME	SEC	RECOVERY TIME	SEC	

LOAD TEST @ 1.0 POWER FACTOR

TIME STAMP	LOAD	VOLTS	AMPS	HZ	KW	AMB ºF	WATER ºF	OIL PSI	ENGR HRS
WARM UP	0								
0.1	25								
0.1	50								
0.2	75								
0.2	100								
3.4	100								

NOTES:

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

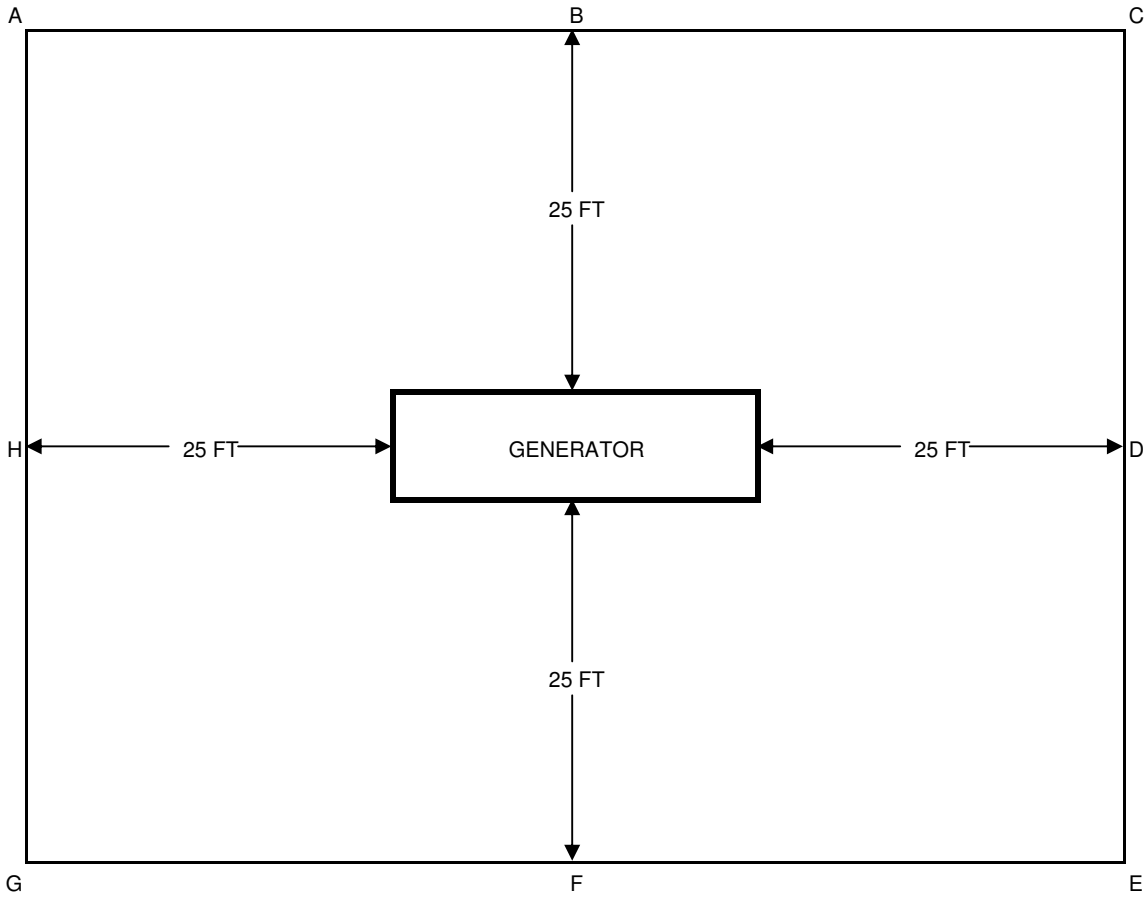
SIGNATURE COMPANY DATE

GENERATOR SOUND LEVEL DATA FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

SITE CONDITIONS



MEASURED NOISE - LOCATION									
	A	B	C	D	E	F	G	H	
NOT RUNNING									
NO LOAD									
EXPECTED MAX LOAD									
FULL LOAD									

NOTES:

1) Note permanent obstructions (within 25 FT) as they exist on site on this drawing.

2) Measure sound pressure level (dB) using acoustic sound meter on "A" setting.

3) Measure SPL background noise, generator at idle, and at full load.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

MOTOR TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

MOTOR NAME: _____ MOTOR TAG: _____

SERIAL #: _____

MOTOR NAMEPLATE DATA

MFG:		PHASE:		TYPE:		P.F:		S.F:		NEMA:	
VOLTS:		HP:		DUTY:		RPM:		CODE:		DESIGN:	
FREQ:		FLA:		MODEL:		FRAME #:		ROTATION (CW/CCW):			

INSULATION RESISTANCE TEST PHASE-TO-GROUND/PHASE-TO-PHASE

A: _____ / _____ B: _____ / _____ C: _____ / _____

CONTROL SETTINGS AND TESTS

MOTOR HEATER MEASURED AMPS:	_____ (AMPS)	MOTOR OVERLOAD SETTING:	_____ (AMPS)			
MOTOR THERMAL TRIP TEST:	_____	OVERLOAD RESET TEST:	_____ (YES/NO)			
MINIMUM SPEED (IF VFD):	_____ (HERTZ)	COIL RESISTANCE:	AB	BC	CA	

PHYSICAL MOTOR TESTS - ACTUAL MEASURED VALUES

VOLTAGE (VOLTS)		AMPERAGE (AMPS)		POWER	
AB:	_____ V	A:	_____ A	POWER FACTOR:	_____
BC:	_____ V	B:	_____ A	POWER DRAW:	_____ KW
CA:	_____ V	C:	_____ A	HORSEPOWER:	_____ HP
IMBALANCE:	_____ %	IMBALANCE:	_____ %		

NOTES:

1) Perform coil resistance measurements on motor leads with a low-resistance ohmmeter. Note measurements.

2) Perform insulation-resistance test utilizing 500 volt megger and/or accordance with manufacturer's published testing procedures. Motors 200 HP and more test duration 10 minutes, 200 HP and less test duration 1 minute.

3) Perform DC overpotential tests on motors rated 1000 HP and 4000 volts or greater in accordance with ANSI/IEEE Standard 95.

4) Verify that pump/shaft seals are lubricated and that automated lubrication systems are functional.

5) Verify that motor protection/monitoring circuits are installed and connected per contract drawings and manufacturer requirements.

6) Verify that the motor space heater is functional.

7) Perform a rotation test to insure correct shaft direction by "bumping" motor. Reverse as necessary in appropriate place. Phase taping must remain in order on terminals left-to-right once completed.

8) Measure running current and evaluate relative to load conditions and nameplate full-load amperes.

9) Record the voltage and current on all phases while operating under full-load. If voltage or current imbalance is above 2 percent, or if current is above nameplate FLA or expected level, investigate cause and report on findings. Calculate imbalance by dividing (high minus low measurement) by the average measurement of all 3 phases.

10) Vibration tests shall be conducted in cases of discernable abnormal vibration or when ordered by the Engineer (due to perceived excessive vibration). Vibration shall not exceed 0.1 in./sec as measured opposite driven end of motor. Make necessary corrections to reduce vibration below limit at all operational speeds and loads.

COMMENTS:

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

PROGRAMMABLE LOGIC CONTROLLER I/O POINT-TO-POINT TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING CO: _____ TEST LOCATION: _____

PANEL NAME: _____ PANEL TAG #: _____

PLC NAME: _____ RACK # _____ SLOT # _____ I/O TYPE _____

I/O POINT				Scale					Digital	Operator	SCADA	Pass/Fail
I/O #	TYPE	TAG #	Description	@4mA	@8mA	@12mA	@16mA	@20mA	On/Off	Interface	Screen	CM or R
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												

NOTES:

1) Connect signal generator to each I/O point for factory testing.
2) Utilize actual instrument to generate signals for field pre-operational tests where possible.
3) Verify function and accuracy of loop by switching the digital signal or modulating the analog signal from the connected device or instrument
4) Field verify all instruments and indicators within loop of signal.
4) Confirm polarity of signals and calibration ranges are equivalent for all components in loop.
5) Include significant digits past decimal in scale columns
6) Complete checklist above by entering a checkmark (CM) for acceptable, or R for needs repair or attention
7) Note items that need attention below

Attention Requied:

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

INSTRUMENTATION SWITCH CALIBRATION TESTS FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

INSTRUMENT NAME: _____ INSTRUMENT TAG#: _____

INSTRUMENT UNITS: _____ NAME: _____

TYPE: _____ MODEL: _____

SERIAL #: _____

MANUFACTURER	INSTRUMENT
NAME: _____	UNITS: _____
TYPE: _____	
MODEL: _____	
SERIAL #: _____	

PROCESS SETPOINT	INCREASING TRIP POINT	DECREASING TRIP POINT	DEADBAND	SETPOINT TIME DELAY	ACTUAL TIME DELAY

NOTES:

1) Field test instrumentation and associated control systems in accordance with the specifications and the manufacturer's instructions. Instrumenatation shall function as intended under actual process conditions or shall be repaired or replaced at Contractors expnse.

2) Complete a separate calibration form for each instrument provided.

3) Simulate process variable in field by applying known pressure, temperature, opening/closing measured device, raising/lowering actual level, etc. as required to confirm calibration. This step must be witnessed by inspector.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

INSTRUMENTATION TRANSMITTER CALIBRATION TEST FORM

PROJECT NAME: _____ DATE OF TEST: _____

TESTING COMPANY: _____ TEST LOCATION: _____

INSTRUMENT NAME: _____ INSTRUMENT TAG#: _____

MANUFACTURER		INSTRUMENT	
NAME:		RANGE:	
TYPE:		SCALE:	
MODEL:		UNITS:	
SERIAL #:		TRANSMITTER OUTPUT:	
REMOTE SENSOR TYPE:		FACTORY SPECIFIED ACCURACY:	
(If Applicable)		REMOTE SENSOR OUTPUT:	
		(If Applicable)	

DESIGNED VALUE				ACTUAL VALUE			
INPUT SIGNAL	OUTPUT	ENG VALUE	CALCULATED TOLERANCES	INSTRUMENT DISPLAY	INSTRUMENT OUTPUT SIGNAL	PROCESS INDICATOR	LOGIC VALUE

NOTES:

1) With this form, attach and submit factory calibration forms for flowmeters and transmitters that are available from factory.

2) Field test and calibrate instrumentation and associated control systems in accordance with the specifications and the manufacturer's instructions. Instrumentation shall meet specified accuracy or shall be repaired or replace at Contractor's expense.

3) Complete a separate calibration form for each instrument provided.

4) Simulate process variable in field by applying known pressure, temperature, pH, etc. as required to confirm calibration. This step must be witnessed by inspector.

5) Provide parameter value for each parameter changed from factory default.

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

PUMP PERFORMANCE TEST FORM

TEST NUMBER: _____ DATE OF TEST: _____

PUMP EQUIPMENT #: _____ WATER TEMP: _____

AMBIENT TEMP: _____

GUARANTEED PUMP CONDITIONS					
PPM	GPM	TDH	%EFF	NPSH	SPGR

DIMM TO DATIUM: _____ SUCT GAGE RANGE AND ACCURACY: _____

CL OF SUCT PIPE: _____ DISC GAGE RANGE AND ACCURACY: _____

CL SUCT GAGE: _____ LIST VALVES, PIPE CHANGES ETC BETWEEN PUMP AND GAGES:

CL DISC GAGE: _____

MOTOR NAMEPLATE DATA								
MAKE	SERIAL NO.	TYPE	FRAME	VOLTS	AMPS	RPM	HP	

PIPE SIZE	PIPE LENGTH GAGE TO PUMP	FLOW METER
SUCT:	SUCT:	TYPE:
DATE:	DATE:	ACCURACY:

		SUCT HEAD (1)		DISC HEAD (2)						PWR MEASURE	
TEST POINT	FLOW GPM	PSG/ IN HG	FEET OF H20	PSIG/ IN HG	FEET OF H20	PRESS DIFF FT H20 (1-2)	EL DIFF. GAGE CENT. FT (3)	FRICT. HEAD FT H20 (4)	TDH IN FT H20 2-1 +3+5	H20 HP (7)	WATT MTR KW
1											
2											
3											
4											
5											
6											
7											
8											
9											

	POWER MEASUREMENTS					TEMPERATURE READINGS				
TEST POINT	VOLTS	AMPS	PWR FACTOR	ELEC HP (8)	% EFF (7/8) *100	MTR	ERG	MIDFT	PUMP BRGS	
1										
2										
3										
4										
5										
6										
7										
8										
9										

PUMP DATA:

IMPELLER DIAMETER: _____

IMPELLER PATTERN: _____

PUMP MODEL:

PUMP SERIAL NUMBER: _____

PUMP SIZE: _____

NOTES: 1) Complete 1 form for each pump

CERTIFIED BY: _____ _____ _____

SIGNATURE COMPANY DATE

WITNESSED BY: _____ _____ _____

SIGNATURE COMPANY DATE

SECTION 16910
PLC & OI HARDWARE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Providing and installing Programmable Logic Controller (PLC) and Operator Interface Hardware and all supporting hardware, wiring and devices as specified in Electrical Specifications.

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Low Voltage Wire and Data Cable]

C. Electrical Specifications [PLC and OI Application Programming]

1.03 SUBMITTAL REQUIREMENTS

A. Provide submittals per Electrical Specifications [Electrical General, Submittal Requirements].

B. Submit documentation showing the number and type of I/O modules required to meet the I/O requirements specified herein. Include complete manufacturer's part and model numbers.

1. PLC I/O points are determined by the P&ID Drawings. The Contractor shall count and total the PLC I/O points per PLC controller and per type of I/O required based on the P&ID diagrams. Provide 25% spare I/O points per I/O type per PLC.

C. Submit calculations showing that the power supply meets the specified requirements and the requirements of the devices powered. Confirm PLC power supply is sufficient for all possible operable conditions.

D. Submit shop drawings showing physical backpan layout of equipment in Control Panel.

E. Submit communications block diagram including PLC, OI, motor controls, power supplies, switches, routers, radios, and any other connected components.

F. Submit hardware Operations and Maintenance Manual per Electrical Specifications [Electrical General].

PART 2 PRODUCTS

2.01 GENERAL

A. Provide PLC modules from a single family of products, using the same software and interchangeable I/O cards, that can be configured for a range of applications from small, uncomplicated sites to large, complex sites with a variety of equipment.

B. Provide a PLC that will meet the following requirements:
   1. Size and provide a CPU and power supply to accommodate the CPU, I/O cards, communication devices, etc. as specified herein.

C. Provide a PLC that can be expanded in the field by the addition of the following types of plug-in modules or cards and interface cables without rendering the originally furnished PLC components obsolete.
   1. Digital Inputs
   2. Digital Output
   3. Analog Input
   4. Analog Output with PID control

D. Size the PLC enclosure such that local I/O modules and supporting hardware required to meet the ultimate point count, as specified herein, will fit into the space of a single enclosure.

2.02 MECHANICAL

A. Provide modular PLC consisting CPU, power supply, communications, and I/O modules.

B. Provide I/O modules with removable terminal strips so that I/O modules can be removed without disconnecting field wiring.

2.03 PLC COMPONENTS

A. The following components (Xylem Nexicon, no equal) shall be provided to complete the PLC(s). Only major components are listed. Multiples of some components are required.

B. Nexicon Programmable Logic Controller (PLC)

1.	Processor – (Includes internal DI/DO/AI/AO, and Ethernet, SD slot, USB, RS485)	XAM 912
2.	Power Supply	XBS 251
3.	Digital I/O Module (DC)	XDC 411
4.	Analog I/O Module	XAC 411
5.	Pump Interface Module	FPM 411
6.	Probe Module	XLM 411
7.	Redundancy Module	XRM 211
8.	Backplane Assembly	XBP 251

C. Nexicon Operator Interface (OI)
   1. Touchscreen graphical interface for adjustment of configuration settings and control operations.
   2. 15” color touchscreen 800x480 pixel resolution

3. Dual core process @ 8MHz
4. 12 MB Flash and 1GB Ram
5. IP65 front panel
6. Power: 12-24VDC @8.5W
7. Operating temperature: 0-60C, Fan-less design

2.04 ETHERNET SWITCH

A. The unmanaged Ethernet switch shall have minimum 8 ports. Ports shall be 10/100 Base-Tx with RJ-45, 8 pin female connectors. Switch shall be suitable for power from 10 - 30 VDC. Switch shall be N-Tron 108TX, Allen Bradley Stratix 2000, or equal.

2.05 BROADBAND WIRELESS CELLULAR ROUTER

A. Acceptable products: Sierra Wireless RV55 4G LTE intelligent gateway, or equal. Compatible with Verizon and AT&T

B. General Specifications
1. Internet Connections Supported: 1 Embedded 3G/4G connection
2. Networks Supported for Embedded Modem: Verizon 2G, 3G, and 4G
3. Ethernet ports: 1 LAN, 10/100.
4. SIM card slot for with broadband plan (by Owner)
5. AC wall pack power supply or 12 to 28 VDC from panel power supply.
6. AWS, LTE, HSDPA, HSDPA+
7. Onboard IPSec SSL VPN client, SSH, HTTPS
8. Operating Temperature: -30˚C to +70˚C (-22 to 158˚F)

C. Host Interfaces:
1. 10/100 Base-T RJ45 Ethernet
2. RS-232 Serial Port

D. LED Indicators:
1. Signal strength, Activity, Power

E. Antenna:
1. SMA Male Connector and 50-Foot RG174 Coax Cable
2. Wilson Electronics, or equal

2.06 IP SERVICE ROUTER

A. Acceptable products: Netgate SG-2100.

B. Provide shelf for panel mounting of router.

C. General Specifications
1. 2x 1 Gigabit WAN/LAN ports plus a 4 port switch provide high-speed wired connectivity
2. PF-Sense firewall to support stateful packet filtering, firewall, and pure router capability.
3. Supports IPsec, OpenVPN, PPTP, IPv6, NAT, BGP, RADIUS
4. ARM v7 Cortex-A9, 2 GB DDR4L memory, M.2 expansion for SSD, or LTE.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. All work in this Section shall conform to the codes and standards specified in Electrical Specifications [Electrical General, Workmanship].

3.02 INSTALLATION

A. Fabrication
   1. Mount, wire and Ground PLC and OI per manufacturer's recommendations.
   2. Organize equipment on control panel backpan per Backpan Layout detail in Contract Drawings.
   3. Locate and install PLC(s) and OI(s) per Contract Drawings.

B. Wiring
   1. Terminate status, control and analog wiring on terminal blocks.
   2. Label and wire PLC to terminal blocks per Electrical Specifications [Wire, Fuses & Terminal Block] and Example I/O Wiring Diagram in the Drawings.
   3. All spare I/O points shall be wired to terminal blocks.
   4. Install communication cables to connect the PLC to external devices.
   5. Bundle and tie down wires in a neat and orderly manner.
   6. Terminate drain wire of shielded cables at backpan terminal block only.

3.03 FIELD ASSISTANCE

A. Provide testing as specified in Electrical Specifications [Factory and Field Testing].

3.04 WARRANTY

A. Provide warranty per Electrical Specifications [Electrical General, Warranty].

B. Perform the following services during the warranty period:
   1. Repair or replace damaged modules returned for service within 24 hours.
   2. Determine and report the cause of failure of modules returned for service.
   3. Resolve design or implementation problems discovered.

3.05 FINAL ACCEPTANCE

A. Final Acceptance per Electrical Specifications [Electrical General].

END OF SECTION

SECTION 16915
PLC & OI APPLICATIONS PROGRAMMING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Programming of the PLCs, OIs and SCADA to control the station automatic functions and communications.
   1. PLC, OI, and SCADA programming to be completed by Application Programmer (Xylem, Inc. or factory representative.)
   2. Provide custom programming to PLC and Cloud SCADA to perform functions and remote interface as described herein.

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Project Drawings

1.03 QUALIFICATIONS

A. Services furnished under this specification shall be performed by Application Programmer meeting requirements specified in Electrical Specifications [Electrical General, Qualifications].

1.04 SECTION INCLUDES

A. Program definition and control descriptions for Programmable Logic Controller(s) (PLCs) used to control new equipment (and existing equipment as noted) as it relates to this project.

B. Operator Interface(s) (OIs) configuration and programming to compliment PLC program code.
   1. Touch screen graphics, database, and configuration to support local control of the station/project. Graphic screens shall generally be based on P&ID drawings.
   2. Display of station status and values and allow for changes to settable parameters within the PLC program.
      a. Display of analog values and associated alarms.
      b. Display of digital values and alarms
      c. Alarm notification of un-acknowleged and acknowleged alarms.
      d. Manual control of equipment.
      e. Display values for setpoints and ability to modify setpoint values.
   3. Configuration of alarm notifications system for all alarms.

C. SCADA system configuration and programming: Currently, Flygt Advensor system is configured only by Flygt. Contract Flygt vendor for services to configure Advensor Cloud SCADA system for site specific graphics, monitoring, and alarm notification.

1. SCADA screen graphics, database, and configuration to support remote control of the station/project. Graphic screens shall generally be based on P&ID drawings.
    a. Standard graphics screens for preconfigured process controls
    b. Custom graphics screens for unique items and I/O points as shown on PLC I/O drawings.
2. Configuration of historian database to log specific datapoints to record station activities and situations.
    a. Analog values and associated alarms.
    b. Digital alarms
    c. Equipment start/stop or open/close.
    d. Time stamp of all events.
3. Configuration of (voice and/or text) alarm notifications system for all alarms.
    a. Add phone numbers of on-call operations personnel
    b. Add schedule for shifts and responsibilities that are based on a monthly assignable calendar.
    c. Deliver alarm notification messages via email, text message, and voice dial.

D. Related work as specified in Electrical Specifications [Electrical General].

1.05 SUBMITTAL REQUIREMENTS

A. Provide submittals per Electrical Specifications [Electrical General, Submittal Requirements].

B. Submit software operations manual including the following as a minimum.
1. Program Code
    a. Program code demonstrating function in compliance with descriptions herein.
2. Setpoint listing with description
3. Program description
    a. Provide written description of program operation. Description shall cover all aspects of normal operation and alarm shutdowns. Describe all alarms and their effect on operation. Describe alarms that require manual reset.
4. Register cross reference listing
    a. The listing shall be in table format and include all program constants and variable registers with their functions.
    b. The listing shall show (block and rung number) where the register is used within the program code.
5. Configuration and Set-up
    a. The configuration of the processor and hardware selections shall be summarized.
    b. The configuration of the communication ports shall be shown.
6. Data Tables
    a. Print data tables with initial register values shown.
7. Special files
    a. Include any special files that are particular to the manufacturer. All files pertinent to programming or configuration shall be submitted.

C. Submit software documentation demonstrating understanding of control software requirements and compliance with Portability and Maintainability requirements specified in this Section.
   1. Submit OI graphic layout and PLC program listing with cross-references for approval 4 weeks prior to factory test.
   2. A PDF color copy of SCADA and OI graphic screens and PLC applications programs (with comments) shall be provided with the submittals and for as-programmed final documentation for O&M manuals. Layout shall be sized so that the complete program logic with comments fits on one page (portrait or landscape) and rotated upward.
   3. Submit electronic version of SCADA and OI graphic screens and PLC applications programs native file format with each software submittal and at the end of the project for as-programmed final documentation for O & M manuals. Provide thumb drive with files or via internet with project name and purpose identified file and folder names.

1.06 PROGRAMMING METHODS

A. Design and code programs per the following:
   1. Utilize Codesys logic programming language as available in the PLC manufacturer's configuration software. Custom Programming is required for this project to achieve all functions as described herein..
   2. Clearly comment each line of program logic code. Include module headers detailing the purpose of the module, programmer name, date of last revision, revision history, and description of sequence of events.
   3. Comment for each block of code explaining purpose of program block.
   4. Code shall use the P&ID device names as the prefix to the names or tagnames throughout the program logic. Reference tag formation below. If PLC does not use tagnames as data reference, then provide tagname in symbol name or in comment areas at minimum.
   5. Data arrays may be used in tagname aliases for communication data transfers.
      a. Provide program file for each type of program logic. The following are types that should be used, as applicable and at minimum.
      b. Analog input scaling
      c. Analog output scaling
      d. Analog alarms
      e. Digital alarms
      f. PLC clock, midnight and today/yesterday control
      g. Flow totalizations
      h. Equipment runtimes
      i. Equipment starts
      j. Communications
      k. Each individual piece of controlled equipment (digital control)
      l. Each individual piece of controlled equipment (analog control)
      m. Each individual process system (digital control)
      n. Each individual process system (analog control)

B. All custom software, including diagnostic, configuration and applications programming software shall become the sole property of the Owner for their use on this and future Owner projects.

C. No software or documentation shall be labeled proprietary.

D. Provide two (2) digital copies of all as-installed programs at the end of the project.

E. Furnish and maintain 256MB (min) USB RAM thumb drive on site and within control panel so that latest program files are always available and up-to-date. Upon conclusion of each downloaded program change, the USB RAM thumb drive shall be updated.

PART 2 PRODUCTS

2.01 APPLICATIONS PROGRAMMING SOFTWARE

A. The Applications software shall be of latest revision available to program the PLC. If a newer revision of the software is available at the time of factory testing, the Application Programmer shall make whatever changes are necessary to make the applications program compatible with the newest revision.

B. The Application Programmer is responsible for obtaining correct revision of PLC & OI configuration software, manuals and licensing necessary to program and configure the PLC & OI. Application Programmer shall coordinate the proper version of software prior to the start of PLC programming. Programming software version shall be compatible and consistent with installed base at other Owner stations.

2.02 APPLICATIONS PROGRAM CODE

A. The Application Programmer will provide, install and test (with Contractor assistance) application programming. The descriptions provided herein are not final and may have modifications made to them during construction that may change the nature of operation.

B. The program code shall be written without any “hard-coded” constants that would effectively require a program change to modify the value. Program code shall contain variable registers only.

2.03 CONTROL STRATEGIES

A. General Requirements:
   1. The following requirements (General and Specific) are intended to be used as a guideline for application programming of the PLC. They are the major functions and are not intended to be completely comprehensive of all requirements of the station operation and do not attempt to cover all necessary program routines for an operational system. Additional features, functions and registers will be required for an operational system.
   2. The following general program functions shall be provided:
      a. Enable/disable toggle bits and variable time delays for all alarms.
      b. Analog input noise filtering -- software or firmware.
      c. SCADA Auto-Off-Manual controls for all equipment controlled by the PLC. These control buttons shall also be accessible via the OI(s).
      d. All equipment to have a Remote Reset feature available from SCADA and OI(s). Remote Reset signal to be held on until cleared by Reset Feedback signal.

e. Normal operations shall continue with loss of SCADA connection. The PLC code shall act on I/O connections, PLC to PLC communications, and non-SCADA communications only to control the system. Only in the event of SCADA override, shall the system not act on PLC I/O connections and non-SCADA communications. None of the program code to control the system shall reside in the SCADA system.

f. Time of day clock synchronization with SCADA system. PLC shall have registers defined for SCADA system clock write. The PLC shall have code written to recognize that the register(s) have been written to, stop the real time clock, set the clock, and restart it, with the value in the register(s). Date and time of day shall be set.

g. Resettable and non-resettable operation hour meters for all equipment and resettable starts counters for all equipment.

h. Scaling to engineering values of all variables. Minimum of 3 significant digits required.
   1) Level in 1/10th Feet or Inches
   2) Pressure in 1/10th PSI.
   3) Flow in GPM.
   4) Flow totalization
      a) Total non-resettable flow displayed in MGD with 9999999.999 presentation layout.
      b) Total resettable flow displayed in MGD with 9999999.999 presentation layout.
      c) Total yesterday flow displayed in KGAL with 99999.9 presentation layout.
      d) All registers shall roll over to zero automatically.
   5) Speed in percent %.
   6) Motor current in 1/10 amps.
      a) Convert current input to power (in KW) where shown on drawings. Assume voltage to be 480 and power factor to be 0.85.

i. Data register types:
   1) Any register that requires precision past the decimal shall be floating point type.
   2) Integer registers may be used where decimal precision is not required.
   3) Boolean registers shall be used for all statuses and on/off controls.

j. All set point registers, enable/disable toggle bits and settable variable time delays shall be adjustable from the OI direct to program data table.

k. Provide communications messaging as required to share data information and interlocks between PLCs. Message structure shall be fail safe as to keep overflows or other improper operation from occurring.

l. A power fail shall reset all routines.

m. Pumps and equipment shall have backspin delays and power fail sequential re-start delay routines.

n. All powered equipment and devices shall have an assigned essential / non-essential status for purposes of generator load shedding.

o. Programming code shall have automatic error checking and proper initialization to prevent illegal operations such as negative values being

placed in timer presets or mathematical out of range functions which could cause a processor fault.

p. PLC shall be programmed so that, in the event of a power interruption, the equipment controlled shall resume normal operation upon power restoration without requiring a manual reset unless otherwise shown.

q. Set points

1) Minimum required set points for Lead / Lag pumping scenario.

a) Lead Pump start level
b) Lag Pump start level
c) Lead Pump stop level
d) Lag Pump stop level
e) Pump Start delay time
f) Pump Stop delay time
g) Backspin delay time
h) Sequential Start delay time
i) Pump rotation selection (0=auto rotate, 1=P1 Lead, 2=P2 Lead)

2) Additional minimum required set points for Lead / Lag pumping scenario when variable speed control is used.

a) Minimum Lead Pump speed to start Lag Pump
b) Minimum Lag Pump speed to stop Lag Pump
c) Maximum Pump Speed
d) Minimum Pump Speed

3. Analog Scaling:

a. All analog values shall be adjusted (if necessary) prior to scaling for required offsets due to hardware / firmware conditions.

b. All analog input values shall be scaled into real world engineering units and presented in REAL (floating point) format for use by SCADA and the OI(s).

c. All analog output values shall be scaled from real world engineering units into INT (decimal) format to control current or voltage output from an analog output device.

4. Alarms General:

a. Common alarms: Provide all applicable alarms per device based on available P&ID inputs and outputs.

1) Motor power or amperage alarms shall be disabled when the motor is not running.
2) If a device is called to start or move and the associated run status does not confirm start or move after a time delay then post a device “Run fail” alarm.
3) All equipment (as marked on P&ID drawings) shall have a non-running alarm.
4) Not in Auto alarm: All devices (valves, gates, pumps) with auto switch monitoring shall have associated “Not in auto” alarms.
5) Moisture / Temperature alarms: All submersible pumps shall have “Moisture” and “Over temperature” alarms.
6) Seal Water Fail alarm: All sludge type pumps shall have “Seal water fail” alarms.
7) Pressure alarm: All sludge type pumps shall have “Inlet and Outlet pressure” alarms.

8) Temperature alarm: All sludge type pumps shall have a pump body "Over Temp" alarm.
9) Differential pressure alarm: All filters shall have "Differential pressure" alarms.
10) Low oil alarm: All lubricated mechanical devices (gearboxes etc.) shall have a "Low oil" alarm.
11) Vibration alarm: All moving mechanical devices (gearboxes, aerators, pumps etc.) shall have a "Vibration" alarm.
12) Over torque alarm: All geared mechanical devices (clarifiers etc.) shall have an "Over torque" alarm.
13) VFD Fault: All VFDs shall have a common fault alarm as a minimum. Further breakdown of alarms shall be provided based on data available from the VFD. All VFDs shall have a manual reset available from the OI(s) and SCADA.
14) Flow, level, pressure, analytical and other analog alarms shall follow alarm structure as defined herein.
15) All digital alarm values will have at a minimum an associated alarm structure as defined herein.

b. Analog Alarms:
1) If an analog value is above/below the associated set point, and the associated time delay has exceeded the time delay set point, then the alarm shall be generated / annunciated.
2) Transducer out of range alarms. If the scaled value of the analog input exceeds 21 mA or falls below 3.5 mA, an out of range alarm shall be triggered for that input.
3) The alarm shall automatically reset unless a latch is required to keep the process from resuming and re-creating the alarm. A latching alarm requires either a reset set point for hysteresis or a manual reset.
4) The low flow alarms (and pressure alarms if applicable) shall only be enabled when the associated pump or system is running.
a) Provide low flow alarm for pump operation where flow is expected above setpoint continuously when running. Alarm shall shutdown system and fail pump. If other pumps are available, they shall be called in its place.
5) Example analog alarm display structure (Units per alarm type). ENABLE / DISABLE shall be a toggle switch. DELAY to be editable timer base value for associated alarm delay timer. SET POINT column to contain current analog value in Transducer Fail Alarm row. Other alarm rows to contain editable alarm set point value with REAL (floating point) data type. LATCH to be either reset set point value for reset of alarm or manual reset toggle (blank if alarm is not latching).

Description	Status	En / Dis	Delay	Set Point	Latch
Transducer Fail Alarm	ALARM	Enable	10 sec.	28.4 GPM	Reset
High Alarm	OK	Enable	5 Sec.	xxx.x GPM	OK
High Warning	ALARM	Enable	5 Sec.	xxx.x GPM	

Low Warning	OK	Enable	5 Sec.	xxx.x GPM	xxx.x GPM
Low Alarm	OK	Disable	5 Sec.	xxx.x GPM	xxx.x GPM

c. Digital Alarms:
   1) If the digital alarm state is TRUE and the associated time delay timer has exceeded the time delay set point, then the alarm shall be generated / annunciated.
   2) The alarm shall automatically reset unless it is designated as "latch". A latching alarm requires a manual reset.
   3) Example digital alarm Structure. ENABLE / DISABLE to be a toggle switch. DELAY to be editable timer base value for associated alarm delay timer. LATCH to be a manual reset toggle (blank if alarm is not latching).

Description	Status	En / Dis	Delay	Latch
Generic Digital Alarm 1	OK	Disable	10 sec.	
Generic Digital Alarm 2	ALARM	Enable	10 sec.	Reset

d. Communications Alarm:
   1) The SCADA and connected PLC(s) shall monitor for communications between controllers and they shall post an alarm if any PLC fails to respond to message queries.

5. Totalization:
   a. Flow totalization (Example):
      1) If an analog flow input value is positive, then increment the flow totalizers (resettable and not resettable) for each 1000 gallons of accumulated flow.
      2) If internal flow reset status is set, then set resettable flow totalizer to zero and reset the resettable totalizer.
      3) Similar for all flowmeters / totalizers.
   b. Hour Meters (Example):
      1) If Generic Pump #1 running is set, then start hour timers.
      2) If internal run time hours reset status is set, then set resettable run time hours to zero.
      3) Similar for all device run time hours.
   c. Starts Counters (Example):
      1) If Generic Pump #1 running input is set or Generic Pump #1 start command is set (if running input is not available), then increment starts counter.
      2) If internal starts reset status is set, then set resettable starts counter to zero and reset.
      3) Similar for all device starts.
   d. Intrusion Alarms (Example):
      1) Provide intrusion alarms for panels and buildings with intrusion switches.
      2) Alarm shall be generated after an adjustable time delay to SCADA.

3) If an OI or SCADA is present, then provide a way for an operator to reset and disable the intrusion alarm for a setpoint period of time.
4) After that time elapses, then the alarm shall be re-activated automatically.
5) If no SCADA or OI, then the alarm shall reset automatically once the condition is returned to normal state.

B. SPECIFIC REQUIREMENTS (Pump Station Level Control)
1. To be further defined by System Integrator and submitted for review. Include all operations to provide a fully functioning system.
a. Must comply with general requirements.
b. Provide time delays and time delay setpoints for all functions.
2. Pump Interlocks:
a. Power failure via power monitor.
b. Low flow alarm per pump (when pump is operating)
3. Level Sensor:
a. Subtract barometric pressure from Station level transmitter (absolute pressure) to obtain accurate wetwell level for use in algorithm.
4. Consists of programming function for the following:
a. Wastewater Lift Station (Wetwell Level Control)
1) Wastewater lift pump station shall maintain wetwell level between start and stop level setpoints.
2) Pump Start Control
a) Start lead pump on lead pump start level setpoint.
b) Start lag pump on lag pump start level setpoint.
c) Start standby pump on standby pump start level setpoint.
d) Stop standby pump on standby pump stop level setpoint.
e) Stop lag pump on lag pump stop level setpoint.
f) Stop lead pump on lead pump stop level setpoint.

C. SPECIFIC REQUIREMENTS (Mixer Control)
1. To be further defined by System Integrator and submitted for review. Include all operations to provide a fully functioning system.
a. Must comply with general requirements.
b. Provide time delays and time delay setpoints for all functions.
2. Pump Interlocks:
a. Power failure via power monitor.
b. Low Level alarm
3. Consists of programming function for the following:
a. Wetwell Mixer Control
1) Mixer shall run prior to and during each pump run.
2) Mixer Start Control
a) If the lead pump is required to start, start wetwell mixer.
b) If the lead pump is no longer required and is off, then turn off mixer.

D. SPECIFIC REQUIREMENTS – Additional Components
1. To be further defined by Application Programmer and submitted for review. Include all operations to provide a fully functioning system.
2. Must comply with general requirements.

3. Consists of programming function for the following:
    a. Additional inputs (not addressed in other specific requirements) for station monitoring and alarming
        1) Provide PLC code to set alarms and SCADA status based on the I/O descriptions or conditions as shown in the PIDs and drawings and standard programming requirements.
        2) Outputs shall provide status and reset control to the devices connected.

E. SPECIFIC REQUIREMENTS – Power Monitor
1. To be further defined by Application Programmer and submitted for review. Include all operations to provide a fully functioning system.
2. Must comply with general requirements.
3. Consists of programming function for the following:
    a. Communications to power monitor via ethernet.
        1) Obtain real time data for Voltage, L-L, L-N each phase.
        2) Obtain real time data for Current, each phase.
        3) Obtain real time data for Power, total, KW and KVA
        4) Use power data to detect if pump that is not running at expected power level when operating.
        5) Create alarms on low and high power level when one pump is operating, and when two pumps are operating.

F. SPECIFIC REQUIREMENTS – Hardware Autodialer or Mission
1. To be further defined by Application Programmer and submitted for review. Include all operations to provide a fully functioning system.
2. Must comply with general requirements.
3. Consists of programming function for the following:
    a. Autodialer or Mission inputs
        1) Provide PLC code to set digital outputs based on the I/O descriptions or conditions as shown in the PIDs and drawings.
        2) Outputs shall mirror the alarms in the PLC. Once acknowledged or reset, the output to the alarm system is released.

2.04 OPERATOR INTERFACE (OI) and SCADA

A. Operator Interface
1. Full manual and automatic control interface to be provided on each touchscreen OI. Group controls logically to provide intuitive navigation through display screens for operators. Utilize colors and flashing symbols to designate abnormal conditions.
    a. Station overview with current status and alarms.
    b. Pump or equipment status, setpoints, and alarms for each pump. Use green for run, red for stop, yellow for alarm.
    c. Station setpoints operation screens. Gray, white, black colors.
    d. Alarm summary screens – flashing in alarm, yellow if active and acknowledged, gray if acknowledged and corrected.
2. Include all setpoints, controls selections, alarms, enable/disables, delay setpoints, status of equipment, and scaled analog values.
3. Each OI to allow full station operation and adjustment independent of SCADA.

B. Cloud SCADA: Currently, Flygt Advensor system is configured only by Flygt. Contract Flygt vendor for services to configure Advensor Cloud SCADA system for site specific graphics, monitoring, and alarm notification.
   1. SCADA screen graphics, database, and configuration to support remote control of the station/project. Graphic screens shall generally be based on P&ID drawings.
      a. Standard graphics screens for preconfigured process controls
      b. Custom graphics screens for unique items and I/O points as shown on PLC I/O drawings.
   2. Configuration of historian database to log specific datapoints to record station activities and situations.
      a. Analog values and associated alarms.
      b. Digital alarms
      c. Equipment start/stop or open/close.
      d. Time stamp of all events.
   3. Configuration of (voice and/or text) alarm notifications system for all alarms.
      a. Add phone numbers of on-call operations personnel
      b. Add schedule for shifts and responsibilities that are based on a monthly assignable calendar.
      c. Deliver alarm notification messages via email, text message, and voice dial.

PART 3 EXECUTION

3.01 SOFTWARE DEVELOPMENT

A. The programming, setup and configuration of the PLC & OI shall be done by the Application Programmer as defined in [Electrical, General].

B. The PLC & OI shall be ready to be placed in operation at the time of Operational Testing.

C. Do not enable or set any passwords on the PLC software or hardware for this project.

D. Additional Programmer Labor Hours
   1. The Application Programmer shall include in his bid price an additional 32 hours of PLC/OI program configuration changes to be designated by the Engineer or Owner during testing and start-up.

3.02 MEDIUM

A. Provide PLC & OI applications programs on USB Flash Drive media with each submittal. Clearly label drive with station name and contents. Flash drive shall contain the following:
   1. Application program, configuration and data tables.
   2. OI software with graphics and all support files.
   3. These disks and all copyrights shall become the property of the Owner, for its use on this and future projects.

B. In addition, one USB Flash drive of the application PLC & OI programs shall remain on site in the control panel. All programs and files shall be updated each time the Application Programmer modifies the PLC program.

C. Provide two (2) copies of as-installed applications programs printed with standard laser print 8 1/2" x 11" paper at end of project. Insert new print-outs into the Operations and Maintenance manuals. Provide number of copies as specified in [Electrical General, Operations and Maintenance Instructions].

3.03 FIELD ASSISTANCE

A. Provide testing as specified in Electrical Specifications [Factory and Field Testing].

3.04 WARRANTY

A. Troubleshoot and correct all program abnormalities, glitches and bugs uncovered during the warranty period. Provide phone and/or on-site support as required to correct problem(s).

B. Software support which shall be provided by the Application Programmer as it relates to this project:
   1. Free technical software and hardware troubleshooting phone support for a period of one year. Phone support shall be provided directly from the Application Programmer. Phone support shall be available between 8 a.m. and 4 p.m. Pacific Standard Time Monday through Friday.
   2. The Application Programmer shall correct any software configuration error that is discovered within the warranty period, at no additional cost to Owner. Updated documentation for each "operation and maintenance" manual and new USB flash drives of updated software shall be provided for each correction.

END OF SECTION

SECTION 16940
INSTRUMENTATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish, configure, test, commission, and warrant instrumentation as shown in the P&IDs, plans, and/or listed in specification section.

B. Include necessary piping, valves, pressure reducers, mounting brackets or flanges, supports, and anchors to complete installation.

C. Provide sunshades for instrumentation for all instruments that are exposed to direct sunlight.

D. System Integrator selection of instrumentation shall be per manufacturer's recommendation for the application and per specifications. If a manufacturer's recommendation or installation instructions are inconsistent with the Contract installation details or specifications, then the Contractor shall submit an RFI describing the inconsistency. If the inconsistency is due to substitution from the first named equipment, then the responsibility of coordination and any additional cost shall be borne by the Contractor.

E. The Contractor shall coordinate with each supplier of instrumentation to confirm that primary elements are provided in a timely manner, meeting critical path scheduling.

F. The Contractor shall coordinate process connection size, equipment size, and material type, and oversee the installation, calibration, and acceptance testing.

G. Projects that come into contact with drinking water: (NSF-61 certification)
   1. Furnish NSF/ANSI 61 certified products that have undergone testing for any device, valve, instrument, or assembly that will come into contact with drinking water.
   2. The certification determines what contaminants may migrate or leach from the product into drinking water and confirms if they are below the maximum levels allowed to be considered safe.
   3. Flowmeters, pressure transmitters, and chemical analyzers are a few of the products that may fall into this category requirement.

H. Provide all devices, valves, tubing, fittings, wiring, terminal blocks, calibration consumables, initial calibration equipment, accessories, sunshades and enclosures as specified herein and as shown on Contract Drawings.

I. The Contractor shall furnish all tools, calibration equipment, calibration materials, specialized parts and incidentals necessary to integrate the instrument to the application.

J. Contractor shall furnish labor for installation, verification, start-up, calibration, testing and commissioning. Contractor shall prove proper function of instrument prior project completion.

1.02 REFERENCES

A. Electrical Specifications [Electrical General]

B. Electrical Specifications [Factory and Field Testing]

1.03 SUBMITTALS AND DRAWINGS

A. Submit shop documents and drawings for approval in accordance with this subsection and as specified in Electrical Specifications [Electrical General, Submittal Requirements].

B. Submit Operating Instructions (O&M Manuals) for each instrumentation device prior to equipment installation.

1.04 OPERATING AND MAINTENANCE INFORMATION

A. Provide operating instructions as specified in Electrical Specifications [Electrical General, Operating and Maintenance Instructions].

PART 2 PRODUCTS

2.01 QUALITY

A. Electrical Specifications [Electrical General, Quality].

B. All equipment shall be designed and constructed so that in the event of a power interruption, the equipment specified hereunder shall resume normal operation without requiring a manual reset.

C. Signal transmission from remote or field electric and electronic devices shall be 4 20 mA, sourced by a 24 VDC supply internal to the instrument or from a 24 VDC power supply located within the panel that is to receive the signal. Nonstandard transmission methods such as impulse duration, pulse rate, and voltage regulated will not be permitted except where specifically noted.

D. Transmitters or devices located in Class 1, Division 1 hazardous areas shall be rated for hazardous location installations per NEC and UL. Explosion proof enclosures and raceways or current/spark limiting devices located inside or outside of the classified area shall be furnished to comply with code requirements.

E. Outputs of equipment that are not of the standard signals as outlined, shall have the output immediately converted to 4-20 mA signals for remote transmission.

2.02 INSTRUMENT IDENTIFICATION

A. All major instrumentation and equipment items or systems specified in this Division and/or on the P&IDs are identified by tag numbers. Tag field equipment with assigned instrumentation tag number and functional description.
   1. Tags shall be 1/2" stainless steel DYMO impressed tape with 3/16"(minimum) height characters.
   2. Metal tape embosser shall feature a built in hole punching device and scissor cutoff tool.

B. Attach tags to equipment with a 4" long, 20-gage stainless steel wire leash for small devices, or two stainless steel screws for larger instruments; however, such permanent attachment shall not be on an ordinarily replaceable part or in an area that will be subject to unintended overuse fatigue. Make the tag plainly visible.

2.03 LEVEL COMPONENTS

A. Float Switch
   1. Tilting float level switches shall be a mercury free float switch, whose specified weight is less than that of the process liquid displaced, to actuate switches as the level changes. The non-mercury hermetically sealed snap action switch is actuated by a steel ball rolling back and forth within a switching tube in plastic float housing. The SPDT switch shall be rated 16A at 250 VAC shall be integrally mounted in the float and connected to a control box by a PVC jacketed waterproof electric cable with three finely stranded No.17 conductors. The weight shall be integrally mounted so that no metals shall contact the process liquid. Tilting type level switch shall be MJK Model 7030, or equal.

B. Submersible Level Transmitter
   1. The submersible level transmitter shall be 4-20 mA loop powered with integral manufacturer's cable containing electrical conductors and breather tube. The transmitter electronics shall be electrically isolated from the fluid and include lightning protection and a sealed breathing system on the end of the breather tube.
   2. The suspension cable shall be Oil resistant PVC insulated with #20 ga shielded wire cable with integral non-pinch breather tube. The transmitter shall be suspended from the electrical cable.
   3. The calibration of the level transmitter and cable length shall be as shown in the instrument schedule, and available in 0-10ft, 0-15ft, 0-30ft standard ranges.
   4. The body of the transmitter shall be rated IP68 (NEMA 6P) and constructed of polypropylene with a ceramic diaphragm measuring cell. The submersible level transmitter shall be Flygt LU-801, MJK model 3400 or equal.

2.04 PRESSURE COMPONENTS

A. Pressure Transmitter – submergence rated:
   1. Designed to withstand the harsh conditions with ingress protection grades of IP68 (10 ft submersion) and 316SS machined housing.
      a. Utilize absolute pressure transmitters where submergence rating is required.
   2. Display – None.

3. Capacitive ceramic sensor able to measure absolute or gauge pressure available in -15psi to 150psi, to 240psi, to 375psi, or to 600psi ranges.
4. Accuracy: ±0.3% of span.
5. Process temperature: -25 to +100°C (-13 to +212°F)
6. Process connections: ½" MNPT (May be adapted or as coordinated with diaphragm seal)
7. Electrical connection: 4-20ma loop powered, electrically isolated from case, 2-wire twisted pair cable with length as required per application.
8. The compact submersible (threaded connection) pressure transmitter shall be PMC VL1000 Series, or equal.
9. The compact pressure transmitter shall be Endress and Hauser Cerabar PMC 21, or equal.

B. Barometric Air Pressure Sensor Transmitter
1. Measurement of Absolute pressure (atmospheric pressure) for use in barometric offset of absolute pressure submersible level transmitters.
2. Plastic enclosure, NEMA 1, backpan or din rail mounting.
3. Power Supply: 10-30V DC operating voltage
4. Output signal: RS485/4-20mA/O-5V/0-10V signal
5. Accuracy: ±0.15Kpa at 25C and 75Kpa
6. Calibration: 0-120Kpa or 0-17.4psi or similar.
7. PMC, Endress and Hauser, Druck, or equal

C. Isolation Seal:
1. Diaphragm Seal (316SS) -- shall be factory assembled and filled prior to shipment. The fill fluid shall be silicone oil and suitable for the application. The diaphragm seal shall be designed for continuous duty, and shall prevent loss of process fluid if pressure instrument is removed or fails. The diaphragm seal shall feature a flushing connection and flushing ball valve. The diaphragm materials shall be suitable for contact with the measurement liquid without corrosion. The body of the diaphragm seal shall all welded made of 316 stainless steel with removable diaphragm. Instrument connection shall be 1/2-inch NPT. Furnish Ashcroft diaphragm seal Type 203 or equal.

2.05 FLOW COMPONENTS

A. Magnetic Flow Meter:
1. The magnetic flow meter shall consist of a flow tube FE and a converter FIT, complete with interconnecting cables.
2. The magnetic flow meter shall be of the low frequency electromagnetic induction type and shall produce a DC pulse signal directly proportional and linear to the flow rate, with the duration not less than 100 milliseconds. Complete zero stability shall be an inherent characteristic of the metering system. Meters requiring field zero adjustment will not be acceptable. The meter accuracy shall not be affected by changes in fluid pressure, temperature, viscosity, or conductivity.
3. Accuracy
   a. The maximum error of the complete metering system including flow element and flow indicating transmitter shall be 0.50% of actual flowrate (in specified units) and readout over the range of full scale velocity settings from 1 to 30 feet per second. Variations in temperature, voltage,

and frequency within the ranges listed herein shall not affect the overall measuring accuracy.

b. Measured variables: volume flow, mass flow, and conductivity indications and signal transmission outputs as required and shown in the P&IDs. Accuracy on conductivity shall be 5% of range.

c. Suitable for 0xDN applications where inlet and outlet straight pipe length pipe requirements are 1 pipe diameter or less. Flowmeter inaccuracy shall not exceed 0.75% of actual flowrate over the range 0.5 to 1 M/S and 0.5% for 1 to 30 feet per second.

4. Flow Element (FE)

a. The flow element shall be based on a carbon steel pipe spool (full continuous diameter, non-constricted) with ANSI class 150 flange connections or be flangeless construction as required by mechanical drawings. Class 300 flanges shall be provided where shown or when the pressure and temperature of the process fluid exceeds the rating of a 150 lb flange. The flow element size shall be as shown in the mechanical drawings and listed in the Instrumentation Schedule. Flange type and bolt pattern shall be coordinated with the mechanical Contractor prior to submittal.

b. The flow element shall have Hastalloy C4 coil and grounding electrodes.

c. Stainless steel grounding rings shall be provided at both ends of the flow element for all flowmeter applications. Grounding rings shall be manufactured from stainless steel, 2 to 4 mm thickness with grounding tab for electrical wire connection, and fit within the flange bolt circle to self center it within pipe.

d. The flow element internal liner material shall be hard rubber, unless recommended otherwise by the manufacturer for the application and approved.

e. Nema rating as defined in the Instrumentation Schedule.

5. Flow Indicating Transmitter (FIT)

a. The electronic flow indicating transmitter shall be mounted remotely from flow tube as shown on Contract drawings.

b. The electronic transmitter shall be provided in a NEMA rated enclosure per the Instrumentation Schedule.

c. The transmitter shall be interchangeable with all sizes of flow elements and shall be field replaceable (without replacing flow element) in the event of transmitter failure.

d. The transmitter shall be microprocessor controlled, utilizing digital signal processing with automatic zero correction to provide a linear 4 20 mA signal proportional to flow rate.

e. The transmitter shall incorporate a high impedance amplifier of 100,000 Megohms or greater, eliminating the need for electrode cleaning systems.

f. The transmitter shall contain a self test mode to allow the operator to manually simulate the output 4 20 mA signal to any value between 0% and 100% to check out any driven devices in the loop.

g. Rate indicator and totalizer: An alphanumeric LCD backlit display shall be provided to continuously display the flowrate and totalizer with units and all programming functions.

h. All programming configuration of the Flowmeter shall be completed through the transmitter's pushbutton interface. A communication device shall not be necessary to configure the flow transmitter.

i. PC based software shall be available and included for configuration and troubleshooting. Connection to flowmeter shall be via computer USB port and include interface cables as required.

j. The transmitter shall be designed for operation from a power source of 120 volts AC, with a power consumption of less than 20 watts. The flow element shall be powered from the transmitter.

k. The transmitter shall operate continuously without fault in an ambient temperature range from 14 to 140 °F. The flowmeter shall be suitable for operation in direct sunlight without the use of a sunshade. If a sunshade becomes required after installation for any operational reason, one shall be furnished and installed free of charge.

l. The following configurable parameters shall be provided at a minimum:
   1) Field adjustable flow signal dampening.
   2) Low flow cutoff (forces zero flow signal) between 0.0-5.0% of full scale rate.
   3) Empty pipe detection (forces zero flow signal) if the pipe is not full.
   4) Selection for forward/reverse/both flow directions.

6. Flow Indicating Transmitter (FIT) I/O Interface
   a. Flow Signal: 4-20 mA signal proportional to the flow. The signal shall be field configurable for the flow calibration specified and others within the flow tube accuracy range. The flow signal shall be capable of measurement for forward and reverse flows combined by offsetting zero to mid scale (12 mA).

7. If the flow indicating transmitter (FIT) is shown in the Contract drawings to be mounted remotely from the flow element (FE), the manufacturer shall provide all cabling between flow element and flow indicating transmitter.

8. All mounting hardware and/or devices necessary to complete the installation shall be provided by the manufacturer at no additional cost to the Owner.

9. The meter shall be hydraulically calibrated at a facility located in the United States and the calibration shall be traceable to the National Bureau of Standards. A certified copy of the calibration test results shall be submitted to the Owner prior to shipment of the meter.

10. The magnetic flowmeter shall be Endress and Hauser Promag, or equal.

2.06 EVENT, STATE OR POSITION DEVICES

A. Position Switch:

1. Door switch – door intrusion switch shall have a wide gap magnetic sensor with S.P.S.T. contacts mounted in an aluminum housing with integral jacketed cable for wiring to a junction box. Switch contacts shall have 0.1A at 120VAC minimum capability. When attaching to a ferrous metal surface, space sensor components away from metal by minimum ¼" using plastic spacer in order to maintain magnetic gap. Intrusion door switches shall be Sentrol 151-6Z-12K or equal.

B. Smoke Detector:

1. General
   a. The smoke detector shall detect smoke produced by fire and signal an alarm system. The detector shall be housed in a flame retardant plastic

housing and shall be unaffected by vibration. Detector shall be sealed against dirt, insects and back pressure

b. Detector shall utilize photoelectronic sensor technology.

c. The detector/base shall be 120V, four-wire operation with built-in Form A and Form C dry contacts. Form A contact shall be rated for 2.0A at 30VAC/DC. Form C contact shall be rated for 2.0A at 30VAC/DC and 1.0A at 120VAC.

d. The detector shall have an operating temperature 32 to 120°F and an operating humidity of 10 to 93% relative humidity.

e. The detector shall have built-in test switch (magnetic proximity actuation) and 360 degree view angle of built-in alarm LEDs.

f. The detector shall be approved by UL and Factory Mutual and meet requirements of NFPA 72.

2. The fire alarm smoke detector shall be photoelectric type. The smoke detector shall be System Sensor 100 Series model 2151 with B114LP base, Gentex 8000 Series with 120VAC base, or equal.

2.07 INSTRUMENTATION SUN PROTECTION

A. Instrument Sunshade

1. Provide wall mount bracket or pole mounted sunshade where instruments are exposed to direct sunlight. Sunshades shall be fabricated from stainless steel with hinged rubber flap on front for viewing of displays and performing calibrations. Sunshade shall be custom manufactured for the instrument protected and sized such that there is 3" free space around sides and front of instrument.

2.08 INSTRUMENTATION SCHEDULE

A. The Instrumentation Schedule (attached to this section) is intended to be a summary of instrumentation equipment required. Not all instrumentation details are shown on the schedule. Some requirements may be shown in the Instrumentation Schedule such as enclosure rating and instrument span that are not described in the specifications. Both are required for a complete specification.

B. If an instrument is shown in the P&IDs or indicated on Drawings, then the device shall be provided whether or not it is shown on the Instrumentation Schedule.

PART 3 EXECUTION

3.01 WORKMANSHIP

A. Instrumentation work shall conform to workmanship standards specified in Electrical Specifications [Electrical General, Workmanship].

B. The Contractor shall employ personnel who are skilled and experienced in the installation and connection of equipment defined in this section. Contractor qualifications are specified in Electrical Specifications [Electrical General].

C. Verify that all equipment and materials fit properly.

D. All instrumentation configuration, programming and calibration shall be completed prior to the start of field tests.

E. Equipment without approved submittals shall not be installed.

F. All equipment shall be properly stored indoors while awaiting installation. Protect installed equipment from construction debris or mishaps. The Contractor will replace any equipment that is not in new condition at the time of installation and/or start-up.

G. Perform work to remedy non-compliant installations after inspection.

3.02 INSTALLATION

A. Install and supply all products necessary to provide an operational instrumentation system. This shall include the following:
   1. Contract Drawings are intended to show the basic functional requirements of the instrumentation system. Insufficient detail does not relieve the Contractor from the responsibility to provide a complete and functioning system. If additional detail or clarification is required, the Contractor shall request such information prior to installation.
   2. Provide relays, signal converters, isolators, boosters, power conditioners, circuit cards, and other miscellaneous devices as required for the compatible and functional interface.
   3. Provide analog loop isolators where required to eliminate "ground loops."
   4. The instrumentation and accessory equipment shall be installed in accordance with the manufacturer's instructions and located as shown on the Drawings or as approved. When manufacturer's installation literature specifies a particular location or orientation in a process line due to measurement accuracy considerations, the installation shall be in conformance with the manufacturer's instructions.

B. Instrument installation methods.
   1. Install instruments at the location shown on the Plans or approved. Instruments enclosures shall be NEMA rated for the installed location.
   2. Install level and plumb.
   3. All instruments shall be provided with floor stands or wall brackets as shown in installation details or as required for functional installation.
   4. Mounting stands shall be custom manufactured of aluminum channel with base plate unless otherwise noted in installation detail.
   5. Mounting channels (unistrut), and spacers shall be galvanized steel above ground outdoors and stainless steel below ground (wetwell), unless otherwise noted in installation details.
   6. All screws, bolts and anchors shall be stainless steel.

C. Wiring and raceway installation methods:
   1. Terminal blocks shall be provided at all instrument cable junctions and all wires shall be identified at such junctions.
   2. Instrumentation wiring shall be run without splices between instruments, terminal boxes, or panels.

D. Wiring, grounding, and shielding: The following practices shall be observed unless modified by manufacturer's standards.
   1. Each electronic equipment chassis shall be grounded to power ground.
   2. Shielded twisted pair, shielded triad, or manufacturer supplied cables only shall be used for analog signals and communications signals.
   3. Drain wire of shielded cables used for analog inputs to the PLC shall be connected at the PLC unit only. Shield shall be isolated from ground at all other termination points including transmitters.
   4. Drain wire of shielded cables used for analog outputs from the PLC shall be connected at signal receiving device only. Shield shall be isolated from ground at all other termination points.
   5. If electrical interference noise is imposed on DC status and alarm signals, then they shall be re-routed or wire changed to shielded twisted pair cables.
   6. Each shield drain wire which is not connected to ground shall be cut off covered with a heat shrink insulating boot at cable jacket end. Shields shall be connected together at each transition from one cable to another for an effectively continuous shield circuit.

3.03 SUPPLIER SERVICES

A. The Contractor shall be responsible for each supplier of equipment to provide the following minimum services for each type of instrument supplied. Each supplier shall provide a qualified instrumentation field technician to perform services listed herein. Contractor shall supply all calibration materials necessary to commission unit and shall not use any consumable materials that are intended to be furnished for the first period of use.
   1. Advise and instruct Contractor on proper installation requirements.
   2. Inspect, calibrate, test, and place equipment in operation. Calibrate instruments to values as shown in the instrument index or as noted herein. If instrument spans are required to change (within instrument range) during startup for process reasons, the Contractor shall change them as directed by the Engineer.
   3. Programmable devices shall be programmed and tested prior to startup. Programming shall be adjusted or changed as directed by the Engineer at any time prior to final acceptance.
   4. Perform testing in the presence of Engineer.
   5. Visit the project site as often as required and spend as much time as necessary to ensure accurate and operational instrumentation.
   6. Provide training as specified in FIELD ASSISTANCE.

3.04 FIELD ASSISTANCE

A. The instrument supplier shall provide a minimum of one (1) hour of field training to instruct Owner’s personnel in the use, operation, calibration, programming, and maintenance on each type of "field" instrument.

3.05 SPARE PARTS

A. Provide spare parts as described in each products section herein and specified in Electrical Specifications [Electrical General, Spare Parts].

B. Contractor shall supply all calibration materials necessary to commission unit and shall not use any consumable materials that are intended to be handed over to the Owner as defined in the instrument specifications.

3.06 WARRANTY

A. Provide warranty as specified in Electrical Specifications [Electrical General, Warranty].

3.07 FINAL ACCEPTANCE

A. Final Acceptance per Electrical Specifications [Electrical General].

3.08 ATTACHMENTS

A. Instrumentation Schedule.

END OF SECTION

16940 INSTRUMENTATION INDEX

DWG # P&ID	Tag No.	DESCRIPTION	Type	Specification Section	Min. NEMA Rating	Size	SP/ Range	Units	DWG. DET. Reference	Notes
I-02	FE/FIT 71	Flow Indicating Transmitter	Magnetic	16940-2.05 A	4X	12"	0-2500	GPM	FM/FLG	
I-02	LSL 52	Level Switch	Float	16940-2.03 A	-	-	-	-	WWE / FSD	30 Ft. Cable
I-02	LSH 53	Level Switch	Float	16940-2.03 A	-	-	-	-	WWE / FSD	30 Ft. Cable
I-02	LSHH 54	Level Switch	Float	16940-2.03 A	-	-	-	-	WWE / FSD	30 Ft. Cable
I-02	LSH 55	Level Switch	Float	16940-2.03 A	-	-	-	-	WWE / FSD	30 Ft. Cable
I-02	LT 51	Level Transmitter	Submersible	16940-2.03 B	-	-	0-25	FT	PLT	30 Ft. Cable
I-02	PT 61	Pressure Transmitter	Gauge	16940-2.04 A	IP68	-	0-150	PSI	PT	Diaphragm Seal
I-02	PT 62	Pressure Transmitter	Guage	16940-2.04 B	1	-	0-17.4	PSI	Panel	barometric
I-03	SS 98	Smoke Detector	photo	16940-2.06 B	1	-	-	-	Ceiling Mount	
I-03	ZS 91 A	Door Switch	magnetic	16940-2.06 A	1	-	-	-	Door	
I-03	ZS 91 B	Door Switch	magnetic	16940-2.06 A	1	-	-	-	Door	
I-03	ZS 91 C	Door Switch	magnetic	16940-2.06 A	1	-	-	-	Door	
I-03	ZS 91 D	Door Switch	magnetic	16940-2.06 A	1	-	-	-	Door	

APPENDIX A

Geotechnical Investigation
San Juan Pump Station Wet Well And Valve Vault

GEOTECHNICAL INVESTIGATION

CITY OF BELMONT
SAN JUAN PUMP STATION WET WELL AND VALVE VAULT
BELMONT, CALIFORNIA





Prepared for:
SCHAAF AND WHEELER
4699 Old Ironsides Drive, Suite 350
Santa Clara, California 95054
March 2025

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

646 University Avenue ¦ Los Gatos, California 95032 ¦ (408) 354-5542
6417 Dogtown Road ¦ San Andreas, California 95249 ¦ (209) 736-4252 Fax (209) 736-1212
699 Hampshire Road, Suite 102 ¦ Thousand Oaks, California 91361 ¦ (805) 370-8710

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

March 17, 2025
E6025
By Email (bshick@swsv.com)

Mr. Ben Shick
Vice President
SCHAAF AND WHEELER
4699 Old Ironsides Drive, Suite 350
Santa Clara, CA 95054

SUBJECT: **Geotechnical Investigation**
RE: San Juan Pump Station Wet Well and Valve Vault
Belmont, California

Dear Mr. Shick:

Cotton, Shires and Associates, Inc. (CSA) is pleased to submit the following report in which we describe the findings, conclusions and recommendations of our geotechnical investigation for a proposed wet well installation at the San Juan Pump Station located on East Laurel Creek Road in Belmont, California. This investigation was performed in accordance with our revised proposal to you dated September 10, 2024.

In this report, we characterize the geotechnical conditions underlying the proposed wet well, and provide conclusions and recommendations regarding geotechnical hazards, soil parameters and design criteria, and site excavation.

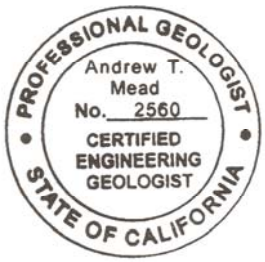
We appreciate the opportunity to have been of service to you on this project. If you have any questions regarding this report, please feel free to call us.



Sincerely,
COTTON, SHIRES AND ASSOCIATES, INC.

David T. Schrier
Principal Geotechnical Engineer
GE 2334

Andrew T. Mead
Principal Engineering Geologist



GEOTECHNICAL INVESTIGATION
San Juan Pump Station Wet Well and Valve Vault
Belmont, California

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APPENDIX A - Field Investigation and Logs of Exploratory Borings

Field Investigation A-1
Logs of Exploratory Borings ..... Follows A-1

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Summary of Sieve Analysis ..... Follows B-1

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GEOTECHNICAL INVESTIGATION
San Juan Pump Station Wet Well and Valve Vault
Belmont, California

1.0 INTRODUCTION

1.1 Project Description

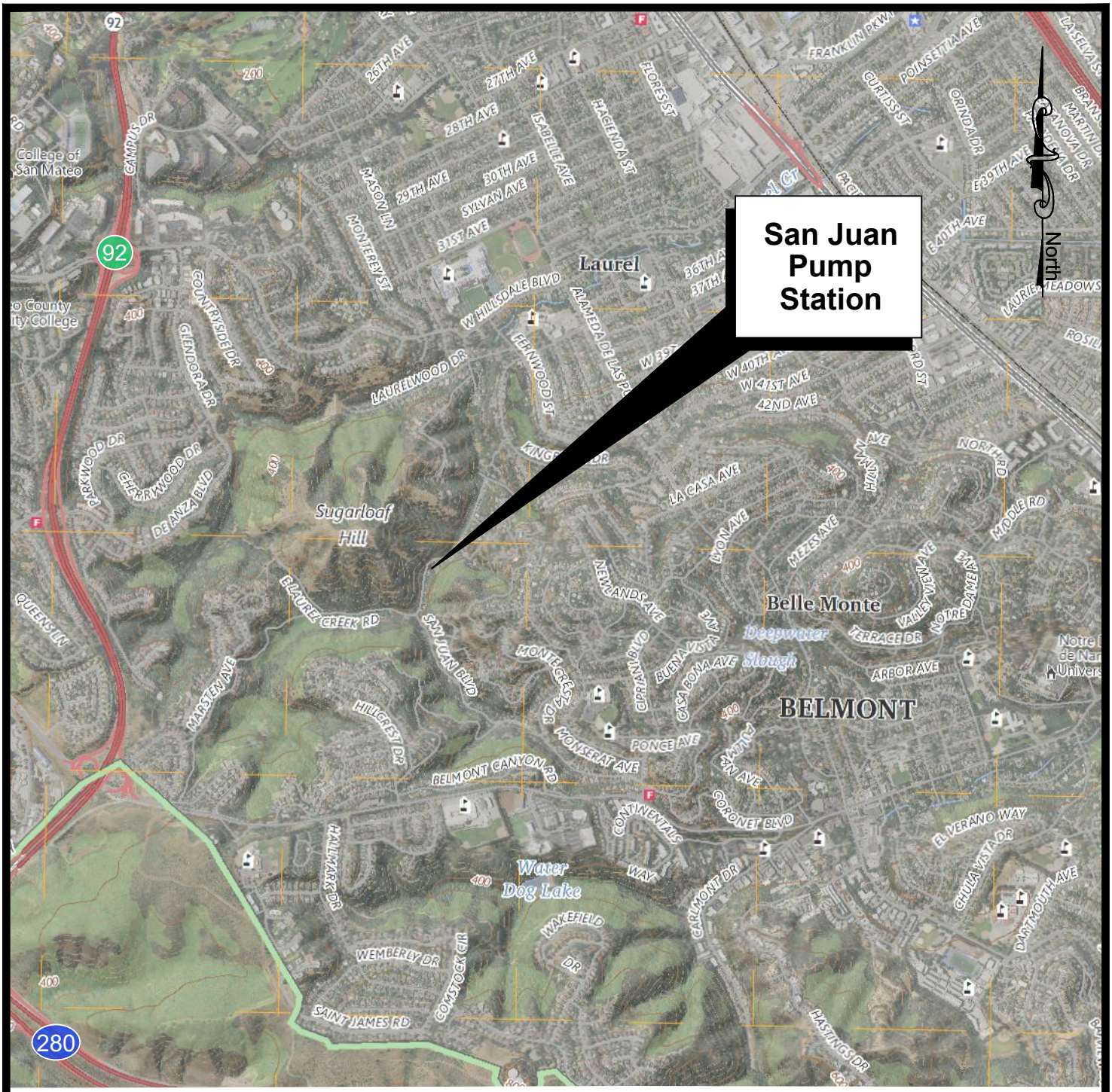
In this report, Cotton, Shires and Associates, Inc. (CSA) is pleased to present the results of our geotechnical investigation for a proposed wet well and valve vault at the San Juan Pump Station located on East Laurel Creek Road in Belmont, California, as shown on the attached Site Location Map, Figure 1. We performed this investigation between February and March of 2025 in accordance with our revised proposal dated September 10, 2024.

We anticipate that the proposed wet well project will consist of excavating (or drilling) a roughly 15-foot deep hole in the driveway area of the San Juan Pump Station, installing the (concrete, steel, fiberglass, or polymer) wet well structure, and backfilling to fill the void space between the wet well structure and the sides of the excavation.

Between 2003 and 2004, CSA completed a geotechnical investigation at the San Juan Pump Station for developing recommendations to mitigate creek bank instability potentially impacting the pump station. We understand that in 2006 a portion of the southeastern side of the pump station was underpinned with 7-foot deep piers, and the creek bank along the northeastern side of the pump station was improved with 16, 30-foot long soldier pile piers. We also understand that in 2022, WM Tucker prepared plans to extend the 2006 soldier pile wall southward, with nine, 35-foot deep soldier pile piers.

1.2 Purpose and Scope of Work

The purpose of our geotechnical investigation was to: 1) investigate the subsurface conditions at the proposed wet well location; and 2) develop conclusions and recommendations regarding: geotechnical hazards; groundwater conditions; subsurface earth material conditions; site grading; and design criteria for lateral wall earth pressures, bearing capacity for foundation loads, and coefficient of friction.



Source: San Mateo 7.5' quadrangle, San Mateo County, California, U.S. Geological Survey, dated 2025



Source: Google Maps

0 1000 2000 4000

(feet)

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

SITE LOCATION MAP
San Juan Pump Station
BELMONT, CALIFORNIA

GEO/ENG BY	SCALE	PROJECT NO.
CSS	1"=2000'	E6025
APPROVED BY	DATE	FIGURE NO.
DTS	March 2025	1

The specific scope of work performed for our investigation included the following tasks:

1) Review regional geologic maps;
2) Geotechnical reconnaissance to layout boring location, prepare a City encroachment permit, and the mark boring location for USA;
3) Applying for a San Mateo County drilling permit;
4) Contract with a private utility locator;
5) Subsurface investigation;
6) Laboratory testing;
7) Geotechnical analysis; and
8) Preparation of this Geotechnical Investigation report.

2.0 PHYSICAL AND GEOLOGIC SETTING

2.1 Terrain

The pump station is located in a narrow canyon, along the western bank of East Laurel Creek, and surrounded by steep slopes to the southeast, west, and northwest. The station is located at the base of a drainage descending from the steep slope northwest of the site. The station is situated on the eastern side of East Laurel Creek Road, approximately 800 feet north of the intersection with San Juan Boulevard, as shown on Figure 1. The site is located on a cut-fill pad approximately 19 feet above the bottom of the adjacent Laurel Creek channel. The overall creek bank slopes are as steep as 35 degrees. The elevation at the pump station is approximately 185 feet.

2.2 Geologic Setting

The San Juan Pump station is located near the base of the Santa Cruz Mountains within the Coast Range Geomorphic Province, not far from the transform fault boundary between the Pacific and North American tectonic plates.

The site is mapped as being underlain by slope wash debris (Qsr) which is mapped along the channel and banks of East Laurel Creek. The slopes surrounding the pump station are mapped as Franciscan Complex sandstone (on Regional Geologic Maps, see Figure 2). Based on our engineering geologic mapping the pump station is located on a lobe/fan of

slope debris issuing from the drainage northwest of the site. The pump station is located on a cut/fill pad that was constructed on the lobe/fan of slope debris and blocks of asphaltic concrete and fill material were observed below the pump station along the west bank of E Laurel Creek.

The adjacent creek bank is actively eroding/slumping and encroaching toward the San Juan Pump Station building, and several landslides have been mapped on the adjacent creek bank and surrounding steep slopes (San Juan Canyon Geologic Map, Figure 3).

2.3 Seismic Setting

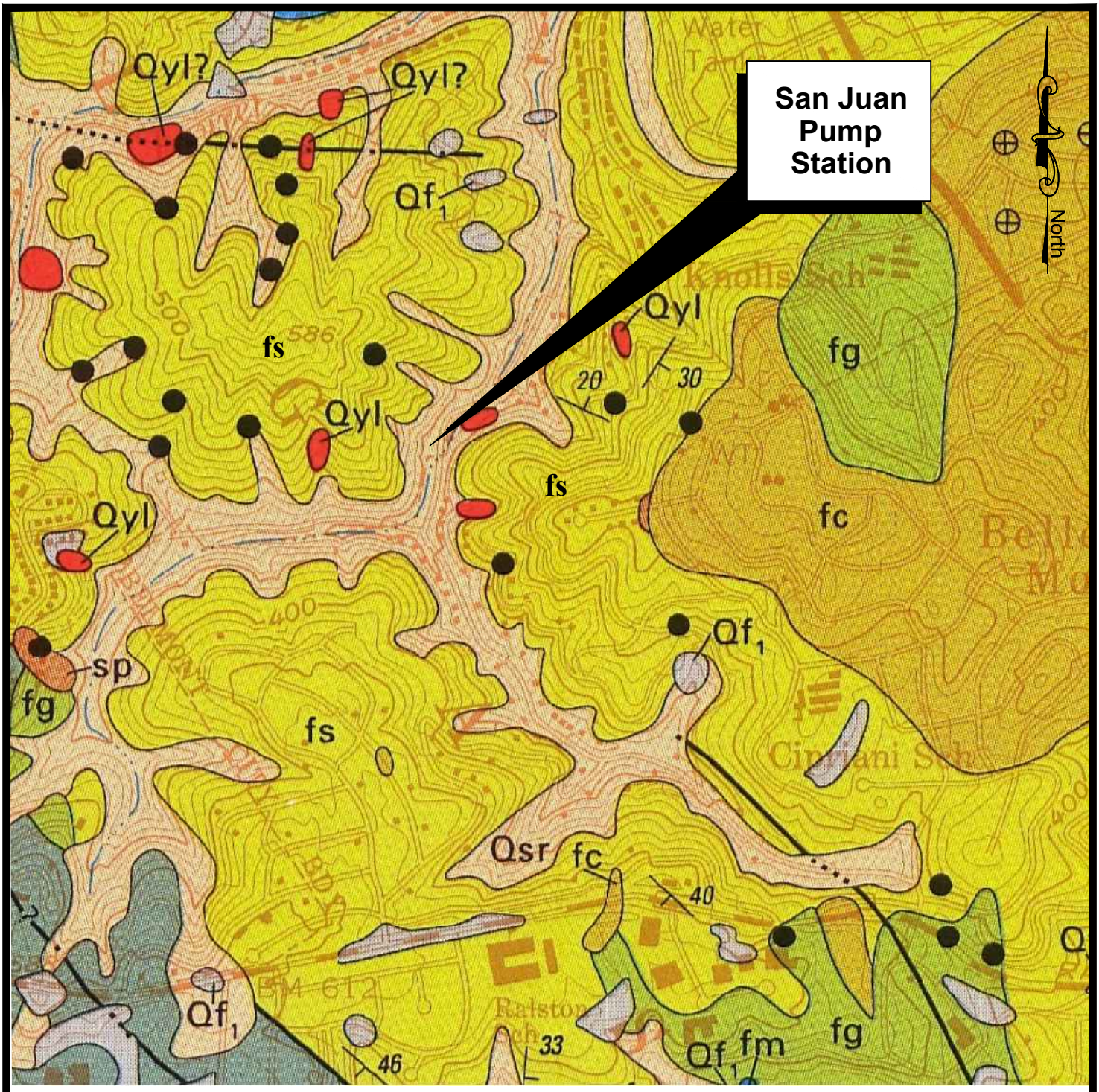
The subject site is situated in an area of high seismicity. The nearest and controlling fault, with respect to site ground shaking is the San Andreas Fault with an estimated slip rate of over 5 mm per year and located approximately 2.1 miles (3.4 km) southwest of the site.

2.3.1 Peak Ground Acceleration - We calculated the peak ground acceleration at the site employing the Structural Engineers Association of California Seismic Design Map Tool (https://seismicmaps.org), for the 2016 ASCE/SEI 7-16 and 2022 ASCE/SEI 7-22 Standards. The results of our analysis indicate an appropriate Peak Ground Acceleration (PGA_M) of 0.94g (ASCE 7-22) to 1.01g (ASCE 7-16).

3.0 SITE CONDITIONS

3.1 Surface Conditions

The proposed wet well is located at the driveway entrance to San Juan Pump Station, located on East Laurel Creek Road (Figure 4, Engineering Geologic and Boring Location Map). The pump station is presently improved with single-story wood-framed buildings, buried utilities, a buried dry well, paved parking area, fences, and a soldier pile retaining wall along the top of the creek bank. The pump station is situated in a residential neighborhood, and bordered by East Laurel Creek Road to the west and East Laurel Creek to the east. Mature trees surround the pump station.



Source: Geologic Map of the Montara Mountain and San Mateo 7.5' quadrangle, San Mateo County, California, U.S. Geological Survey, dated 1994

EXPLANATION

SURFICIAL DEPOSITS

- Qf1 — Artificial Fill
- Qsr — Slope wash, ravine fill, and colluvium
- Qyl — Younger Landslide Deposits

FRANCISCAN COMPLEX BEDROCK

- fc — Chert
- fg — Greenstone
- fs — Sandstone

MAP SYMBOLS

- Geologic Contact, dashed where inferred
- Fault, dashed where inferred, dotted where concealed
- Shallow landslide, commonly in surficial materials
- Bedrock orientation (strike and dip)

0 250 500 1000
(feet)

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

REGIONAL GEOLOGIC MAP
San Juan Pump Station
BELMONT, CALIFORNIA

GEO/ENG BY	SCALE	PROJECT NO.
CSS	1"=500'	E6025
APPROVED BY	DATE	FIGURE NO.
DTS	March 2025	2

3.2 Subsurface Conditions

We explored the subsurface conditions at the proposed San Juan Pump Station wet well by means of one, 27.5-foot deep small-diameter boring (CSA/SD-4). We have also previously explored the subsurface conditions in the vicinity of the soldier pile wall by means of three small-diameter borings drilled to depths of 20 feet to 32.5 feet (CSA/SD-1 to CSA/SD-3). We also prepared a cross section to depict the materials encountered in our boring for the proposed wet well (Figure 5, Engineering Geologic Cross Section A-A'). Log of Boring CSA/SD-4, is included in Appendix A. In the following section we list the borings and summarize the materials encountered in each:

3.2.1 CSA/SD-1 to CSA/SD-3 (Previous Borings) – In our previous borings drilled at the San Juan Pump Station, we generally encountered 6.75 feet to 8 feet of sandy silty fill overlying silty sand/sandy silt alluvium, to a depth of 19 to 21 feet. Underlying the alluvium, we encountered siltstone/sandstone bedrock of the Franciscan Complex which extended to the bottom of the borings.

3.2.2 CSA/SD-4 (Recent Boring for Wet Well) - CSA/SD-4 was located in the driveway, at the approximate wet well location. In Boring CSA/SD-4 we encountered about 3 inches of Asphaltic Concrete pavement overlying about 2 feet of artificial fill consisting of very stiff sandy clay. Below the fill, we encountered slope debris consisting of medium stiff to very stiff sandy clay and medium dense clayey sand.

3.2.3 Laboratory Testing - We performed laboratory tests on relatively undisturbed and disturbed samples obtained from our boring. Those tests included natural moisture content, in-situ unit weight of the soil, sieve analysis, Atterberg limits, and triaxial compression shear. Based on the results of these tests, the fill material has a moderate moisture content (12.2 percent), and low dry unit weight (101.5 pcf); while the underlying slope debris has moderate to high moisture contents (10.0 percent to 20.9 percent), moderate to high dry unit weights (106.6 pcf to 118.4 pcf), low plasticity (LL=26, PI=11), and moderate undrained shear strength (Su=2,123.5 psf). The clayey sand between 8 and 12 feet has moderate fines content (40.2 percent).



Source: Engineering Geologic Map, San Juan Canyon Study Area, Cotton, Shires and Associates, dated July 1984

EXPLANATION

Af	Artificial Fill	KJfg	Franciscan Greenstone
Col	Colluvium	KJfc	Franciscan Chert
Al	Alluvium		Boundary of Landslide Deposit
Als	Active Landslide		Approximate Location of reported shallow landslide
Dls	Dormant Landslide		
KJfs	Franciscan Sandstone		

See source for more detailed descriptions

0 250 500 1000
(feet)

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

SAN JUAN CANYON GEOLOGIC MAP
San Juan Pump Station
BELMONT, CALIFORNIA

GEO/ENG BY CSS	SCALE 1"=500'	PROJECT NO. E6025
APPROVED BY DTS	DATE March 2025	FIGURE NO. 3

The results of the laboratory tests performed on representative samples are presented on the boring logs in Appendix A (Field Investigation) and in Appendix B (Laboratory Testing).

3.3 Groundwater Conditions

Groundwater, in the vicinity of the pump station, was previously encountered at depths of 20 feet, 21 feet and 19 feet in Borings CSA/SD-1, CSA/SD-2, and CSA/SD-3, respectively. In our recent boring (CSA/SD-4) we encountered groundwater at a depth of 19 feet. Groundwater levels may vary with time and location depending on rainfall and runoff. During our recent site reconnaissance, the creek had approximately 1-1.5 feet of water.

It should be understood that fluctuations in groundwater levels could occur from variations in rainfall, flooding and other factors. Groundwater levels may be different at different times, climatic conditions and locations.

4.0 POTENTIAL GEOTECHNICAL HAZARDS

In the following section, we list identified potential geotechnical hazards at the proposed wet well site along with the corresponding degrees of determined potential risk and recommendations for possible mitigation measures.

4.1 Seismic Hazards

Seismic ground shaking associated with a large earthquake on the San Andreas Faults is considered to be a **high** potential hazard in the project area. Peak ground accelerations up to 1.01g should be anticipated at the site (see report Section 2.3).

Based on our review of geologic maps reviewed for the project, it appears that the proposed wet well at the San Juan Pump Station does not cross a mapped active fault. We consider the potential for surface faulting and ground rupture at these areas to be **low**.

Seismically-induced ground failure mechanisms include: landsliding, liquefaction, lateral spreading, lurching, and differential compaction. The proposed wet well is surrounded

Col.

Qsd

Af

Af

Af

Col.

Col.

A

A'

San Juan
Pump Station

FINISH FLOOR: 184.85'

CSA/SD-4

Laurel
Creek
Road

Area of Proposed
Wetwell and Valve
Vault

Laurel Creek

ROAD

CREEK

LAUREL

EAST

220
210
200
190
180
170

0 10 20 40
(feet)

North

EXPLANATION

Earth Materials

- Af — Artificial Fill
- Col — Colluvium overlying Franciscan Complex bedrock
- Qsd — Slope Debris

Map Symbols

- CSA/SD-4 — 2025 Small-Diameter Exploratory Boring Location
- A A' — Engineering Geologic Cross Section Location
- LiDAR topographic contours
- Surveyed topographic contours
- Fill Slope
- Geologic Contact, dashed where approximate

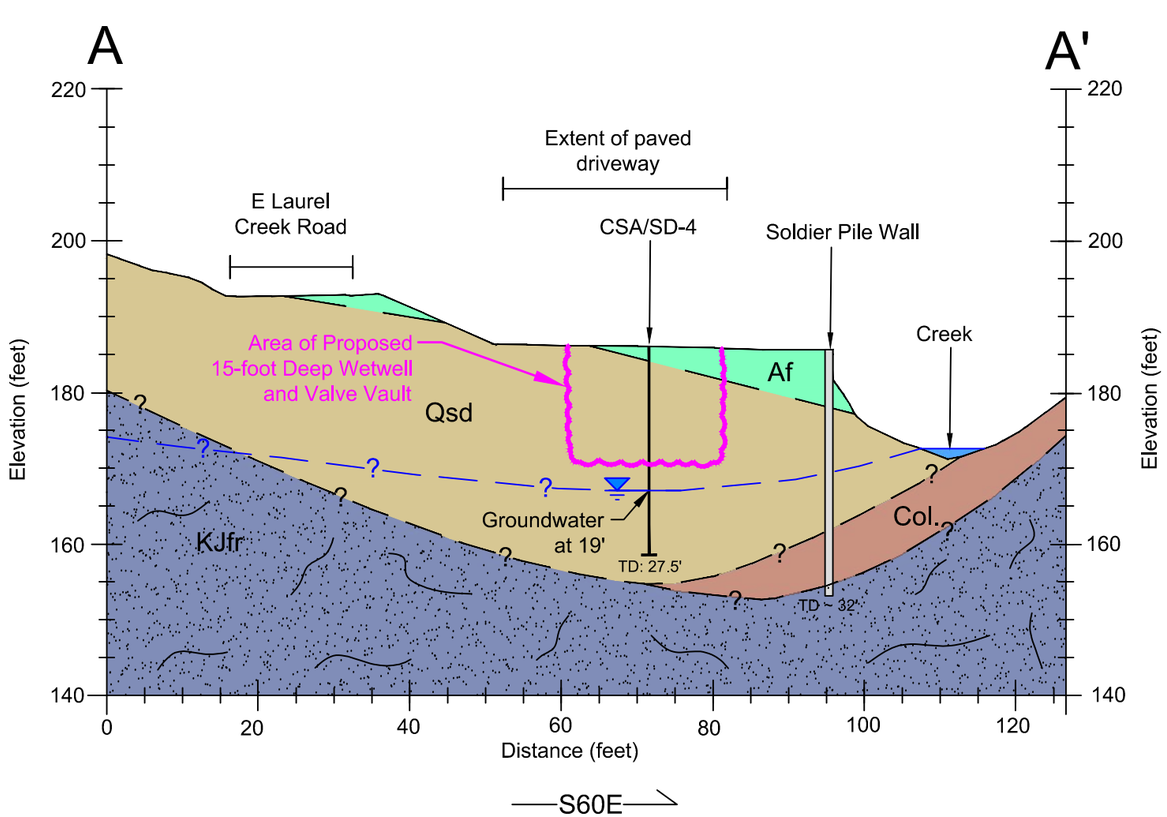
LiDAR Source: 2017 San Mateo County Lidar

Survey Source: Topographic Map of San Juan Pump Station, San Mateo, CA, by Cinquini & Passarino, Inc., dated February 7, 2025

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

ENGINEERING GEOLOGIC AND BORING LOCATION MAP
San Juan Pump Station
BELMONT, CALIFORNIA

GEO/ENG BY	SCALE	PROJECT NO.
CSS	1"=20'	E6025
APPROVED BY	DATE	FIGURE NO.
DTS	March 2025	4



EXPLANATION

Earth Materials

- Af — Artificial Fill
- Col — Colluvium
- Qsd — Slope Debris
- KJfr — Franciscan Complex Bedrock

Symbols

- CSA/SD-4 / TD: 27.5' — 2025 Small-Diameter Exploratory Boring Location
- Geologic Contact, dashed where approximate, queried where uncertain
- Groundwater Level, dashed where approximate, queried where uncertain

COTTON, SHIRES AND ASSOCIATES, INC.
CONSULTING ENGINEERS AND GEOLOGISTS

ENGINEERING GEOLOGIC CROSS SECTION A-A'
San Juan Pump Station
BELMONT, CALIFORNIA

GEO/ENG BY	SCALE	PROJECT NO.
CSS	1"=20'	E6025
APPROVED BY	DATE	FIGURE NO.
DTS	March 2025	5

by steep slopes, including the adjacent unstable creek bank (recently improved with a soldier pile retaining wall). Furthermore, regional and local geologic maps have identified landslides on the opposite bank and upslope of the pump station (Figures 2 and 3). Consequently, the potential for seismically induced landsliding to impact the proposed wet well would typically be considered high; however, assuming that the recently constructed soldier pile retaining wall has adequately stabilized the creek bank, the potential for seismically induced landsliding to impact the proposed wet well is now estimated to be **low to moderate.**

Soil liquefaction is a phenomenon in which a saturated, cohesionless, near-surface soil layer loses strength during cyclic loading (such as that typically generated by earthquakes). During the loss of strength, the soil develops mobility sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are loose, saturated, fine-grained sands and non-plastic silts and clays that are generally located within 50 feet of the ground surface.

In our Boring CSA/SD-4, we generally encountered non-liquefiable clay except for a roughly 4-foot thick layer of clayey sand between depths of 8 feet and 12 feet. The sandy layer has 40 percent fines and is located above the depth of groundwater, encountered at 19 feet in our recent boring and slightly deeper in previous borings. Consequently, the potential for liquefaction of sandy soils below the water table and dynamic dry densification of soils above the water table is considered to be **low** at the proposed wet well location.

Based on our calculations, the 4-foot thick sandy layer encountered in our Boring CSA/SD-4 between depths of 8 feet and 12 feet with a blow count of 13 and 40% fines has a **low** potential for dynamic dry densification (Idriss, Boulanger, 2008).

Due to the absence of liquefiable soils encountered above the adjacent East Laurel Creek channel elevation, the potential for lateral spreading to impact the wet well is **low.**

Due to the very stiff consistency of the near-surface soils encountered at the wet well site, there is a **low** potential that the near-surface clayey soil could lurch and compress under seismic loads, settle differently, and result in differential movement/compaction.

The significant potential seismic hazard to the proposed wet well is seismic induced landsliding of the adjacent creek bank, which should be mitigated by the recently constructed soldier pile retaining wall. Our investigation did not include an evaluation of the recently designed and constructed retaining wall. We recommend that the Project Engineer evaluate the soldier pile wall design, and confirm with the City that the retaining wall was constructed as designed.

4.2 Landsliding

Based on our review of regional and local published geologic maps of the area, there are no landslides mapped at the wet well site. We also did not observe signs of landslides during our site visits.

4.3 Potentially Challenging Construction Aspects

We have identified a couple of potentially challenging aspects of the proposed wet well construction including the following: 1) we encountered a large rock at a depth of about 7 feet in our boring, the Contractor should anticipate encountering other large rocks during excavation; and 2) we encountered 2 feet of fill in our recent boring, and we anticipate that the fill is thicker/deeper closer to the creek bank. Consequently, the Contractor should anticipate a thicker layer of undocumented fill closer to the creek bank, and excavations in this material may not be stable and could require shoring.

The Contractor should photo document the pre- and post-construction conditions around the San Juan Pump Station, and place settlement monuments along the building foundations. The monuments should be monitored daily, and if settlement or displacement in excess of 3/4 inch is measured, the construction should be halted and mitigation measures installed to protect the existing building.

5.0 GEOTECHNICAL RECOMMENDATIONS

5.1 Temporary Shoring Design for the Wet Well

5.1.1 Active Pressures - In designing the active pressures for the shoring for the wet well excavations, we recommend that the following parameters be used for the various earth materials encountered in our borings:

Fill/Slope Debris Wet Well (0-15 feet) – Active Pressures

Moist Unit Weight (γ)	130 pcf
Cohesion (C)	0 psf
Friction Angle (ϕ)	28^0

None of the above values have been reduced or include a factor of safety.

5.1.2 Passive Pressures - In designing the shoring for the wet well excavation, we recommend that the following equivalent fluid passive pressures be used:

In upper 2 feet of the excavation/pit bottom	0 pcf
Below 2 feet of the excavation/pit bottom (factor of safety = 1.5)	475 pcf

5.1.3 Surcharge Loading – Shoring should also be designed to support surcharge loads, including the following:

Construction Vehicles (within a 1:1.5 slope of the pit bottom)	85 psf
Stockpiled Soil (within a 1:1.5 slope of the pit bottom)	35H psf

(H is the height of the stockpile in feet)

5.2 Wet Well Structure Design

We recommend that the wet well structure be designed for an allowable bearing pressure (factor of safety = 2.5) of 2,500 psf for dead-plus-live loads, assuming it is embedded at least 15 feet below existing ground surface (if shallower, please contact us for supplemental recommendations). Resistance to lateral loads, when founded in undisturbed soil, should be calculated using a base friction coefficient of 0.23 (includes a factor of safety = 1.5). Lateral loads can also be resisted by an equivalent fluid passive pressure of 475 pcf if the wet well structure is poured neat against the excavation or if the

void between the wet well structure and the shoring is filled with lean concrete or CLSM/CDF. Based on a bearing pressure of 2,500 psf, and an assumed 5-foot diameter footing, we calculate an immediate elastic settlement of 1/2 inch.

5.3 Active, Passive and Seismic Pressures on Wet Well Wall

The following active and passive pressures should be used for the design of the permanent wet well walls:

Lateral Active Pressure - In designing the wet well wall, we recommend that the following equivalent fluid active pressures be used:

Cantilevered walls [equivalent fluid pressure] ..... 45 pcf
Internally braced wall [uniform lateral pressure] ..... 70 psf

Surcharge Loading - [uniform lateral pressure]

Construction Vehicles (within a 1:1.5 slope of the pit bottom) ..... 85 psf
Stockpiled Soil (within a 1:1.5 slope of the pit bottom) ..... 35H psf
(H is the height of the stockpile in feet)

Lateral Passive Resistance - In designing the dry well wall, we recommend that the following equivalent fluid passive pressures be used:

In upper 2 feet of the well bottom ..... 0 pcf
Below 2 feet of the well bottom (factor of safety = 1.5) ..... 450 pcf

Seismic Load – The wet well wall should be designed to resist a triangular seismic earth pressure acting on the cantilevered (active) portion equal to ..... 24 H^2 pcf

5.4 Site Grading

The following recommendations should be followed as part of site grading, including excavating the wet well:

5.4.1 Clearing and Site Preparation - All asphaltic concrete, concrete, baserock, loose material, debris, and other deleterious material should be stripped and removed

from the areas to be excavated. This material should be disposed of in a suitable location off-site.

5.4.2 **Excavation** - The wet well should be excavated as necessary for design depths and grades, including appropriate bedding thickness. Based on the materials encountered in our borings, temporary excavations may not "stand" (remain open) after excavation and will therefore likely require shoring immediately upon excavation, especially during wetter months. Excavations in the upper 15 feet should be within the capabilities of standard excavation equipment (i.e., backhoes and excavators).

5.4.3 **Compacted Fill** – In general, excavated on-site material may be used as fill provided it is free of organic material and contains no materials larger than 4 inches in size. Imported fill should be non-expansive and free of organic material; it should contain no material larger than 4 inches in size, and have a Plasticity Index of less than 15.

Backfill should be placed in horizontal lifts not exceeding 8 inches in thickness in a loose state; moisture conditioned to at least optimum moisture content and, where the trench depth exceeds 3 feet, compacted in lifts to at least 90 percent relative compaction based on ASTM D1557 (most recent version). Within the upper 3 feet of trench backfill (from the road/parking surface), each lift of the trench backfill should be compacted to at least 95 percent relative compaction. Equipment and methods should be used that are suitable for work in confined areas without damaging the pipe, manholes, and other structures.

Grout slurry, CLSM or CDF are acceptable backfill alternatives from a geotechnical standpoint; however, they are typically more costly, more difficult to excavate, will require that the excavated material be off-hauled and disposed of in a suitable location, and placement of the pavement section should be delayed until the grout sets.

5.5 Pavement Design

The replacement pavement section should be (at a minimum) according to the City standard pavement section, even if the existing section does not meet the standard; however, where the existing pavement section exceeds the City standards, the section should be replaced "in kind" with what was removed.

Asphaltic concrete should be placed and compacted in accordance with the requirements of Section 39 of the Caltrans Standard Specifications; aggregate baserock should conform to the provisions of Section 26 (Caltrans) for 3/4-inch maximum Class 2 Aggregate Base, and should be compacted to at least 95 percent relative compaction based on ASTM D-1557-12 rather than Caltrans Method 216.

5.6 Construction Considerations

Excavations should be cleaned of all loose material prior to the placement of concrete or bedding or the wet well structure, and they should be pumped dry if water is present. Alternatively, the concrete can be poured by tremie methods to displace the water, and the displaced water should be collected and not allowed to discharge into the creek channel.

As previously indicated, the excavating Contractor should plan on shoring the excavation, and the shoring should assume an OSHA Soil Classification Type B.

5.7 Seismic Design

A peak ground acceleration of 1.01g (ASCE 7-16) or 0.94g (ASCE 7-22) should be anticipated for design purposes at the site. Based on our geotechnical investigation, the site location and our interpretation of the 2022 CBC and the ASCE 7-16 and ASCE/SEI 7-22 online tool and Hazard Report, we are providing the following parameters recommendations from the corresponding figures and tables:

Parameter	ASCE 7-16 Value
Risk Category	IV
Soil Classification	D
Mapped Spectral Acc. 0.2 Sec. (g)	S_S = 2.143
Mapped Spectral Acc. 1 Sec. (g)	S_1 = 0.89
S_{MS} = FaSs	2.143
S_{M1} = $F_V S_1$	N/A
S_{DS}=2/3 S_{MS}	1.429
S_{D1}=2/3 S_{M1}	N/A
T_L	12
PGA_M	1.01g

F_{PGA}	1.1
Seismic Design Category	-

Parameter	ASCE 7-22 Value
Risk Category	IV
Soil Classification	CD
Mapped Spectral Acc. 0.2 Sec. (g)	S_S = 2.48
Mapped Spectral Acc. 1 Sec. (g)	S_1 = 0.97
S_{MS} = FaSs	2.66
S_{M1} = F_vS_1	1.93
S_{DS}=2/3 S_{MS}	1.77
S_{D1}=2/3 S_{M1}	1.29
T_L	12
PGA_M	0.94g
Vs_{30}	365 m/s
Seismic Design Category	F

5.8 Technical Review

Supplemental geotechnical design recommendations should be provided by our firm based on specific design needs developed by the other project design professionals. This report, and any supplemental recommendations, should be reviewed by the contractor as part of the bid process. It is strongly recommended that no construction be started nor grading undertaken until the final drawings, specifications, and calculations have been reviewed and approved in writing by a representative of **Cotton, Shires and Associates, Inc.**

5.9 Earthwork Construction Inspection and Testing

All excavations should be inspected by a representative of **Cotton, Shires and Associates, Inc.** prior to backfilling of excavations. Any grading should also be inspected and tested as appropriate to assure adequate stripping and compaction. Our office should be contacted with a minimum of 48 hours advance notice of construction activities requiring inspection and/or testing services and a minimum of 72 hours advance notice and provision of representative laboratory compaction curve samples for testing of fill.

6.0 INVESTIGATION LIMITATIONS

Our services consist of professional opinions and recommendations made in accordance with generally accepted engineering geology and geotechnical engineering principles and practices. No warranty, expressed or implied, or merchantability of fitness, is made or intended in connection with our work, by the proposal for consulting or other services, or by the furnishing of oral or written reports or findings.

Any recommendations and/or design criteria presented in this report are contingent upon our firm being retained to review the final drawings and specifications, to be consulted when any questions arise with regard to the recommendations contained herein, and to provide testing and inspection services for earthwork and construction operations. Unanticipated soil and geologic conditions are commonly encountered during construction that cannot be fully determined from existing exposures or by limited subsurface investigation. Such conditions may require additional expenditures during construction to obtain a properly constructed project. Some contingency fund is recommended to accommodate these possible extra costs.

This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are called to the attention of the project architect and/or engineer and incorporated into the plans. Furthermore, it is also the responsibility of the owner, or of his representative, to ensure that the contractor and subcontractors carry out such recommendations in the field.

7.0 REFERENCES

ASCE 7 Hazard Tool, Online Application, ASCE/SEI 7-16.

Bowles, J.E., Foundation Analysis and Design, Third Edition, 1982, McGraw-Hill Book Company, Page 184, and Tables 2-6 and 2-7.

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U. S. Department of the Navy, 1982, Design Manual Soil Mechanics, Foundations, and Earth Structures, NAVFAC DM-7.2.

APPENDIX A

Field Investigation
Logs of Exploratory Borings

APPENDIX A
FIELD INVESTIGATION

We explored subsurface conditions at the proposed San Juan Pump Station wet well, on February 12, 2025 by means of one boring drilled to a depth of 27.5 feet using a track-mounted solid stem drilling equipment. The location of the boring is shown on the attached Engineering Geologic and Boring Location Map, Figures 4. The geologist who logged the boring visually classified the soils in accordance with ASTM D-2487. We obtained relatively undisturbed samples of the materials encountered at selected depths. These samples were obtained in brass/steel liners that were 2.5 inches in outside diameter and 6 inches long; the liners were placed inside a 3-inch diameter modified split-barrel California Sampler for sampling. The sampler was driven with a 140-pound hammer that was raised by an automatic hammer and allowed to freely fall about 30 inches. We also performed Standard Penetration Tests at selected depths. The depths of the sampling are shown on the boring logs. The circled number at the conclusion of the sampling interval represents the corrected blow count from a modified California sampler to Standard Penetration Test value accomplished by multiplying the blow count by a factor of 0.68.

Descriptive logs of the borings are presented in this appendix. These logs depict our interpretation of the subsurface conditions at the dates and locations indicated, based on representative samples collected at roughly five-foot sampling intervals. It is not warranted that they are representative of subsurface conditions at other times and locations. The contacts on the logs represent the approximate boundaries between earth materials, and the transitions between these materials may be gradual.

COTTON, SHIRES AND ASSOCIATES, INC.

LOG OF EXPLORATORY DRILLING

Project San Juan Pump Station Wet Well — **Boring** CSA/SD-4

Location Paved Driveway, near gate/fence — **Project No.** E6025

Drilling Contractor/Rig Britton Exploration/Track Rig — **Date of Drilling** 2/12/25

Ground Surface Elev. 188' — **Logged By** CSS — **Hole Diameter** 6", solid stem auger

Surface Asphaltic Concrete — **Weather** Foggy, 50s

Depth (feet)	Graphic Log	USCS Class.	Geotechnical Description	Sample Desig.	Dry Unit Weight(pcf)	Moisture Content (%)	SPT Blows/ft	Sample Type	Recov. (%)	Remarks
			0.0' - 0.25' ASPHALTIC CONCRETE							Driller: Sergio
			0.25' - 2' ARTIFICIAL FILL							Helper: Manuel
2			0.25' - 2.0' Sandy Clay, dark brown, very stiff, moist, loose, trace rootlets	T-1			5	MC		Start 8:35
				T-2	101.5	12.2	7			
							9			
							(11)			
		CL	**2' - BOH SLOPE DEBRIS**							
4			2.0' -8.0' Sandy Clay, brown, very stiff, moist, trace rootlets	T-3	118.4	10.0	8	MC		
				T-4			10			LL=26, PI= 11
							11			
							(14)			
6							9			
			@7.25' Sandstone clast, red brown, medium dense, moist, fine grained	T-5			17	MC		
				T-6	117.9	10.8	20			
8							(25)			Adds Water
		SC	8.0' - 12.0' Clayey Sand, brown, medium dense, wet							
10										
				T-7			6	MC		Sieve Analysis: 59.8%
12			12.0' - 26.5' Sandy Clay, brown to grey, stiff, wet	T-8	111.8	17.1	9			Sand, 40.2% Fines
							11			TX/UU Su= 2,123 psf (2,512 psf)
							(13)			Adds Water
14										
16		CL		B-1			6	SPT		
							10			
							12			Adds Water
18							(22)			
			19.0' - Groundwater at time of drilling							
20										
				T-9	106.6	20.9	5	MC		
22				T-10			6			
							7			(9)
				B-2			3	SPT		
							4			
24							5			
							(9)			
26			26.5' - BOH Sandy Clay, brown to gray, medium stiff to stiff, saturated, trace coarse sand and gravel	T-11			4	MC		
				T-12			5			
							8			
28			Bottom of Hole - 27.5 Feet				(9)			End: 9:45
			Groundwater encountered at 19.0 Feet							
			Hole backfilled with grout							

Sheet 1 of 1

APPENDIX B

Laboratory Testing
Unconsolidated Undrain Triaxial Shear Testing
Sieve Analysis

APPENDIX B
LABORATORY TESTING

The laboratory analysis performed for the site consisted of limited testing of the principal soil types sampled during the field investigation to evaluate index properties and strength parameters of subsurface materials. The soil descriptions and the field and laboratory test results were used to assign parameters to the various materials at the site. The results of the laboratory testing program are presented in this appendix and on the boring logs.

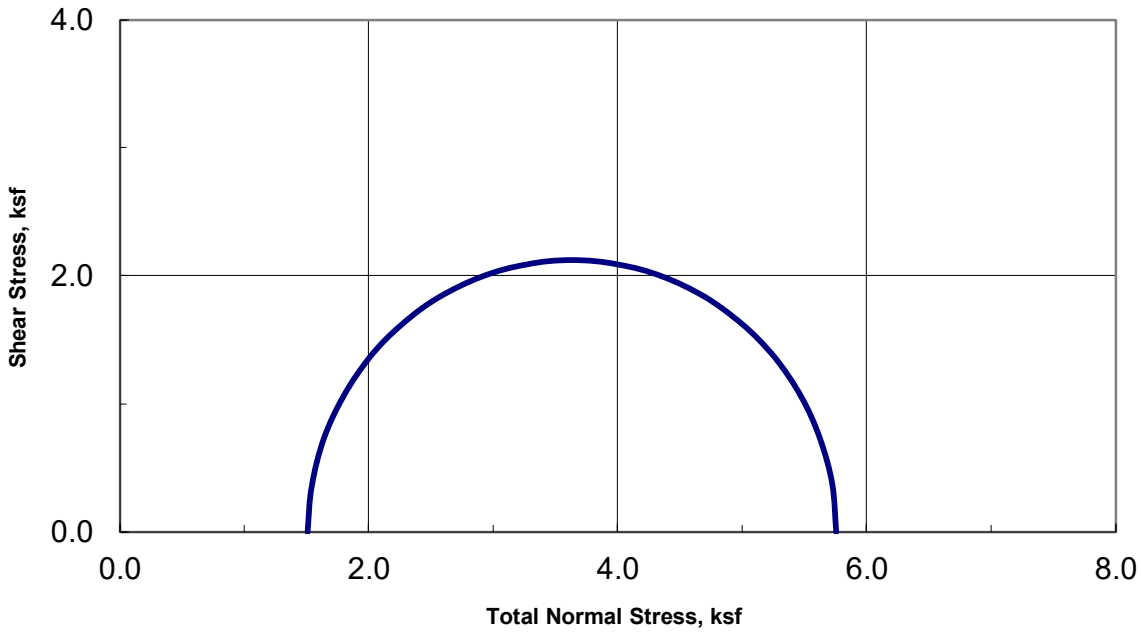
The following laboratory tests were performed as part of this investigation:

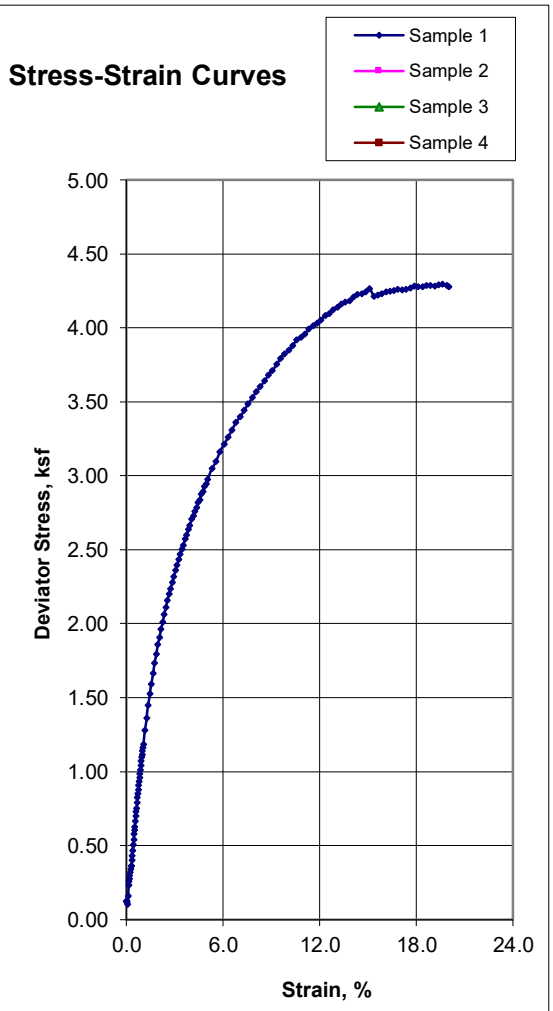
1. Detailed soil description, ASTM D2487;
2. Natural moisture content of the soil, ASTM D2216;
3. In-situ unit weight of the soil (wet and dry);
4. Particle size ASTM D422;
5. Atterberg limits determination: ASTM D 4318; and
6. Unconsolidated undrained triaxial shear test, ASTM D2850

Cooper Testing Labs, Inc.
937 Commercial Street
Palo Alto, CA 94303

COOPER TESTING LABORATORY

Unconsolidated-Undrained Triaxial Test
ASTM D2850





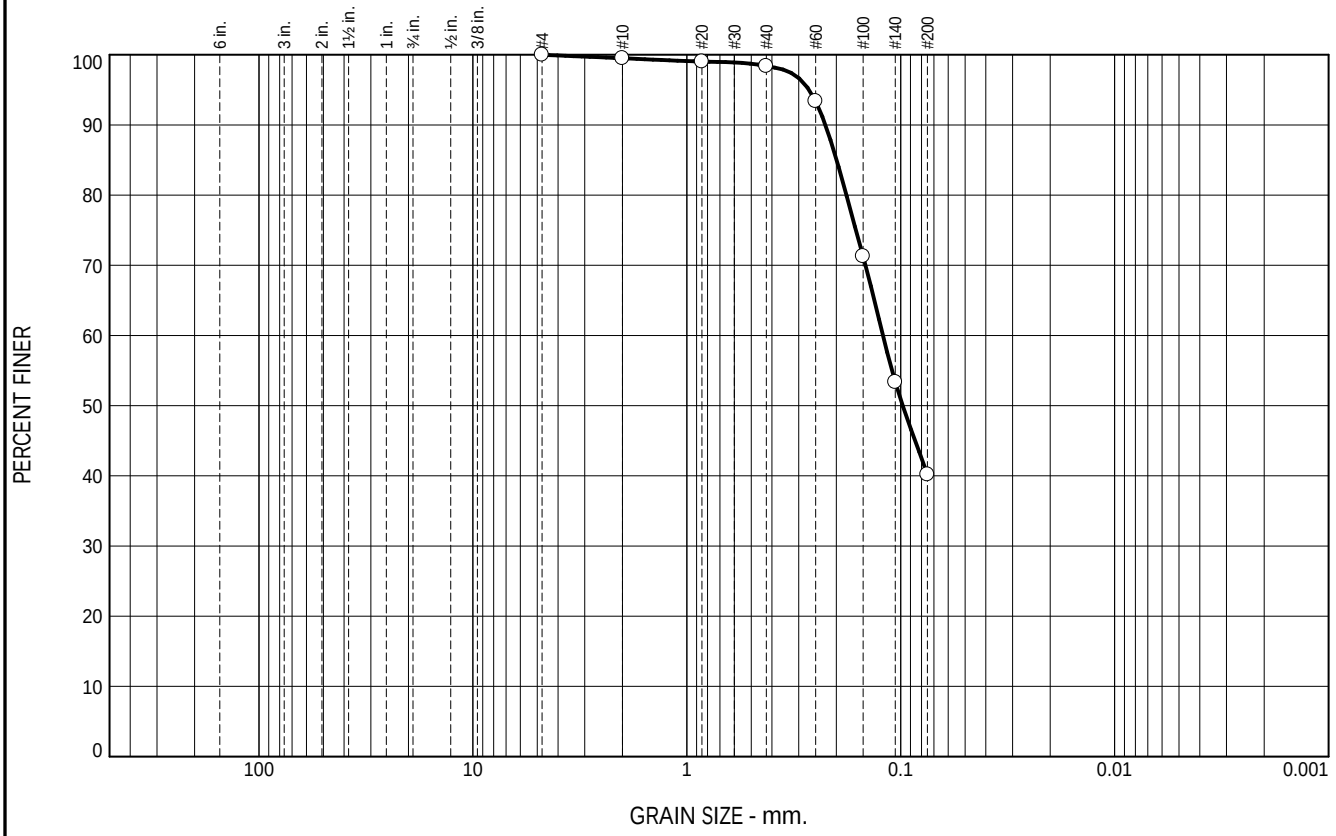
Sample Data	1	2	3	4
Moisture %	17.1			
Dry Den,pcf	111.8			
Void Ratio	0.508			
Saturation %	90.7			
Height in	5.06			
Diameter in	2.40			
Cell psi	10.5			
Strain %	15.00			
Deviator, ksf	4.247			
Rate %/min	1.00			
in/min	0.050			
Job No.:	026-799			
Client:	Cotton, Shires & Associates			
Project:	E6025			
Boring:	T-8			
Sample:				
Depth ft:	12			

Visual Soil Description	
Sample #	
1	Grayish Brown Sandy SILT
2	
3	
4	

Remarks:

Note: Strengths are picked at the peak deviator stress or 15% strain which ever occurs first per ASTM D2850.

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PL	PI
○	0.0	0.0	59.8	40.2					

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.1210		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#10	99.5		
#20	99.0		
#40	98.4		
#60	93.4		
#100	71.3		
#140	53.4		
#200	40.2		

Material Description

○ Brown Silty SAND

REMARKS:

○

○ Source of Sample: T-7 Depth: 11.5-12'

COOPER TESTING LABORATORY

Client: Cotton, Shires & Associates

Project: San Juan Pump Station - E6025

Project No.: 026-799 Figure

APPENDIX B

Structural Evaluation For
San Juan Pump Station

STRUCTURAL EVALUATION REPORT

FOR

SAN JUAN SEWER PUMP STATION



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05/23/25

May 23, 2025

Job #: 25-002

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Appendix A: ASCE/SEI 41-17 Checklists

Appendix B: FEMA P-154 Data Collection Forms

Appendix C: Supporting Calculations

1.0 Introduction

The purpose of this project is to perform a structural evaluation of the existing City of Belmont San Juan Sewer Pump Station. This evaluation included a review of as-built drawings for the building and a site visit to observe the current structural condition of the building. Subsequently, PASE also completed a seismic risk assessment of the building including a Tier 1 Screening per ASCE/SEI 41-17 and a Level 1 and Level 2 Rapid Visual Screening per FEMA P-154. This report presents the results of our structural evaluation.

2.0 Definitions

The following terms are defined as follows in ASCE/SEI 41-17 Section 1.2.1:

Basic Performance Objective for Existing Buildings (BPOE): A series of defined Performance Objectives based on a building's Risk Category meant for evaluation and retrofit of existing buildings.

Benchmark Building: A building designed and constructed or evaluated to a specific Performance Level using an acceptable code or standard.

BSE-1E: Basic Safety Earthquake-1 for use with the Basic Performance Objective for Existing Buildings, taken as a seismic hazard with a 20% probability of exceedance in 50 years, but not greater than the BSE-1N, at a site.

Building Type: A building classification that groups buildings with common seismic-force-resisting systems and performance characteristics in past earthquakes.

Immediate Occupancy: The postearthquake damage state in which a structure remains safe to occupy and essentially retains its preearthquake strength and stiffness.

Level of Seismicity: A degree of expected seismic hazard. Levels are categorized as very low, low, moderate, or high, based on mapped acceleration values and site amplification factors.

Performance Level: A limiting damage state used in the definition of Performance Objectives (including the Structural Performance Level for structural building components and the Nonstructural Performance Level for nonstructural building components).

Performance Objective: One or more pairings of a selected Seismic Hazard Level with both an acceptable or desired Structural Performance Level and an acceptable or desired Nonstructural Performance Level.

Risk Category: A categorization of a building for determination of earthquake performance based on the governing regulation, building code, or policy or in lieu of an applicable regulation, building code, or policy, ASCE 7.

3.0 Building Description

San Juan Sewer Pump Station is a one-story, L-shaped building with a wood roof, reinforced masonry walls, and concrete foundations. The northwest portion of the current building was originally designed and constructed prior to 1977 (no as-built drawings are available). A major building expansion and modification was then designed in 1977 and subsequently constructed (as-built drawings are available). The as-built drawings note "All new work shall conform to the requirements of the 1973 edition of the Uniform Building Code." Further modifications (including converting the pump room to a wet well, converting the comminutor room to a storage/work room, and other upgrades) were then constructed at some time after 1977 (date of modifications unknown with no as-built drawings available). The current building is about 32'-0" in each principal direction with a pump room above the wet well, a storage/work room, and an electrical/generator room. Photos 1 – 3 show interior views of the three rooms.

From the available as-built drawings, the building foundation appears to be a combination of shallow concrete footings, slabs-on-grade, and below-ground concrete walls and mat slab at the wet well. The masonry walls consist of 8" concrete block (presumably solid-grouted) with #4 at 24" on center (o.c.) vertical bars and 2-#4 at either 32" or 40" o.c. horizontal bars. The wood roof consists of 2x8 joists at 16" o.c. with ½" CDX plywood roof sheathing and 5/8" gypsum board on the ceiling, and it is covered by tar and gravel roofing. The existing roof diaphragm construction appears to also include wall anchorage at 8'-0" o.c., drag struts running across the diaphragm to interior masonry shear walls, and diaphragm cross ties.



Photo 1: Interior of Pump Room above the Wet Well



Photo 2: Interior of Storage/Work Room



Photo 3: Interior of Electrical/Generator Room

4.0 Overview of Structural Evaluation

Our structural evaluation of the building consisted of the following three tasks:

1. Conduct a site visit to the building and assess the current structural condition of the building. See Section 5.0 of this report.
2. Perform a seismic risk assessment of the building by completing a Tier 1 Screening per ASCE/SEI 41-17. See Section 6.0 of this report.
3. Perform a seismic risk assessment of the building by completing a Level 1 and Level 2 Rapid Visual Screening per FEMA P-154. See Section 7.0 of this report.

Based on the results of these assessments, recommended repairs and retrofits are discussed in Section 8.0 of this report.

5.0 General Structural Evaluation

On May 8, 2025, PASE personnel (Tim Elliott, S.E. and Alex Hoglund) conducted a site visit to the pump station and performed a visual observation of the structural and nonstructural components that were visible and accessible to them. This included the complete exterior of the building and the interior of the three rooms. We were not able to observe the roof framing due to the existing ceiling gypsum board. We also did not access the roof of the building or the below-ground wet well. PASE also reviewed the as-built drawings for the building by Richard M. Trainer Engineers Inc. (and subconsultants) that are dated March 9, 1977.

The purpose of the site visit was to observe the existing construction and structural condition of the building and to document any visible construction errors or areas of deterioration. Our site visit identified the following minor areas of concern:

1. There is corrosion on the steel crane beam, support beams, and piping in the pump room above the wet well (see Photo 1).
2. Vents in the exterior roof soffits seem small and partially blocked by paint or other debris (see Photo 4).
3. Rooftop communications equipment is possibly not anchored and/or braced adequately.



Photo 4: Typical Soffit Vent

6.0 ASCE/SEI 41-17 Seismic Risk Assessment

ASCE/SEI 41-17, *Seismic Evaluation and Retrofit of Existing Buildings*, is a standard used by structural engineers, building code officials, and building owners wishing to assess the seismic resilience of existing buildings. It includes several different procedures to use in the evaluation and retrofit process which involve various levels of effort and knowledge about the building. For this project, PASE performed a Tier 1 Screening evaluation procedure, defined by ASCE/SEI 41-17 as a "Completion of checklists of evaluation statements that identify potential deficiencies in a building based on performance of similar buildings in past earthquakes." The Tier 1 procedure is a preliminary screening tool by which seismic deficiencies can be identified in the structural systems and nonstructural components in a building. The procedure uses checklists and requires only minimal structural calculations allowing for a rapid evaluation of the building.

The following is a summary of the evaluation criteria used on this project:

1. Risk Category: IV (Essential Facility).
2. Performance Objective: Basic Performance Objective for Existing Buildings (BPOE).
3. Structural Performance Level: Immediate Occupancy.
4. Nonstructural Performance Level: Position Retention.
5. Seismic Hazard Level: Basic Safety Earthquake-1 (BSE-1E).
6. Level of Seismicity: High.
7. Building Type: Reinforced Masonry Bearing Walls with Flexible Diaphragms (RM1).
8. Evaluation Procedure: Tier 1 Screening Procedure.
9. Benchmark Building? No.

The Tier 1 checklists that PASE completed based on these criteria are shown in Appendix A. Supporting structural calculations are provided in Appendix C. Structural deficiencies identified in the checklists are as follows:

1. Wall Anchorage: the existing wall anchors at 8'-0" o.c. (shown on the as-built drawings) are not adequate. See the calculations in Appendix C.
2. Plan Irregularities: the closest cross-tie in the east-west direction is about 2'-6" away from the reentrant corner.

Nonstructural component deficiencies identified in the checklists are as follows:

1. Generator exhaust piping is unbraced.
2. Other piping, conduits, lighting, junction boxes, etc. are unbraced.
3. Electrical equipment and rooftop communications equipment may not be anchored and/or braced adequately.
4. Cabinets in the storage/work room appear to be unanchored.

See Section 8.0 for further discussion of these deficiencies and for recommended retrofits.

7.0 FEMA P-154 Seismic Risk Assessment

FEMA P-154, *Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook*, contains "…recommended methodology for rapid visual screening of buildings for potential

seismic hazards." Like ASCE/SEI 41-17, the rapid visual screening (RVS) procedure uses straightforward data collection forms that depend on the seismicity of the site. However, the result of the RVS forms is a Final Score that is determined based on the building type Basic Score and Score Modifiers (positive features of the building which add to the score and building irregularities or deficiencies which subtract from the score). The Final Score (S) can then be used to determine the Probability (P) of significant structural damage to the building or collapse of the building if it is subjected to the Maximum Considered Earthquake (MCE) currently used in national design and evaluation standards.

The data collection forms that PASE completed are shown in Appendix B. Starting with the Basic Score for Reinforced Masonry with Flexible Roof Diaphragms (RM1), we then applied the appropriate Score Modifiers including a negative value for the plan irregularity (reentrant corner) and positive values for redundant shear walls, roof-to-wall ties, and full-height interior walls. The net result is a Final Score (S) of 1.5. The Probability (P) is calculated based on S as follows:

$$P = 1 / 10^{S}$$

So, the probability of significant building damage or building collapse in a rare earthquake is 1 in 32 or about a 3% chance of that occurring. FEMA P-154 suggests a Final Score of 2 as a "cut-off" score with scores of 2 or less indicating that a building requires further seismic evaluation. However, due to the small size of the building, it is our professional opinion that acceptable seismic performance can be expected, and further study is not warranted.

8.0 Discussion and Recommendations

The two main structural issues identified in the ASCE/SEI 41-17 and FEMA P-154 seismic risk assessments are 1) the inadequate anchorage of the masonry walls to the wood roof diaphragm and 2) the reentrant corner due to the L-shaped plan layout of the building (plan irregularity).

The existing wall anchors do not have the required strength per ASCE/SEI 41-17. Two additional issues also exist from ASCE 7-16 Section 12.11.2 as follows:

1. Since the anchor spacing exceeds 4 feet, the existing wall must be able to span between the anchors. It is likely that the wall does not have the capacity to do this.
2. The wall anchors are installed on only one side of the roof joists. This introduces an eccentric load into the joists for which they were likely not originally designed.

Therefore, PASE recommends that the existing wall anchors be supplemented with additional new wall anchors. This should include both 1) an additional anchor on the opposite side of the joists from the existing anchor (to correct the eccentric loading issue) and 2) additional anchors (with blocking and strapping where required) in between the existing anchors (to correct the capacity and spacing issues). This retrofit work will require removal and replacement of portions of the existing ceiling gypsum board.

The reentrant corner plan irregularity is inherent to the original design of the building and is not easily remedied. Significant modifications to the building would be required to completely remove the reentrant corner which would not be either practical or straightforward. The normal

design approach with a reentrant corner is to ensure that the strength of the roof diaphragm is developed at the interior corner (typically with blocking and strapping in a wood diaphragm). Therefore, PASE recommends that an additional new wall anchor be installed in the east-west direction at the reentrant corner with blocking and strapping all the way across the diaphragm.

With regards to the other deficiencies noted in this report, PASE recommends the following:

1. Anchor and brace all non-structural components including the generator fuel and exhaust piping, other piping, electrical conduits and equipment, lighting, storage cabinets, rooftop equipment, etc.
2. On the steel crane beam, support beams, and piping in the pump room above the wet well, remove the existing peeling paint and corrosion and recoat as necessary.
3. Improve the exterior roof soffit ventilation.

9.0 Conclusion

PASE has completed a structural evaluation of the San Juan Sewer Pump Station building including a visual observation and seismic risk assessment per ASCE/SEI 41-17 and FEMA P-154. With a few noted exceptions, the building construction appears to be in general conformance with the as-built drawings, and the building appears to be in overall good structural condition. The recommended work that we have included in this report should be able to be easily completed as part of the proposed overall facility rehabilitation project. In our professional opinion, with these recommended improvements, the City of Belmont can expect acceptable structural and seismic performance of the building in the future.

10.0 Limitations

Our structural evaluation was limited to the areas of the building that were accessible and visible. This did not include the building foundations, the interior of the wet well, any roof framing above the ceiling gypsum board, or the rooftop. As part of our evaluation, we did review the current Geotechnical Investigation Report by Cotton, Shires and Associates, Inc. dated March 2025. Statements in Appendix A as to the compliance of the site with regards to the liquefaction, slope failure, and surface fault rupture hazards in ASCE/SEI 41-17 are solely based on the information contained in the Geotechnical Investigation Report.

PASE's structural evaluation has been based on generally accepted standards of engineering practice. PASE relied on as-built drawings prepared and provided by Others and did not independently confirm all information shown on the as-built drawings. The opinions included in this report are, therefore, dependent on the as-built drawings, and any errors or omissions in the original design and construction could impact these conclusions and recommendations.

APPENDIX A

ASCE/SEI 41-17 Checklists

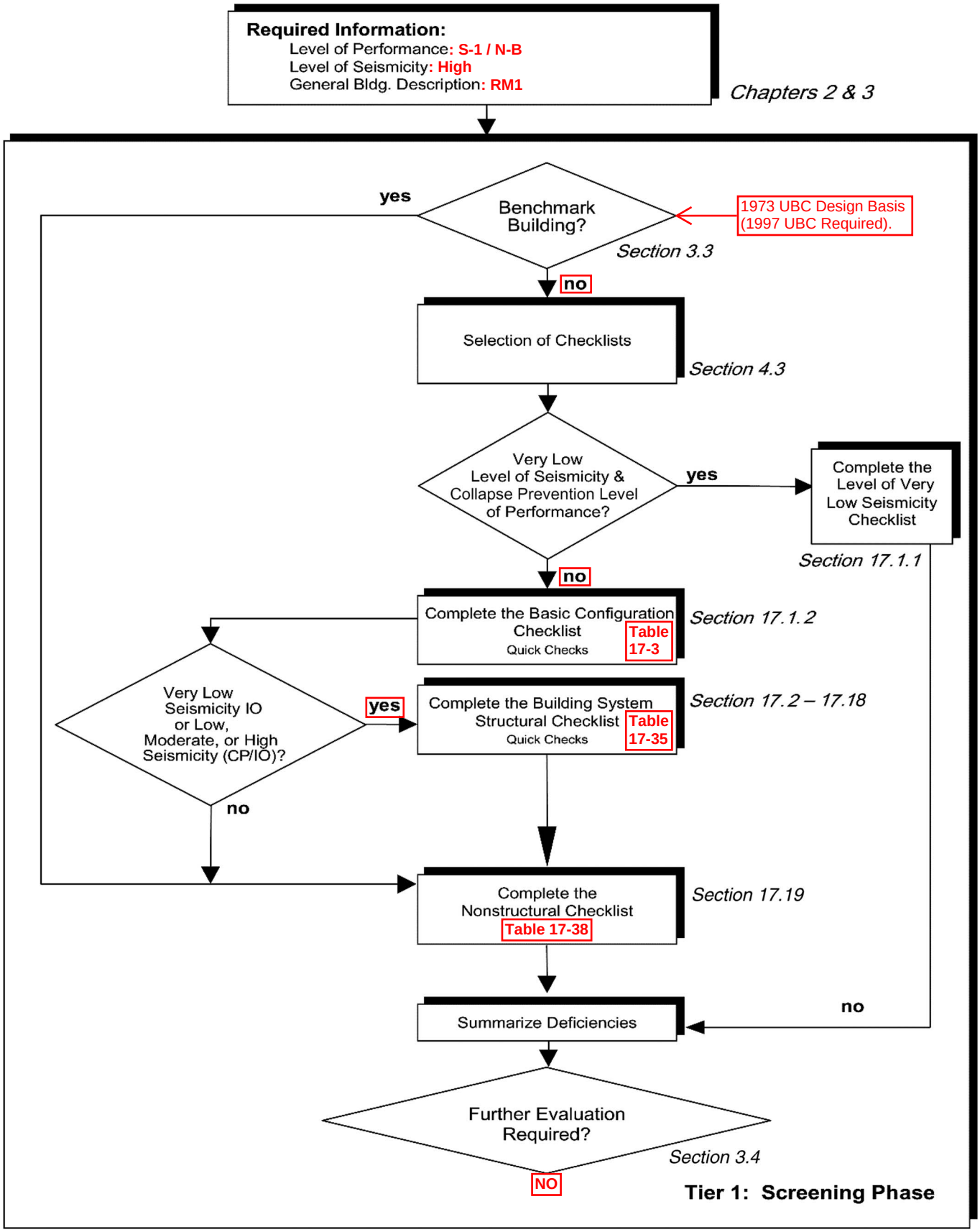


Figure 4-1. Tier 1 Evaluation Process
Note: IO = Immediate Occupancy, LS = Life Safety.

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Table 17-2 *(Continued)*. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)			
Geologic Site Hazards			
C NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1
C NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2
C NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3
High Seismicity (Complete the Following Items in Addition to the Items for Moderate Seismicity)			
Foundation Configuration			
C NC N/A U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$.	5.4.3.3	A.6.2.1
C NC N/A U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	5.4.3.4	A.6.2.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Very Low Seismicity			
Building System—General			
C NC N/A U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	5.4.1.1	A.2.1.1
C NC N/A U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity.	5.4.1.2	A.2.1.2
C NC N/A U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3
Building System—Building Configuration			
C NC N/A U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	5.4.2.1	A.2.2.2
C NC N/A U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	5.4.2.2	A.2.2.3
C NC N/A U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4
C NC N/A U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	5.4.2.4	A.2.2.5
C NC N/A U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	5.4.2.5	A.2.2.6

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These are compliant according to the Geotechnical Investigation Report by Cotton, Shires and Associates, Inc.

Table 17-3 *(Continued)*. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7
Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)			
Geologic Site Hazards			
C NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1
C NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2
C NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3
Moderate and High Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)			
Foundation Configuration			
C NC N/A U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$. See Appendix C.	5.4.3.3	A.6.2.1
C NC N/A U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	5.4.3.4	A.6.2.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low and Moderate Seismicity			
Seismic-Force-Resisting System			
C NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1
C NC N/A U	SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values: Structural panel sheathing 1,000 lb/ft (14.6 kN/m) Diagonal sheathing 700 lb/ft (10.2 kN/m) Straight sheathing 100 lb/ft (1.5 kN/m) All other conditions 100 lb/ft (1.5 kN/m)	5.5.3.1.1	A.3.2.7.1
C NC N/A U	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system.	5.5.3.6.1	A.3.2.7.2
C NC N/A U	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building.	5.5.3.6.1	A.3.2.7.3
C NC N/A U	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces.	5.5.3.6.1	A.3.2.7.4
C NC N/A U	WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor.	5.5.3.6.2	A.3.2.7.5
C NC N/A U	HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1.	5.5.3.6.3	A.3.2.7.6

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Table 17-34 *(Continued)*. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Flexible Diaphragms			
C NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
C NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
C NC N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6
C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	5.6.2	A.4.2.1
C NC N/A U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
Connections			
C NC N/A U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. (3 mm) before engagement of the anchors.	5.7.1.2	A.5.1.4

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-35. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Very Low Seismicity			
Seismic-Force-Resisting System			
C NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1
C NC N/A U	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in.^{2} (4.83 MPa). See Appendix C.	5.5.3.1.1	A.3.2.4.1
C NC N/A U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls.	5.5.3.1.3	A.3.2.4.2 The total ratio is 0.0024, the minimum ratio is 0.0011 for the vert. steel, and the maximum spacing is 40" o.c. (all per the as-built drawings).
Connections			
C **NC** N/A U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1 See Appendix C. Existing wall anchors at 8' o.c. are not adequate. Add new wall anchors to provide wall anchorage at 4' o.c.
C NC **N/A** U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers. No ledgers.	5.7.1.3	A.5.1.2
C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, ~~and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.~~ Strength not evaluated.	5.7.2	A.5.2.1

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Table 17-35 *(Continued)*. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, ~~and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation.~~ Strength not evaluated.	5.7.3.4	A.5.3.5
C NC **N/A** U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. No girders or columns.	5.7.4.1	A.5.4.1
Stiff Diaphragms			
C NC **N/A** U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1
C NC **N/A** U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3
Foundation System			
C NC **N/A** U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.		A.6.2.3
C NC **N/A** U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.		A.6.2.4
Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)			
Seismic-Force-Resisting System			
C NC N/A U	REINFORCING AT WALL OPENINGS: All wall openings that interrupt rebar have trim reinforcing on all sides. Per details on as-built drawings.	5.5.3.1.5	A.3.2.4.3
C NC N/A U	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30. 11' / 0.67' = 16.5 < 30	5.5.3.1.2	A.3.2.4.4
Diaphragms (Stiff or Flexible)			
C NC **N/A** U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length. Openings are 2' minimum away from walls.	5.6.1.3	A.4.1.4
C NC **N/A** U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 4 ft (1.2 m) long. Openings are 2' minimum away from walls.	5.6.1.3	A.4.1.6
C **NC** N/A U	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	5.6.1.4	A.4.1.7
C NC **N/A** U	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. No opening that large.	5.6.1.5	A.4.1.8
Flexible Diaphragms			
C NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
C NC **N/A** U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	5.6.2	A.4.2.1
C NC N/A U	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
C NC **N/A** U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1.	5.6.2	A.4.2.3
C NC **N/A** U	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	5.6.3	A.4.3.1
C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
Connections			
C NC N/A **U**	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. before engagement of the anchors. Anchors are concealed and could not be observed.	5.7.1.2	A.5.1.4

The closest cross-tie per plan is 2.5' away from the corner. Add a new wall anchor at the corner.

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

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Table 17-38. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
Life Safety Systems			
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13.	13.7.4	A.7.13.1
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13.	13.7.4	A.7.13.2
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. EMERGENCY POWER: Equipment used to power or control Life Safety systems is anchored or braced. Generator.	13.7.7	A.7.12.1
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints.	13.7.6	A.7.14.1
C NC N/A U	**HR—not required; LS—MH; PR—MH**. SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13.	13.7.4	A.7.13.3
C NC N/A U	**HR—not required; LS—not required; PR—LMH**. EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced.	13.7.9	A.7.3.1
Hazardous Materials			
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers. Generator.	13.7.1	A.7.12.2
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. HAZARDOUS MATERIAL STORAGE: Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods. Generator day tank.	13.8.3	A.7.15.1
C NC N/A U	**HR—MH; LS—MH; PR—MH**. HAZARDOUS MATERIAL DISTRIBUTION: Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release. Diesel fuel piping not braced.	13.7.3 13.7.5	A.7.13.4
C NC N/A U	**HR—MH; LS—MH; PR—MH**. SHUTOFF VALVES: Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks. Generator.	13.7.3 13.7.5	A.7.13.3
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, have flexible couplings. Generator.	13.7.3 13.7.5	A.7.15.4
C NC N/A U	**HR—MH; LS—MH; PR—MH**. PIPING OR DUCTS CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5 13.7.6	A.7.13.6
Partitions			
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity.	13.6.2	A.7.1.1
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
C NC N/A U	**HR—not required; LS—MH; PR—MH**. DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005.	13.6.2	A.7.1.2
C NC N/A U	**HR—not required; LS—not required; PR—MH**. LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
C NC N/A U	**HR—not required; LS—not required; PR—MH**. STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.	13.6.2	A.7.1.3

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Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC N/A U	**HR—not required; LS—not required; PR—MH**. TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	13.6.2	A.7.1.4
Ceilings			
C NC N/A U	**HR—H; LS—MH; PR—LMH**. SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
C NC N/A U	**HR—not required; LS—MH; PR—LMH**. SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
C NC N/A U	**HR—not required; LS—not required; PR—MH**. INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) and ceilings of smaller areas that are not surrounded by restraining partitions are laterally restrained at a spacing no greater than 12 ft (3.6 m) with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression.	13.6.4	A.7.2.2
C NC N/A U	**HR—not required; LS—not required; PR—MH**. EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	13.6.4	A.7.2.4
C NC N/A U	**HR—not required; LS—not required; PR—MH**. CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures.	13.6.4	A.7.2.5
C NC N/A U	**HR—not required; LS—not required; PR—H**. EDGE SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	13.6.4	A.7.2.6
C NC N/A U	**HR—not required; LS—not required; PR—H**. SEISMIC JOINTS: Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2,500 ft^2 (232.3 m^2) and has a ratio of long-to-short dimension no more than 4-to-1.	13.6.4	A.7.2.7
Light Fixtures			
C NC N/A U	**HR—not required; LS—MH; PR—MH**. INDEPENDENT SUPPORT: Light fixtures that weigh more per square foot than the ceiling they penetrate are supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture.	13.6.4 13.7.9	A.7.3.2
C NC N/A U	**HR—not required; LS—not required; PR—H**. PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure.	13.7.9 Swinging pendant lights adjacent to the crane beam.	A.7.3.3
C NC N/A U	**HR—not required; LS—not required; PR—H**. LENS COVERS: Lens covers on light fixtures are attached with safety devices.	13.7.9	A.7.3.4
Cladding and Glazing			
C NC N/A U	**HR—MH; LS—MH; PR—MH**. CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft^2 (0.48 kN/m^2) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m)	13.6.1	A.7.4.1

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Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC N/A U	**HR—not required; LS—MH; PR—MH**. CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3
C NC N/A U	**HR—MH; LS—MH; PR—MH**. MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.4
C NC N/A U	**HR—not required; LS—MH; PR—MH**. THREADED RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.	13.6.1	A.7.4.9
C NC N/A U	**HR—MH; LS—MH; PR—MH**. PANEL CONNECTIONS: Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.	13.6.1.4	A.7.4.5
C NC N/A U	**HR—MH; LS—MH; PR—MH**. BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	13.6.1.4	A.7.4.6
C NC N/A U	**HR—MH; LS—MH; PR—MH**. INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	13.6.1.4	A.7.4.7
C NC N/A U	**HR—not required; LS—MH; PR—MH**. OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft^2 (1.5 m^2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	13.6.1.5	A.7.4.8
Masonry Veneer			
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft^2 (0.25 m^2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).	13.6.1.2	A.7.5.1
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. SHELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.	13.6.1.2	A.7.5.2
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. WEAKENED PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	13.6.1.2	A.7.5.3
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup.	13.6.1.1 13.6.1.2	A.7.7.2
C NC N/A U	**HR—not required; LS—MH; PR—MH**. STUD TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	13.6.1.1 13.6.1.2	A.7.6.1

continues

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Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC N/A U	**HR—not required; LS—MH; PR—MH**. ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	13.6.1.1 13.6.1.2	A.7.7.1
C NC N/A U	**HR—not required; LS—not required; PR—MH**. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	13.6.1.2	A.7.5.6
C NC N/A U	**HR—not required; LS—not required; PR—MH**. OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.1 13.6.1.2	A.7.6.2
Parapets, Cornices, Ornamentation, and Appendages			
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.	13.6.5	A.7.8.1
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).	13.6.6	A.7.8.2
C NC N/A U	**HR—H; LS—MH; PR—LMH**. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	13.6.5	A.7.8.3
C NC N/A U	**HR—MH; LS—MH; PR—LMH**. APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.	13.6.6	A.7.8.4
Masonry Chimneys			
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. URM CHIMNEYS: Unreinforced masonry chimneys extend above the roof surface no more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney.	13.6.7	A.7.9.1
C NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. ANCHORAGE: Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof.	13.6.7	A.7.9.2
Stairs			
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. STAIR ENCLOSURES: Hollow-clay tile or unreinforced masonry walls around stair enclosures are restrained out of plane and have height-to-thickness ratios not greater than the following: for Life Safety in Low or Moderate Seismicity, 15-to-1; for Life Safety in High Seismicity and for Position Retention in any seismicity, 12-to-1.	13.6.2 13.6.8	A.7.10.1
C NC N/A U	**HR—not required; LS—LMH; PR—LMH**. STAIR DETAILS: The connection between the stairs and the structure does not rely on post-installed anchors in concrete or masonry, and the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.4.3.1 for moment-frame structures or 0.5 in. for all other structures without including any lateral stiffness contribution from the stairs.	13.6.8	A.7.10.2
Contents and Furnishings			
C NC N/A U	**HR—LMH; LS—MH; PR—MH**. INDUSTRIAL STORAGE RACKS: Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15.	13.8.1	A.7.11.1

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Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC N/A U	**HR—not required; LS—H; PR—MH**. TALL NARROW CONTENTS: Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other. Storage cabinets.	13.8.2	A.7.11.2
C NC N/A U	**HR—not required; LS—H; PR—H**. FALL-PRONE CONTENTS: Equipment, stored items, or other contents weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained. Storage cabinets.	13.8.2	A.7.11.3
C NC N/A U	**HR—not required; LS—not required; PR—MH**. ACCESS FLOORS: Access floors more than 9 in. (229 mm) high are braced.	13.6.10	A.7.11.4
C NC N/A U	**HR—not required; LS—not required; PR—MH**. EQUIPMENT ON ACCESS FLOORS: Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor.	13.7.7 13.6.10	A.7.11.5
C NC N/A U	**HR—not required; LS—not required; PR—H**. SUSPENDED CONTENTS: Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components. Generator exhaust piping.	13.8.2	A.7.11.6
Mechanical and Electrical Equipment			
C NC N/A U	**HR—not required; LS—H; PR—H**. FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	13.7.1 13.7.7	A.7.12.4
C NC N/A U	**HR—not required; LS—H; PR—H**. IN-LINE EQUIPMENT: Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system. Generator exhaust piping.	13.7.1	A.7.12.5
C NC N/A U	**HR—not required; LS—H; PR—MH**. TALL NARROW EQUIPMENT: Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls. Electrical panels.	13.7.1 13.7.7	A.7.12.6
C NC N/A U	**HR—not required; LS—not required; PR—MH**. MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01. Roll-up door.	13.6.9	A.7.12.7
C NC N/A U	**HR—not required; LS—not required; PR—H**. SUSPENDED EQUIPMENT: Equipment suspended without lateral bracing is free to swing from or move with the structure from which it is suspended without damaging itself or adjoining components. Generator exhaust piping.	13.7.1 13.7.7	A.7.12.8
C NC N/A U	**HR—not required; LS—not required; PR—H**. VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning. Generator.	13.7.1	A.7.12.9
C NC N/A U	**HR—not required; LS—not required; PR—H**. HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure. Pumps and electrical equipment.	13.7.1 13.7.7	A.7.12.10
C NC N/A U	**HR—not required; LS—not required; PR—H**. ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure. Junction boxes.	13.7.7	A.7.12.11
C NC N/A U	**HR—not required; LS—not required; PR—H**. CONDUIT COUPLINGS: Conduit greater than 2.5 in. (64 mm) trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections.	13.7.8	A.7.12.12
Piping			
C NC N/A U	**HR—not required; LS—not required; PR—H**. FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings.	13.7.3 13.7.5	A.7.13.2

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Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C **NC** N/A U	**HR—not required; LS—not required; PR—H**. FLUID AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks.	13.7.3 13.7.5 No bracing.	A.7.13.4
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained.	13.7.3 13.7.5	A.7.13.5
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. PIPING CROSSING SEISMIC JOINTS: Piping that crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5	A.7.13.6
Ducts			
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. DUCT BRACING: Rectangular ductwork larger than 6 ft^2 (0.56 m^2) in cross-sectional area and round ducts larger than 28 in. (711 mm) in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft (9.2 m). The maximum spacing of longitudinal bracing does not exceed 60 ft (18.3 m).	13.7.6	A.7.14.2
C NC N/A U	**HR—not required; LS—not required; PR—H**. DUCT SUPPORT: Ducts are not supported by piping or electrical conduit.	13.7.6	A.7.14.3
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. DUCTS CROSSING SEISMIC JOINTS: Ducts that cross seismic joints or isolation planes or are connected to independent structures have couplings or other details to accommodate the relative seismic displacements.	13.7.6	A.7.14.4
Elevators			
C NC **N/A** U	**HR—not required; LS—H; PR—H**. RETAINER GUARDS: Sheaves and drums have cable retainer guards.	13.7.11	A.7.16.1
C NC **N/A** U	**HR—not required; LS—H; PR—H**. RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight.	13.7.11	A.7.16.2
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.	13.7.11	A.7.16.3
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min (0.30 m/min) or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations.	13.7.11	A.7.16.4
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking.	13.7.11	A.7.16.5
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1.	13.7.11	A.7.16.6
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1.	13.7.11	A.7.16.7
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.	13.7.11	A.7.16.8
C NC **N/A** U	**HR—not required; LS—not required; PR—H**. GO-SLOW ELEVATORS: The building has a go-slow elevator system.	13.7.11	A.7.16.9

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.
[a] Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.
[b] Level of Seismicity: L = Low, M = Moderate, and H = High.

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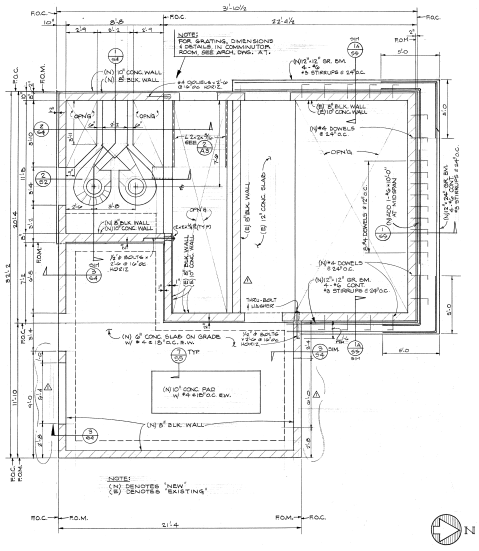
APPENDIX B

FEMA P-154 Data Collection Forms

Rapid Visual Screening of Buildings for Potential Seismic Hazards
FEMA P-154 Data Collection Form

Level 1
VERY HIGH Seismicity





SKETCH

Address: 3118 E. Laurel Creek Road
Belmont, CA **Zip:** 94002
Other Identifiers:
Building Name: San Juan Sewer Pump Station
Use: Sanitary Sewer Pumping Facility
Latitude: 37.520846 **Longitude:** -122.314351
S_S: 2.143g (ASCE 7-16) **S_1:** 0.890g (ASCE 7-16)
Screener(s): TEE/AGH **Date/Time:** 05/08/25 11:00

No. Stories: Above Grade: 1 Below Grade: 1 **Year Built:** 1977 ☐ EST
Total Floor Area (sq. ft.): 889 **Code Year:** 1973 UBC
Additions: ☐ None ☒ Yes, Year(s) Built: Unknown

Occupancy: Assembly ☐ Commercial ☐ Emer. Services ☐ Historic ☐ Shelter
Industrial ☐ Office ☐ School ☐ Government
☒ Utility ☐ Warehouse ☐ Residential, # Units:

Soil Type: ☐A Hard Rock ☐B Avg Rock ☐C Dense Soil ☒D Stiff Soil ☐E Soft Soil ☐F Poor Soil **DNK** *If DNK, assume Type D.*

Geologic Hazards: Liquefaction: Yes ☒ No DNK Landslide: Yes ☒ No DNK Surf. Rupt.: Yes ☒ No DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Vertical (type/severity)
☒ Plan (type) Reentrant Corner

Exterior Falling Hazards: ☐ Unbraced Chimneys ☐ Heavy Cladding or Heavy Veneer
☐ Parapets ☐ Appendages
☐ Other:

COMMENTS: NONE.

☐ Additional sketches or comments on separate page

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE (Do Not Know)	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score	**2.1**	**1.9**	**1.8**	**1.5**	**1.4**	**1.6**	**1.4**	**1.2**	**1.0**	**1.2**	**0.9**	**1.1**	**1.0**	**1.1**	**1.1**	**0.9**	**1.1**
Severe Vertical Irregularity, V_{L1}	-0.9	-0.9	-0.9	-0.8	-0.7	-0.8	-0.7	-0.7	-0.7	-0.8	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6	NA
Moderate Vertical Irregularity, V_{L1}	-0.6	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3	NA
Plan Irregularity, P_{L1}	-0.7	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.4	-0.4	-0.5	-0.3	-0.5	-0.4	-0.4	-0.4	-0.3	NA
Pre-Code	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	0.0
Post-Benchmark	1.9	1.9	2.0	1.0	1.1	1.1	1.5	NA	1.4	1.7	NA	1.5	1.7	1.6	1.6	NA	0.5
Soil Type A or B	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.1	0.1
Soil Type E (1-3 stories)	0.0	-0.2	-0.4	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	-0.1
Soil Type E (> 3 stories)	-0.4	-0.4	-0.4	-0.3	-0.3	NA	-0.3	-0.1	-0.1	-0.3	-0.1	NA	-0.1	-0.2	-0.2	0.0	NA
Minimum Score, S_{MIN}	*0.7*	*0.7*	*0.7*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.3*	*0.3*	*0.2*	*1.0*

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$: +0.7

EXTENT OF REVIEW

Exterior: ☐ Partial ☒ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☒ Entered
Drawings Reviewed: ☒ Yes ☐ No
Soil Type Source: N/A
Geologic Hazards Source: ASCE Hazard Tool
Contact Person: N/A

LEVEL 2 SCREENING PERFORMED?

☒ Yes, Final Level 2 Score, S_{L2} +1.5 ☐ No
Nonstructural hazards? ☒ Yes ☐ No

OTHER HAZARDS

Are There Hazards That Trigger A Detailed Structural Evaluation?

☐ Pounding potential (unless S_{L2} > cut-off, if known)
☐ Falling hazards from taller adjacent building
☐ Geologic hazards or Soil Type F
☐ Significant damage/deterioration to the structural system

ACTION REQUIRED

Detailed Structural Evaluation Required?

☐ Yes, unknown FEMA building type or other building
☐ Yes, score less than cut-off
☐ Yes, other hazards present
☒ No

Detailed Nonstructural Evaluation Recommended? *(check one)*

☐ Yes, nonstructural hazards identified that should be evaluated
☒ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data OR DNK = Do Not Know

Legend: MRF = Moment-resisting frame; BR = Braced frame; RC = Reinforced concrete; SW = Shear wall; URM INF = Unreinforced masonry infill; TU = Tilt up; MH = Manufactured Housing; LM = Light metal; FD = Flexible diaphragm; RD = Rigid diaphragm

Rapid Visual Screening of Buildings for Potential Seismic Hazards — **Level 2 (Optional)**

FEMA P-154 Data Collection Form — **VERY HIGH Seismicity**

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Bldg Name: San Juan Sewer Pump Station	**Final Level 1 Score:**	S_{L1} = **+0.7**	*(do not consider S_{MIN})*
Screener: TEE/AGH	**Level 1 Irregularity Modifiers:**	*Vertical Irregularity,* V_{L1} = **0.0**	*Plan Irregularity,* P_{L1} = **-0.4**
Date/Time: 05/08/25 11:00	**ADJUSTED BASELINE SCORE:**	$S' = (S_{L1} - V_{L1} - P_{L1})$ = **+1.1**	

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement *(If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)*		Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	~~-0.9~~	
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	~~-0.2~~	
	Weak and/or Soft Story *(circle one maximum)*	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	~~-0.5~~	
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	~~-0.9~~	
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	~~-0.9~~	
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	~~-0.7~~	
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	~~-0.4~~	
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	~~-0.7~~	
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	~~-0.4~~	
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	~~-0.2~~	
	Short Column/ Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	~~-0.4~~	
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	~~-0.4~~	
	Split Level	There is a split level at one of the floor levels or at the roof.	~~-0.4~~	
	Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	~~-0.7~~	V_{L2} = **0.0**
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	~~-0.4~~	*(Cap at -0.9)*
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. *(Do not include the W1A open front irregularity listed above.)*		~~-0.5~~	
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.		~~-0.2~~	
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.		-0.2	
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.		~~-0.2~~	
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.		~~-0.2~~	P_{L2} = **-0.2**
	Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		~~-0.5~~	*(Cap at -0.7)*
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.		+0.2	
Pounding	Building is separated from an adjacent structure by less than 1.5% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	~~-0.7~~	
		One building is 2 or more stories taller than the other.	~~-0.7~~	
		The building is at the end of the block.	~~-0.4~~	
		(Cap total pounding modifiers at -0.9)		
S2 Building	"K" bracing geometry is visible.		~~-0.7~~	
C1 Building	Flat plate serves as the beam in the moment frame.		~~-0.3~~	
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. *(Do not combine with post-benchmark or retrofit modifier.)*		+0.2	
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).		+0.2	
URM	Gable walls are present.		~~-0.3~~	
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.		~~+0.5~~	
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.		~~+1.2~~	M = **+0.6**

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$: +1.5 *(Transfer to Level 1 form)*

There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: ☐ Yes ☒ No

If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement (*Check "Yes" or "No"*)	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.		X	
	There is heavy cladding or heavy veneer.		X	
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.		X	
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.		X	
	There is a sign posted on the building that indicates hazardous materials are present.		X	
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.		X	
	Other observed exterior nonstructural falling hazard:		X	
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.		X	
	Other observed interior nonstructural falling hazard:	X		Lack of bracing on piping.

Estimated Nonstructural Seismic Performance (*Check appropriate box and transfer to Level 1 form conclusions*)

☐ Potential nonstructural hazards with significant threat to occupant life safety → Detailed Nonstructural Evaluation recommended

☐ Nonstructural hazards identified with significant threat to occupant life safety → But no Detailed Nonstructural Evaluation required

☒ Low or no nonstructural hazard threat to occupant life safety → No Detailed Nonstructural Evaluation required

Comments: Although there are some nonstructural hazards, the building is not occupied; therefore, the threat to Life Safety is low. The probability (P) of significant structural damage to the building if it is subjected to forces associated with the MCE = 1 / 10^{S} = 1 / $10^{1.5}$ = 1 in 32 probability.

APPENDIX C

Supporting Calculations

PASE

San Juan Sewer PS **S&W**

SEISMIC EVALUATION LOADS

Roof Load

	Dead	Live	Seismic
Tar and Gravel Roofing	6.0 psf		6.0 psf
1/2" Plywood Sheathing	1.7 psf		1.7 psf
2x8 R.J. @ 16" o.c.	2.2 psf		2.2 psf
Mechanical/Electrical/Plumbing/Lighting	3.5 psf		3.5 psf
5/8" Gypboard	2.8 psf		2.8 psf
Miscellaneous	1.8 psf		1.8 psf
	18.0 psf	20.0 psf	18.0 psf

Wall Load

	Dead
8" Medium Weight CMU, Fully Grouted	78.0 psf
Mechanical/Electrical/Plumbing/Misc.	2.0 psf
	80.0 psf

LATERAL FORCE ANALYSIS - Structure Weight

Structure Weight: N-S Direction

Roof Diaphragm:	Area (ft^2)	Unit Wt. (psf)	Weight (lbs)
Roof including Overhangs:	1256	18	22608
Exterior CMU Walls:	684	80	54743
Interior CMU Walls:	248	80	19800
Total Weight of Building:			**97151** **lbs**

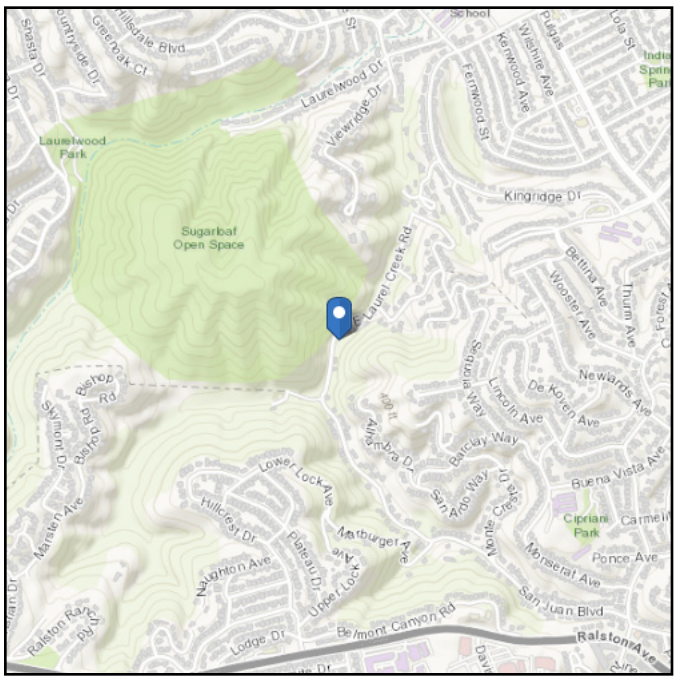
Structure Weight: E-W Direction

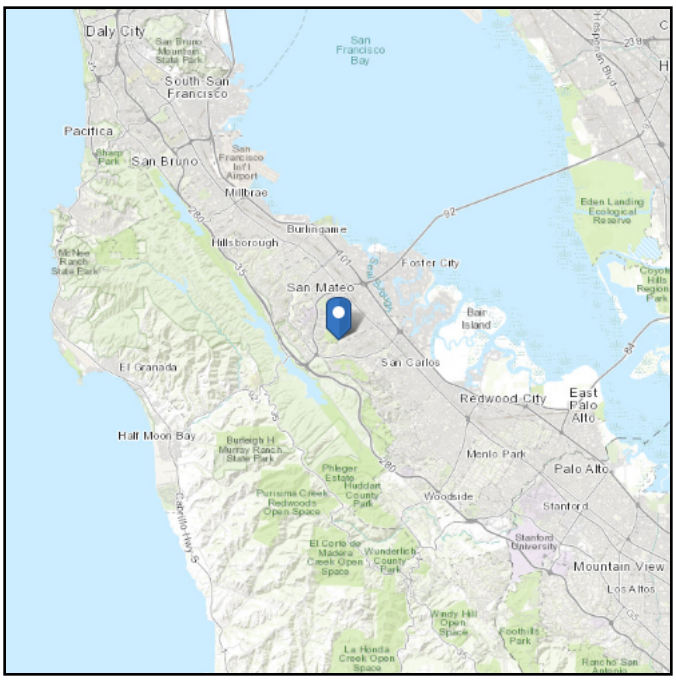
Roof Diaphragm:	Area (ft^2)	Unit Wt. (psf)	Weight (lbs)
Roof including Overhangs:	1256	18	22608
Exterior CMU Walls:	684.292	80	54743
Interior CMU Walls:	247.5	80	19800
Total Weight of Building:			**97151** **lbs**

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 41-17	**Latitude:**	37.520846
Risk Category:	NaN	**Longitude:**	-122.314351
Soil Class:	D - Stiff Soil	**Elevation:**	180.7006383119478 ft (NAVD 88)





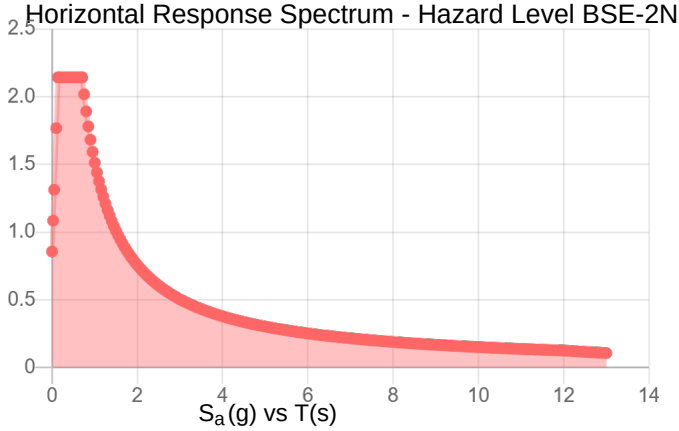
Seismic

Site Soil Class: D - Stiff Soil

Hazard Level BSE-2N:

SsUH :	2.825	S1UH :	1.194
CR_S :	0.887	CR_1 :	0.877
SsRT :	2.505	S1RT :	1.048
SsD :	2.143	S1D :	0.89
S_S :	2.143	S_1 :	0.89
F_a :	1	F_v :	1.7
S_{XS} :	2.143	S_{X1} :	1.513

Horizontal Response Spectrum - Hazard Level BSE-2N



Hazard Level BSE-1N:

S_{XS} :	1.429	S_{X1} :	1.009

Hazard Level BSE-2E:

S_S :	1.927	S_1 :	0.782
F_a :	1	F_v :	1.7
S_{XS} :	1.927	S_{X1} :	1.329

Hazard Level BSE-1E:

S_S :	0.833	S_1 :	0.307
F_a :	1.167	F_v :	1.993
S_{XS} :	0.972	S_{X1} :	0.611

TL Data:

T_L :	12

Data Accessed: **Thu May 01 2025**

BY TEE DATE 5/14/25
CHKD. BY _____ DATE _____

PEOPLES ASSOCIATES
STRUCTURAL ENGINEERS

SHEET NO. C4 OF _____
JOB NO. 25-002

SAN JUAN SEWER PS — S&W

SEISMIC DESIGN CRITERIA

* FOR ASCE 41 BSE-1E : $S_{xs} = 0.972g$, $S_{x1} = 0.611g$.
* PER §4.4.2.4, PERIOD (T) = $C_t h_n^{\beta}$, $C_t = 0.020$, $\beta = 0.75$, $h_n = 11$ feet.

$\therefore T = (0.020)(11)^{0.75} =$ 0.121 sec.

* PER §4.4.2.3, $S_a = \frac{S_{x1}}{T} = \frac{0.611}{0.121} = 5.058g > S_{xs}$.

$\therefore S_a = S_{xs} =$ 0.972g.

ASCE 41 OVERTURNING CHECK

* Least Horiz. Dimension (L) = 20' (AT NORTH WALL).
* Bldg. Height to Flat Roof (H) = 11'

$L/H = 20'/11' = 1.82 > 0.6 S_a = (0.6)(0.972) = 0.58$ OK

ASCE 41 SHEAR STRESS QUICK CHECK

* PER §4.4.2.1, $V = CS_aW$, $C = 1.0$

$\therefore V = (1.0)(0.972)(97,151 \text{ lbs.}) =$ 94,431 lbs. $= V_j$

* PER §4.4.3.3, $v_j^{Avg} = \frac{1}{M_s}\left(\frac{V_j}{A_w}\right)$. $M_s = 1.5$ (FOR IO).

$A_w = (7.625")(59.4583' \times 12) = 5,440 \text{ in}^2$

$\therefore v_j^{Avg} = \left(\frac{1}{1.5}\right)\left(\frac{94,431}{5440}\right) =$ 12 psi $<$ 70 psi OK

ASCE 41 WALL ANCHORAGE QUICK CHECK

* PER §4.4.3.7, $T_c = \psi S_{xs} W_p A_p$. $\psi = 1.8$ (FOR IO).

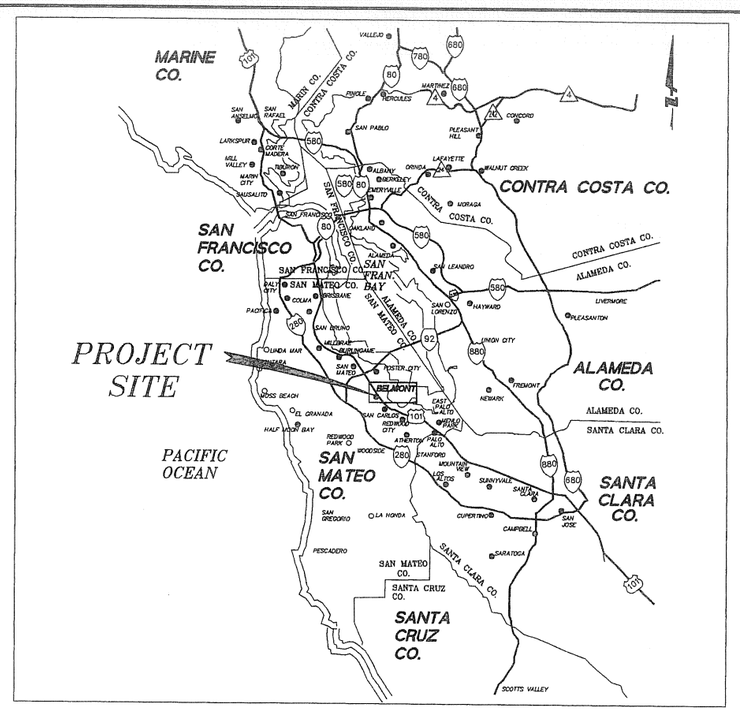
$\therefore T_c$ (ASD) $= (1.8)(0.972)(80 \text{ psf})(11'/2 \times 8')/1.4 \cong$ 4,400 lbs.

* ORIGINAL CAPACITY OF PURLIN ANCHORS UNKNOWN BUT PROBABLY AROUND 2,300 lbs. MIN. NO GOOD. RETROFIT TO ADD WALL ANCHORAGE AT 4' o.c. T_c (ASD) $\cong$ 2,200 lbs. OK.

APPENDIX C

San Juan Pump Station Rehabilitation
Project 337B

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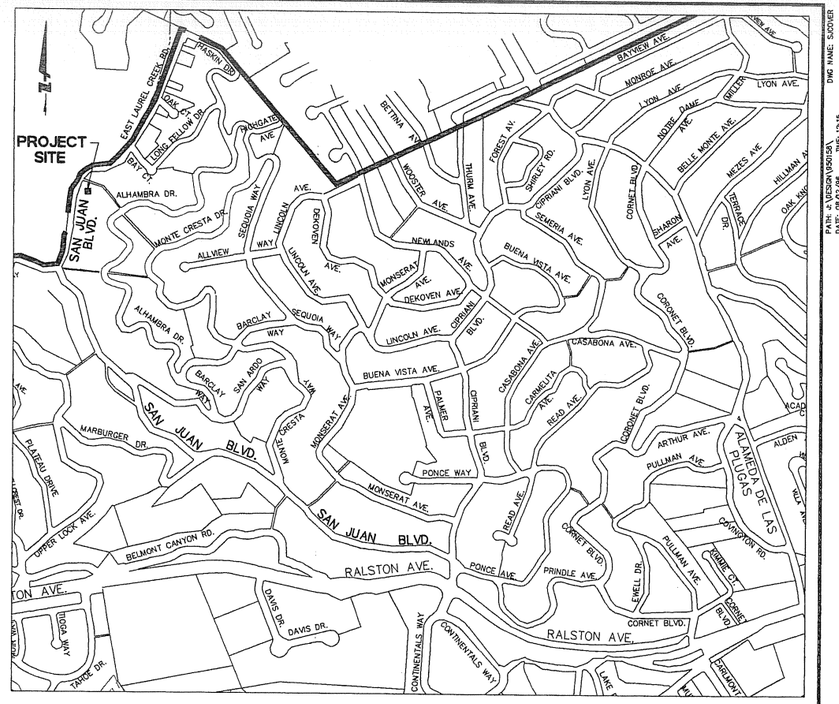


VICINITY MAP
NOT TO SCALE

CITY OF BELMONT

SAN MATEO COUNTY, CALIFORNIA

CALIFORNIA
CITY OF BELMONT



LOCATION MAP
NOT TO SCALE

PATH: J:\VISION\VISIO5A\
DWG NAME: SJCOVER
DATE: 09/12/96
TIME: 12:15

DEPARTMENT OF PUBLIC WORKS

SAN JUAN PUMP STATION REHABILITATION

PROJECT NO. 337B

CITY OF BELMONT

MAYOR	NANCY LEVITT
VICE MAYOR	GARY HARRIS
COUNCIL MEMBER	CORALIN FEIERBACH
COUNCIL MEMBER	PAM RIANDA
COUNCIL MEMBER	ADELE DELLA-SANTINA

STAFF

CITY MANAGER	DAMON EDWARDS
DIRECTOR OF PUBLIC WORKS	MARGARET HANZL DIVINE
CITY ATTORNEY	JEAN SAVAREE
CITY CLERK	KATHY KERN

APPROVALS

APPROVED BY CITY COUNCIL ON 11/12/96
DATE

Margaret Hanzl Divine
MARGARET HANZL DIVINE – DIRECTOR OF PUBLIC WORKS

RCE NO. C 40423 REG. EXP. 3/31/99

APPROVED BY :
DAVID P. EVANS – ENGINEER OF WORK
BRIAN KANGAS FOULK

REGISTERED PROFESSIONAL ENGINEER DAVID P EVANS 21639 Exp 9-30-97 CIVIL STATE OF CALIFORNIA
RCE NO.

DESIGNED BY :
MICHAEL C. LIU – PROJECT MANAGER
BRIAN KANGAS FOULK

18870
RCE NO.

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PUMP STATION DEMOLITION PLAN	5
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GENERAL NOTES

1. SCREENED FREEHAND LETTERING SHOWN ON SHEETS 3, 4, 5, 6, 10 & 12 ARE TAKEN FROM THE ORIGINAL PUMP STATION IMPROVEMENT PLANS AND ARE SHOWN FOR INFORMATION ONLY. NOTES SHOWN ON THESE DRAWINGS IN HELVETICA OR BLOCK TYPE ARE NEW INFORMATION.

2. THE "SUGGESTED CONSTRUCTION STAGING" IS PROVIDED BY THE ENGINEER FOR THE CONTRACTOR AS REFERENCE AND IS NOT MEANT TO BE THE REQUIRED CONSTRUCTION SEQUENCE.

3. CONTRACTOR SHALL SUBMIT BY-PASS PUMPING PLAN FOR THE ENGINEER TO REVIEW AT LEAST 14 DAYS PRIOR TO ORDERING EQUIPMENT. THE ENGINEERS REVIEW WILL NOT RELEASE THE CONTRACTOR FROM RESPONSIBILITY FOR THE SEWER BY-PASS. CONTRACTOR SHALL PUMP OUT ALL SLUDGE IN THE EXISTING WET PIT PRIOR TO THE INSTALLATION OF THE PUMPS FOR BY-PASS.

CONSTRUCTION NOTES

1. CONTRACTOR SHALL NOTIFY ALL ADJACENT RESIDENTS WITH WRITTEN NOTICES DETAILING THE TYPES, LIMITS, AND HOURS OF WORK, AT LEAST 7 DAYS PRIOR TO START OF CONSTRUCTION. THE PROPOSED NOTICE SHALL BE SUBMITTED TO THE ENGINEER AND CITY 7 DAYS PRIOR TO DISTRIBUTION FOR REVIEW AND APPROVAL.

2. CONTRACTOR SHALL WORK CLOSELY WITH CITY OF BELMONT STAFF TO COORDINATE PUMP STATION SHUT DOWN. PRIOR TO SHUT DOWN, CONTRACTOR SHALL FIRST CONSTRUCT A 8" SEWER BY-PASS SYSTEM TIE-IN TO THE 8" VALVE AT THE EXISTING 12" FORCE MAIN AT THE PUMP STATION. CONTRACTOR SHALL EXPOSE THE 8" CONTROL VALVE AND REMOVE THE BLIND FLANGE AND SECURE THE TIE-IN AGAINST THE SURGE PRESSURE.

3. CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT FOR SEWER BY-PASS OF EXISTING PUMPS DURING CONSTRUCTION INCLUDING SUBMERSIBLE DUPLEX PUMPS, ONE FOR NORMAL OPERATION AND ONE FOR BACKUP, BACKUP POWER SUPPLY, AND CONTROLS TO BY-PASS SAN JUAN PUMP STATION SANITARY SEWER THROUGH THE EXISTING WET PIT AND THE EXISTING 12" FORCE MAIN. THE TWO HORIZONTAL PUMPS INLET PLUG VALVES SHALL BE COMPLETELY CLOSED PRIOR TO BY-PASS. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY OF BY-PASSING THE SEWER FLOW DURING THE ENTIRE COURSE OF REHABILITATION OF THE PUMP STATION. CAREFUL PLANNING AND TIGHT CONTROL OF THE EQUIPMENT DELIVERY AND CONSTRUCTION SCHEDULE ARE THE BASIC INGREDIENTS FOR SUCCESSFULLY COMPLETING THE PROJECT. THE CITY WILL PROVIDE THE ELECTRICAL POWER THROUGH EXISTING METERS.

4. ALL BOLTS, NUTS, WASHERS AND TIE-RODS SHALL BE STAINLESS STEEL TYPE 304.

5. CONTRACTOR SHALL VERIFY ALL NEW AND EXISTING DIMENSIONS AND CONDITIONS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH ANY PART OF THE WORK.

6. CONTRACTOR SHALL VERIFY LOCATION AND SIZE OF FLOOR, ROOF AND WALL OPENINGS, NO UNAUTHORIZED HOLES ARE PERMITTED.

7. CONTRACTOR SHALL VERIFY ALL INSERTS AND EMBEDDED ITEMS BEFORE POURING CONCRETE.

SUGGESTED CONSTRUCTION STAGING

1. CONTRACTOR CAN SCHEDULE THE CONSTRUCTION SEQUENCE, SO AS TO INSTALL THE NEW MOTOR CONTROL CENTER, AND WILL BE PERMITTED TO USE THE TWO NEW SUBMERSIBLE PUMPS FOR THE SEWER BY-PASS PRIOR TO REHABILITATING THE PUMP STATION. CONTRACTOR MAY USE EXISTING GENERATOR FOR STAND BY POWER. UNDER THIS CONTRACT, THE CONTRACTOR SHALL RELOCATE THE TOILET AND WATER SINK, REMOVE THE HOT WATER HEATER, WORK BENCH, CLOTH LOCKER & TOOL LOCKER, AND WALL MOUNTED CABINET, HOT WATER AND COLD WATER PIPES, SEAL THE HOLES IN THE CONCRETE BLOCK WALLS, PROVIDE ALL ELECTRICAL CONDUIT FOR THE NEW MCC AND CONDUIT TO THE PROPOSED WET WELL, CONCRETE PAD FOR THE MCC, AND ALL NECESSARY FACILITIES FOR THE BY-PASS AND PUMP STATION OPERATION.

2. AFTER THE PUMP STATION SEWER BY-PASS IS IN OPERATION AND SATISFACTORY TO THE CITY, ALL EXISTING EQUIPMENT WITHIN THE PUMP ROOM SHALL BE REMOVED, INCLUDING ALL PUMP DISCHARGE PIPING TO THE FLEXIBLE COUPLING, AND CONDUITS ATTACHED TO THE EXISTING CONCRETE WALL. ALL WALL AND END OF CONDUIT OPENINGS SHALL BE SEALED WITH NON-SHRINK, NON-METALLIC GROUT. THE METAL STAIR WAY AND HANDRAIL SHALL STAY DURING THE CONSTRUCTION PROCESS UNTIL THE I-BEAM FOR THE ALUMINUM CHECKER PLATE ARE READY TO BE INSTALLED.

3. ALL REMOVED ELECTRICAL AND MECHANICAL EQUIPMENT INCLUDING PUMPS AND MOTORS, CONTROL PANEL, HORIZONTAL PUMPS, CHECK VALVES, PLUG VALVE, SUMP PUMP, PIPE FITTINGS LARGER THAN 4", AND OTHER EQUIPMENT SPECIFIED BY THE CITY ARE TO BE SALVAGED AND DELIVERED TO THE CITY CORPORATION YARD FOR STORAGE. ALL OTHER EQUIPMENT FROM THE PUMP STATION THAT ARE NOT NEEDED BY THE CITY SHALL BE THE PROPERTY OF THE CONTRACTOR AND DISPOSED OFF THE SITE.

4. LEVEL THE PUMP ROOM FLOOR WITH CONCRETE, CONSTRUCT THE CONCRETE STEP FOR THE SUBMERSIBLE PUMPS, INSTALL THE ANCHOR BOLTS FOR THE NEW PUMPS AS SHOWN ON SHEET 8.

5. REMOVE THE TWO EXISTING HORIZONTAL 6" INLET PIPES WHILE BLOCKING THE WET PIT; SEAL THE HOLES WITH REBAR AND CONCRETE GROUT. CONSTRUCT NEW 12" SEWER INLET LINE AND GROUT THE VOID AROUND THE PIPE AT THE CONCRETE WALL; SAWCUT THE CONCRETE BLOCK WALL FOR THE RELOCATION OF THE PUMP ROOM DOUBLE DOOR AND FRAME. FILL THE HOLE WITH 8" CONCRETE BLOCK. INSTALL DRAIN PIPES FOR FLOOR DRAINS, SINK AND TOILET TO THE NEW WET PIT. REMOVE HANDRAIL AND METAL STAIR FOR I-BEAM INSTALLATION. MODIFY AND RELOCATE THE HEADER SUPPORTS AND ALIGN CRANE WITH CENTERLINE OF PUMPS. REMOVE THE LOWER MOVABLE PART OF THE CRANE AND INSTALL DOUBLE HOIST.

6. AFTER ALL EMBEDDED ITEMS AND THE I-BEAM ARE INSTALLED FOR THE NEW PUMP STATION, PATCH ALL HOLES WITH NON-SHRINK, NON-METALLIC GROUT, THEN THOROUGHLY CLEAN THE ENTIRE INTERIOR FACE OF THE NEW PUMP STATION PRIOR TO APPLYING THE PROTECTIVE EPOXY COATING.

7. AFTER THE NEW SUBMERSIBLE PUMPS ARE INSTALLED IN THE EXISTING DRY PIT AND ARE FULLY OPERATIONAL TO THE CITY'S SATISFACTION, ALL EQUIPMENT WITHIN THE EXISTING WET PIT SHALL BE REMOVED. THIS SHALL INCLUDE ALL HANDRAIL, STAINLESS GRATES, TWO CHICAGO GRINDERS, GRINDERS HANDLING CRANE, LIGHTING SYSTEM, CEILING SHEET ROCK AND THE TWO METAL DOORS WITHIN WET PIT ROOM. CONTRACTOR THEN SHALL CONNECT THE FLOOR DRAINS, SINK AND TOILET, FILL THE ENTIRE WET PIT WITH 3 SACKS SLURRY CONCRETE. THE TOP 3" CONCRETE FLOOR SLAB SHALL BE 2000 PSI CONCRETE AND WITH BROOM FINISH SURFACE.

8. ADDITIONAL 2" X 8" RAFTERS SHALL BE INSTALLED PARALLEL TO THE EXISTING 2" X 8" RAFTERS FOR EACH MEMBER ABOVE THE WET PIT AREA ONLY. ADD BLOCKING BETWEEN ALL 2" X 8", INSTALL NEW WATER RESISTANCE TYPE SHEET ROCK (GREEN BOARD) FOR THE NEW STORAGE ROOM CEILING.

9. REPLACE THE METAL DOOR AND FRAME ON THE SOUTH SIDE OF THE EXISTING WET PIT WITH NEW METAL DOOR AND FRAME. REMOVE THE METAL DOOR ON THE WEST SIDE OF THE EXISTING WET PIT AND SAW CUT THE CONCRETE BLOCK WALL FOR THE 6' WIDE ROLL UP DOOR INSTALLATION. INSTALL STEEL ANGLE TO SUPPORT THE CONCRETE BLOCK WALL.

10. INSTALL COMPLETE ROOFING SYSTEM INCLUDING ROOF DRAINS AND ROOF VENTS.

11. THOROUGHLY CLEAN THE EXISTING WET PIT CONCRETE BLOCK WALL AND EPOXY COAT THE ENTIRE ROOM INCLUDING CEILING FOR STORAGE AND SHOWER USE, AND THE NEW PUMP ROOM WALL AND CEILING ABOVE THE ALUMINUM COVER PLATE.

12. INSTALL ALL LIGHTING FIXTURES AND FURNITURE AS SHOWN ON ELECTRICAL AND STORAGE ROOM DRAWINGS.

13. INSTALL COMPLETE COMMUNICATION SYSTEM.

LEGEND

◎	EXISTING MANHOLE
○	PROPOSED MANHOLE
ø	DIAMETER
—HW—	PROPOSED HOT WATER LINE
—CW—	PROPOSED COLD WATER LINE
—W—	EXISTING WATER LINE
⋈	WATER VALVE
—G—	GAS LINE
—FM—	FORCEMAIN
— — —	EXISTING SANITARY SEWER
═══	PROPOSED SANITARY SEWER
◉	PROPOSED ROOF DRAIN

ABBREVIATIONS

A.B.	ANCHOR BOLT
A.C.	ASPHALT CEMENT
AMP	AMPERES
CB	CATCH BASIN
C.C.	CENTER TO CENTER
CIP	CAST IRON PIPE
C/L	CENTER LINE
CLR	CLEARANCE
CO	CLEAN OUT
CW	COLD WATER
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
ELB	ELBOW
EL	ELEVATION
E.W.	EACH WAY
EX.	EXISTING
FCA	FLANGE COUPLING ADAPTOR
FL	FLANGE
FM	FORCEMAIN
G	GAS
GALV.	GALVANIZED
HW	HOT WATER
INV	INVERT ELEVATION
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
O.C.	ON CENTER
PVC	POLYVINYL CHLORIDE
RCP	REINFORCE CONCRETE PIPE
SS	SANITARY SEWER, STAINLESS STEEL
TYP.	TYPICAL
W/	WITH
WL	WATER LINE

PATH: J:\DESIGN\95158\ DWG NAME: S-NOTES
DATE: 06/11/99 TIME: 14:55

REV	DATE	BY	DESCRIPTION	NOTES

Brian Kangas Foulk
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REGISTERED PROFESSIONAL ENGINEER MICHAEL C. LIU No. 18870 * Exp. 6/30/97 * CIVIL STATE OF CALIFORNIA

CONSULTANT | AGENCY APPROVED | CITY ENGINEER

SCALE H: NONE
V: NONE
DRAWN
DESIGNED
CHECKED
DATE 11/12/96

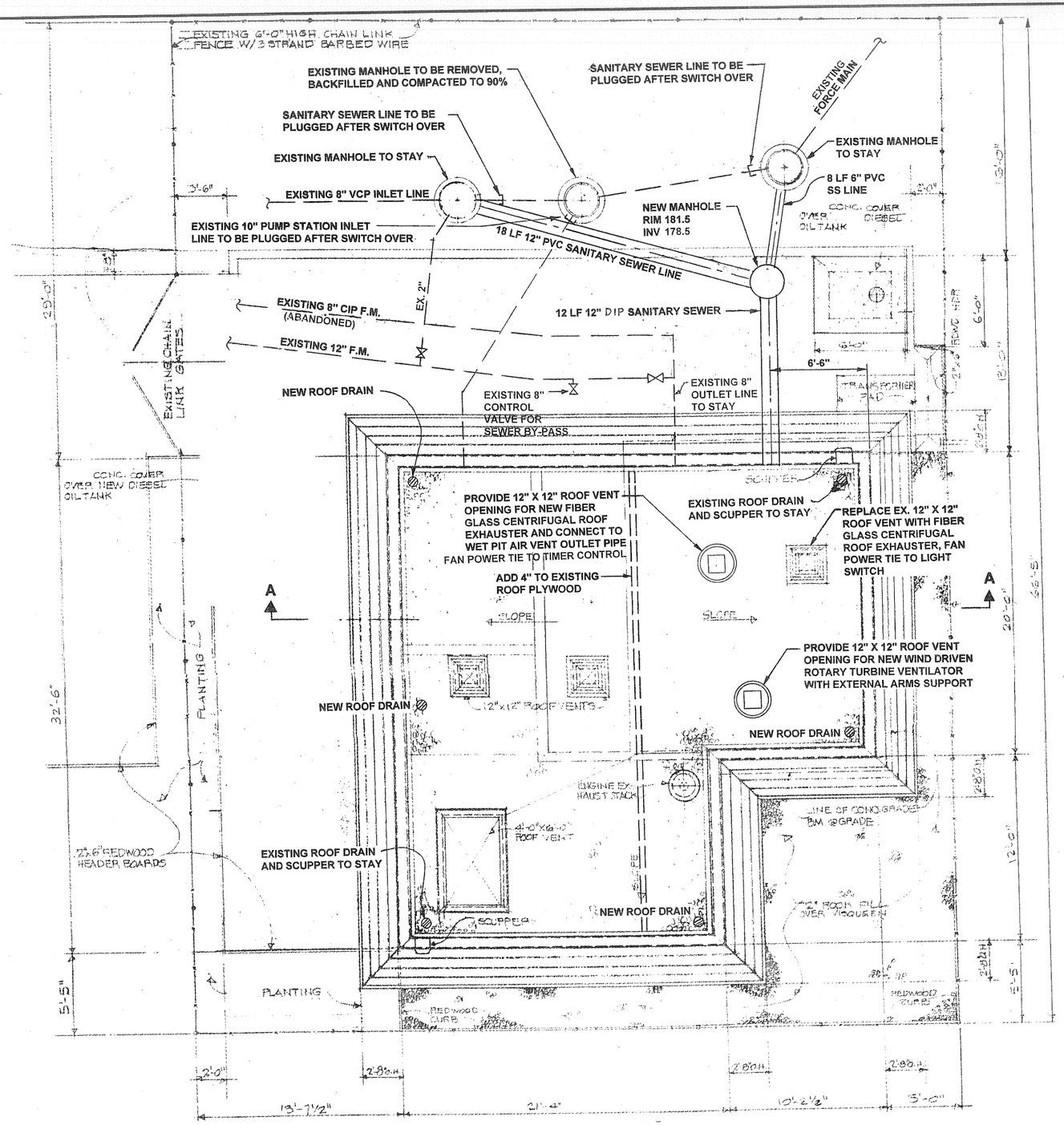
CITY OF BELMONT

DEPARTMENT OF PUBLIC WORKS
CONTRACT NO. 337B

SAN JUAN PUMP STATION REHABILITATION
CONSTRUCTION NOTES, LEGEND AND ABBREVIATIONS

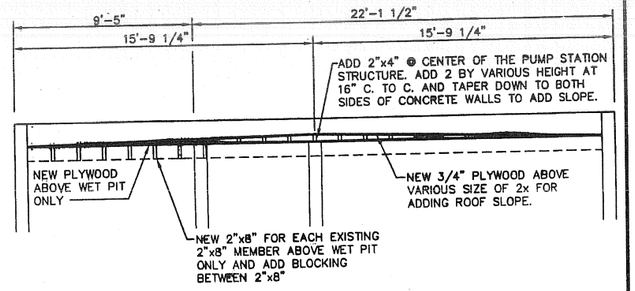
SHEET 2
REVISION 0

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SITE PLAN AND ROOF PLAN

SCALE: 1/4" = 1'-0"

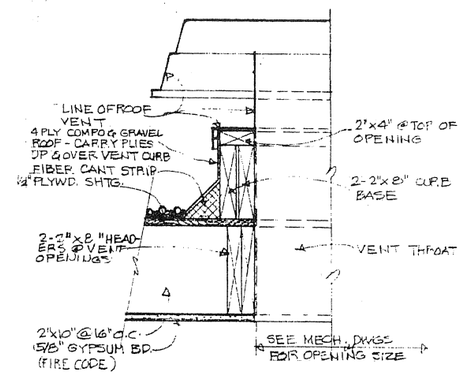


SECTION A-A

SCALE: 1/4" = 1'-0"

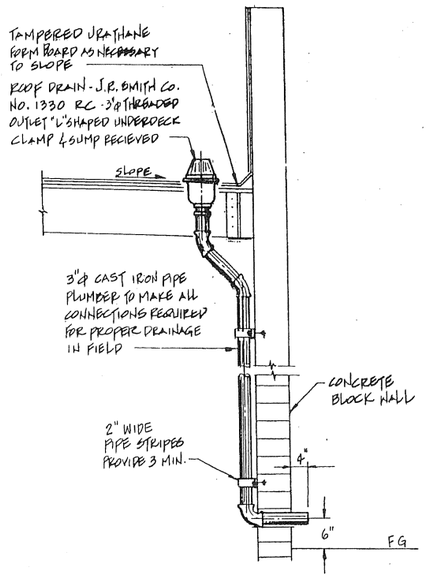
NOTES:

1. EXISTING ROOF DRAINS, VENTS, AND ENGINE EXHAUST STACK TO STAY.
2. REMOVE ALL ROOFING MATERIAL TO BARE PLYWOOD.
3. REMOVE PLYWOOD ABOVE THE EXISTING WET PIT ONLY.
4. ADD 2" X 8" FOR EACH MEMBER OF EXISTING 2" X 8" RAFTER AND SUPPORT BY JOIST HANGER FOR AREA ABOVE WET PIT ROOM
5. ADD 4" (2" X 4") AT MIDDLE OF THE PUMP STATION ROOF STRUCTURE, AND VARIOUS SIZES OF TIMBER STRIPS TO SUPPORT NEW 3/4" PLYWOOD, AND TO PROVIDE ROOF SLOPE TOWARD THE ROOF DRAINS.
6. INSTALL NEW ROOFING MATERIAL.



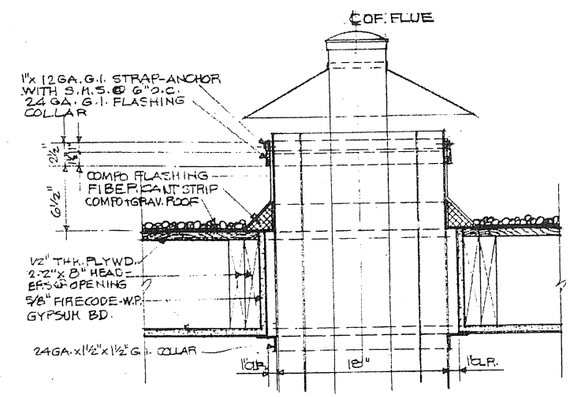
TYPICAL ROOF VENT CURB

NOT TO SCALE



ROOF DRAIN DETAIL

NOT TO SCALE



EXHAUST CURB DETAIL

NOT TO SCALE

REV	DATE	BY	DESCRIPTION

NOTES

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DATE 11/12/96

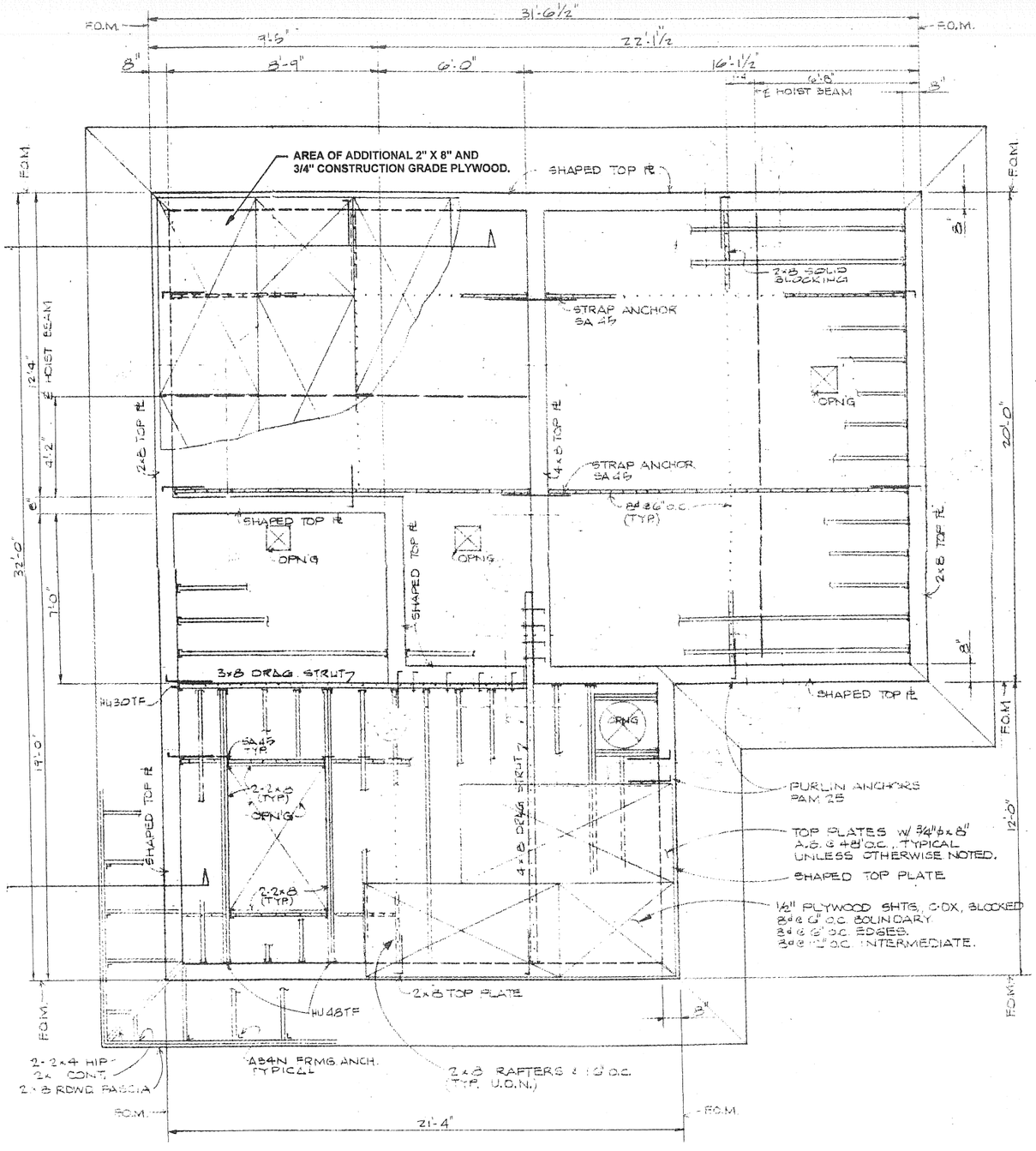
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CONTRACT NO. 337B

SAN JUAN PUMP STATION REHABILITATION
SITE PLAN AND ROOF PLAN

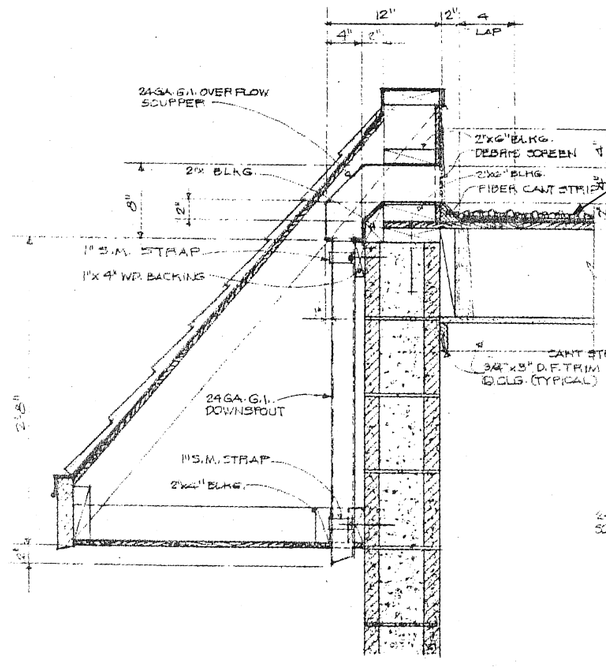
SHEET 3
REVISION 0

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NOTE:

1. CONTRACTOR SHALL REMOVE 3/4" PLYWOOD AND BLOCKING BETWEEN 2" X 8" RAFTER ABOVE THE EXISTING WET PIT ONLY.
2. ADD 2" X 8" FOR EACH EXISTING MEMBER OF 2" X 8" RAFTER WITH SIMPSON LB 28 AT CONCRETE WALL BLOCKING.
3. EXISTING PURLIN ANCHOR @ 8'-0" O.C. ± SHALL BE SAVED AND REUSED.
4. ADD FULL DEPTH BLOCKING BETWEEN EXISTING 2" X 8" AND NEWLY INSTALLED 2" X 8" OR APPROVED CROSS-BRIDGING.
5. ADD 3/4" PLYWOOD WITH 8D AT 6". PLYWOOD ROOF SHEETHING SHALL BE LAID WITH THE GRAIN OF THE OUTER PLIES PERPENDICULAR TO THE FRAMING MEMBERS WITH PANEL JOINTS STAGGERED. USE 2" X 4" FLAT BLOCKING OR APPROVED PLYWOOD CLEATS AT ALL INTERIOR UNSUPPORTED PANEL EDGES.
6. MINIMUM FRAMING NAILING SHALL CONFORM TO TABLE 25-Q OF THE 1994 UBC.



EXISTING OVERFLOW SCUPPER TO STAY
(SECTIONS SHOWN FOR INFORMATION ONLY)

ROOF FRAMING PLAN
SCALE: 3/8" = 1'-0"

OVERFLOW SCUPPER - VERTICAL SECTION
SCALE: 1-1/2" = 1'-0"

OVERFLOW SCUPPER - HORIZONTAL SECTION
SCALE: 1-1/2" = 1'-0"

REV	DATE	BY	DESCRIPTION	NOTES

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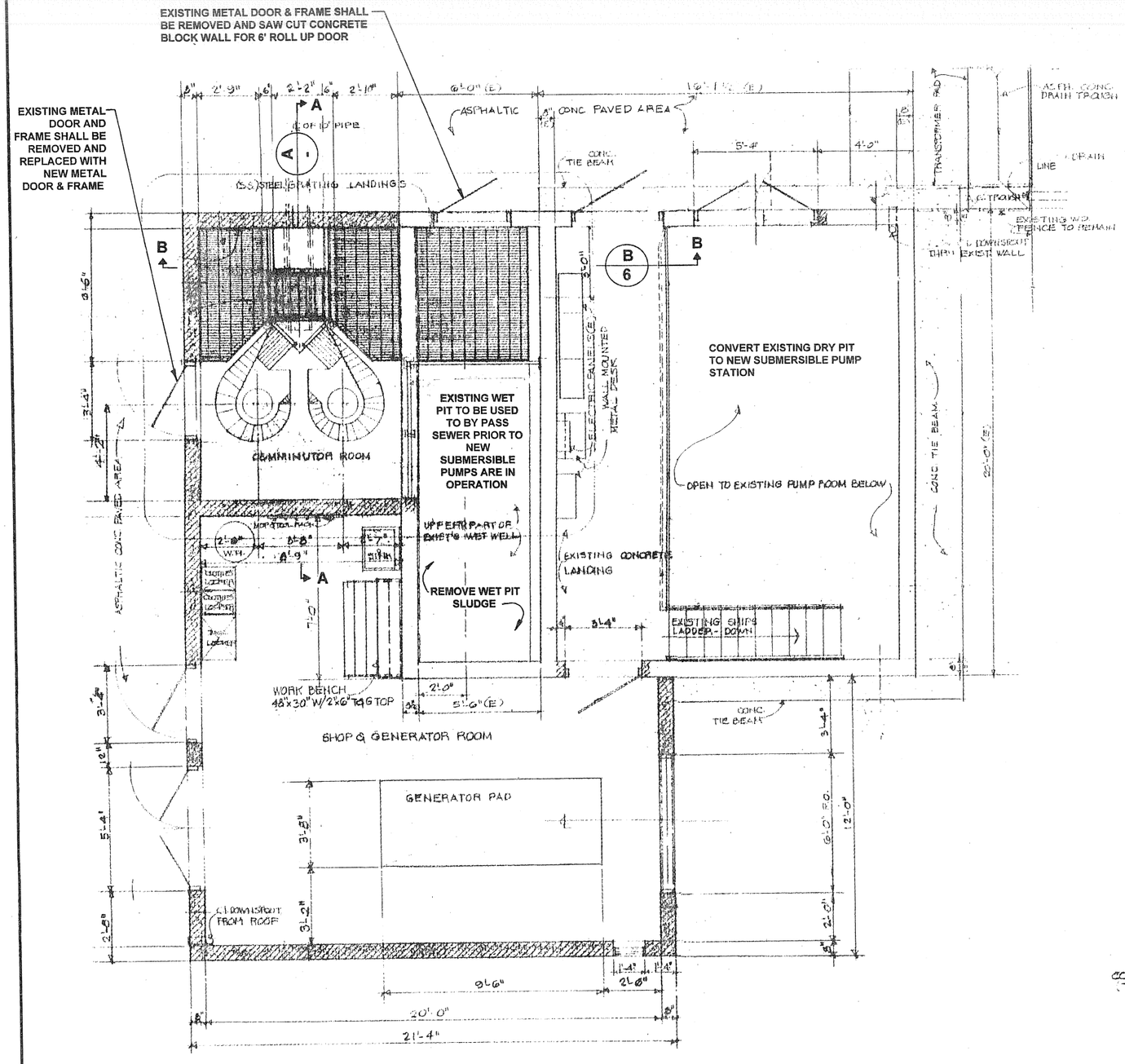
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SAN JUAN PUMP STATION REHABILITATION
ROOF FRAMING PLAN AT EXISTING WET PIT

SHEET 4
REVISION 0

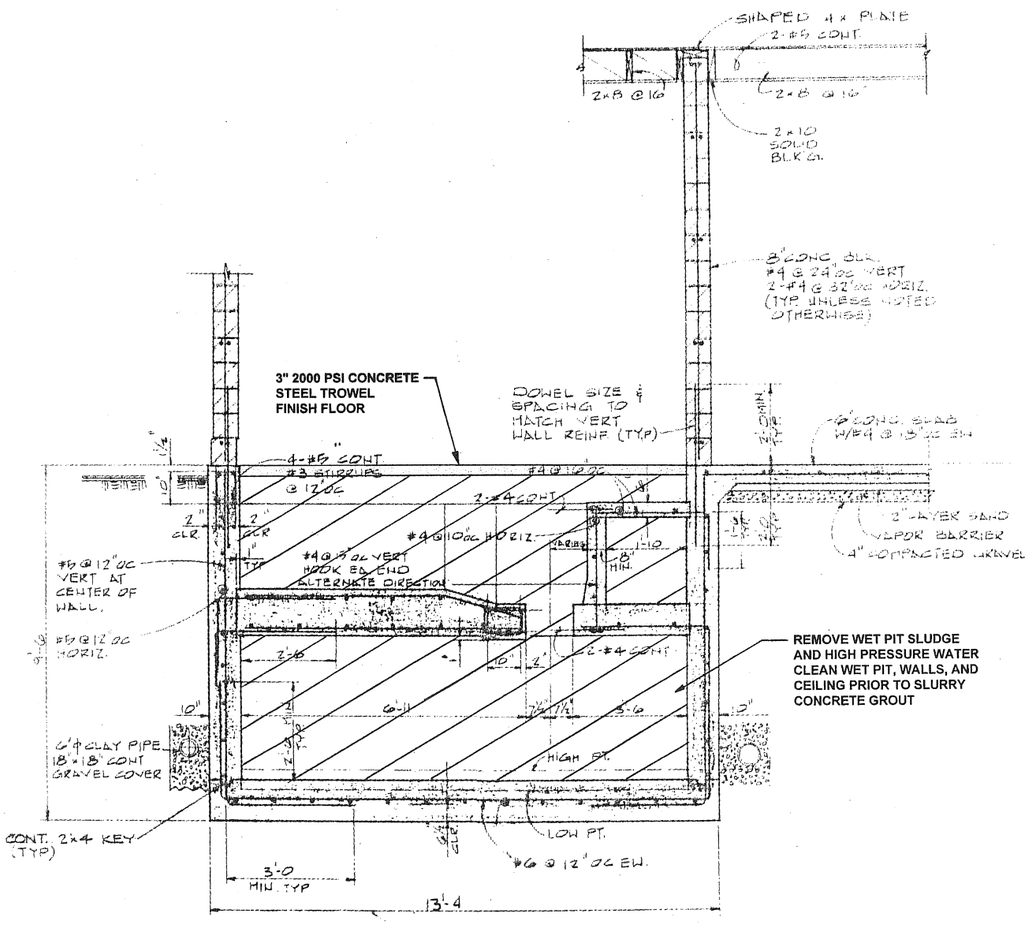
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UPPER LEVEL FLOOR PLAN

SCALE: 3/8" = 1'-0"

1. AFTER THE PUMP STATION SEWER BY-PASS IS IN OPERATION, ALL EXISTING EQUIPMENT WITHIN THE PUMP ROOM SHALL BE REMOVED, INCLUDING ALL PUMP DISCHARGE PIPING TO THE FLEXIBLE COUPLING, AND CONDUITS ATTACHED TO THE EXISTING CONCRETE WALL.
2. AFTER THE NEW PUMPS ARE IN OPERATION, REMOVE ALL EQUIPMENT WITHIN THE EXISTING WET PIT INCLUDING ALL HANDRAIL, STAINLESS STEEL GRATES, TWO CHICAGO GRINDERS, SLIDE GATES, GRINDERS HANDLING CRANE, FLOW METER, LIGHTING SYSTEM & CEILING SHEET ROCK PRIOR TO SLURRY CONCRETE GROUT.
3. REMOVE THE METAL STAIR WAY AND HANDRAIL IN THE EXISTING PUMP ROOM WHEN THE I-BEAM FOR THE ALUMINUM CHECKER PLATE ARE READY TO BE INSTALLED.
4. SEE SHEET 11 FOR NEW LOCATION OF METAL DOORS AND EQUIPMENTS TO BE REMOVED AND/OR RELOCATED IN THE SHOP AND GENERATOR ROOM.
5. SEE SHEET 14 FOR ELECTRICAL EQUIPMENTS TO BE REMOVED AND /OR RELOCATED.



EX. WET WELL AND COMMINUTOR ROOM E/W SECTION (A / -)

SCALE: 1/2" = 1'-0"

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DATE 11/12/96

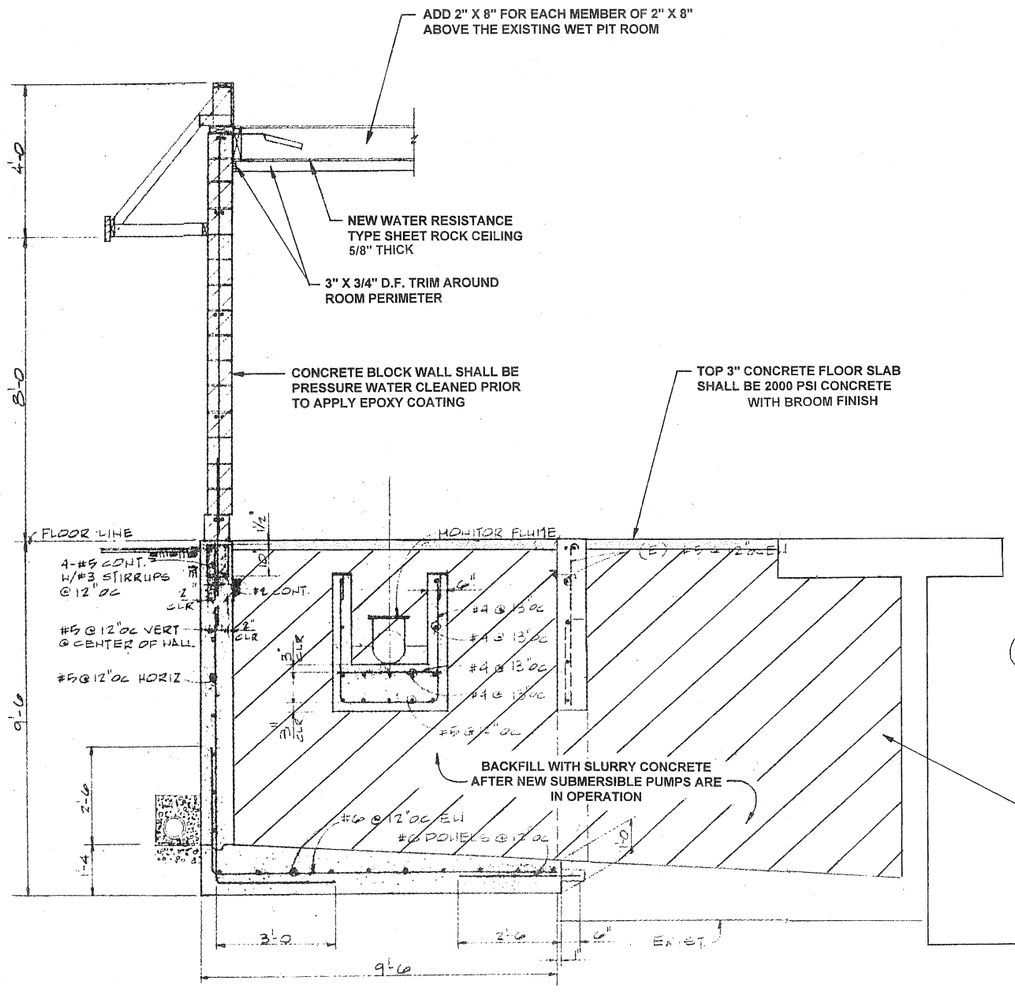
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SAN JUAN PUMP STATION REHABILITATION
DEMOLITION PLAN

SHEET 5
REVISION 0

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NEW PUMP STATION WET PIT

EX. WET WELL AND COMMINUTOR ROOM N/S SECTION B/5

SCALE: 1/2" = 1'-0"

NOTE:

1. EXISTING WET PIT SLUDGE SHALL BE PUMPED OUT PRIOR TO THE INSTALLATION OF THE SUBMERSIBLE PUMPS FOR SEWER BY-PASS WHILE UPGRADING THE EXISTING PUMP ROOM.
2. AFTER THE SANITARY SEWER IS REROUTED TO THE PUMP STATION NEW WET PIT, AND THE NEW SUBMERSIBLE PUMPS ARE IN OPERATION
   - A. THE SLUDGE IN THE EXISTING WET PIT SHALL BE PUMPED OUT AND THE EXISTING WET PIT SHALL BE HIGH PRESSURE WATER CLEANED. (MINIMUM 1,000 PSI PRESSURE WATER JET)
   - B. INSTALL ALL ELECTRICAL CONDUIT AND DRAINAGE PIPES TO THE NEW WET PIT FOR TOILET AND FLOOR DRAIN CONNECTION.
   - C. REMOVE ANY EMBEDDED MATERIAL ABOVE THE PROPOSED FINISHED FLOOR ELEVATION, INCLUDING ALL TUBING, ANCHORS, ELECTRICAL BOX, HANDRAIL, ETC.
   - D. PUMP SLURRY CONCRETE TO SEAL THE ENTIRE WET PIT AFTER ALL CONDUITS AND PIPELINE ARE INSTALLED.
3. THE TOP 3" OF THE WET PIT CONCRETE FINISH SHALL BE 2000 PSI CONCRETE WITH BROOM FINISH AND CONTRACTION JOINTS AT 10' EACH WAY.

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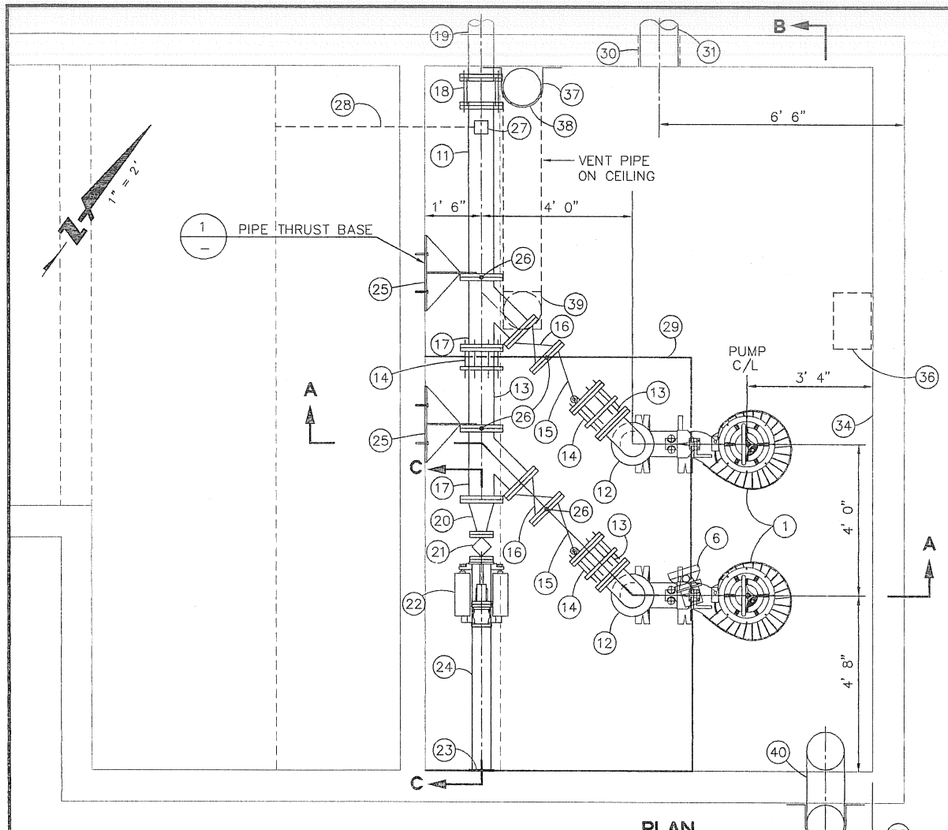
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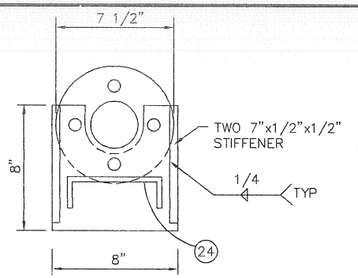
SAN JUAN PUMP STATION REHABILITATION
DEMOLITION PLAN

SHEET 6
REVISION 0

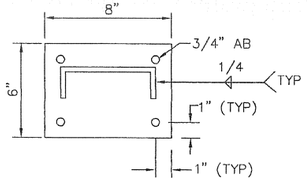
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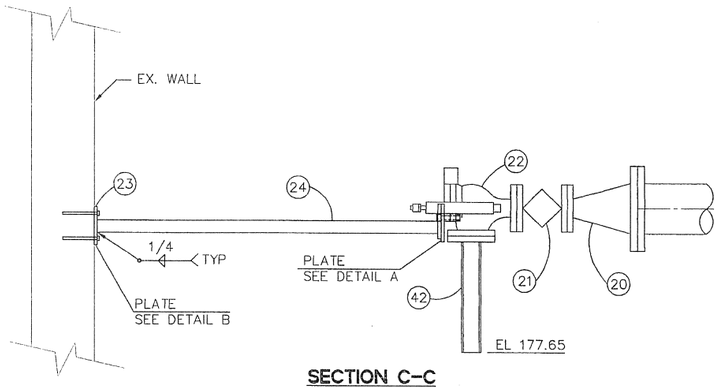
PLAN
SCALE: 1/2" = 1'



DETAIL A
NOT TO SCALE



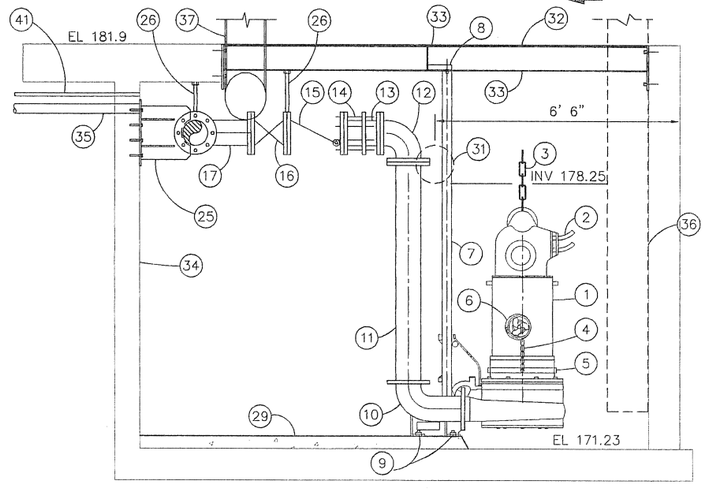
DETAIL B
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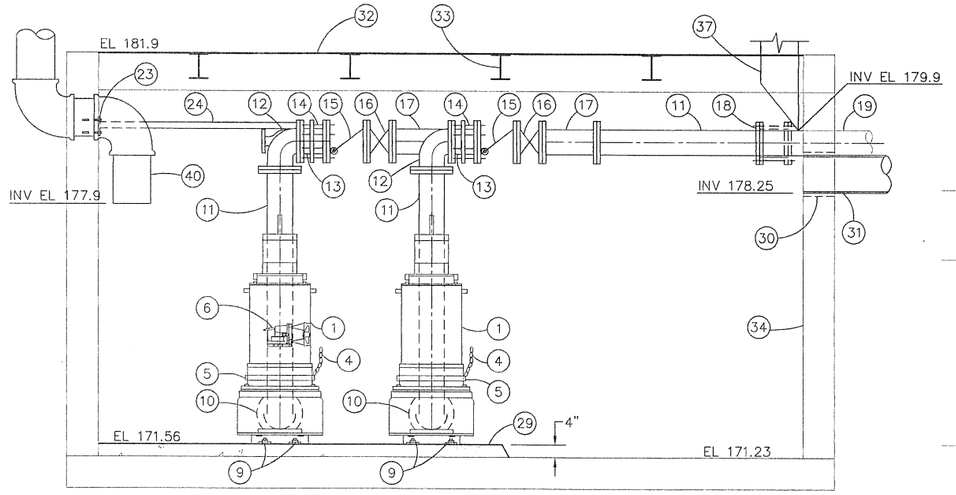
SECTION C-C
SCALE: 1" = 1'

LEGEND

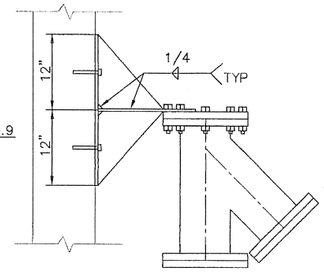
1. SUBMERSIBLE PUMP – FLYGT CP – 3300-461
2. MOTOR CABLE.
3. STAINLESS STEEL PUMP LIFTING CHAIN.
4. STAINLESS STEEL CHAIN FOR TILTING THE SUBMERSIBLE PUMP.
5. STAINLESS STEEL BRACKET AT BOTTOM OF MOTOR FOR TILTING PUMP.
6. FLYGT 4352 SUBMERSIBLE MIXER.
7. GUIDE PIPE, 3" STANDARD STAINLESS STEEL PIPE, TWO REQUIRED FOR EACH PUMP.
8. UPPER GUIDE BAR BRACKETS WELDED TO I-BEAM, CONTRACTOR SHALL FIELD VERIFY DIMENSION.
9. 3/4" STAINLESS STEEL ANCHOR BOLT – 4 PER PUMP.
10. PUMP DISCHARGE 90° ELBOW WITH SUPPORT FRAME.
11. 8" D.I.P. DISCHARGE PIPE.
12. 8" FL x FL 90° ELBOW.
13. 8" D.I.P. SPOOL FL X PE
14. 8" FLANGE COUPLING ADAPTOR WITH ANCHOR BOLTS.
15. 8" BALL CHECK VALVE.
16. 8" FL x FL PLUG VALVE WITH GEAR AND HANDWHEEL OPERATOR. ALL FASTENERS SHALL BE STAINLESS STEEL.
17. 8" x 8" x 8" 45° LATERAL.
18. FLEXIBLE COUPLING ADAPTOR.
19. EXISTING 8" D.I.P. FORCE MAIN TO 12" FORCE MAIN.
20. 8" x 3" D.I.P. REDUCER
21. 3" FL x FL PLUG VALVE.
22. 3" SEWAGE SURGE RELIEF VALVE.
23. CHANNEL THRUST SUPPORT BASE PLATE 6" x 8" x 1/2".
24. C6 x 10.5 STEEL CHANNEL THRUST SUPPORT.
25. PIPE THRUST BASE (REUSE EXISTING BASES, MODIFY IF NECESSARY)
26. PIPE HANGER ATTACHED TO THE I-BEAM OR CONCRETE SLAB.
27. FLOW METER TRANSDUCER.
28. SEALED CONDUIT TO FLOW METER.
29. CONCRETE PAD.
30. CORE DRILL EXISTING CONCRETE WALL FOR 12" INLET LINE AND NON-SHRINK GROUT AROUND THE PIPE
31. NEW 12" PVC INLET LINE.
32. ALUMINUM COVER.
33. COVER PLATE I-BEAM SUPPORT
34. EPOXY COATING ENTIRE INTERIOR FACE OF NEW WET PIT INCLUDING I-BEAMS
35. 3" PVC CONDUIT FOR POWER CABLE TO MCC.
36. EXISTING 12" x 18" GALVANIZE STEEL VENT DUCT TO BE REMOVED.
37. 12" PVC (80 PSI RATING) AIR VENT OUTLET LINE WITH ELBOWS, FROM WET PIT EL 179.90, TIE TO NEW ROOF VENT OPENING.
38. GALVANIZED STEEL STRIP AT 6' C TO C WITH A.B.
39. NEW 12" x 12" OPEN ROOF VENT.
40. 12" PVC (80 PSI RATING) AIR VENT INLET WITH FOUR 90° ELBOWS AND STAINLESS STEEL INSECT SCREEN AT THE END.
41. 3" PVC CONDUIT FOR PUMP LEVEL CONTROL.
42. 3" DIP FL X PE.



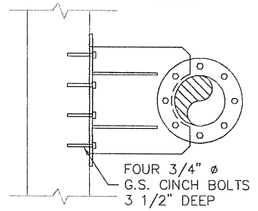
SECTION A-A
SCALE: 1/2" = 1'



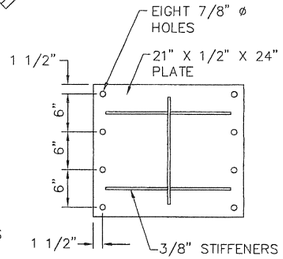
SECTION B-B
SCALE: 1/2" = 1'



PLAN



SECTION



SECTION

1 / – PIPE THRUST BASE
SCALE: 1" = 1'

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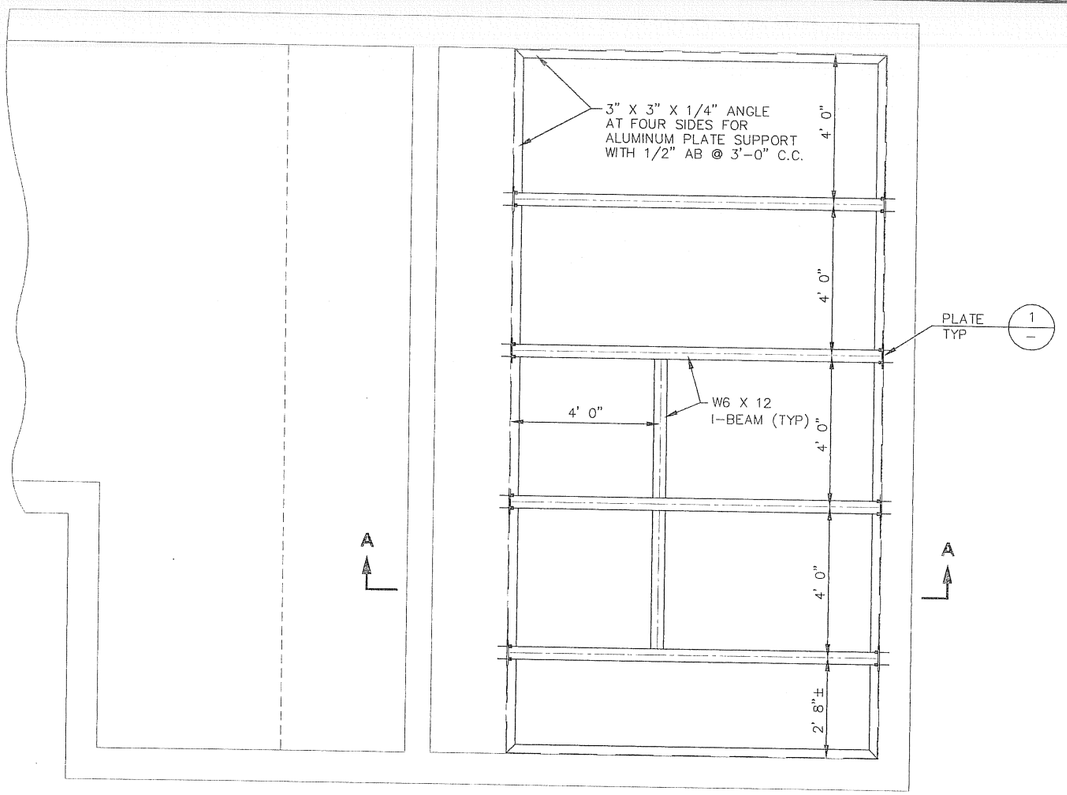
SAN JUAN PUMP STATION REHABILITATION
PUMP STATION PLAN AND SECTIONS

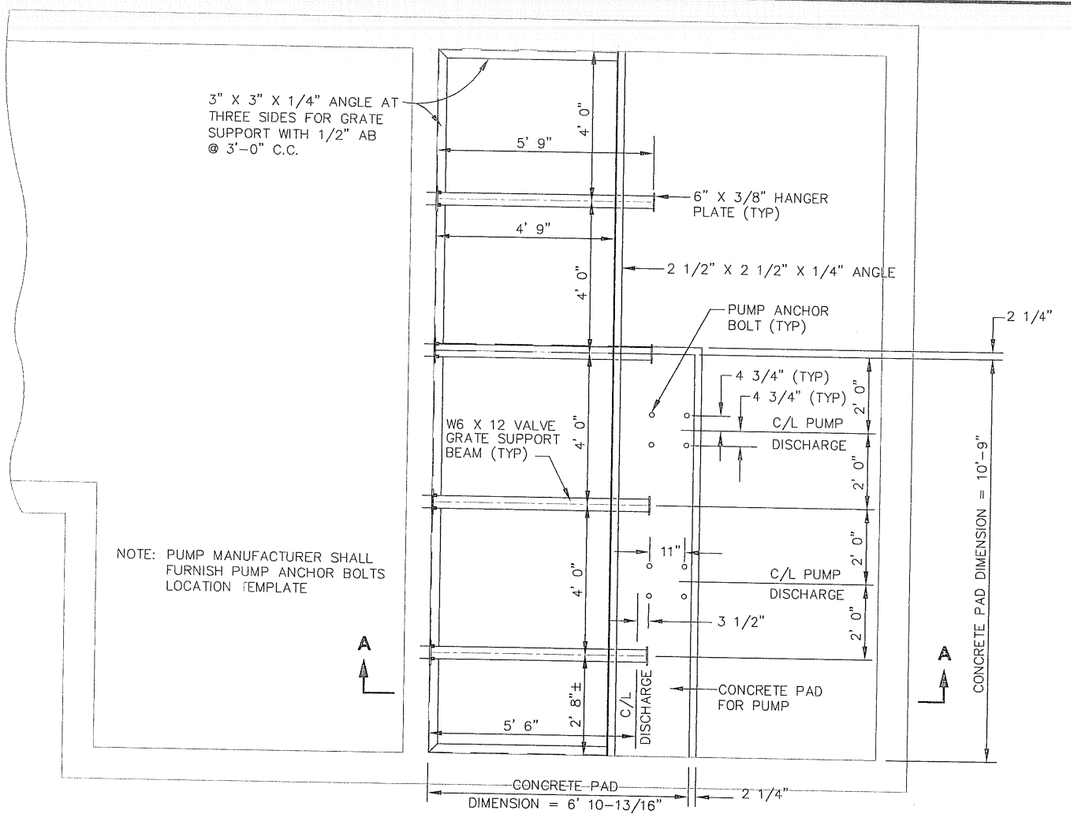
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REVISION 0

677

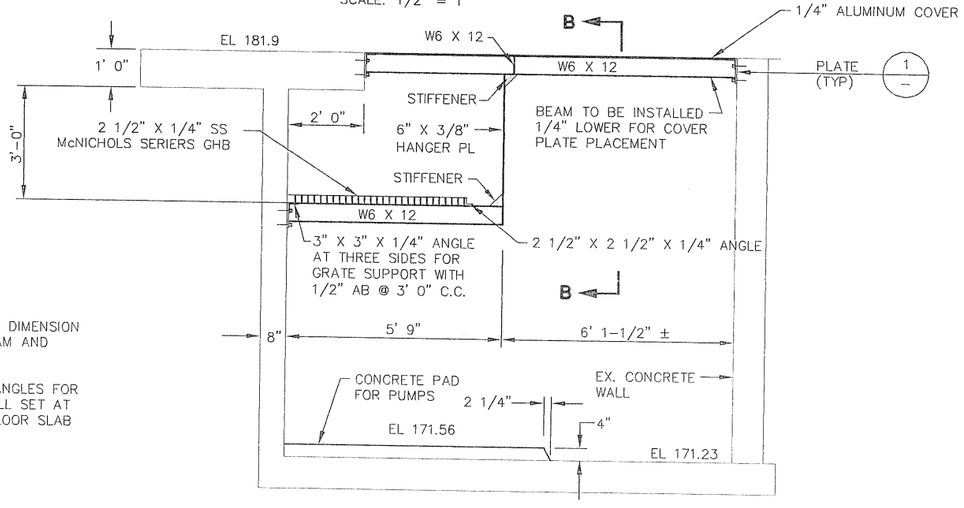
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COVER PLATE BEAM DETAIL
SCALE: 1/2" = 1'

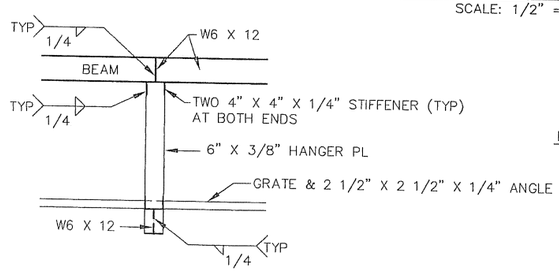


SECTION A-A
SCALE: 1/2" = 1'

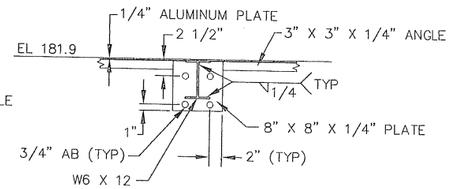
NOTE :

1. CONTRACTOR SHALL VERIFY ALL DIMENSION PRIOR TO FABRICATE THE I-BEAM AND COVER PLATE.
2. I-BEAM AND 3" X 3" X 1/4" ANGLES FOR ALUMINUM PLATE SUPPORT SHALL SET AT 1/4" LOWER THAN CONCRETE FLOOR SLAB

VALVE SUPPORT BEAM DETAIL
SCALE: 1/2" = 1'



SECTION B-B
SCALE: 1/2" = 1'



1 PLATE DETAIL
SCALE: 1" = 1'

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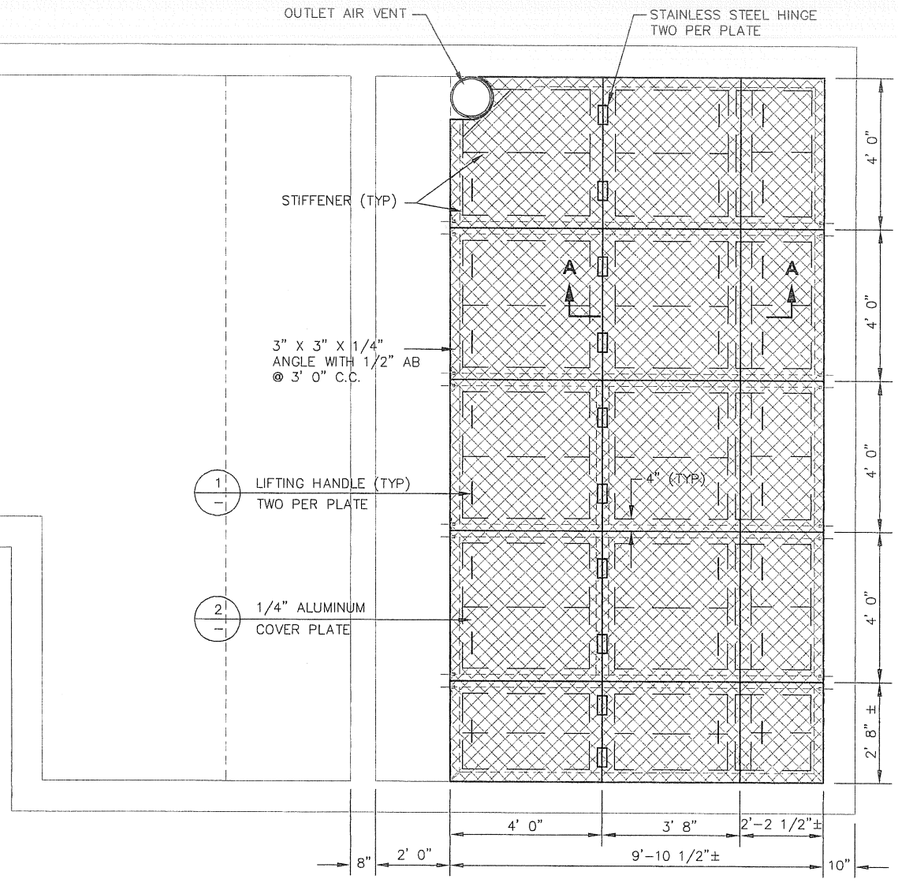
SAN JUAN PUMP STATION REHABILITATION
PUMP ROOM STRUCTURAL PLAN

SHEET 8
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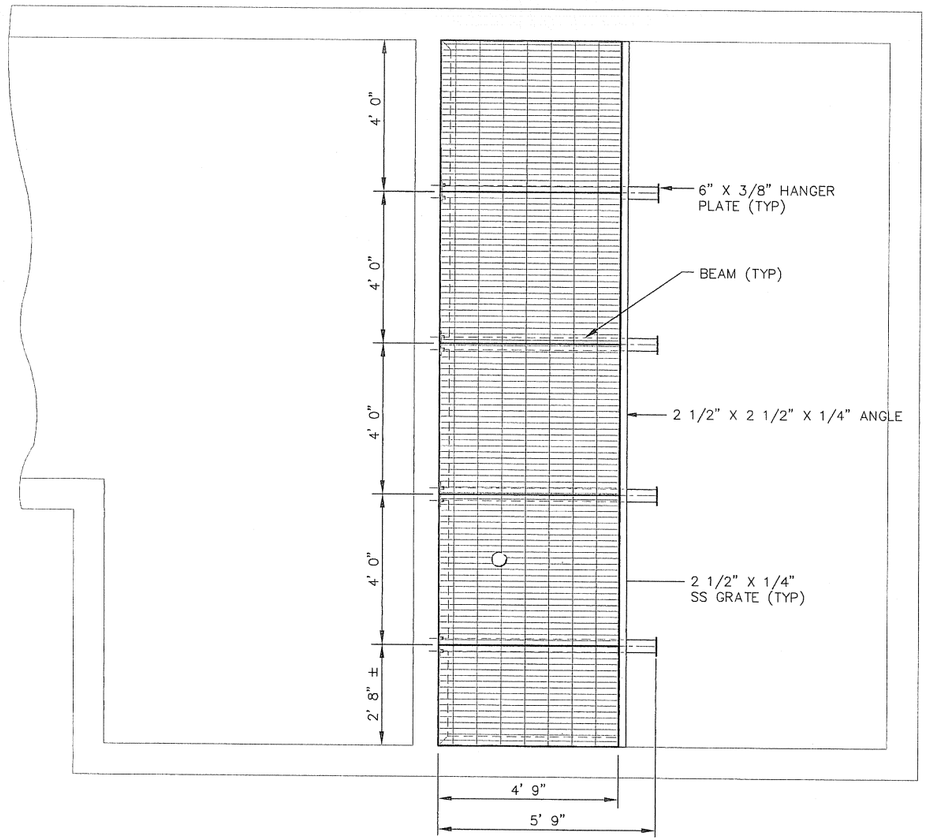
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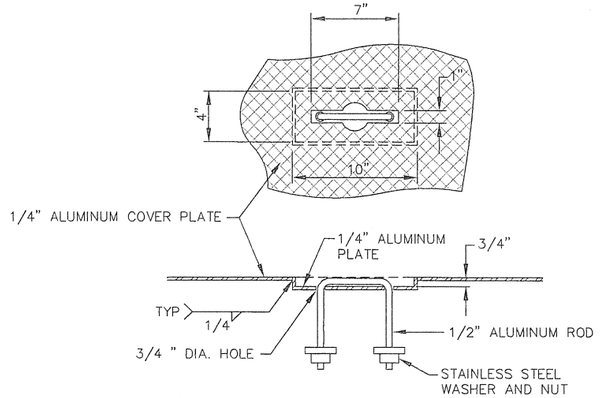
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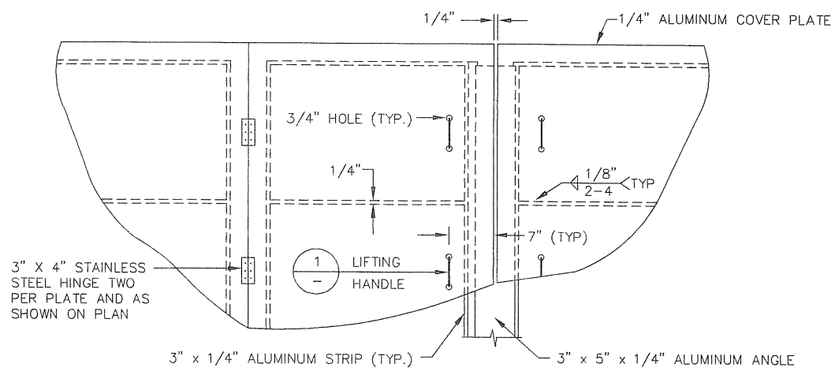
COVER PLATE PLAN
SCALE: 1/2" = 1'



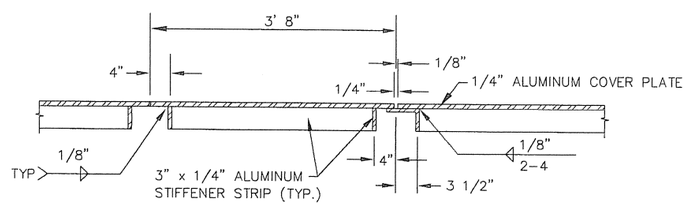
VALVE SUPPORT GRATE PLAN
SCALE: 1/2" = 1'



1/1 LIFTING HANDLE DETAIL
NOT TO SCALE



2/1 COVER PLATE DETAIL
NOT TO SCALE



SECTION A-A
NOT TO SCALE

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CONTRACT NO. 337B

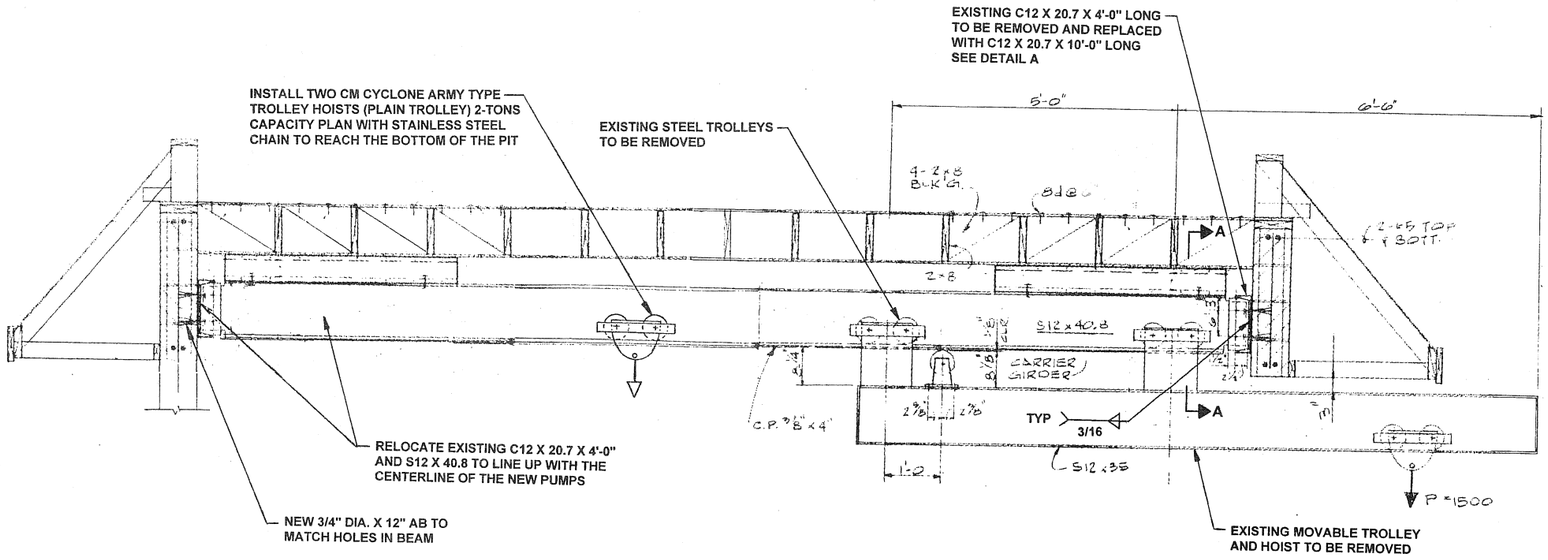
SAN JUAN PUMP STATION REHABILITATION
PUMP ROOM COVER PLATE

SHEET 9
REVISION 0

679

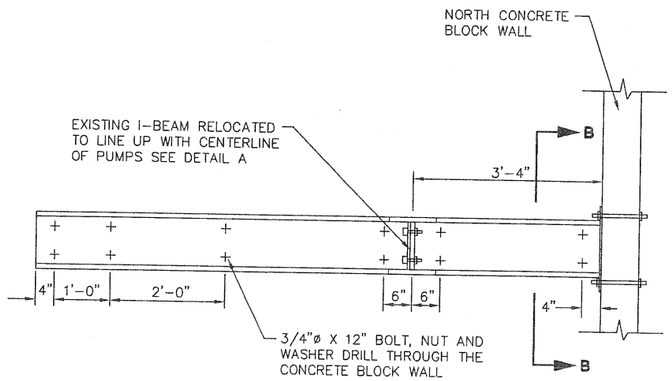
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DATE: 06/14/96 TIME: 10:00

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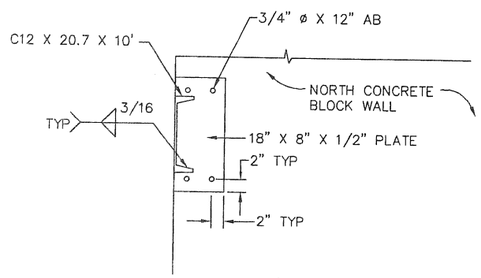


TROLLEY SYSTEM MODIFICATION

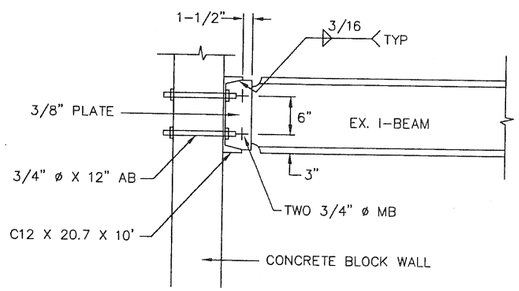
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SECTION A-A
SCALE: 3/4" = 1'-0"



SECTION B-B
SCALE: 1" = 1'-0"



DETAIL A
SCALE: 1" = 1'-0"

REV	DATE	BY	DESCRIPTION

NOTES

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REGISTERED PROFESSIONAL ENGINEER MICHAEL C. LIU No. 18870 Exp. 6/30/97 CIVIL STATE OF CALIFORNIA

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SCALE H: AS SHOWN
V:
DRAWN SL
DESIGNED ML
CHECKED ML
DATE 11/12/96

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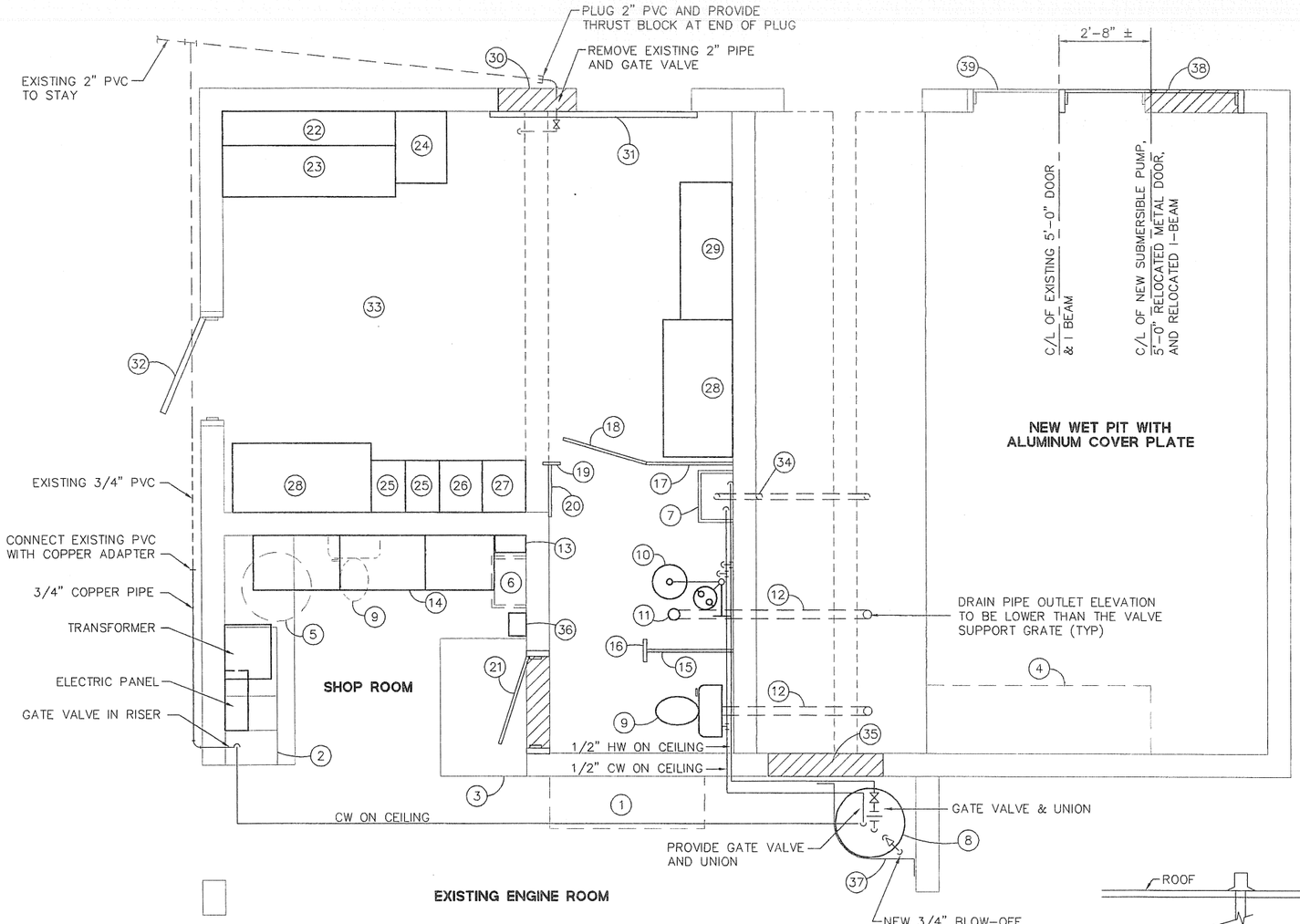
SAN JUAN PUMP STATION REHABILITATION
TROLLEY SYSTEM MODIFICATION

SHEET 10
REVISION 0

680

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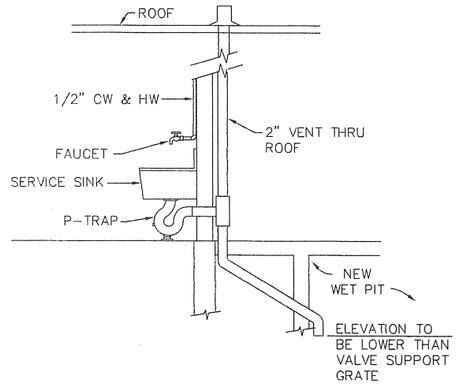


NOTE :

1. CONTRACTOR SHALL RELOCATE EXISTING TOILET AND SINK, REMOVE HOT WATER HEATER AND ALL PLUMBING PIPELINE WITHIN SHOP ROOM AND EXISTING PUMP ROOM.
2. REMOVE HOT WATER BLOW-OFF LINE AND FILL THE HOLE AT CONCRETE WALL WITH CONCRETE GROUT.

STORAGE ROOM LAYOUT PLAN

SCALE: 1/2" = 1'-0"



SINK AND VENT DETAIL

NOT TO SCALE

LEGEND

1. EXISTING TOOL TABLE TO STAY
2. EXISTING CLOTH LOCKER AND TOOL LOCKER TO BE REMOVED
3. EXISTING WORK BENCH TO BE REMOVED
4. EXISTING WALL MOUNTED CABINET AND SINK UNDER THE STAIR TO BE REMOVED
5. EXISTING HOT WATER TANK TO BE REMOVED
6. EXISTING SINK AND FAUCET TO BE RELOCATED TO NEW LOCATION AT (7)
7. NEW LOCATION OF EXISTING SINK AND FAUCET WITH 2" CIP DRAIN PIPE TO NEW WET PIT
8. NEW 40 GALLONS ELECTRIC WATER HEATER, DUAL ELEMENTS 4.5 KW TO OPERATE SIMULTANEOUSLY TOTAL 9 KW, 240V, 1 ø, TO BE LOCATED UNDER THE ENGINE EXHAUST STACK
9. EXISTING TOILET TO BE RELOCATED TO THE NEW LOCATION AS SHOWN
10. FULL HEIGHT COMBINATION SHOWER, EYEWASH SPEAKMAN C&H STOCK NO. 28-426A
11. FLOOR DRAIN WITH JAY R. SMITH 2030-A TRAP OR EQUAL
12. 3" CIP WITH TRAP TO NEW WET PIT FOR FLOOR DRAIN, AND TOILET
13. FLOW METER WITH CONDUIT TO TRANSDUCER AT 8" DISCHARGE LINE
14. MOTOR CONTROL CENTER AND 18" X 7'-6" X 4" CONCRETE PAD WITH 3/4" CHAMFER
15. 30" x 58" x 1" STAINLESS STEEL METAL PARTITION WITH WALL MOUNTED BRACKETS
16. 8" x 70" x 1" STAINLESS STEEL FLOOR MOUNTED PARTITION SUPPORT WITH HARDWARE AND STILL BASE
17. 30" x 58" x 1" FULL FLUSH TYPE STAINLESS STEEL METAL PARTITION WITH WALL MOUNTED BRACKETS
18. 30" X 58" x 1" FULL FLUSH TYPE STAINLESS STEEL METAL PARTITION WITH HANDLE, TOP PIVOT ASSEMBLY, BOTTOM HINGE ASSEMBLY, AND SLIDE LATCH
19. 6" x 82" x 1" FULL FLUSH TYPE STAINLESS STEEL METAL PARTITION WITH OUTSWING BUMPER/KEEPER, AND STILL BASE
20. 18" x 58" x 1" FULL FLUSH TYPE STAINLESS STEEL METAL PARTITION WITH WALL MOUNTED BRACKET
21. SAWCUT EXISTING CONCRETE BLOCK WALL FOR STEEL METAL DOOR AND FRAME RELOCATED FROM (35)
22. TWO-12" x 5' x 3/4" WOOD BOOK SHELVES SUPPORTED BY TWO WALL MOUNTED BRACKET
23. 5' x 3' METAL DESK WITH CHAIR
24. 2 DRAWERS FILE CABINET
25. PENCO VENTILATED LOCKERS (1 LOCKER WIDE) STOCK NO. 57-704DA 12"W x 18"D x 72"H
26. PENCO VENTILATED LOCKERS (1 LOCKER WIDE) STOCK NO. 57-711DAL 15"W x 18"D x 36"H
27. PENCO VENTILATED LOCKERS (1 LOCKER WIDE) STOCK NO. 57-717DAL 15"W x 18"D x 12"H
28. EDSAL HEVILOAD "PLUS II" INDUSTRIAL SHELVING STOCK NO. 52-772AX 18 GAUGE 6 SHELVES 48"W x 24"D x 85"H
29. EDSAL HEVILOAD "PLUS II" INDUSTRIAL SHELVING STOCK NO. 52-754AX 18 GAUGE 6 SHELVES 48"W x 18"D X 85"H
30. REMOVE EXISTING METAL DOOR AND FRAME, SAWCUT EXISTING CONCRETE BLOCK WALL FOR 6' WIDE ROLLUP METAL DOOR
31. 6' x 7'(H) COOKSON TYPE FC-CHAIN DRIVE ROLLUP METAL DOOR
32. REPLACE EXISTING METAL DOOR AND FRAME WITH NEW METAL DOOR AND FRAME 3' W X 7'-2" H X 1-3/4" T WITH 2' X 2' LOUVER, STAINLESS HINGES AND SS DOOR KNOB
33. NEW CONCRETE FLOOR WITH 10' MAXIMUM CONTRACTION SCORE
34. 2" VENT THRU ROOF
35. REMOVE EXISTING METAL DOOR AND FRAME TO NEW LOCATION AS SHOWN AT (21), AND SEAL THE OPENING WITH 8" CONCRETE MASONRY BLOCK WITH #5 DOWEL 24" LONG AT 24" C. TO C.
36. RELOCATED EXISTING GAS DETECTOR
37. METAL STRIPS TO CONCRETE WALL FOR EARTHQUAKE SAFETY
38. SAWCUT EXISTING CONCRETE BLOCK WALL FOR STEEL METAL DOOR AND FRAME RELOCATED FROM (39)
39. REMOVE EXISTING METAL DOOR AND FRAME TO NEW LOCATION AS SHOWN AT (38), AND SEAL THE OPENING WITH 8" CONCRETE MASONRY BLOCK WITH #5 DOWEL 24" LONG AT 24" C. TO C.

PLOT: J:\DESIGN\950158\ DWG NAME: S-STORE
DATE: 08/19/96 TIME: 09:45

REV	DATE	BY	DESCRIPTION

NOTES

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DRAWN SL
DESIGNED ML
CHECKED ML
DATE 8/19/96

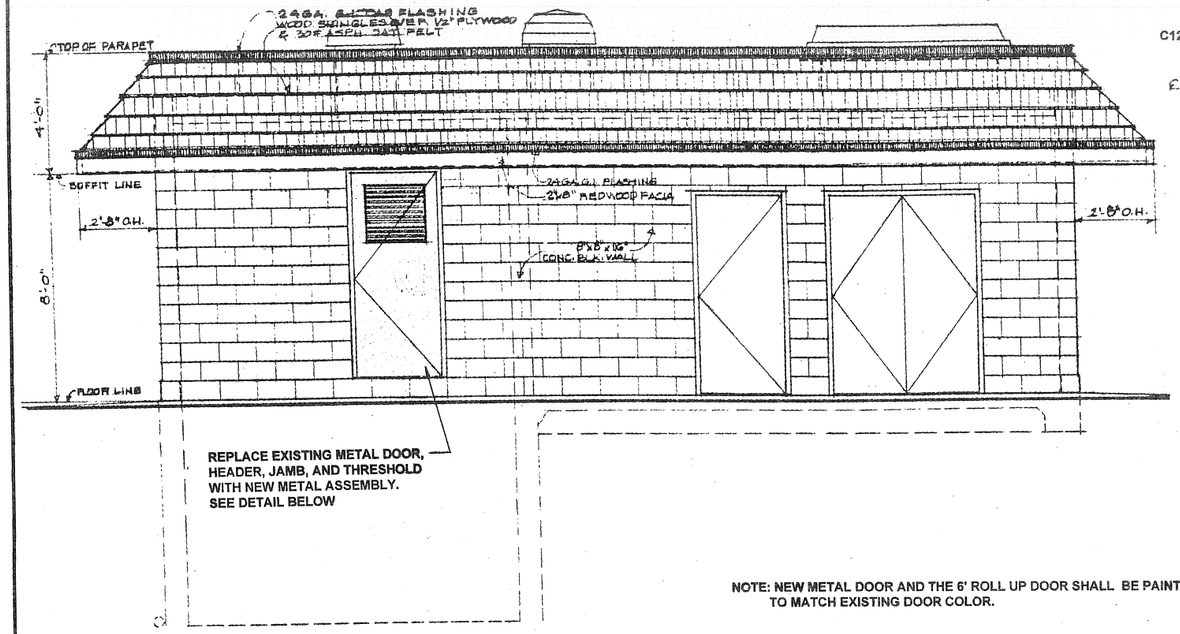
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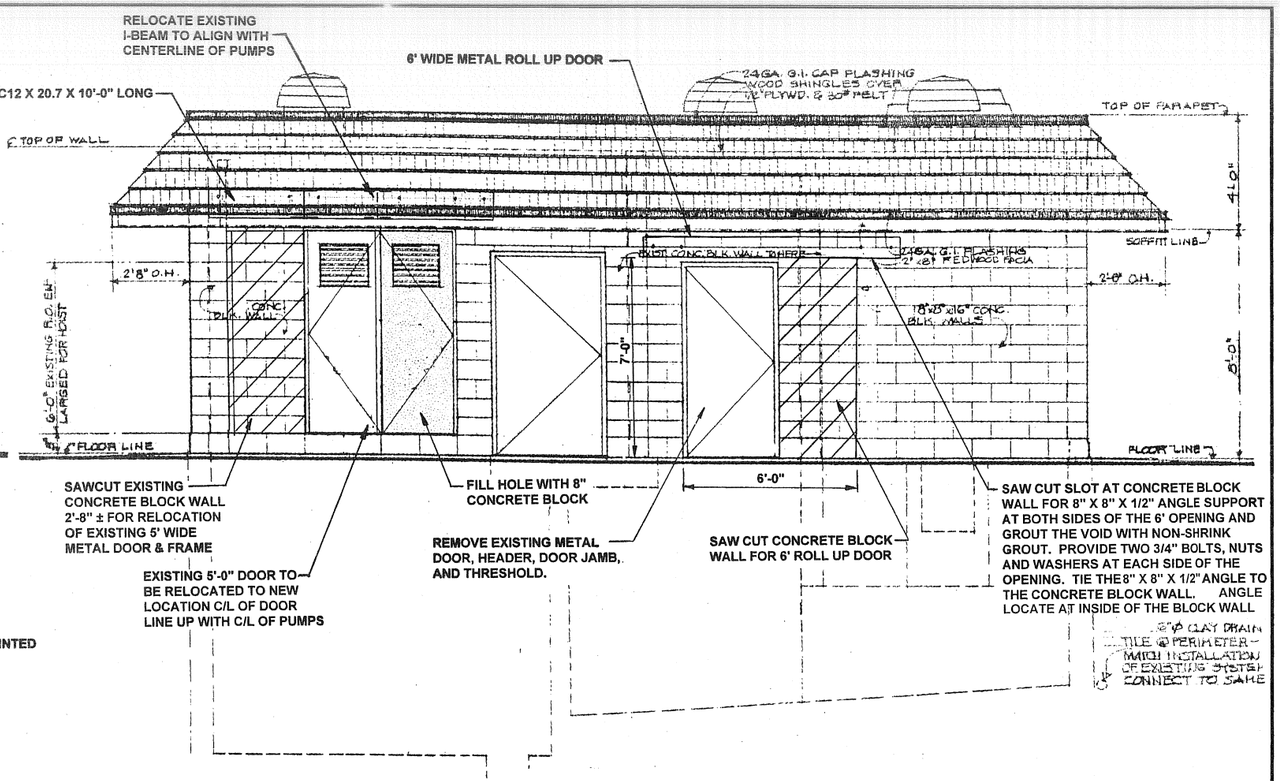
SAN JUAN PUMP STATION REHABILITATION
STORAGE ROOM LAYOUT PLAN

SHEET 11
REVISION 0

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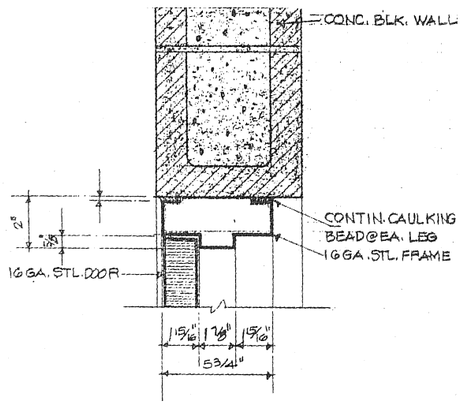


NOTE: NEW METAL DOOR AND THE 6' ROLL UP DOOR SHALL BE PAINTED TO MATCH EXISTING DOOR COLOR.

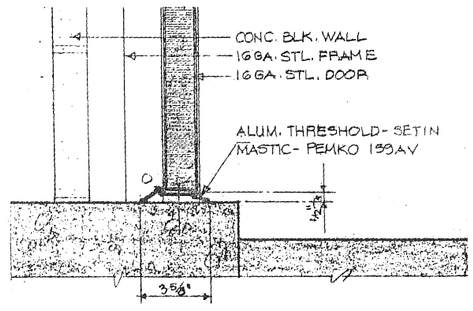


SOUTH ELEVATION
SCALE: 3/8" = 1'-0"

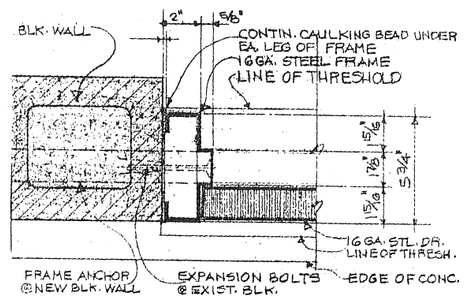
WEST ELEVATION
SCALE: 3/8" = 1'-0"



TYPICAL H. M. DOOR HEAD DETAIL
SCALE: 3" = 1'-0"



TYPICAL THRESHOLD DETAIL
SCALE: 3" = 1'-0"



TYPICAL H. M. DOOR JAMB DETAIL
SCALE: 3" = 1'-0"

REV	DATE	BY	DESCRIPTION	NOTES

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V: _____
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SAN JUAN PUMP STATION REHABILITATION
METAL DOORS REPLACEMENT

SHEET 12
REVISION 0

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GENERAL NOTES

1 GROUT ALL THRU THE WALL PENETRATIONS WITH OR WITHOUT CONDUITS WITH EXPANSIVE CONCRETE GROUT.

2 GROUT ALL UNUSED CONDUIT FLOOR PENETRATION WITH EXPANSIVE CONCRETE GROUT.

3 ALL OTHER MISCELLANEOUS CONDUITS, NOT SHOWN, LOCATED IN OLD WET WELL AND NEW WET WELL TO BE REMOVED.

4 NEW WET WELL TO BE CONSIDERED CLASS I, DIVISION I HAZARDOUS LOCATION. ALL EQUIPMENT AND INSTALLATION TO BE APPROVED FOR THIS CLASSIFICATION.

4 OLD WET WELL TO BE CONSIDERED GENERAL PURPOSE DRY LOCATION.

5 RELOCATE (E) SURFACE MOUNTED CATV CABLE FROM WET WELL TO NEW MCC.

FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	LAMP
A	EXISTING, FLUORESCENT, SURFACE, INDUSTRIAL 1X4, NO CHANGE	2–F40/CW
B	FLUORESCENT, SURFACE, WRAPAROUND, ACRYLIC PRISMATIC LENS, 2 LAMP, T–8, ELECTRONIC BALLAST	2–F032/841
C	HIGH PRESSURE SODIUM, PENDANT, CLASS I GROUP D, ENCLOSED AND GUARDED, SELF–CONTAINED BALLAST, PORCELAIN ENAMEL DOME REFLECTOR. CROUSE HINDS EVMA 43101. MOUNT REFLECTOR HEIGHT TO BOTTOM OF FIXED BEAM.	1–LU100

PLAN NOTES

1 JUNCTION BOX, CROUSE–HINDS EJB 9166

2 JUNCTION BOX, CROUSE–HINDS EJB 684

3 GAS DETECTOR TRANSDUCER, RELOCATED

4 MANUAL MOTOR STARTER, NEMA 7, SIZE TO FAN MOTOR

ELECTRICAL LEGEND

A	FIXTURE TAG – A INDICATES TYPE FROM FIXTURE SCHEDULE.
▭	LIGHTING FIXTURE, FLUORESCENT, RECESSED OR SURFACE, APPROXIMATELY TO SCALE. SEE FIXTURE SCHEDULE
○	LIGHTING FIXTURE, CEILING OUTLET. SEE FIXTURE SCHEDULE.
S	SINGLE POLE TOGGLE SWITCH, QUIET ACTION, 42" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. a INDICATES OUTLETS CONTROLLED.
S3	THREE–WAY TOGGLE SWITCH, QUIET ACTION, 42" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.
SM	MANUAL MOTOR STARTER, NO. POLES AND HEATERS TO MATCH MOTOR INSTALLED.
⊕	DUPLEX RECEPTACLE, 125V, 20A, NEMA 5–20R UP 36".
J	CODE SIZE JUNCTION BOX, MAKE CONNECTIONS TO EQUIPMENT NOTED.
─//─	BRANCH CIRCUIT IN CONDUIT SURFACE MOUNTED ON WALLS OR CEILING. CROSSMARKS INDICATE NUMBER OF CONDUCTORS (#12 UNLESS OTHEERWISE NOTED) IN CODE SIZE CONDUIT. NO MARKS = 2–#12 IN 1/2" CONDUIT UNLESS OTHERWISE NOTED.
↙	HOMERUN TO PANEL OR BACKBOARD
C.	CONDUIT
——o	CONDUIT UP
——›	CONDUIT DOWN
(E)	EXISTING, NO CHANGE UNLESS NOTED
(R)	REMOVE AND DISPOSE OF
(A)	ABANDON IN PLACE
(RE)	RELOCATED
(N)	NEW

PANEL SCHEDULE A (EXISTING RELOCATED)

BUS: 100 AMPS 120/240 VOLTS 1 PHASE 3 WIRE
TYPE: SURFACE 100 AMP. MAIN LUGS

					CONN VOLT–AMP	
	CIR	AMP	POL	DESCRIPTION	A	B
	1	20	1	CANOPY LIGHTING	240	
	3	20	1	STORAGE & WET WELL LIGHTING		752
	2	20	1	RECEPTACLES	540	
	4	20	1	RECEPTACLES		360
*	5	15	1	LEVEL CONTROLLER	150	
*	7	15	1	GAS DETECTOR		50
*	6	15	1	FLOW METER	100	
	8	20	1	TELEMETERING		500
	9	20	1	SPARE	0	
	11	20	1	SPARE		0
*	10	100	2	PANEL B	7390	
*	12			PANEL B		6410
				TOTAL	8420	8072
	* PROVIDE NEW BREAKER			AMPERES	70.2	67.3
				KVA	16.5	

CONDUIT SCHEDULE

1 3–500 MCM, 1#1, 1#1/0 (G) – 3" C.

2 2#6, 1#6 (G) – 1" C.

3 3#1, 1#6 (G) – 1 1/2" C.

4 3#1, 1#6 (G) – 1 1/2" C.

5 3#3/0, 4#10, 1#4 (G) – 2" C.

6 1#RG62U – 1" C.

7 3#14, 1#14 (G) – 3/4" C.

8 2#12, 1#12 (G) – 3/4" C.

9 3#6, 1#8 (G) – 1 1/4" C.

10 10#12, 1#12 (G) – 1" C.

11 6#12, 1#12 (G) – 3/4" C.

12 2 FLOW SENSOR CABLES – 2" C.

REV	DATE	BY	DESCRIPTION	NOTES

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V: NONE
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CITY OF BELMONT

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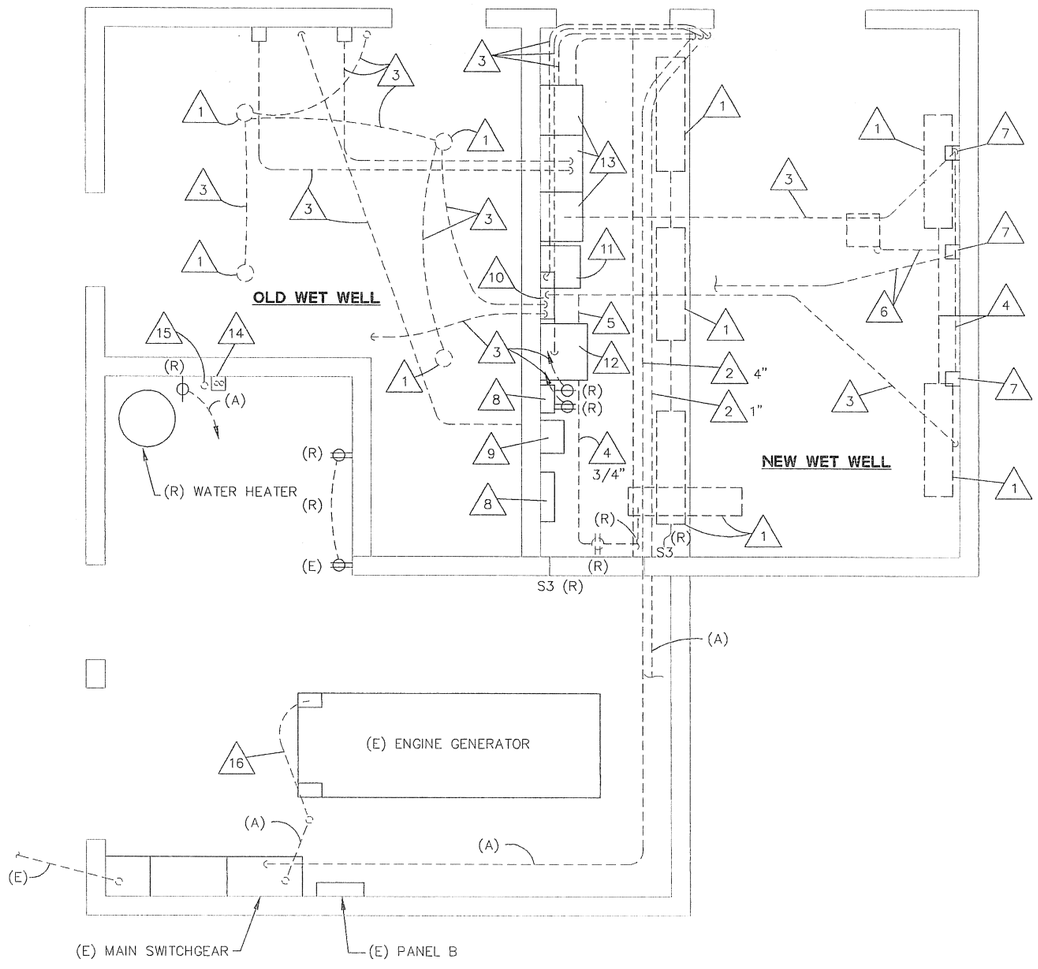
SAN JUAN PUMP STATION REHABILITATION
ELECTRICAL NOTES & LEGEND

SHEET 13
REVISION 0

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TIME: 14:51
DWG NAME: SELNOTE

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PATH: J:\DESIGN\2501SA\
DATE: 09/19/96 TIME: 08:45
DWG NAME: SJELDNO



PLAN NOTES

1. (R) LIGHT FIXTURE
2. (R) CONDUIT BELOW PLATFORM
3. (R) CEILING CONDUIT
4. (R) CONDUIT ON LOWER LEVEL WALL
5. (R) AND PLUG CONDUIT AT SUMP PUMP
6. (E) CONDUIT AT FAN. (R) OR REUSE AS PRACTICAL
7. (R) LOCK-OUT-STOP PUSHBUTTON
8. REMOVE OZONATOR. DELIVER TO CITY
9. (R) FLOW RECORDER
10. RELOCATE PANEL A
11. RELOCATE TRANSFORMER
12. (R) CONTROL PANEL. DELIVER MICROMAX TO CITY
13. (R) MOTOR CONTROL CENTER
14. RAISE FAN J. BOX TO CLEAR NEW MOTOR CONTROL CENTER
15. (R) PIPE GROUND
16. (R) FLEXIBLE CONDUIT. REUSE FOR VERTICAL FEEDER

ELECTRICAL DEMOLITION PLAN
SCALE : 3/8"=1' 0"

REV	DATE	BY	DESCRIPTION	NOTES

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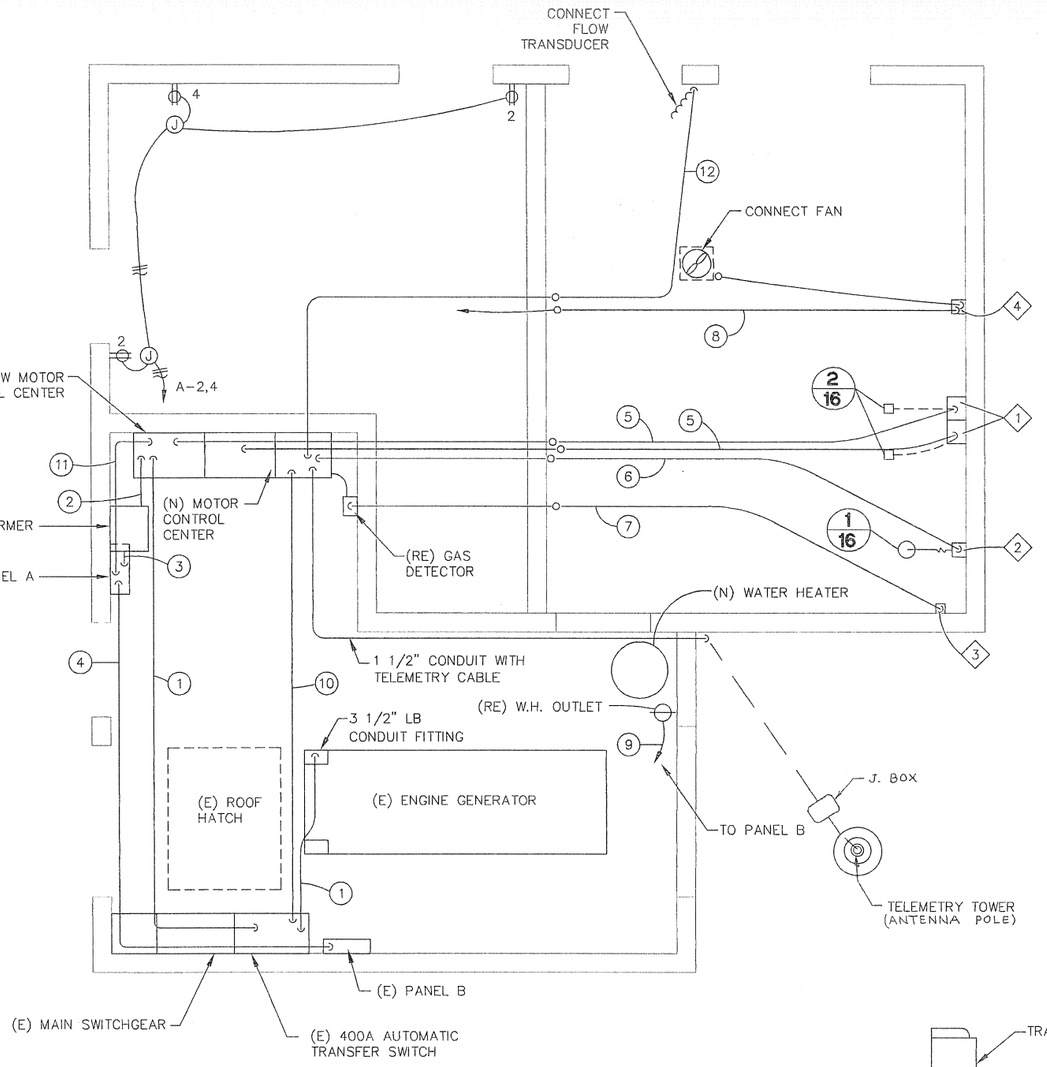
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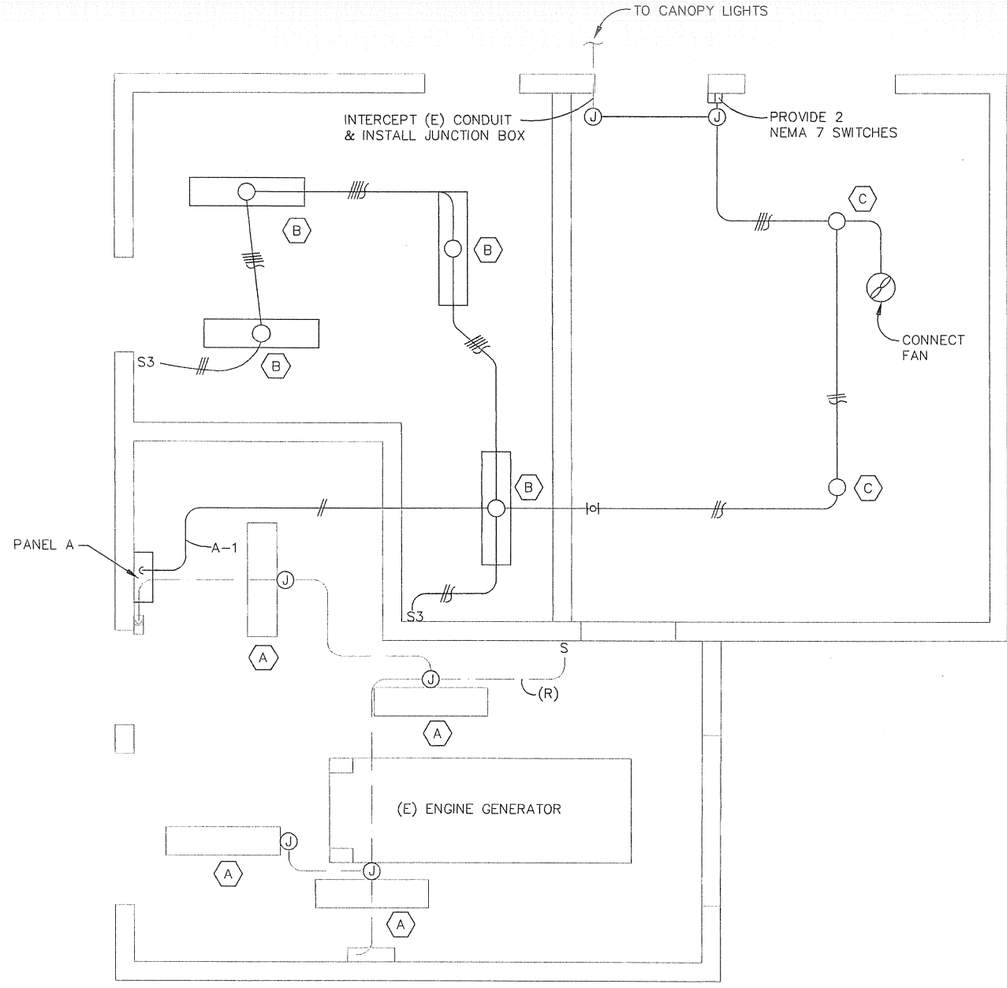
SAN JUAN PUMP STATION REHABILITATION
ELECTRICAL DEMOLITION PLAN

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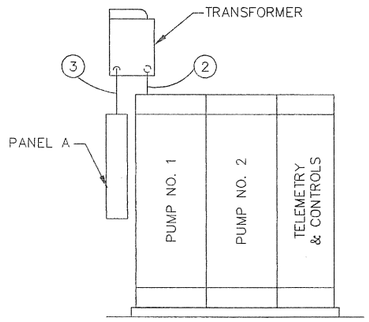
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POWER PLAN



LIGHTING PLAN



MOTOR CONTROL CENTER
N.T.S.

REV	DATE	BY	DESCRIPTION	NOTES

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V: 3/8"=1'-0"
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DESIGNED RMT
CHECKED RMT
DATE 11/12/96

CITY OF BELMONT

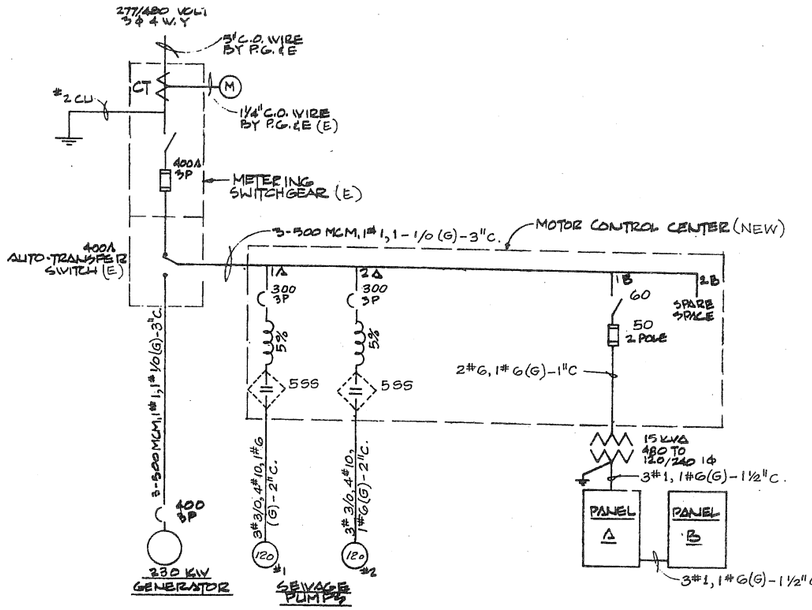
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SAN JUAN PUMP STATION REHABILITATION
POWER AND LIGHTING PLAN

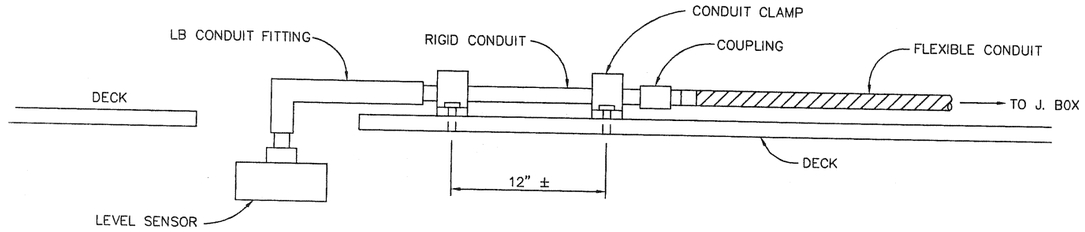
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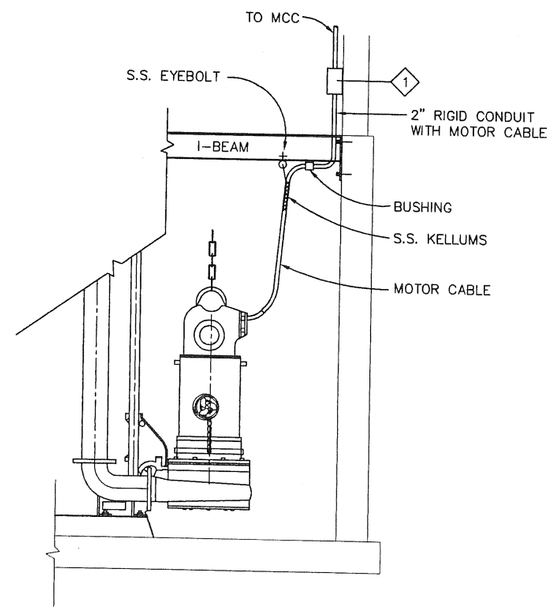
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ONE LINE DIAGRAM



DETAIL 1/15



DETAIL 2/15

REV	DATE	BY	DESCRIPTION	NOTES

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SCALE H: NONE
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CITY OF BELMONT

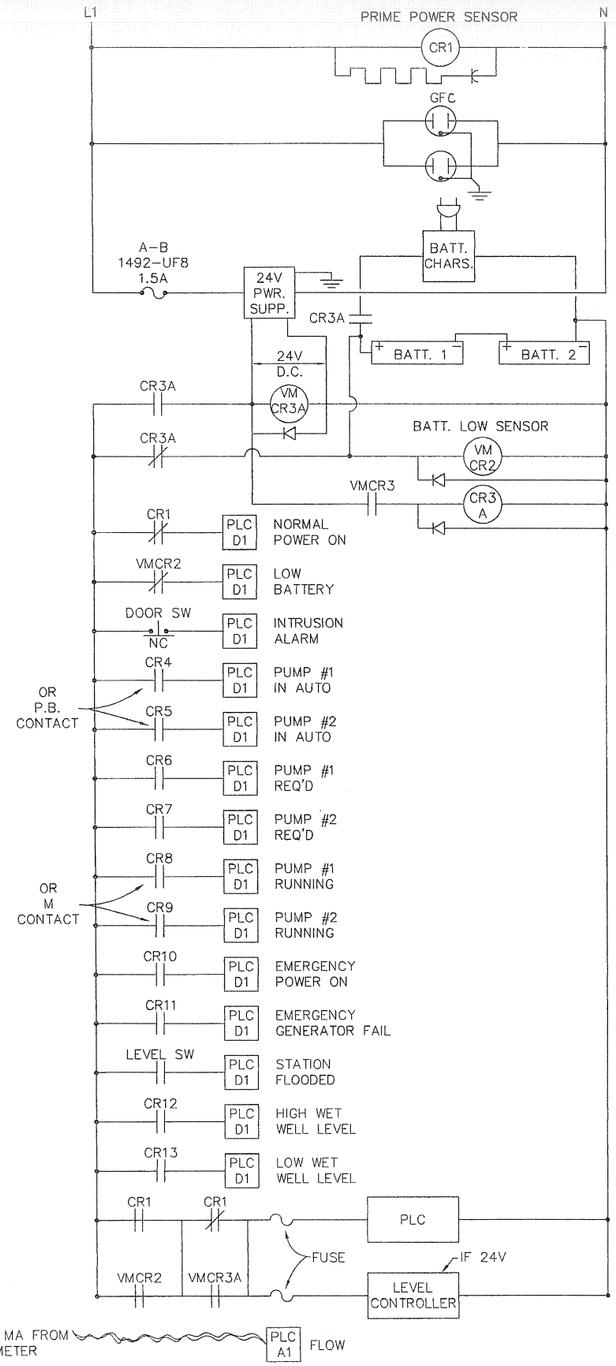
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SAN JUAN PUMP STATION REHABILITATION
ELECTRICAL ONE LINE DIAGRAM

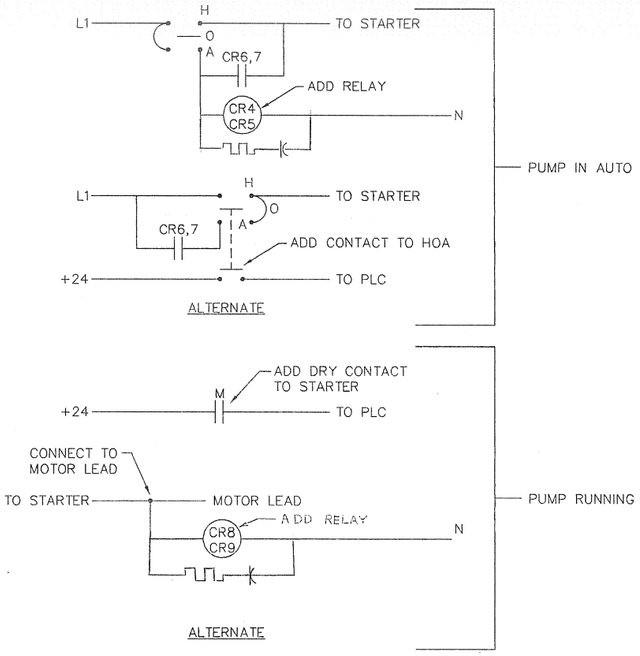
SHEET 16
REVISION 0

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DATE: 10/23/98 TIME: 09:33
DWG NAME: SJELEINE

© Brian Kangas Foulk



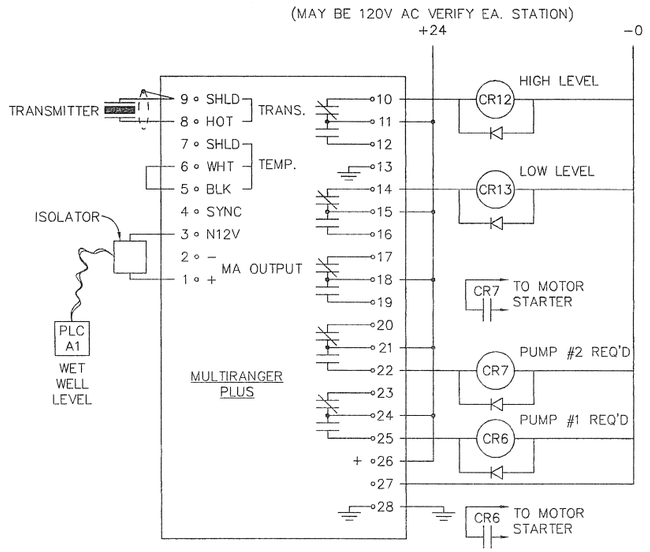
TELEMETRY SCHEMATIC



CONNECTIONS TO EXISTING MOTOR STARTERS

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	MANUFACTURER	PART NUMBER
1	1	PROGRAMMABLE LOGIC CONTROLLER	FLUID SOLUTIONS	UNIMAC
	1	EXPANSION MODULE	OPTO 22	1746–P3
2	1	RADIO – SPREAD SPECTRUM	METRICOM	
3	1	POWER SUPPLY	CONDOR	HE24–7.2–A+
4	1	BATTERY CHARGER	JOHNSON CONTRO	GRC–242000COM
5	2	BATTERY	JOHNSON CONTRO	UI–31
6	32	TERMINAL BOARD	ALLEN–BRADLEY	1492–HM1
	6	TERMINAL BOARD W/1–AMP FUSE	ALLEN–BRADLEY	1492H6
	4	TERMINAL BOARD–GROUNDING	ALLEN–BRADLEY	1492–WG4
	1	RAIL	ALLEN–BRADLEY	199–DR1
	6	BARRIER	ALLEN–BRADLEY	1492–N36
	1	BARRIER	ALLEN–BRADLEY	1492–N37
	4	END ANCHORS	ALLEN–BRADLEY	1492–N47
	3	JUMPERS	ALLEN–BRADLEY	1492–N49
7	2	RELAY VOLTAGE ADJUSTABLE	DIVERSIFIED	UOA–24–PLA
	6	RELAY CONTROL 24 VAC 10 AMP ENCL	IDEC	RR2PUL/24DC
	1	RAIL	ALLEN–BRADLEY	199–DR1
	8	OCTAL SOCKET	IDEC	SR2P–06
8	1	DUPLEX RECEPTACLE	HUBBELL	
9	1	DUPLEX GFI RECEPTACLE	HUBBELL	
10	1	LEVEL CONTROLLER	SPECIFICATIONS	
11	4	LEVEL CONTROLLER RELAYS	IDEC	RR2PUL/24DC
	1	RAIL	ALLEN–BRADLEY	199–DR1
	4	OCTAL SOCKET	IDEC	SR2P–06



MULTIRANGER PLUS SCHEMATIC

TELE. SIGNALS	MOTEL	HILLER	NORTH RD	ISLAND PARK	HASTINGS	NAUGHTON	SAN JUAN	HASKINS	RALSTON RANCH	CORP YARD	REPEATER
WET WELL LEVEL	Y	Y	Y	Y	Y	Y	Y	Y	Y		
SEWAGE FLOW							Y		Y		
LOW BATTERY	Y	Y	Y	Y	Y	Y	Y	Y	Y		
NORMAL POWER ON	Y	Y	Y	Y	Y	Y	Y	Y	Y		
INTRUSION ALARM							Y		Y		
PUMP NO. 1 IN AUTO	Y	Y	Y	Y	Y	Y	Y	Y	Y		
PUMP NO. 1 REQ'D	Y	Y	Y	Y	Y	Y	Y	Y	Y		
PUMP NO. 1 RUNNING	Y	Y	Y	Y	Y	Y	Y	Y	Y		
PUMP NO. 2 IN AUTO	Y	Y	Y	Y	Y	Y	Y	Y	Y		
PUMP NO. 2 REQ'D	Y	Y	Y	Y	Y	Y	Y	Y	Y		
PUMP NO. 2 RUNNING	Y	Y	Y	Y	Y	Y	Y	Y	Y		
EMERGENCY POWER ON				Y			Y				
EMERGENCY GEN. FAIL				Y			Y				
STATION FLOODED		Y	Y								
HIGH WET WELL LEVEL	Y	Y	Y	Y	Y	Y	Y	Y	Y		
LOW WET WELL LEVEL	Y	Y	Y	Y	Y	Y	Y	Y	Y		
EQUIPMENT ANTENNA TYPE	3	1	1	1			2	3	3	1	1
ANTENNA TOWER		15'	25'				35'			25'	
SOLAR PANEL & BATTERY											Y
TELEMETRY ENCL.	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y

REV	DATE	BY	DESCRIPTION	NOTES

Brian Kangas Foulk
Engineers • Surveyors • Planners
540 Price Avenue Redwood City, CA 94063
415/482–6300 415/482–6399 (FAX)

REGISTERED PROFESSIONAL ENGINEER RICHARD M. FOULKROD E5700 Exp. 9/30/98 ELECTRICAL STATE OF CALIFORNIA

CONSULTANT | AGENCY APPROVED | CITY ENGINEER

SCALE H: NONE
V: NONE
DRAWN SL
DESIGNED RMT
CHECKED RMT
DATE 11/12/96

CITY OF BELMONT

DEPARTMENT OF PUBLIC WORKS
CONTRACT NO. 337B

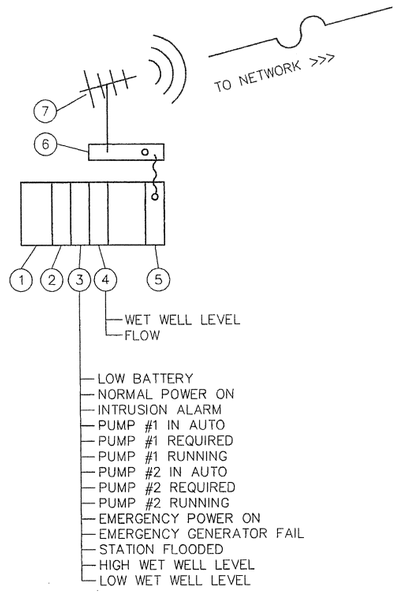
SAN JUAN PUMP STATION REHABILITATION
TELEMETRY – TYPICAL PUMP STATION WIRING

SHEET 17
REVISION 0

687

DWG NAME: SJWIRING
PLOTTED: 10/09/96 TIME: 15:16
PLOTTED BY: J. DESIGN\VER15R\

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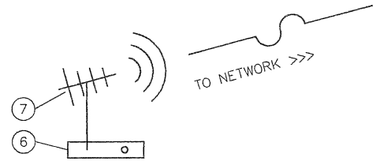
NOTE: SEE TELE. SIGNALS ON SHEET 17 FOR ACTUAL SIGNALS AT EACH STATION.

TYPICAL TELEMETRY SYSTEM

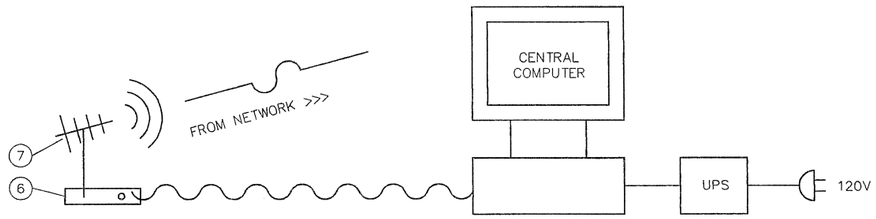
APPLY TO:
1. MOTEL PUMP STATION
2. HILLER PUMP STATION
3. NORTH ROAD PUMP STATION
4. ISLAND PARK PUMP STATION
5. HASTINGS PUMP STATION
6. NAUGHTON PUMP STATION
7. SAN JUAN PUMP STATION
8. HASKINS PUMP STATION
9. RALSTON RANCH PUMP STATION

EQUIPMENT

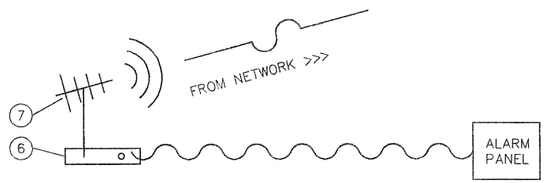
1. PLC POWER SUPPLY
2. PLC CPU
3. DIGITAL INPUT MODULE
4. ANALOG INPUT MODULE
5. COMMUNICATIONS MODULE
6. RADIO
7. ANTENNA



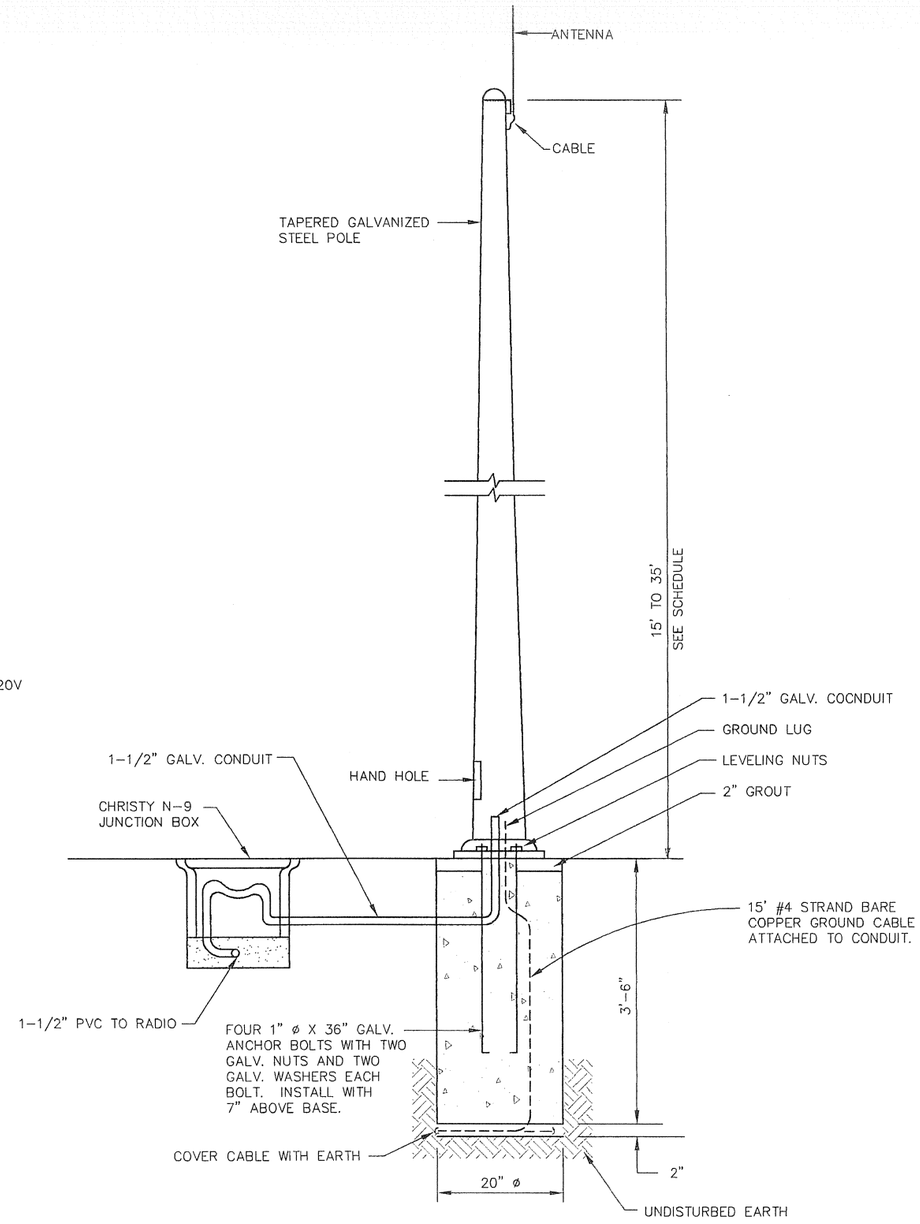
REPEATER STATION



CORPORATION YARD



POLICE STATION



ANTENNA POLE DETAIL

PATH: J:\DESIGN\SJ0513A\
DATE: 10/04/96
DWG NAME: SJTMETRY
SHEET: 11/11

REV	DATE	BY	DESCRIPTION

NOTES

Brian Kangas Foulk
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540 Price Avenue Redwood City, CA 94063
415/482-6300 415/482-6399 (FAX)

REGISTERED PROFESSIONAL ENGINEERS BOARD OF EXAMINERS — Exp. 9/30/98 — ELECTRICAL — STATE OF CALIFORNIA

CONSULTANT | AGENCY APPROVED | CITY ENGINEER

SCALE H: NONE
V: NONE
DRAWN SL
DESIGNED RMT
CHECKED RMT
DATE 11/12/96

CITY OF BELMONT

DEPARTMENT OF PUBLIC WORKS
CONTRACT NO. 337B

SAN JUAN PUMP STATION REHABILITATION
TELEMETRY - PUMP STATIONS COMMUNICATION SYSTEM

SHEET 18
REVISION 0

APPENDIX D

Modifications to San Juan Pump Station

CITY OF BELMONT, CALIFORNIA

PLANS FOR MODIFICATION TO SAN JUAN SEWAGE PUMP STATION

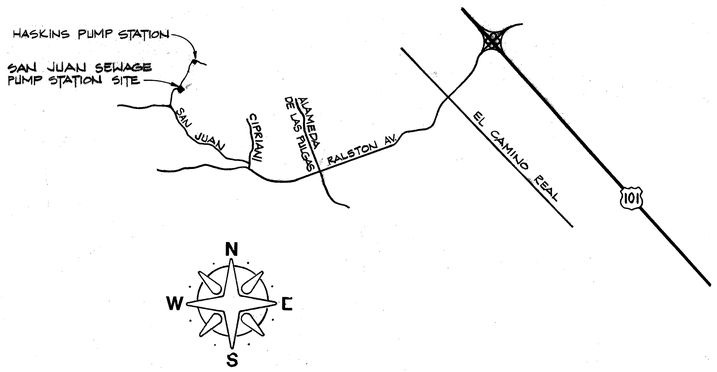
CITY CONTRACT NO. 176 PHASE II

176

TO BE SUPPLEMENTED BY CITY OF BELMONT STANDARD DETAILS DATED APRIL 1972

INDEX	
SHT. NO.	DESCRIPTION
T – 1	TITLE SHEET
A – 1	PLANS, ELEVATIONS, SECTIONS & SITE PLAN
A – 2	SITE & ROOF PLAN & SITE DETAILS
A – 3	FLOOR PLANS & MISC. DETAILS
A – 4	EXTERIOR ELEVATIONS
A – 5	SECTIONS & DETAILS
A – 6	SECTIONS & DETAILS
A – 7	COMMINUTOR ROOM PLAN, SECTIONS & DETAILS
A – 8	SCHEDULES & DETAILS
A – 9	SITE & LANDSCAPING PLAN & DETAILS
S – 1	GENERAL NOTES & TYPICAL DETAILS
S – 2	LOWER LEVEL FOUNDATION PLAN, SECTION & DETAILS
S – 3	ROOF FRAMING PLAN, UPPER LEVEL FLOOR PLAN
S – 4	SECTIONS & DETAIL
S – 5	SECTIONS & DETAIL
S – 6	
M – 1	SITE PLAN
M – 2	PLAN & SECTIONS
M – 3	SECTIONS
M – 4	DETAILS
E – 1	POWER & LIGHTING PLANS, ONE LINE DIAGRAM & DETAILS
E – 2	LEGEND, SCHMATICS & DETAILS

CCN176



VICINITY MAP

CITY COUNCIL

WILLIAM H. HARDWICK - MAYOR
FRANK R. GONSALVES – VICE MAYOR
ROBERT A. JONES – COUNCILMAN
WALTER J. WORTHGE – COUNCILMAN
PAMELA S. KETCHAM – COUNCILWOMAN

APPROVED BY:

CITY OF BELMONT, PUBLIC WORKS

James Dreckson ..... APRIL 4, 1977

JAMES DORKSEN - DATE
DIRECTOR OF PUBLIC WORKS / CITY ENGINEER

SANJUA1977-1

Richard M. Trainer Civil Engineer #13347

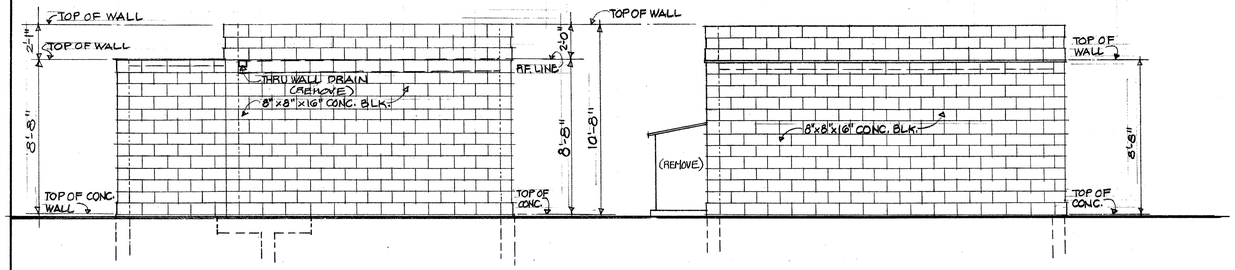
RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 3-9-77
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SCALE: NONE

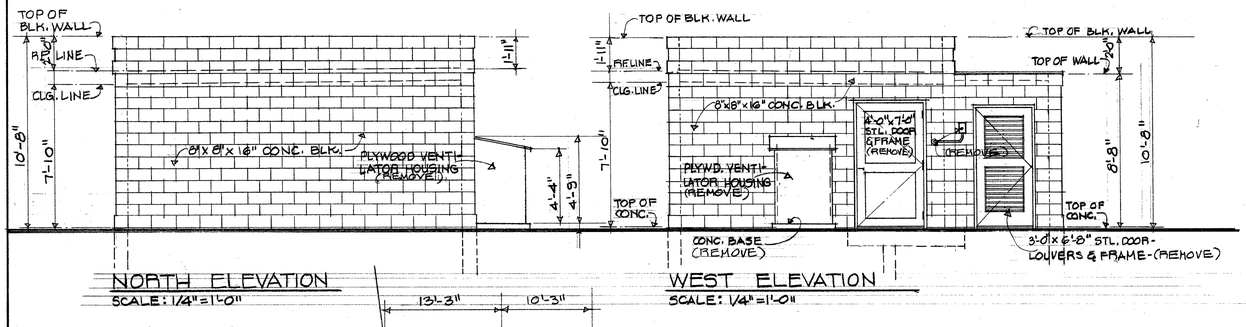
T-1

6901



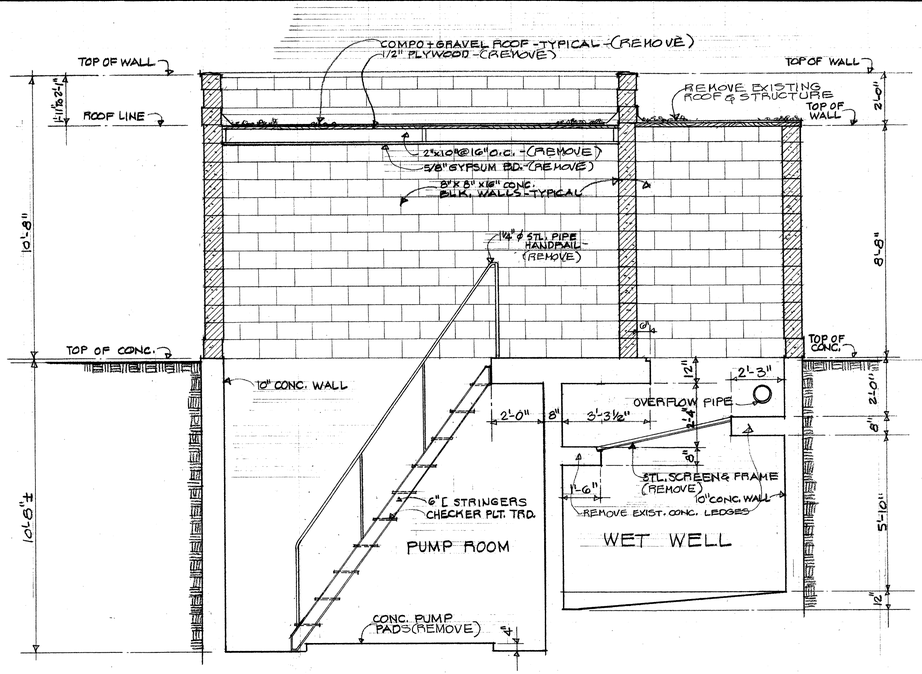
EAST ELEVATION
SCALE: 1/4"=1'-0"

SOUTH ELEVATION
SCALE: 1/4"=1'-0"

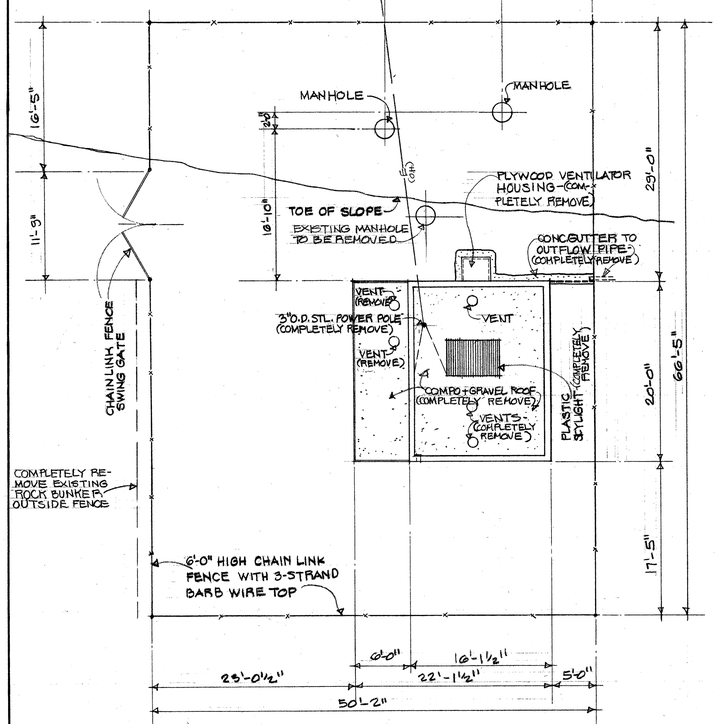


NORTH ELEVATION
SCALE: 1/4"=1'-0"

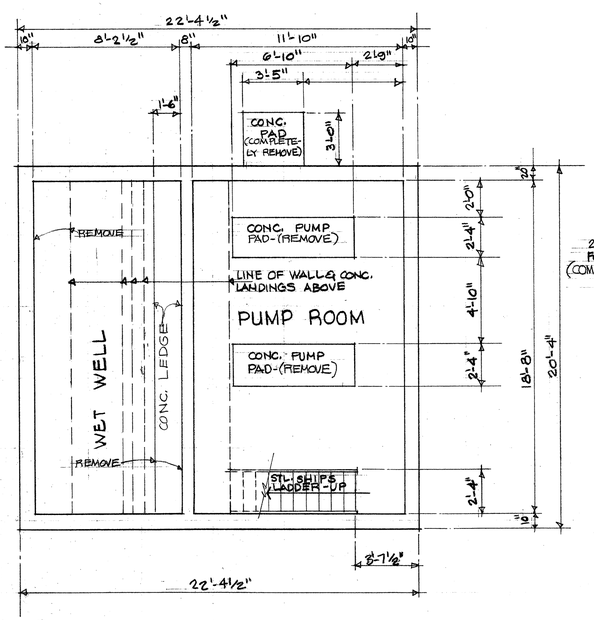
WEST ELEVATION
SCALE: 1/4"=1'-0"



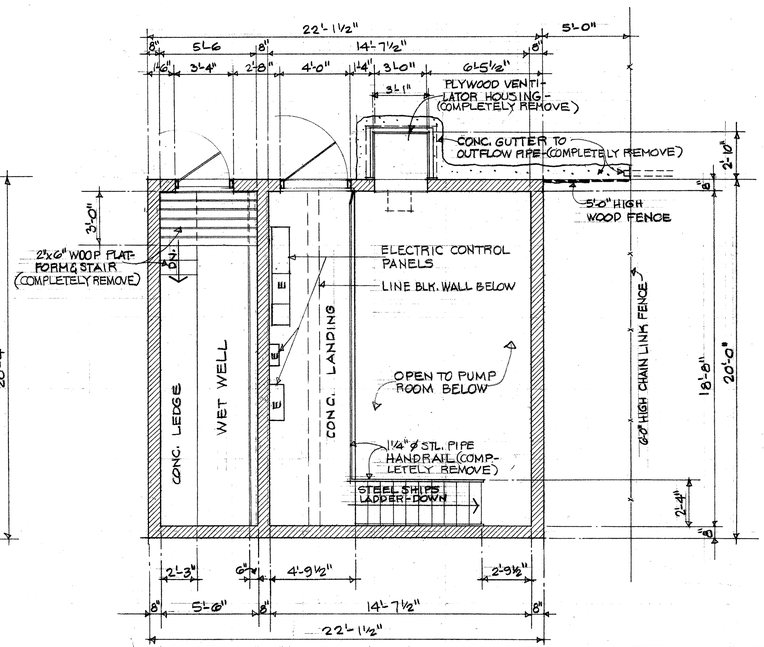
SECTION THRU PUMP ROOM & WET WELL
SCALE: 3/8"=1'-0"



SITE PLAN
SCALE: 1/8"=1'-0"



LOWER LEVEL PLAN
SCALE: 1/4"=1'-0"



UPPER LEVEL PLAN
SCALE: 1/4"=1'-0"

SANJUA 1977-2

CITY CONTRACT NO. 176 PHASE I

CITY OF BELMONT CALIF IA
SPECIFICATIONS TO SAN JUAN PUMP STATION
PLANS, ELEVATIONS, SECTION, SITE PLAN - EXISTING CONDITIONS AND DEMOLITION REQUIREMENTS.

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C-2760

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN BY: DBS
SCALE: AS SHOWN

A-1

EXISTING 6'-0" HIGH CHAIN LINK FENCE W/ 3 STRAND BARBED WIRE

NEW PLANTING (SEE DWG. A-9)

NEW MANHOLE

EXISTING MANHOLES

2 / A-3

3'-6"

2'-0"

NEW CONC. BLK. CURB

7 / A-2 TYP. FOR PAVING

NEW ASPHALTIC CONCRETE PAVING

TOE OF EXISTING SLOPE

EXIST. MANHOLE TO BE REMOVED

2"x6" RDWD. HDR.

LINE OF CONC. GRD. BM. @ GRADE

NEW ASPHALTIC CONC. PAVED ROADWAY — SEE DWG. A-9

EXISTING CHAIN LINK GATES

6 / A-2

NEW CONC. COVER OVER NEW DIESEL OIL TANK

5'-0"

6'-0"

7 / A-2 TYP.

1 / A-4 2 / A-2 SCUPPER ROOF DRAIN

3 / A-2 12"x12" ROOF VENT

SLOPE

12"x12" ROOF VENTS

EXISTING FENCES TO REMAIN

ENGINE EXHAUST STACK 4 / A-2

4'-0"x6'-0" ROOF VENT 3 / A-2

ROOF DRAIN

SLOPE

LINE OF CONC. GRADE BM. @ GRADE

12" ROCK FILL OVER VISQUEEN (SEE DWG. A-9)

SCUPPER 1 / A-4 2 / A-2

REDWOOD CURB

NEW PLANTING (SEE DWG. A-9)

PULL BOX

5 / A-2 TYP.

2"x6" REDWOOD HEADER BOARDS

TRANSFORMER PAD

4'-0"

4'-0"

5'-5"

32'-0"

66'-5"

29'-0"

16'-0"

15'-0"

2'-8½" H.

20'-0"

12'-0"

2'-8" H.

5'-5"

2'-0"

2'-8" H.

2'-8" H.

2'-8" H.

13'-7½"

21'-4"

10'-2⅛"

5'-0"

50'-2"

NEW SITE & ROOF PLAN

SCALE: 1/4"=1'-0"

NOTE: SEE DWG. A-9 FOR LANDSCAPING, ROADWAY, GRADES, PAVING PLANS, DETAILS & SCHEDULES

A

6" THK. ASPHALTIC CONCRETE

2"x6" REDWOOD HEADER CURB

6"

6"

95% COMPACTION

PAVING AT RDWD. CURB 5

SCALE: 1½"=1'-0"

6" THK. ASPHALTIC CONC. PAVING

DIESEL TANK CONC. PAD OR M.H.

6"

6"

95% COMPACTION

PAVING AT CONC. SLAB 6

SCALE: 1½"=1'-0"

MASONRY OR CONC. WALL

6" THK. ASPHALTIC CONC. PAVING

6"

95% COMPACTION

PAVING AT MASONRY OR CONC. WALL 7

SCALE: 1½"=1'-0"

LINE OF ROOF

VENT

4 PLY COMPO & GRAVEL ROOF - CARRY PLIES UP & OVER VENT CURB

FIBER CANT STRIP

½" PLYWD. SHTG.

2"x4" @ TOP OF OPENING

2-2"x8" CURB BASE

VENT THROAT

2-2"x8" HEADERS @ VENT OPENINGS

2"x10" @ 16" o.c.

5/8" GYPSUM BD. (FIRE CODE)

SEE MECH. DWGS FOR OPENING SIZE

DETAIL OF TYPICAL ROOFVENT CURB 3

SCALE: 1½"=1'-0"

℄ OF FLUE

1"x 12 GA. G.I. STRAP-ANCHOR WITH S.H.S @ 6'0 o.c.

24 GA. G.I. FLASHING COLLAR

12½"

6½"

COMPO FLASHING

FIBER CANT STRIP

COMPO GRAV. ROOF

½" THK. PLYWD.

2-2"x8" HEADERS @ OPENING

5/8" FIRECODE-W.P. GYPSUM BD.

24GA. x 1½" x 1½" G.I. COLLAR

18" CLR.

18"

18" CLR.

DETAIL OF EXHAUST CURB & OPENING 4

SCALE: 1½"=1'-0"

12"

2"

4"

2"

4 LAP

24 GA. G.I. OVERFLOW SCUPPER

2"x6" BLKG. DEBRIS SCREEN

4" LAP

2"x BLKG.

2½" BLKG.

FIBER CANT STRIP

8"

2"

1" S.M. STRAP

1"x 4" WD. BACKING

1"

CANT STRIP ¾"x3" D.F. TRIM @ CLG. (TYPICAL)

24GA. G.I. DOWNSPOUT

1" S.M. STRAP

2"x4" BLKG.

2'-8"

2"

OVERFLOW SCUPPER-VERTICAL SECTION 1 / A-

SCALE: 1½"=1'-0"

4" LAP

6" LAP

4" LAP

COMPOS. GRAVEL ROOFING

DEBRIS SCREEN

6" LAP

12"

2"

4"

24GA. G.I. OVERFLOW SCUPPER & DOWNSPOUT

4"

OVERFLOW SCUPPER-HORIZONTAL SECTION 2 / A

SCALE: 1½"=1'-0"

SANJUA1977-3

REVISIONS
⚠ 7-21-77 MINOR REV.

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770 El Camino Real, Belmont, Ca. 94002
Phone: (415) 591-7439

C-2760

CITY CONTRACT NO. 173 PHASE II

CITY OF BELMONT, CALIFORNIA
#JD1 ICATIONS TO SAN JUAN PUMP STATION

SITE & ROOF PLAN-ROOF & SITE DETAILS

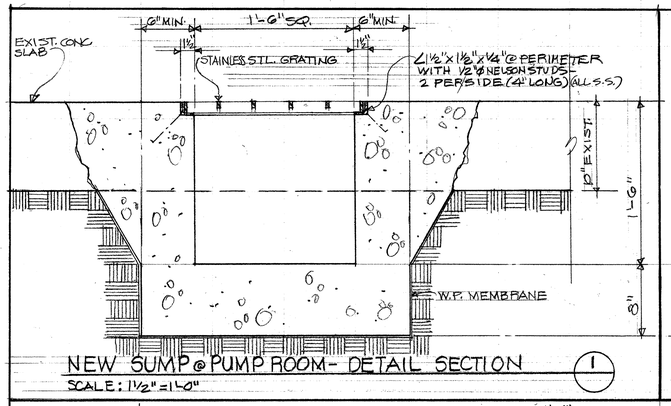
RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

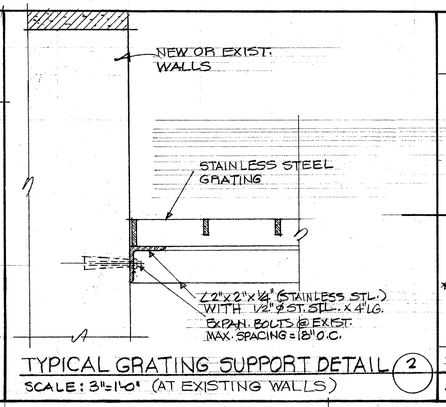
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A-2

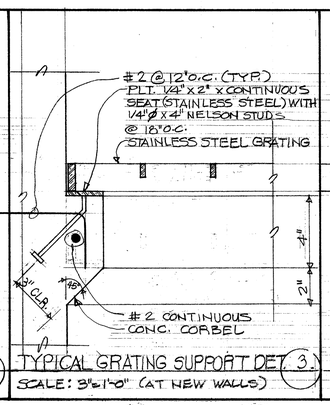
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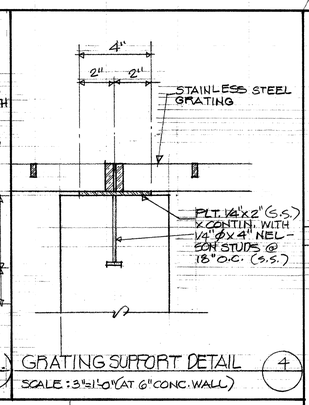
NEW SUMP @ PUMP ROOM - DETAIL SECTION (1)
SCALE: 1½" = 1'-0"



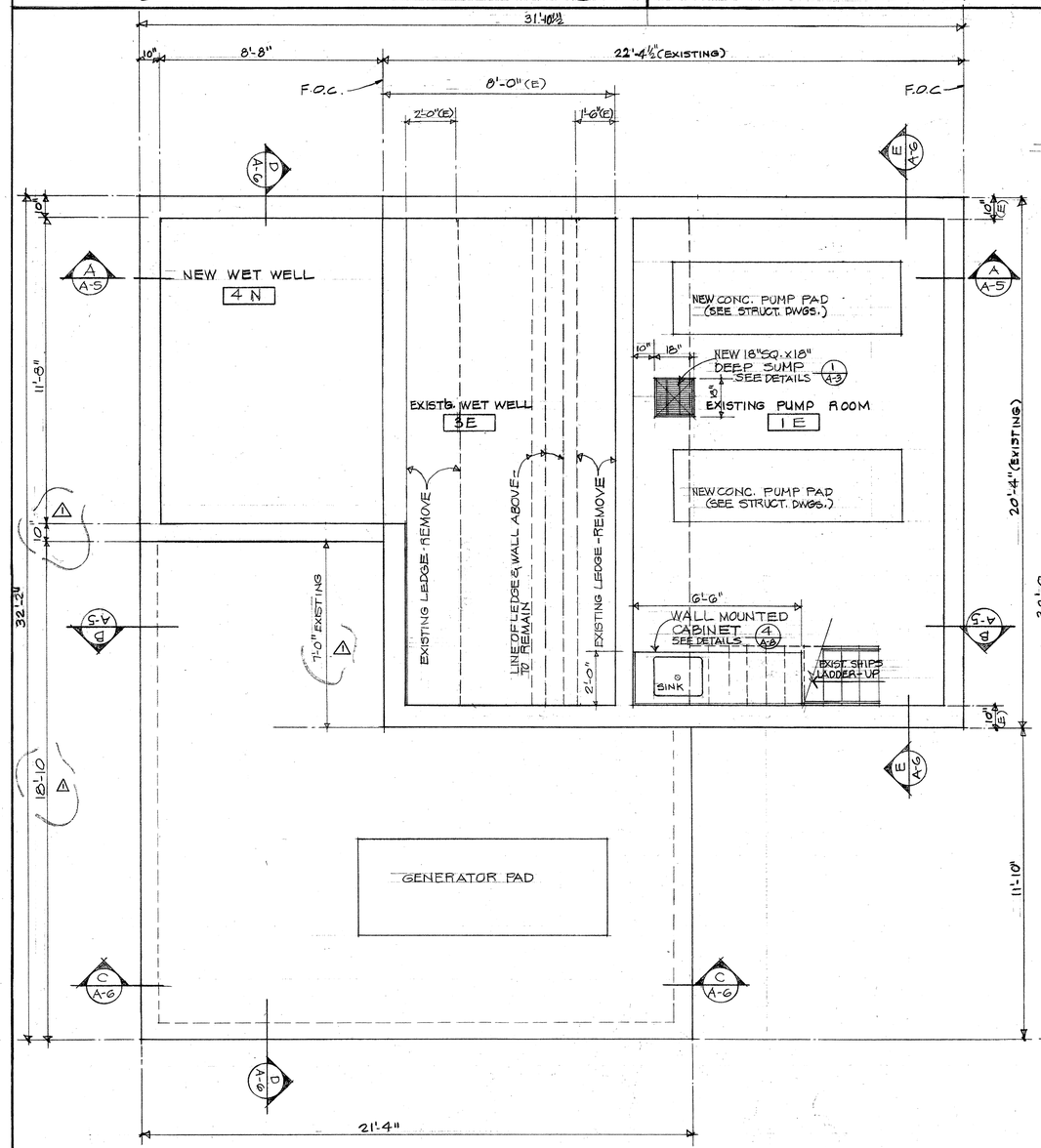
TYPICAL GRATING SUPPORT DETAIL (2)
SCALE: 3"=1'-0" (AT EXISTING WALLS)



TYPICAL GRATING SUPPORT DET. (3)
SCALE: 3"=1'-0" (AT NEW WALLS)



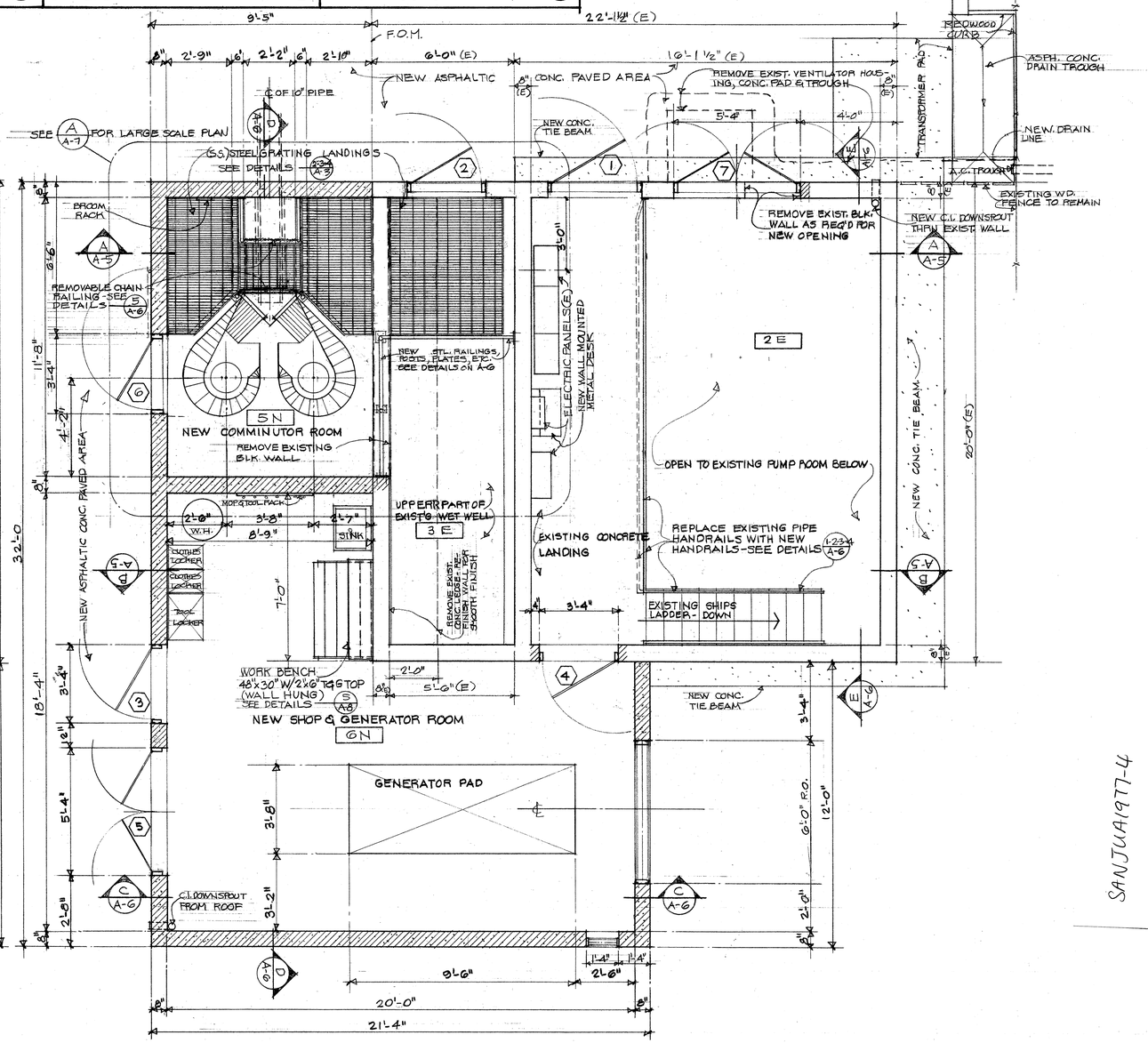
GRATING SUPPORT DETAIL (4)
SCALE: 3"=1'-0" (AT 6" CONC. WALL)



LOWER LEVEL FLOOR PLAN (A)
SCALE: 3/8" = 1'-0"

OR = EXISTING CONCRETE & MASONRY WALLS & FLOORS.

= NEW CONCRETE & MASONRY WALLS & FLOORS



UPPER LEVEL FLOOR PLAN (B)
SCALE: 3/8" = 1'-0"

SANJUA1977-4

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770 El Camino Real, Belmont, Ca. 94002
Phone: (415) 591-7439

C-2760

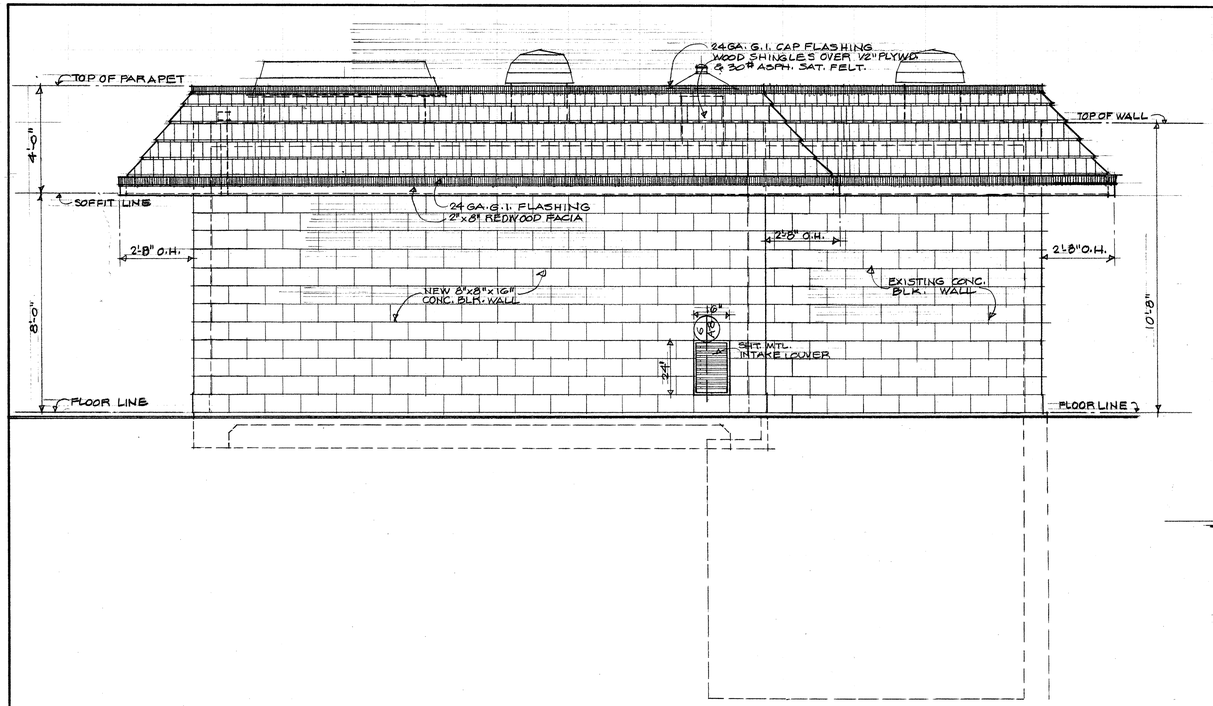
CITY OF BELMONT, CALIFORNIA
LOCATION: T. SAN JUAN PUMP STATION
FLOOR PLANS - MISC. DETAILS

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

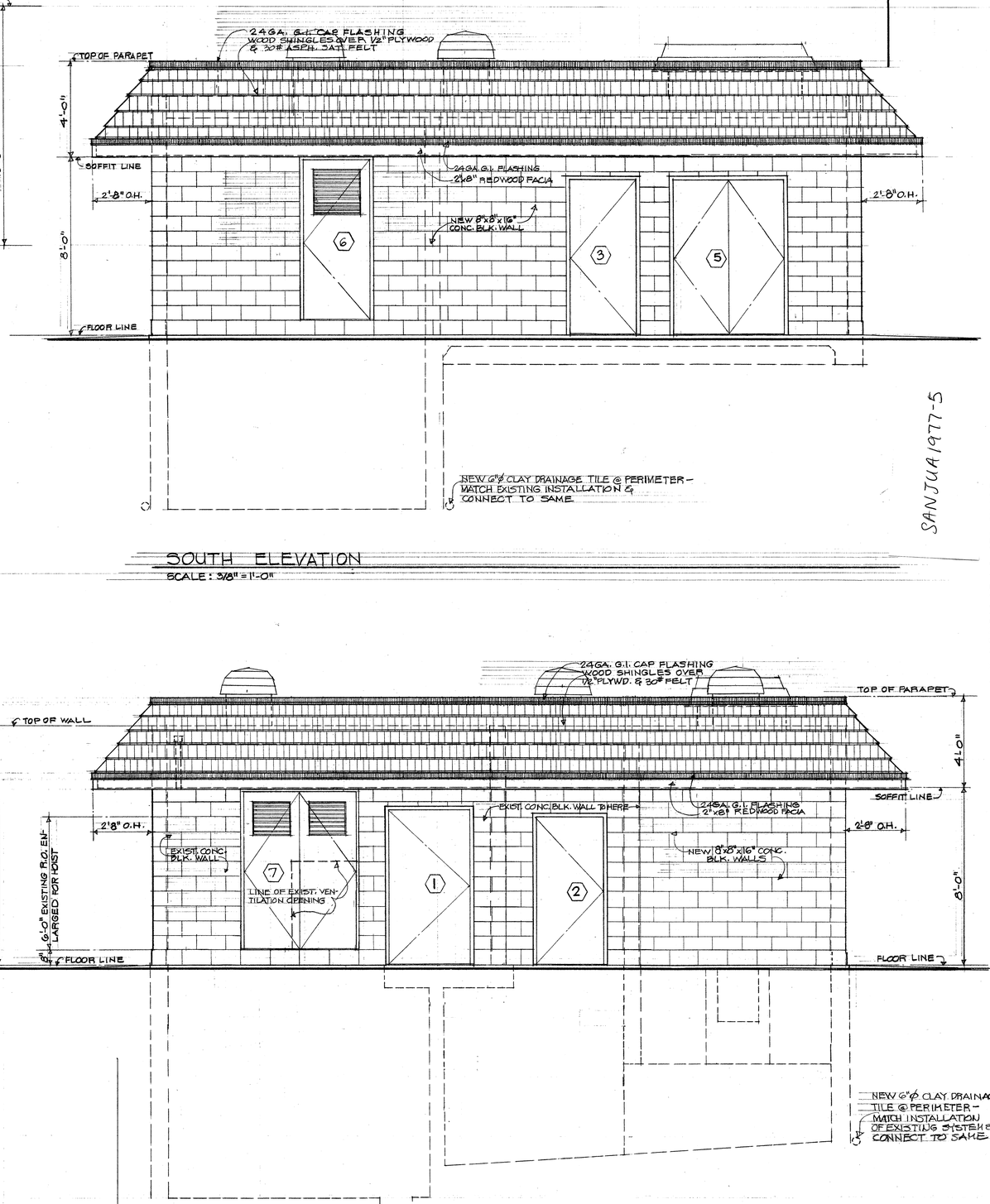
RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN BY: DBS
SCALE: AS SHOWN

A-3

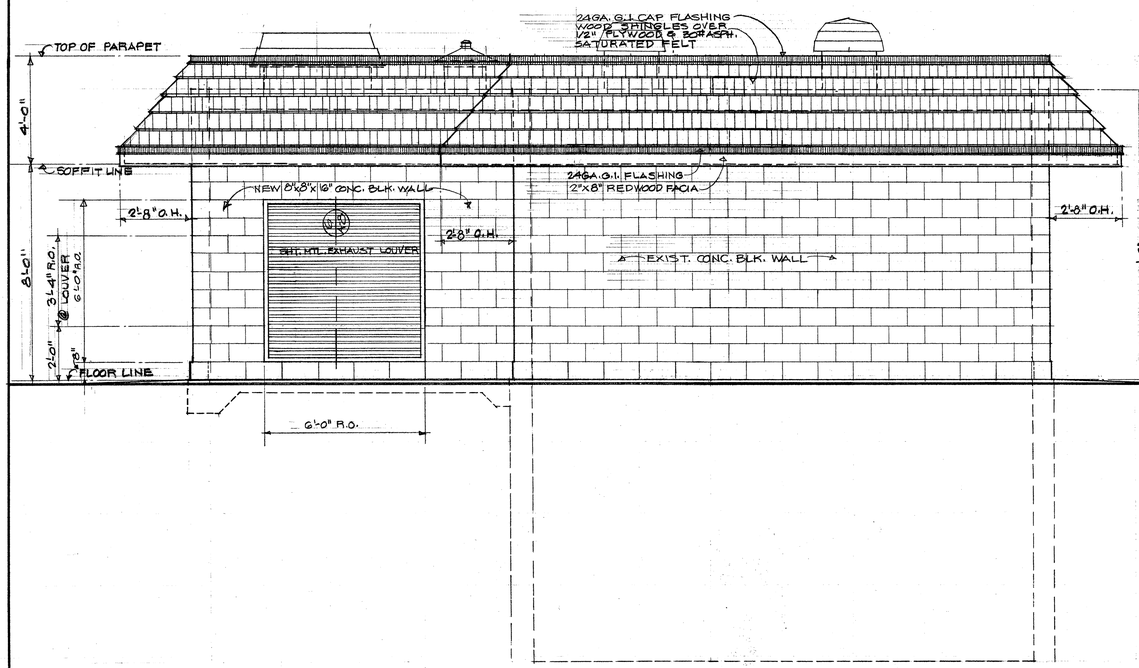


EAST ELEVATION.
SCALE: 3/8" = 1'-0"



SOUTH ELEVATION
SCALE: 3/8" = 1'-0"

SANJUA1977-5



NORTH ELEVATION
SCALE: 3/8" = 1'-0"

WEST ELEVATION
SCALE: 3/8" = 1'-0"

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770 El Camino Real, Belmont, Ca. 94002
Phone: (415) 591-7439

C-2760

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION.
EXTERIOR ELEVATIONS

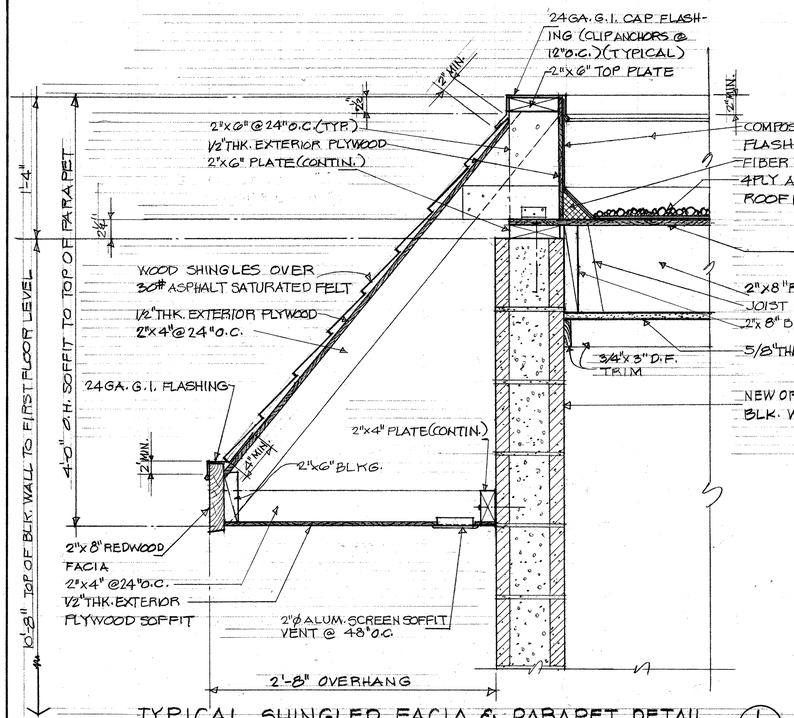
RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 5-1-77
DRAWN BY: DES
SCALE: AS SHOWN

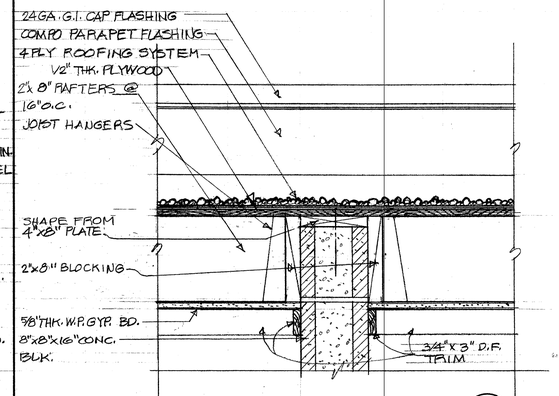
A-4

ALL CONTRACTORS SHALL COMPLY WITH THE PROVISIONS OF THE CALIFORNIA ADMINISTRATIVE CODE, TITLE 8, CHAPTER 4, SUBCHAPTER 4, ARTICLE 36, SECTIONS 1541 THROUGH 1547 INCLUSIVE, AND ARTICLE 91, SECTIONS 1720 THROUGH 1736 INCLUSIVE, AND ARTICLE 176 PHASE II



TYPICAL SHINGLED FACIA & PARAPET DETAIL (1 / A-5)

SCALE: 1½" = 1'-0"



ROOF FRAMING DETAIL AT INTERIOR WALL (2 / A-5)

SCALE: 1½" = 1'-0"

REVISIONS

1 7/21/77 MINOR REV.

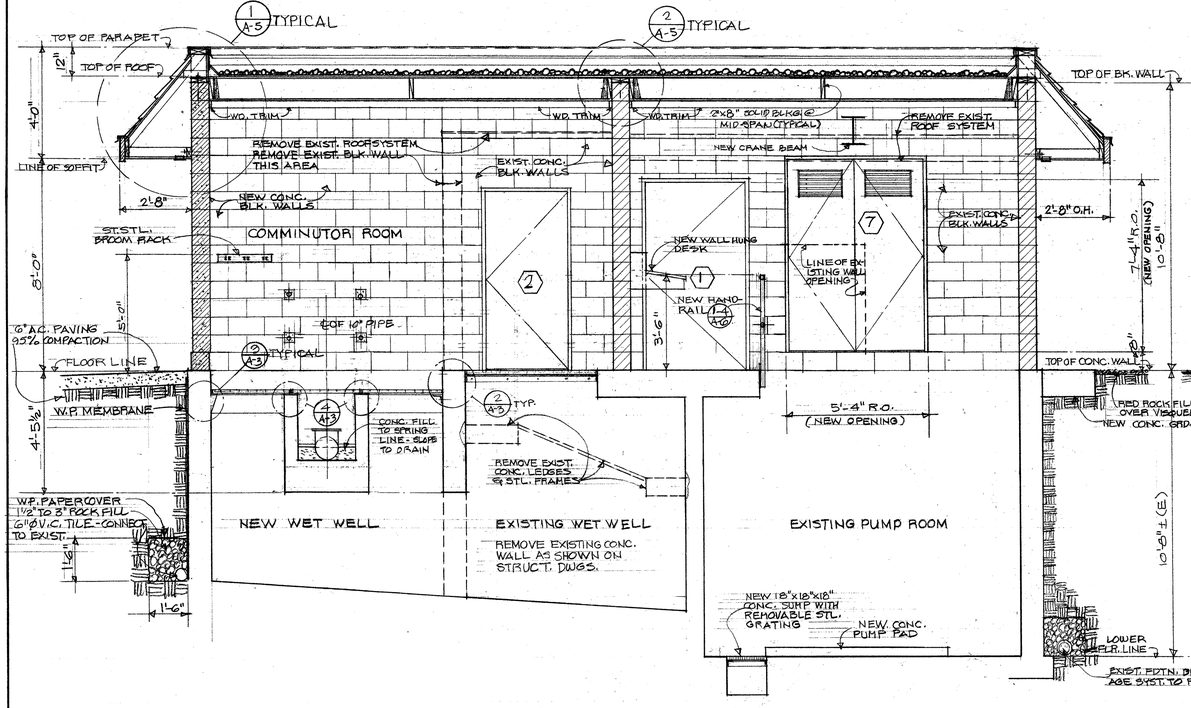
DON SLADE · AIA · ARCHITECT
770 El Camino Real, Belmont, Ca. 94002
Phone: (415) 591-7437

C-2760

CITY CONTRACT NO. 176 PHASE II

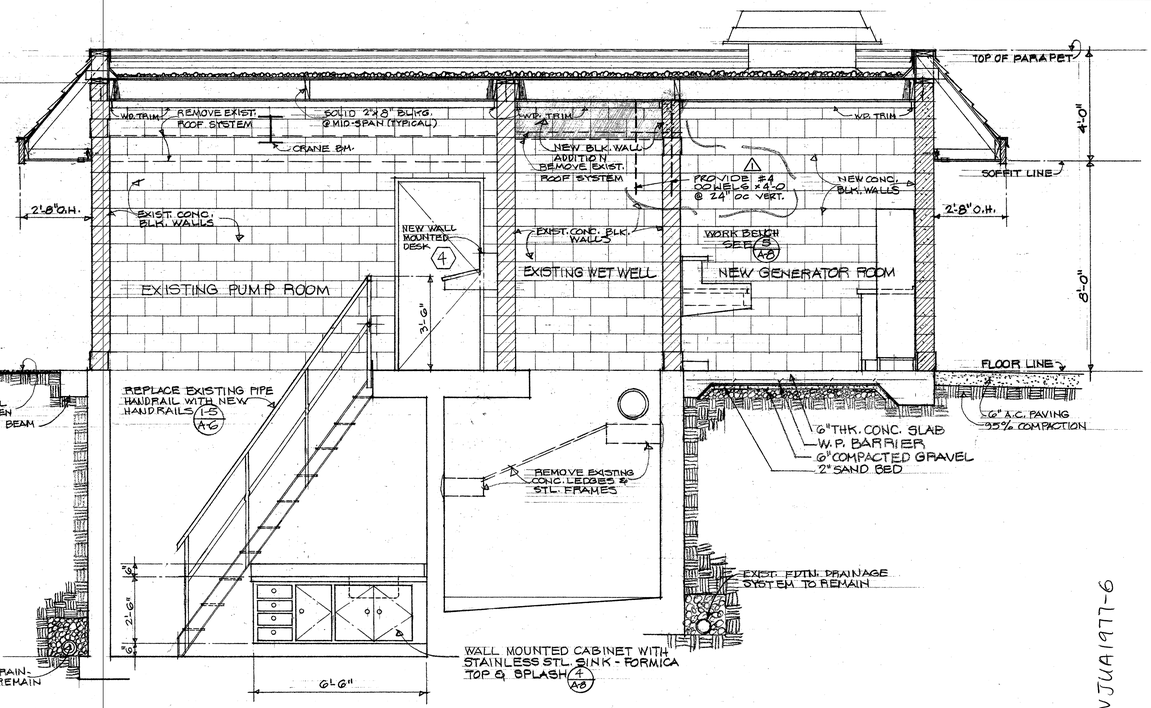
CITY OF BELMONT, CALIF.
MODIFICATIONS TO SAN JUAN PUMP STATION

SECTIONS A & B + DETAILS



SECTION - No./So. - THRU NEW WET WELL & COMMINUTOR ROOM (A)

SCALE: 3/8" = 1'-0"



SECTION - No./So. - THRU NEW GENERATOR ROOM (B)

SCALE: 3/8" = 1'-0"

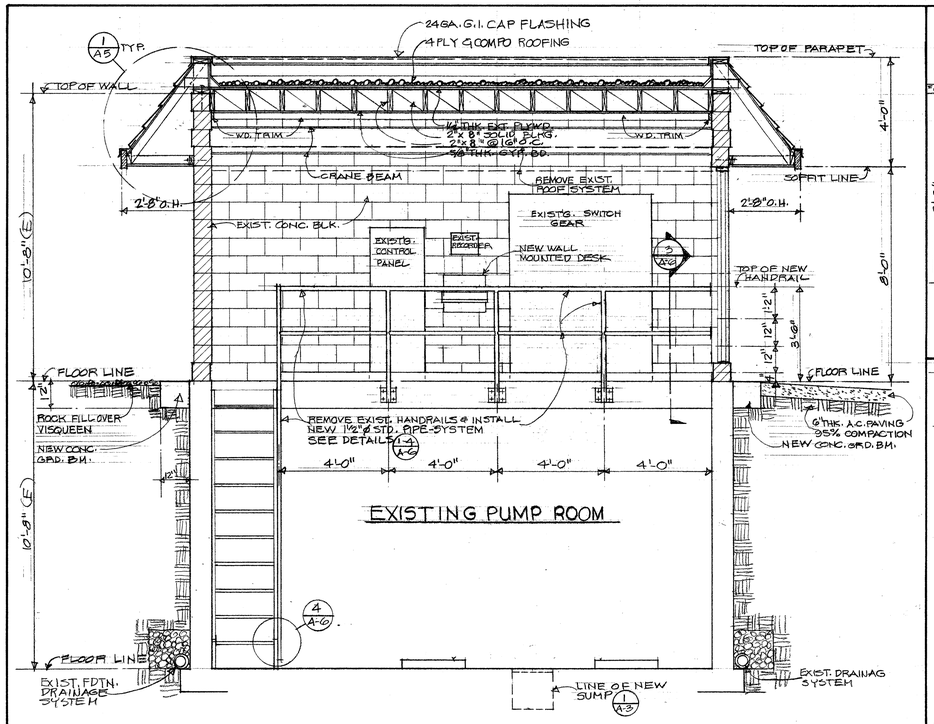
RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

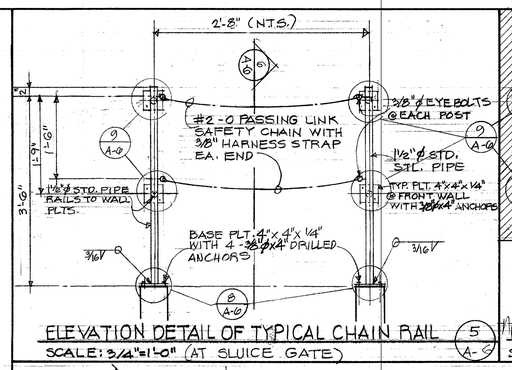
DATE: 9-9-77
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SCALE: AS SHOWN

SANJUA1977-6

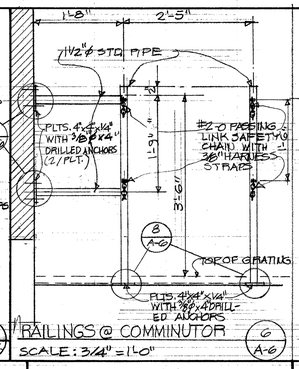
A-5



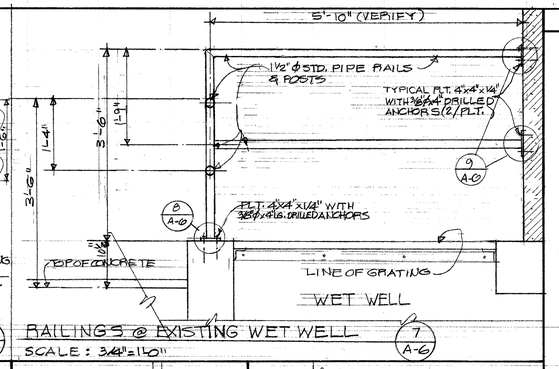
SECTION - E/W - THRU EXISTING PUMP ROOM (E, A-6)
SCALE: 3/8" = 1'-0"



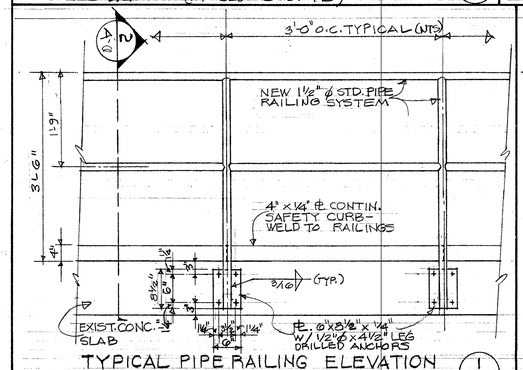
ELEVATION DETAIL OF TYPICAL CHAIN RAIL (5, A-6)
SCALE: 3/4" = 1'-0" (AT SLUICE GATE)



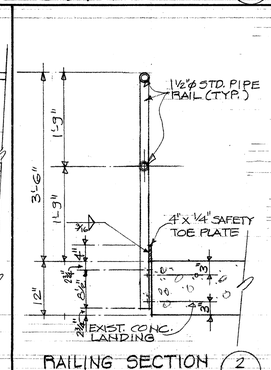
RAILINGS @ COMMINUTOR (6, A-6)
SCALE: 3/4" = 1'-0"



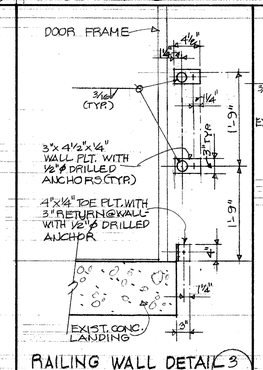
RAILINGS @ EXISTING WET WELL (7, A-6)
SCALE: 3/4" = 1'-0"



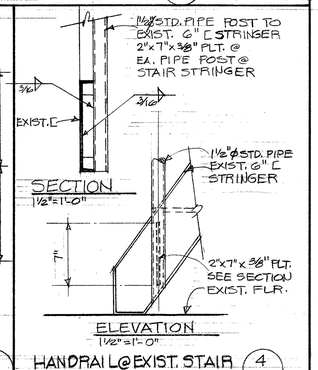
TYPICAL PIPE RAILING ELEVATION (1, A-6)
SCALE: 3/4" = 1'-0"



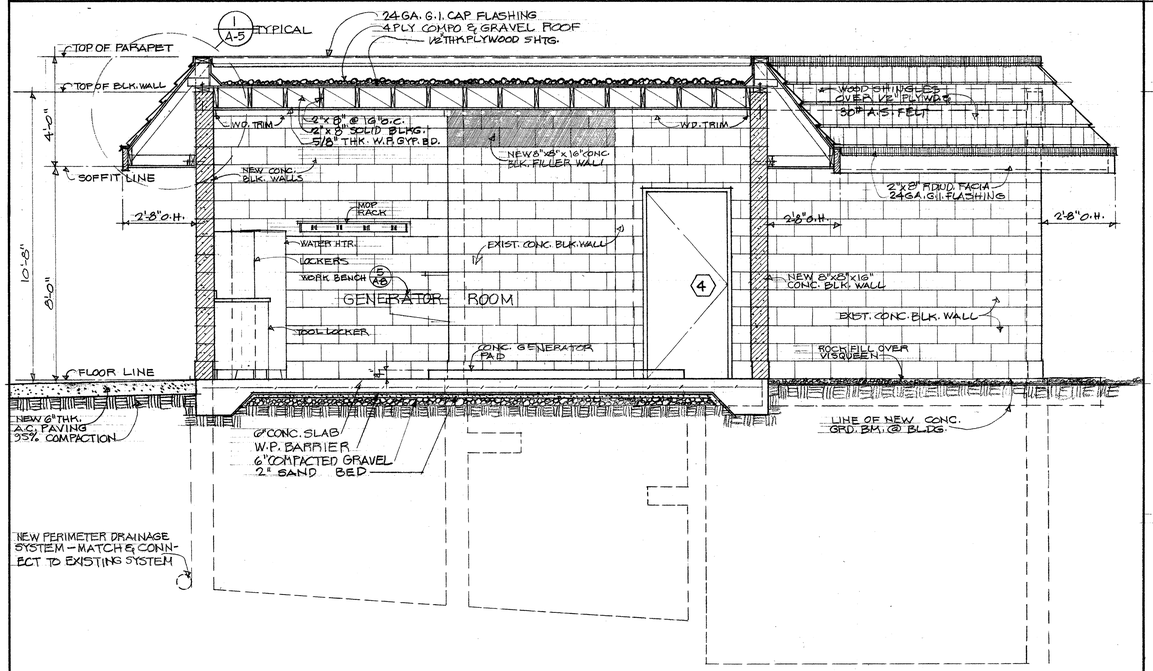
RAILING SECTION (2, A-6)
SCALE: 3/4" = 1'-0"



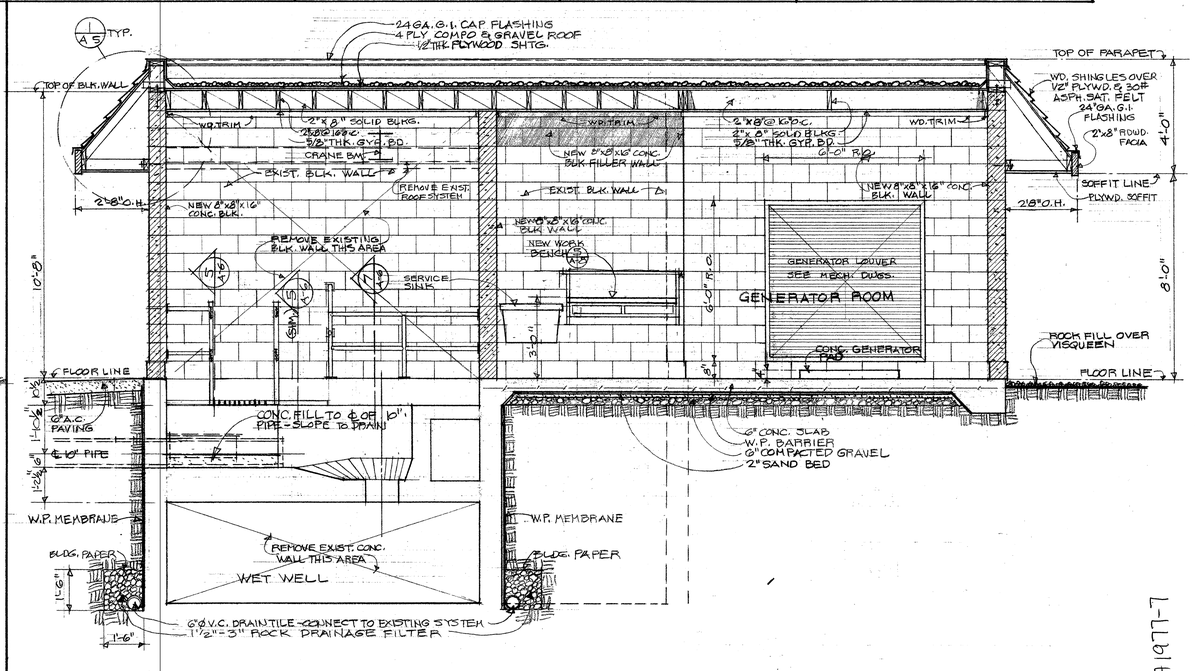
RAILING WALL DETAIL (3, A-6)
SCALE: 3/4" = 1'-0"



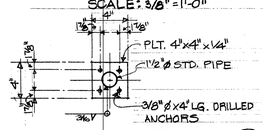
HANDRAIL @ EXIST. STAIR (4, A-6)
SCALE: 3/4" = 1'-0"



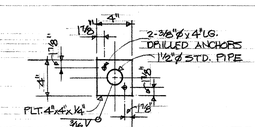
SECTION - N/S - THRU NEW GENERATOR ROOM (C)
SCALE: 3/8" = 1'-0"



SECTION - E/W - THRU NEW COMMINUTOR & GENERATOR ROOMS (D)
SCALE: 3/8" = 1'-0"



TYPICAL RAILING POST BASE PLATE (8, A-6)
SCALE: 1 1/2" = 1'-0"



TYPICAL RAILING WALL PLATE (9, A-6)
SCALE: 1 1/2" = 1'-0"

SANTUA 1977-7

CITY OF BELL JNT. CALIFORNIA
CONTRACT NO. 176 H.S.E. II
MODIFICATIONS TO SAN JUAN PUMP STATION
SECTIONS C-D & E + DETAILS

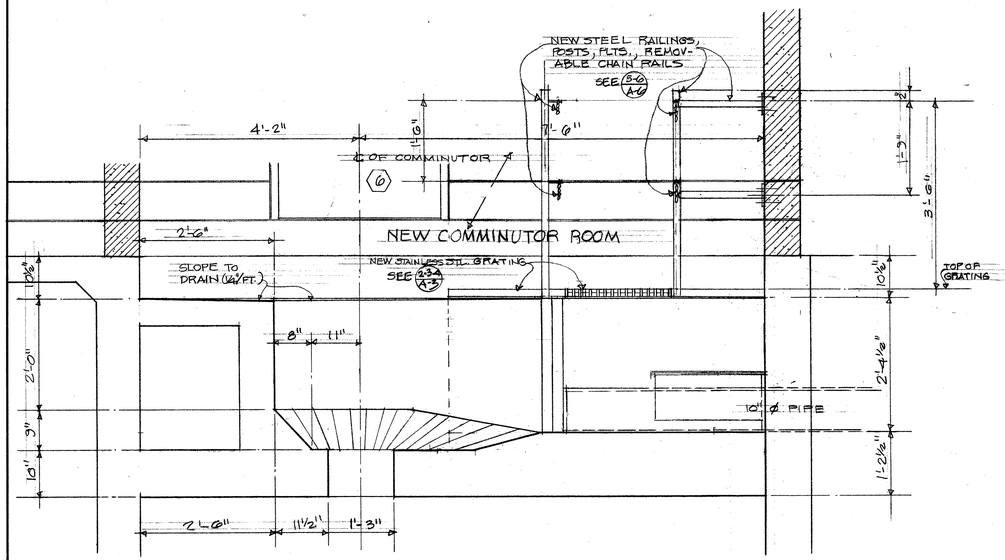
DON SLADE · AIA · ARCHITECT
770 El Camino Real Belmont, Ca. 94002
Phone: (415) 591-7439
C-2760

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

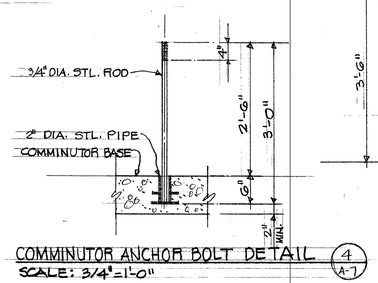
RMT ENGINEERS INCORPORATED

DATE: 4-4-77
DRAWN BY: DES
SCALE: AS SHOWN

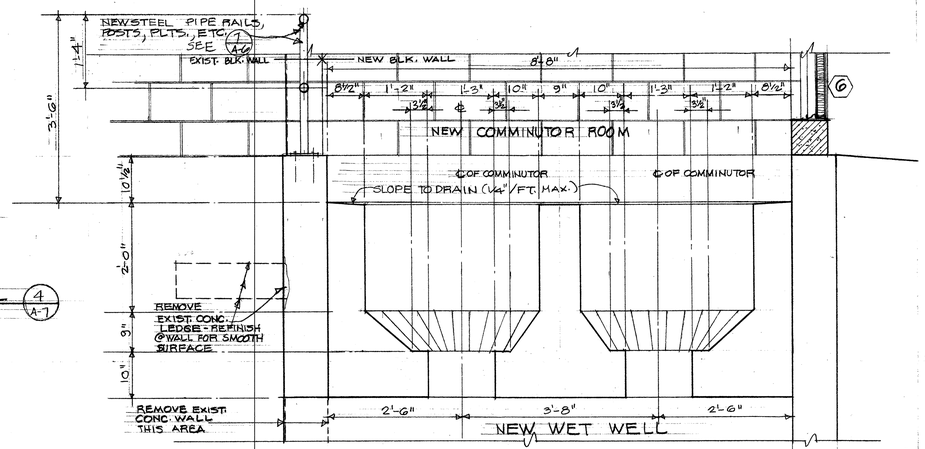
A-6



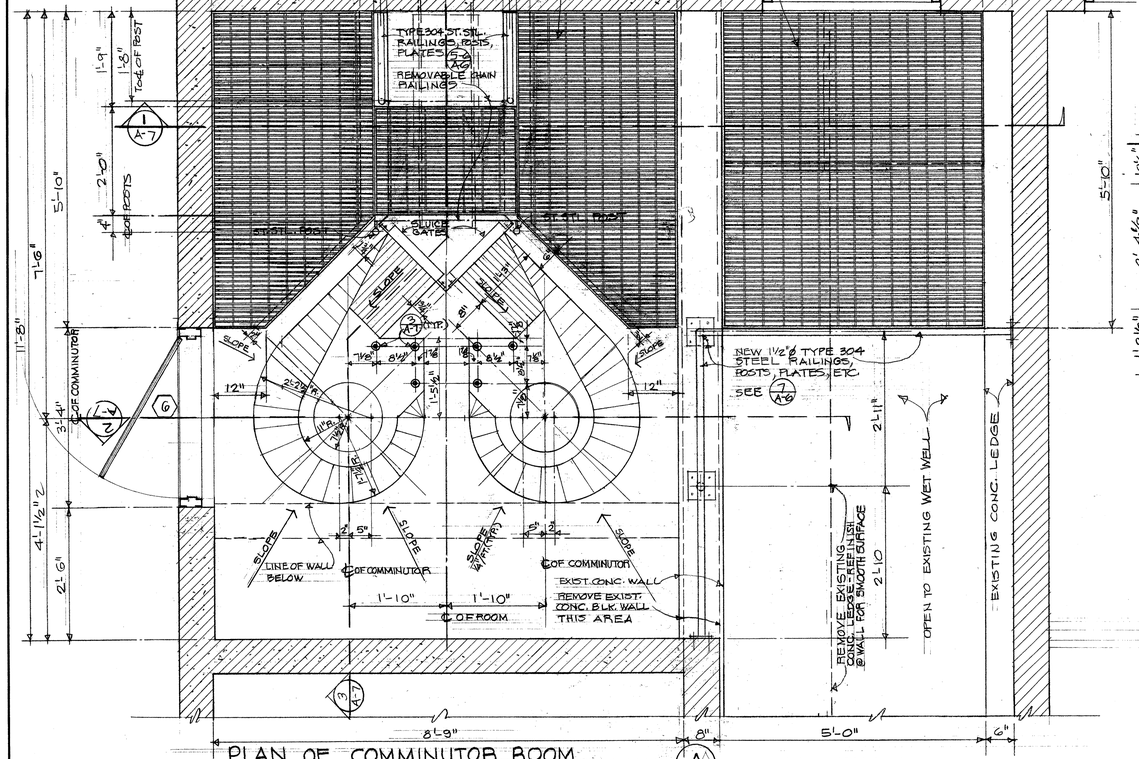
SECTION THRU COMMINUTOR BASIN (3, A-) SCALE: 3/4"=1'-0"



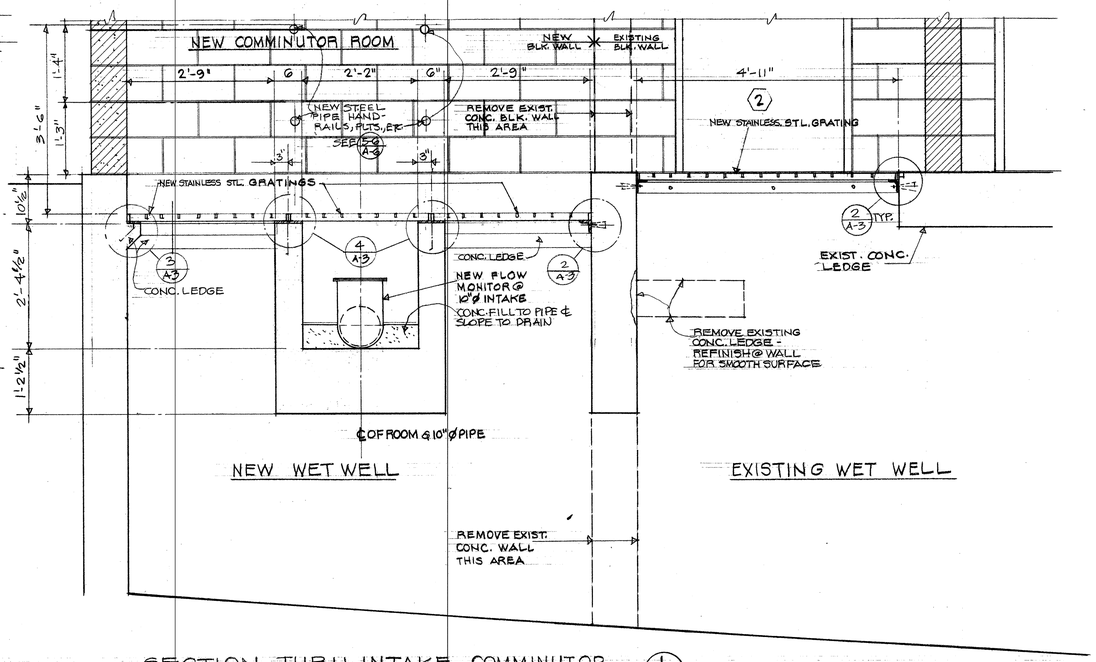
COMMINUTOR ANCHOR BOLT DETAIL (4, A-7) SCALE: 3/4"=1'-0"



SECTION THRU COMMINUTOR BASIN (2, A-) SCALE: 3/4"=1'-0"



PLAN OF COMMINUTOR ROOM (A) SCALE: 3/4"=1'-0"



SECTION THRU INTAKE-COMMINUTOR (1, A-7) SCALE: 3/4"=1'-0"

SANJUA1977-B

CITY CONTRACT No. 176 PHASE II

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION
COMMINUTOR ROOM LARGE SCALE PLAN - SECTIONS - DETAILS

DON SLADE · AIA · ARCHITECT
770 El Camino Real, Belmont, Ca. 94002
Phone: (415) 591-7437
C-2760

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 5-9-77
DRAWN BY: DBS
SCALE: AS SHOWN

A-7

INTERIOR ROOM FINISH SCHEDULE

ROOM OR SPACE NO.	ROOMS TITLE	FLOORS CONC.-PAINT	FLOORS CONC.-SEAL	FLOORS CONC.-EXP.	NORTH WALL CONC.-PAINT	NORTH WALL CONC.-SEAL	NORTH WALL CONC.-EXP.	NORTH WALL MASONRY-PAINT	NORTH WALL MASONRY-SEAL	EAST WALL CONC.-PAINT	EAST WALL CONC.-SEAL	EAST WALL CONC.-EXP.	EAST WALL MASONRY-PAINT	EAST WALL MASONRY-SEAL	SOUTH WALL CONC.-PAINT	SOUTH WALL CONC.-SEAL	SOUTH WALL CONC.-EXP.	SOUTH WALL MASONRY-PAINT	SOUTH WALL MASONRY-SEAL	WEST WALL CONC.-PAINT	WEST WALL CONC.-SEAL	WEST WALL CONC.-EXP.	WEST WALL MASONRY-PAINT	WEST WALL MASONRY-SEAL	CEILINGS SOFFITS CONC.-PAINT	CONC.-SEAL	CONC.-EXP.	GYPSUM BD.	REMARKS
1E	EXISTING PUMP ROOM LOWER LEVEL	■			■					■					■					■									△-EXISTING PAINT TO BE STRIPPED
2E	EXISTING PUMP ROOM UPPER LEVEL	■						■					■					■					■					■	△-EXISTING PAINT TO BE STRIPPED
3E	EXISTING WET WELL			□			□					□					□					□				▲	△	△-EXISTING PAINT TO BE STRIPPED ▲-EXISTING SOFFITS.
4N	NEW WET WELL		■	■			■			■	■				■	■				■	■					■	■	■	
5N	NEW COMMINUTOR RM.	■	■										■	■				■	■				■	■				■	
6N	NEW GENERATOR RM.	■	■					■	■				■	■				■	■				■	■				■	

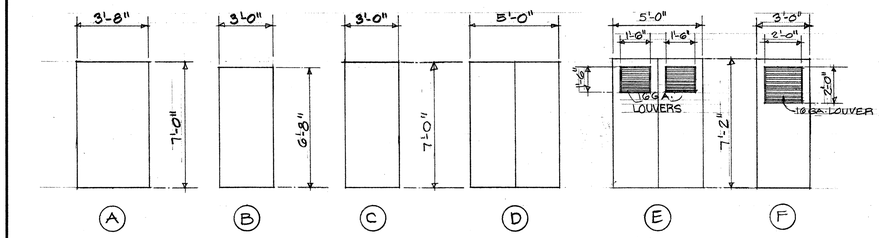
EXTERIOR SURFACE & MATERIAL FINISH SCHEDULE

ITEM NO.	SURFACE OR MATERIAL	FINISHES PAINT-(W.P. COATING)	PAINT-	STAIN-OPAQUE	STAIN-TRANSP.	CLEAR SEAL	NONE	REMARKS
1	MASONRY SURFACES	■						
2	CONCRETE SURFACES	■△						△-DO NOT PAINT BELOW FLR. LINE
3	WOOD SURFACES			■				
4	FACIA SHINGLES				■	■		
5	PLYWOOD SOFFITS	■						
6	STEEL DOORS	■						
7	STEEL FRAMES	■						
8	STEEL LOUVERS	■						
9	SHEET METAL	■						
10	MISC. METALS	■						

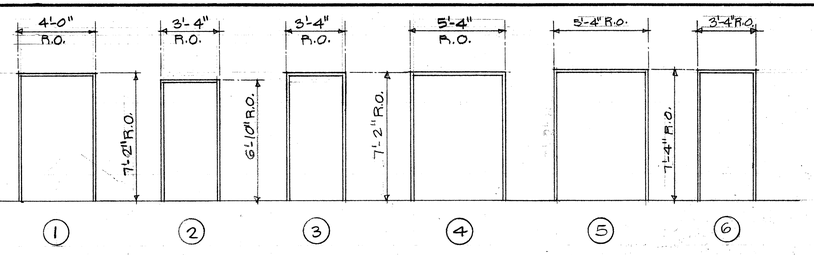
DOOR AND FRAME SCHEDULE

DOOR NO.	DOORS SIZE W	H	T	MATL.	TYPE	LOUVERS W	H	FRAMES MATL.	TYPE	DETAILS JAMB	HEAD	SILL	PROTECTION THRES-HOLD	WEATH-ERSTRIP	FINISH HARDWARE HDWR. GROUP NO.	KEYSIDE - ROOM NO.	REMARKS
1	3'-8"	7'-0"	1¾"	STEEL	A			STEEL	1	3	1	2	ALUM(E)	YES	1	EXTERIOR	REPLACES EXISTING DR.&FRAME
2	3'-0"	6'-8"	1¾"	STEEL	B			STEEL	2	3	1	2	ALUM.	YES	2	EXTERIOR	REPLACES EXIST'G. DR.& FRAME
3	3'-0"	7'-0"	1¾"	STEEL	C			STEEL	3	3	1	2	ALUM.	YES	3	EXTERIOR	
4	3'-0"	7'-0"	1¾"	STEEL	C			STEEL	3	3	1	2	NONE	NO	2	PUMP RM. 2E	
5	PR. 2'-6	7'-0"	1¾"	STEEL	D			STEEL	4	3	1	2	ALUM.	YES	4	EXTERIOR	
6	3'-0"	7'-2"	1¾"	STEEL	F	2'-0"	2'-0"	STEEL	6	3	1	2	ALUM.	YES	3	INTERIOR△	△=BLANK ON EXTERIOR
7	PR. 2'-6	7'-2"	1¾"	STEEL	E	1'-6"	1'-6"	STEEL	5	3	1	2	ALUM.	YES	4	EXTERIOR	

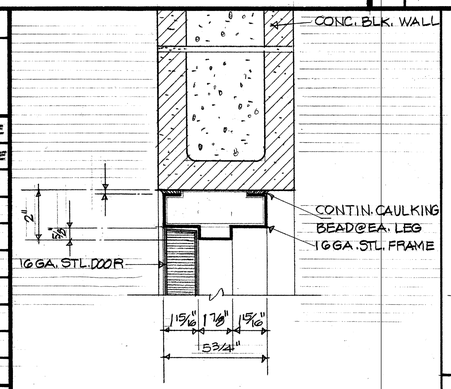
(E) = EXISTING - TO REMAIN.



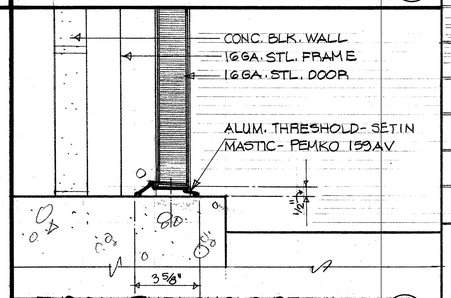
DOOR TYPES



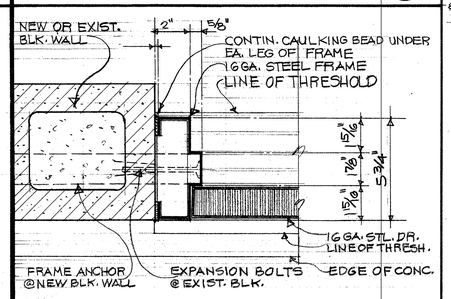
FRAME TYPES



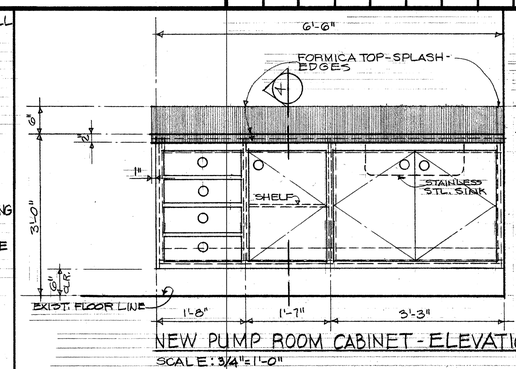
TYPICAL H.M. DOOR HEAD DETAIL (1, A-8)
SCALE: 3"=1'-0"



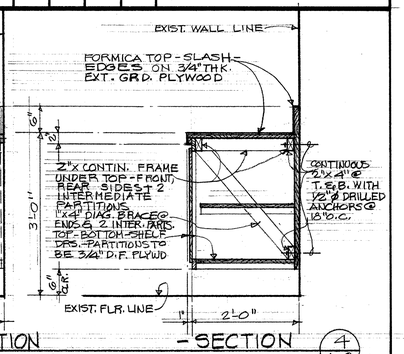
TYPICAL THRESHOLD DETAIL (2, A-8)
SCALE: 3"=1'-0"



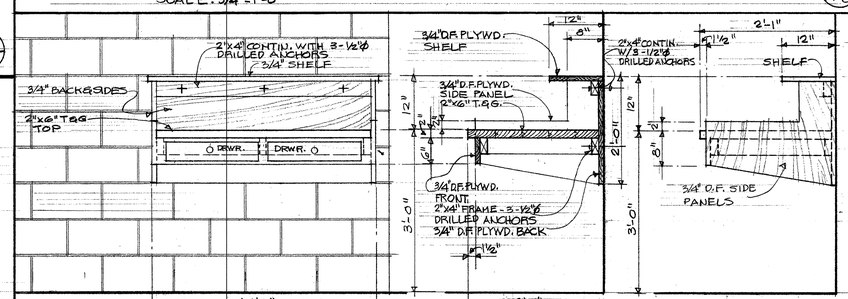
TYPICAL H.M. DOOR JAMB DETAIL (3, A-8)
SCALE: 3"=1'-0"



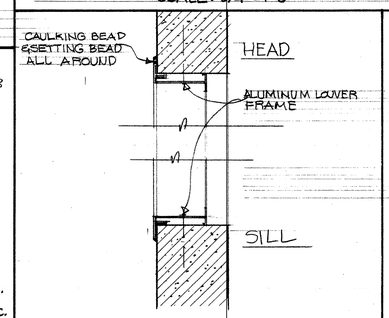
NEW PUMP ROOM CABINET - ELEVATION
SCALE: 3/4"=1'-0"



- SECTION (4, A-8)



FRONT ELEVATION — SECTION — SIDE ELEVATION
NEW WORK BENCH DETAILS (5, A-8)
SCALE: 3/4"=1'-0"



TYPICAL LOUVER FRAME DETAIL (6, A-8)
SCALE: 1½"=1'-0"

DON SLADE · AIA · ARCHITECT
770 El Camino Real, Belmont, Ca. 94002
Phone (415) 591-7439

C-2760

CITY OF BURLINGAME, CALIFORNIA
PUBLIC WORKS DEPARTMENT
SAN JUAN PUMP STATION
SCHEDULES - DOOR DETAILS - CABINET DETAILS

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565
RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN BY: DES
SCALE: AS SHOWN

A-8

SAN JUA 1977-9

LANDSCAPING SCHEDULE

KEY	SYMBOL	BOTANICAL/COMMON/OTHER	SIZE	QUANTITY	REMARKS
1		DESERT TONE VOLCANIC ROCK	1/2" TO 1 1/2"	—	COLOR: RED, 2" DEEP.
2		MESEMBRANTHEMUM – ICE PLANT	FLATS	36 FLATS	COLOR: RED/ORANGE
3		PROSTRATA ROSMARINUS – PROSTRATE ROSEMARY	1 GAL.	260	
4		ROSMARINUS OFFICINALIS/UPRIGHT ROSEMARY	1 GAL.	14	
5		SEANOTHUS	1 GAL.	13	FLOWER COLOR: BLUE

PLANTING & STAKING

FLATS	PLANT @ 18" O.C. MAXIMUM/ PER PLANT
1 GAL.	PLANTING HOLE = 5 GAL. SIZE.
	PLANTING MIXTURE: NURSERY MIX EQUAL TO LYNGSO GARDEN MATERIAL
	MULCHING: REDWOOD COMPOST.

REVISIONS

△ 7/21/77 MINOR REV.

DON SLADE · AIA · ARCHITECT
770 El Camino Real, Belmont, Ca. 94002
Phone: (415) 591-7439

C-2760

CITY CONTRACT NO. 176 PHASE II

CITY OF B: MONT . CALIFORNIA

SITE & LANDSCAPING PLAN & DETAILS

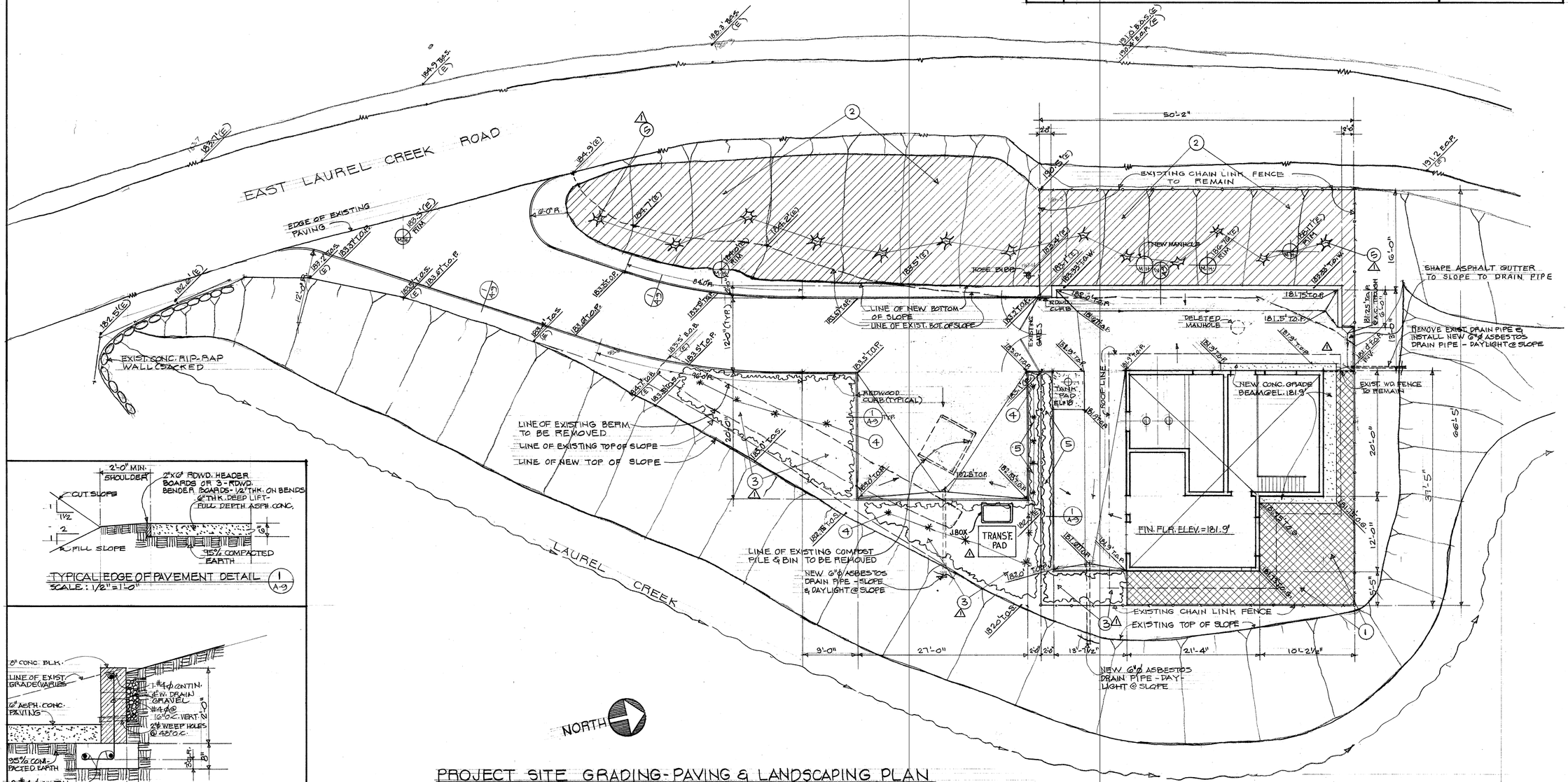
RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3665

RMT ENGINEERS INCORPORATED

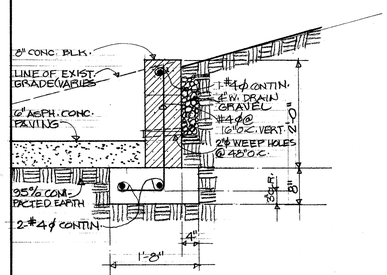
DATE: 3-9-77
DRAWN BY: DES
SCALE: AS SHOWN

A-9

SANJUA1977-10



TYPICAL EDGE OF PAVEMENT DETAIL (1 / A-9)
SCALE: 1/2" = 1'-0"



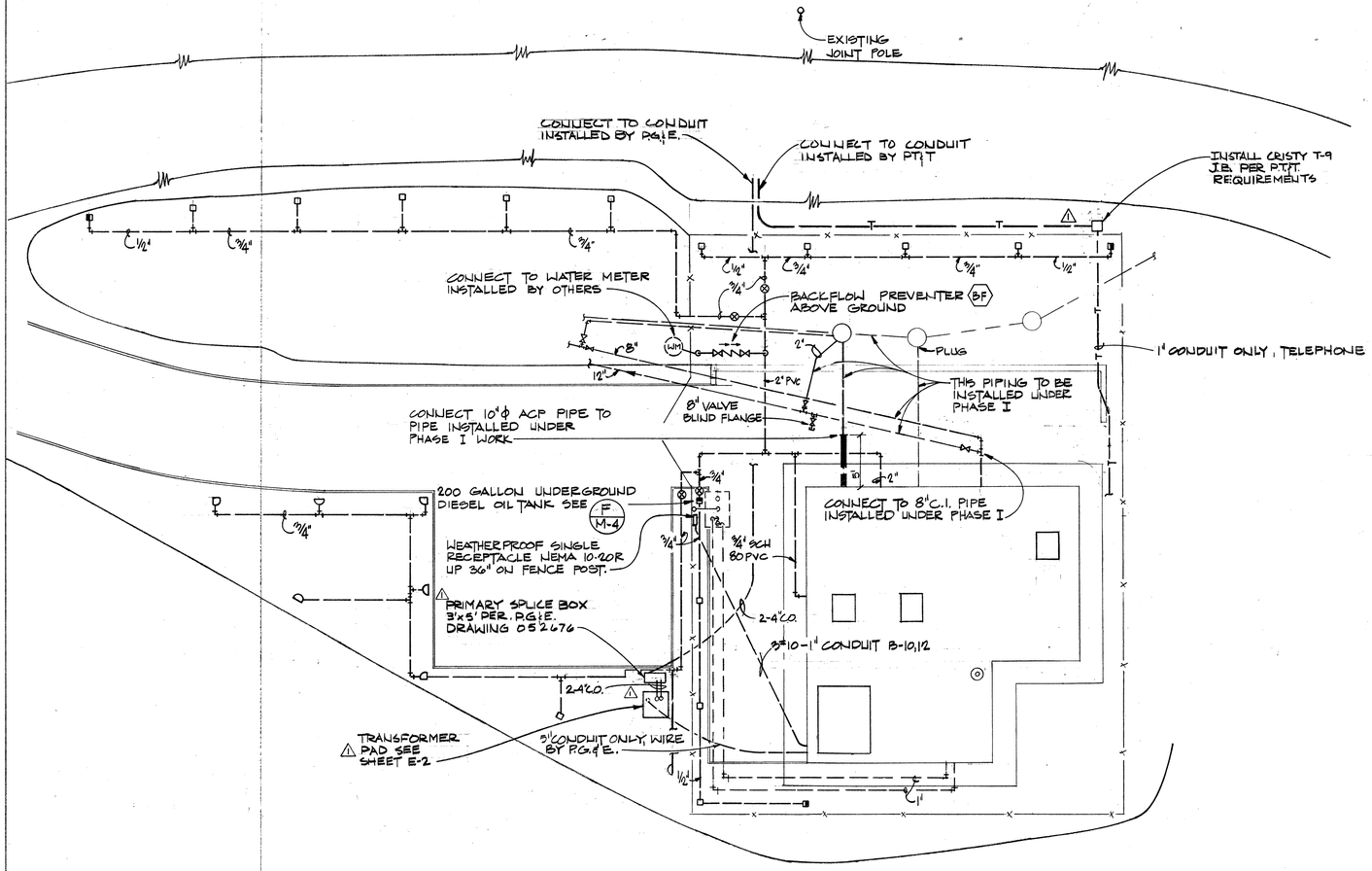
TYPICAL CONC. BLOCK CURB DETAIL (2 / A-9)
SCALE: 3/4" = 1'-0"

PROJECT SITE GRADING-PAVING & LANDSCAPING PLAN

SCALE: 1/8" = 1'-0" (SITE DATA TAKEN FROM SITE SURVEY PREPARED BY L.H. TEASLEY, C.E.)

- = INDICATES NEW PAVED AREAS.
- = INDICATES MANHOLE LOCATIONS.
- = INDICATES CONC. PAD LOCATIONS.

B.O.S.	– BOTTOM OF SLOPE
T.O.S.	– TOP OF SLOPE
T.O.P.	– TOP OF PAVEMENT
T.O.W.	– TOP OF WALL
T.O.G.	– TOP OF GRADE
(00.0'E)	– EXISTING GRADE ELEV.



SITE PLAN

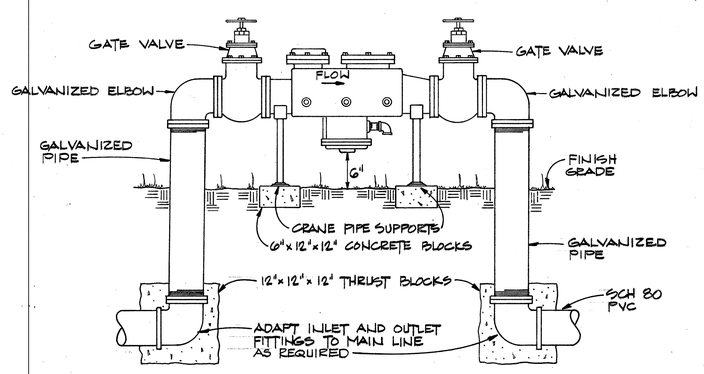
SCALE: 1/8" = 1'-0"

LEGEND

- □ RAINBIRD "SPACE 15" SHRUBBERY SPRAY HEAD MODEL 2400, CENTER STRIP
- ◧ " " " " " " " " , END STRIP
- ⊗ RAINBIRD E SERIES 3/4" SIZE ELECTRIC SOLENOID VALVE INSTALL IN PLASTIC BOX FLUSH WITH GRADE
  IRRIGATION PIPES TO BE CLASS 160 PVC
- D RAINBIRD "SPACE 15" SHRUBBERY SPRAY HEAD MODEL 2400, HALF
- ▽ " " " " " " " " , QUARTER
  IRRIGATION CONTROLLER RAINBIRD MODEL RC-7A

EQUIPMENT

P-1 P-2	SEWAGE PUMPS: ALLIS-CHALMERS TYPE PWO 8 X 14 X 17S, 1770 RPM, 100 HP. 720 GPM @ 262 FT OF T.D.H. AND 1125 GPM @ 238 FT OF T.D.H. 460 V, 3ϕ, 60 HZ.
P-3	SUBMERSIBLE PUMP: PACO MODEL PIP 700 25 GPM @ 15 FT T.D,H. 1/3 HP, 115 V, 1ϕ, 60 HZ.
PV	PLUG VALVE: DE ZURIK SERIES 100 8" SIZE FLANGED, HAND WHEEL ACTUATOR.
CH-V	CHECK VALVE: APCO SERIES 6100 250 LBS CUSHIONED SWING CHECK VALVE, 8" SIZE, HEAVY CAST IRON WITH STAINLESS STEEL SEAT RING WITH SHAFT FOR ATTACHMENT OF OUTSIDE WEIGHT AND LEVEL.
C-1	COMMINUTORS: CHICAGO PUMP COMMINUTOR MACHINES.
C-2	SIZE 15C, 3/4 HP, 460 V, 3ϕ, 60 HZ.
EF-1	PUMP ROOM EXHAUST FAN: EXIT-AIRE TYPE FG SIZE 1508, 1530 CFM @ 1/4" S.P. 1/6 HP, 850 RPM, 120 V, 1ϕ, 60 HZ, PROVIDE BIRD SCREEN AND DISCONNECT SWITCH.
EF-2	ENGINE ROOM EXHAUST FAN: EXIT-AIRE TYPE FG SIZE 1209, 600 CFM @ 1/4" S.P. 1/6 HP, 900 RPM, 120 V, 1ϕ, 60 HZ. PROVIDE BIRD SCREEN AND DISCONNECT SWITCH.
EF-3	WET WELL EXHAUST FAN: EXIT-AIRE TYPE FG SIZE 1508 1530 CFM @ 1/4" S.P. 1/6 HP, 850 RPM, 120 V, 1ϕ, 60 HZ. UNIT TO BE EXPLOSION PROOF CONSTRUCTION. PROVIDE BIRD SCREEN AND EXPLOSION DISCONNECT SWITCH.
EG	ENGINE GENERATOR: KOHLER MODEL 230 ROZ - 71 DIESEL DRIVEN GENERATOR, 460 V, 3ϕ, 230 KW.
SS	SERVICE SINK: AMERICAN STANDARD "LAKEWELL" 7692.023 ENAMELED CAST IRON WITH 7798.176 P-TRAP, 3" OUTLET AND 8301.012 STRAINER AND 8344.111 FAUCET WITH VACUUM BREAKER AND 10-3/4" HOSE OUTLET SPOUT.
S	STAINLESS STEEL SINK: ELKAY DLFR-2519-10 25" X 19" X 10" DEEP, 302 SS SELF-RIM. LK-35 STRAINER AND AMERICAN STANDARD 8344.111 FAUCET.
SL	SLIDE GATE: ARMCO FABRICATED STAINLESS STEEL SLIDE GATES MODEL 5-00. FLAT BACK WITH SIDE WATER SEALS AND FLUSH BOTTOM FLAT BACK OPENING DIMENSIONS AS INDICATED ON DRAWING.
TP	OIL TRANSFER PUMP: SIMPLEX, SEE SPECS.
BF	BACKFLOW PREVENTER SHALL BE HERSEY PRODUCTS MODEL 14 2" SIZE, REDUCED PRESSURE PRINCIPLE DEVICE. TESTING OF THIS DEVICE SHALL BE BY CERTIFIED TESTER APPROVED BY SAN MATEO DEPARTMENT OF PUBLIC HEALTH AND WELFARE.
L	LOUVERS SHALL BE AMERICAN WARMING & VENTILATING, MODEL LW-P-3131-ES-19.



NOTE:
ALL CONNECTIONS ON ASSEMBLY TO BE FLANGED

REDUCED PRESSURE BACKFLOW PREVENTER

NO SCALE

SANJUAI977-11

REVISIONS
⚠TRANSF. PAD LOCATED AT PARKING AREA 5/9/77

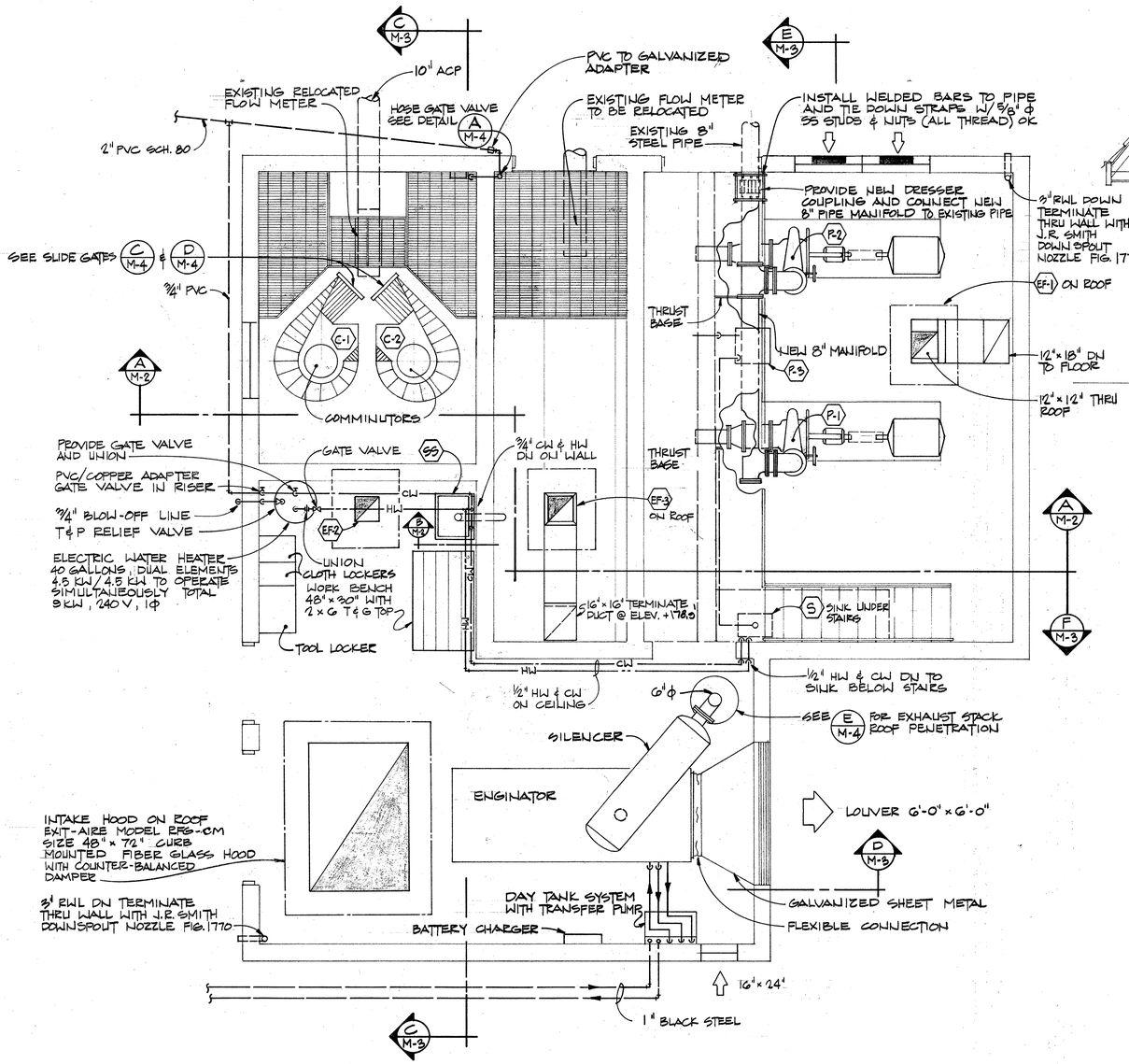
CITY OF BELMONT, CALIFORNIA
CONTRACT NO. 176 PHASE II
MODIFICATIONS TO SAN JUAN PUMP STATION

MECHANICAL AND ELECTRICAL SITE PLAN
MECHANICAL SCHEDULES

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565
RMT ENGINEERS INCORPORATED

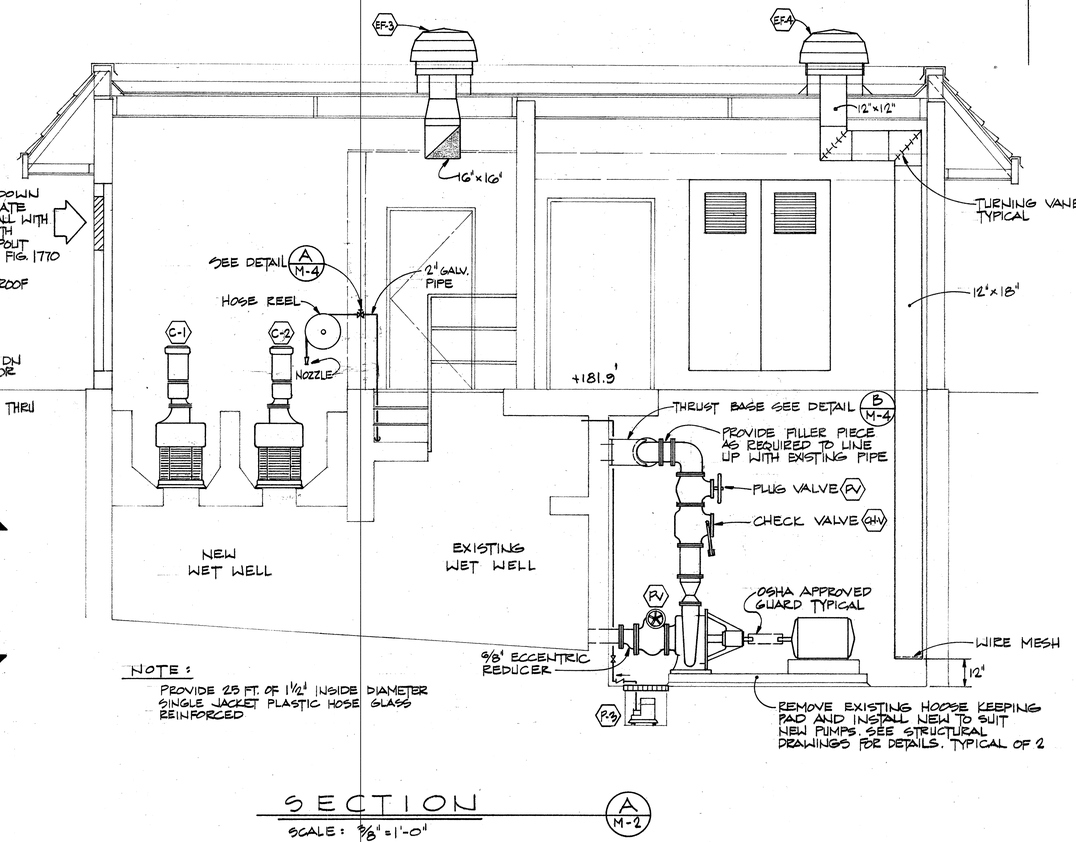
DATE: 3-10-77
DRAWN BY: MS
SCALE: AS NOTED

M-1



PLAN

SCALE: 3/8" = 1'-0"

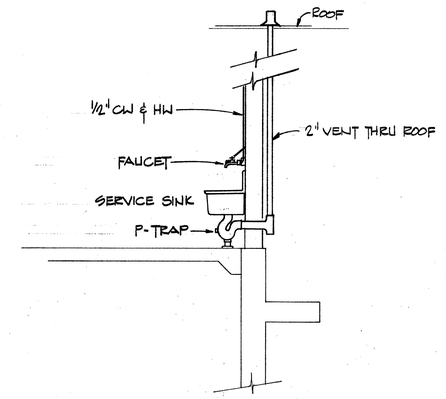


NOTE:
PROVIDE 25 FT. OF 1½" INSIDE DIAMETER SINGLE JACKET PLASTIC HOSE GLASS REINFORCED

SECTION

SCALE: 3/8" = 1'-0"

A M-2



SECTION

SCALE: 3/8" = 1'-0"

B M-2

SAN JUA1977-12

CITY CONTRACT NO. 176, PHASE 4

CITY OF RENO, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

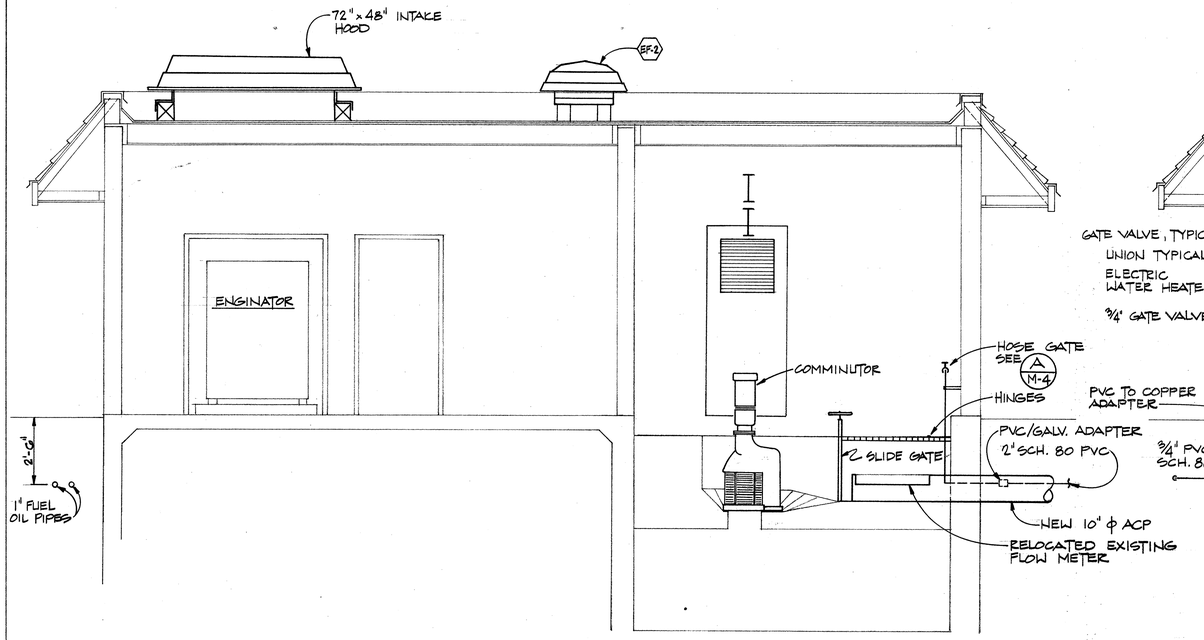
MECHANICAL – PLAN & SECTIONS

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

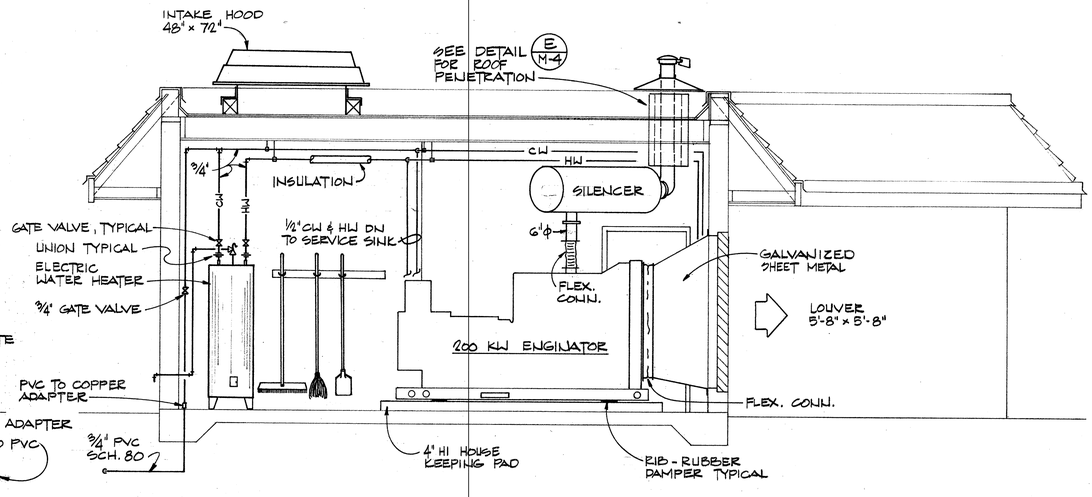
RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN BY: MS
SCALE: AS NOTED

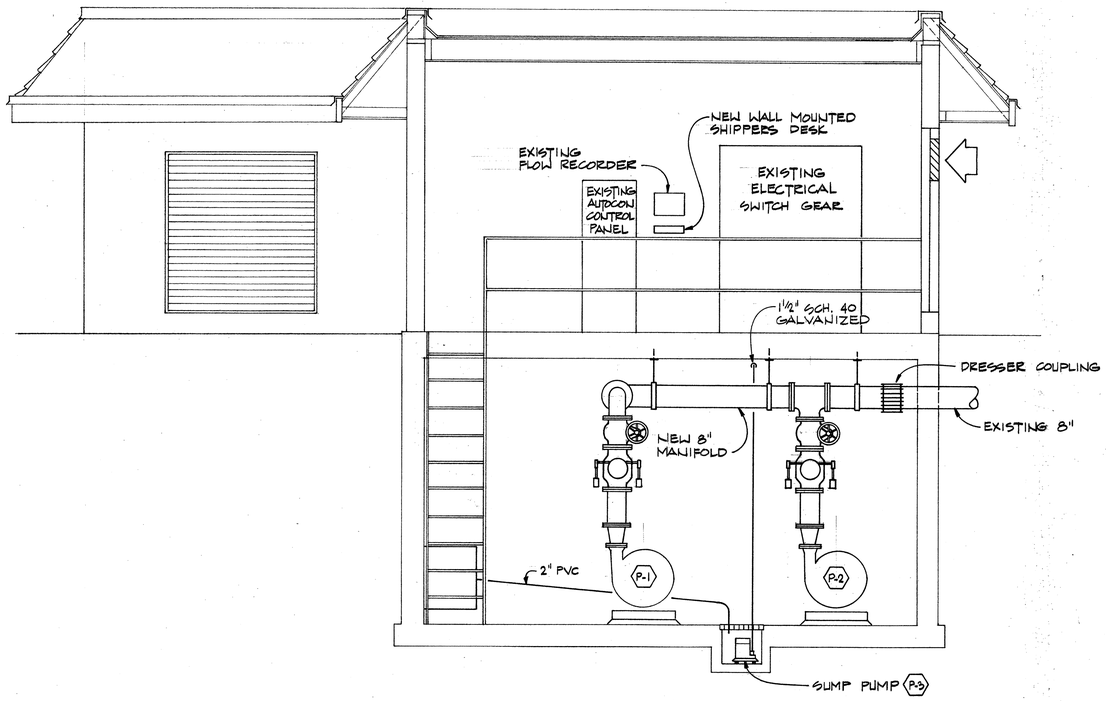
M-2



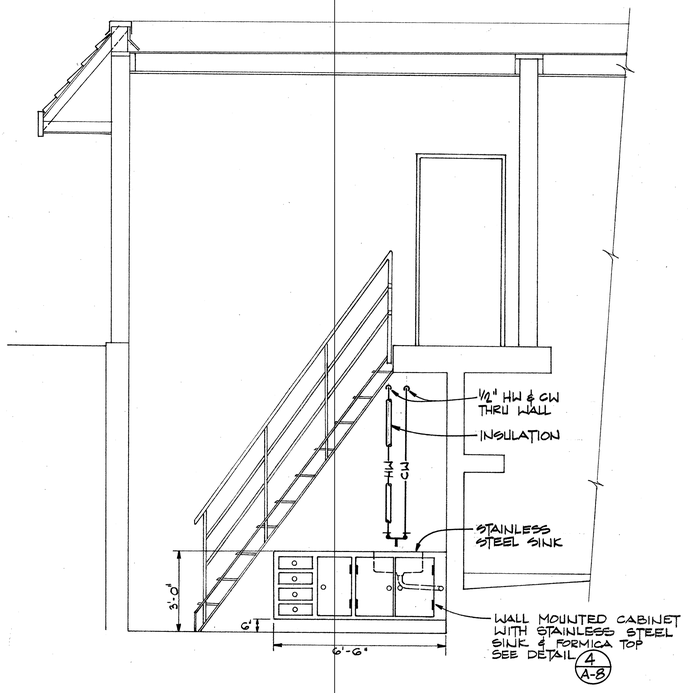
SECTION (C / M-3)
SCALE: 3/8" = 1'-0"



SECTION (D / M-3)
SCALE: 3/8" = 1'-0"



SECTION (E / M-3)
SCALE: 3/8" = 1'-0"



SECTION (F / M-3)
SCALE: 3/8" = 1'-0"

CITY CONTRACT NO. 176, PHASE II

C, F & LMC T, CA-, FN 1
MODIFICATIONS TO SAN JUAN PUMP STATION

MECHANICAL - SECTIONS

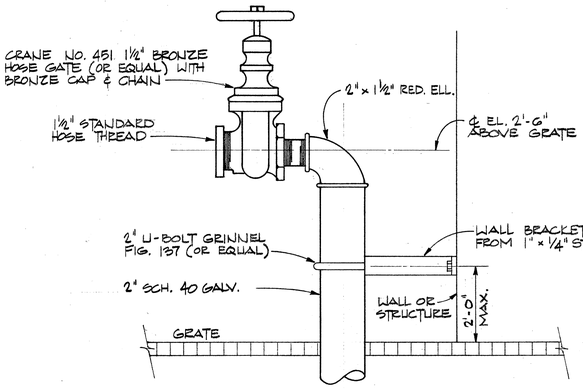
RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN BY: MS
SCALE: AS NOTED

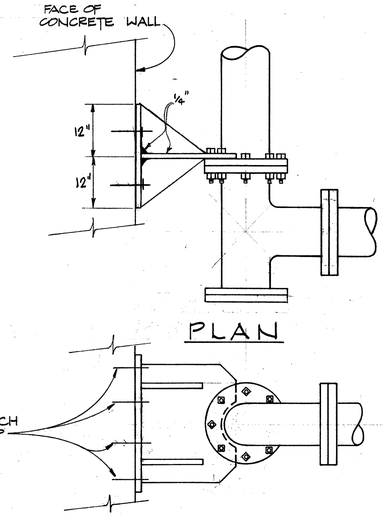
M-3

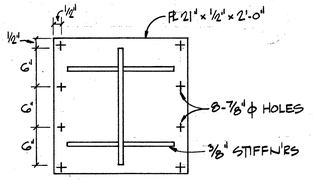
SANTUA1977-13



HOSE GATE VALVE DETAIL (A / M-4)

NO SCALE



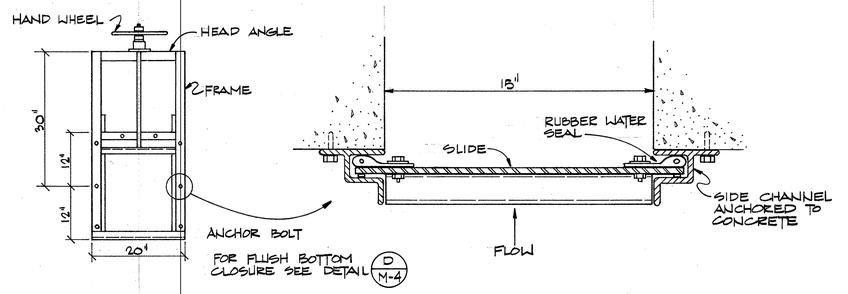


PIPE THRUST BASE (B / M-4)

NO SCALE

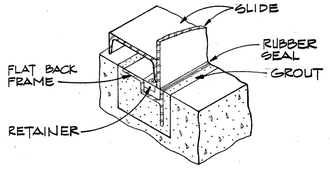
NOTE:

FRAME SIDE GUIDES, SLIDE PLATE, SLIDE REINFORCING AND RETAINER TO BE STAINLESS STEEL ASTM SPECIFICATION A 276 TYPE 304 FASTENERS STAINLESS STEEL ASTM SPECIFICATION A 320 GRADE 38 (BOLTS) AND A 194 GRADE 8 (NUTS). SEAL: RUBBER ASTM SPECIFICATION D 2000 GRADE AA 615. STEM: STAINLESS STEEL, ASTM SPECIFICATION A 276 TYPE 304.



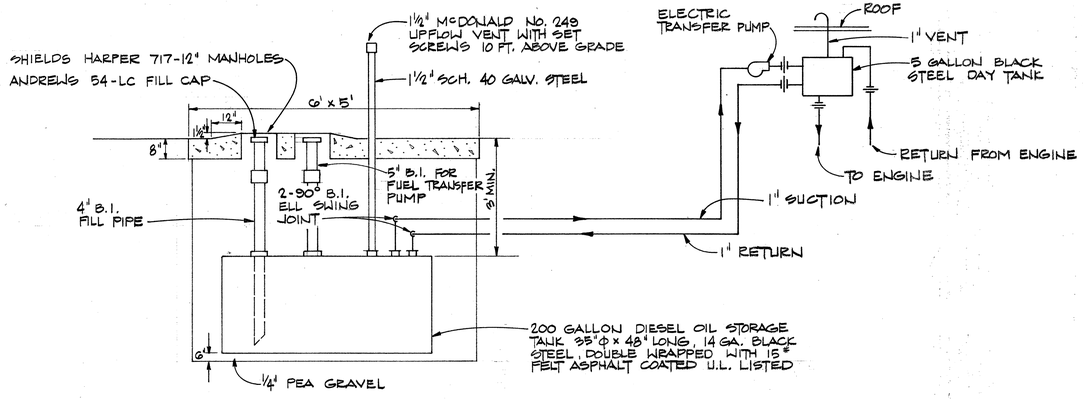
SLIDE GATE DETAIL (C / M-4)

NOT TO SCALE



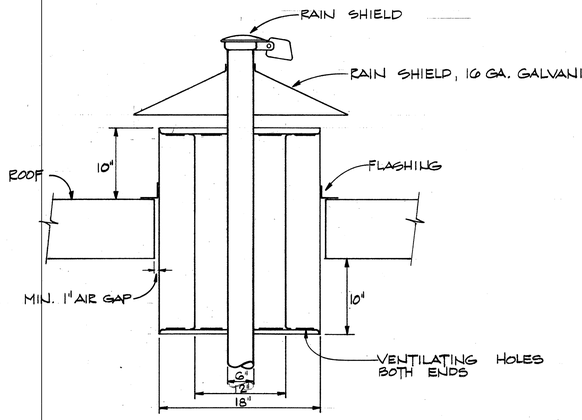
SLIDE GATE FLUSH BOTTOM CLOSURE SEAL DETAIL (D / M-4)

NOT TO SCALE



FUEL OIL SYSTEM SCHEMATIC (F / M-4)

NO SCALE



ENGINE EXHAUST STACK DETAIL (E / M-4)

NO SCALE

CITY CONTRACT NO. 176, PHASE II

CITY OF LAFAYETTE, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

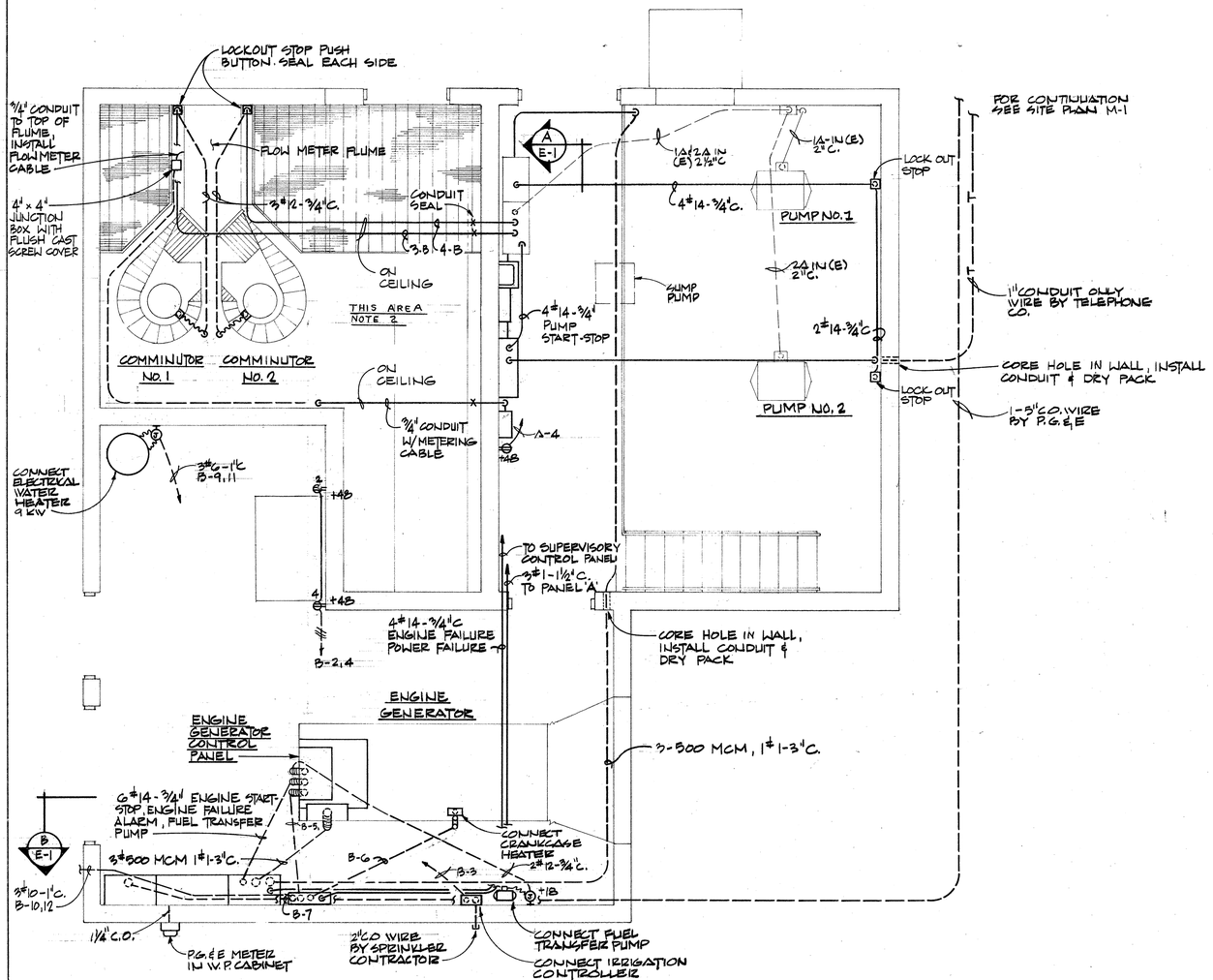
MECHANICAL - DETAILS

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565
RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN BY: MG
SCALE: AS NOTED

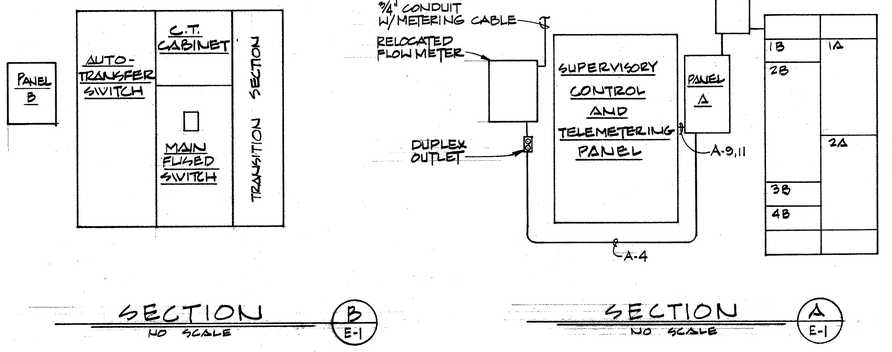
M-4

SANJUA1977-14



POWER PLAN

SCALE 3/8" = 1'-0"



NOTE:

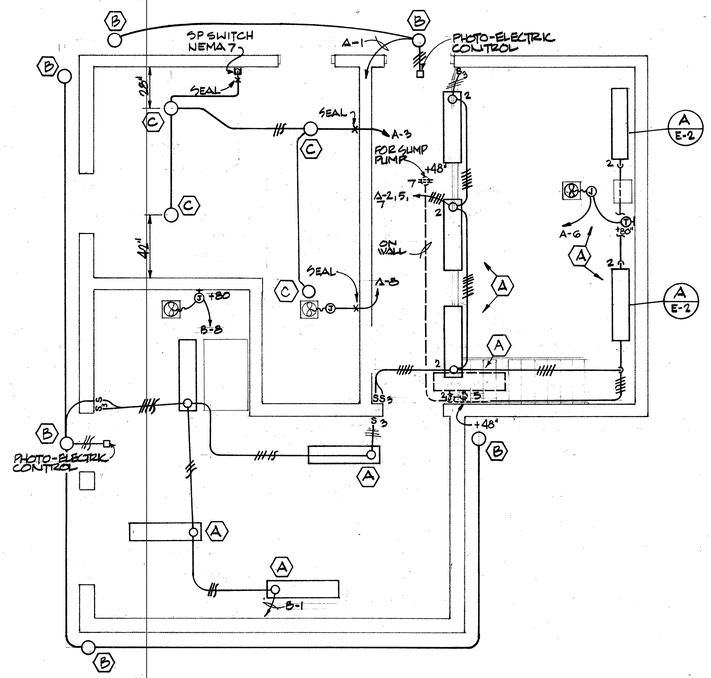
ALL EXISTING EQUIPMENT AT THIS LOCATION TO BE REMOVED. MAINTAIN TEMPORARY PUMPING CONNECTIONS DURING CHANGE OVER

SECTION (B / E-1)

NO SCALE

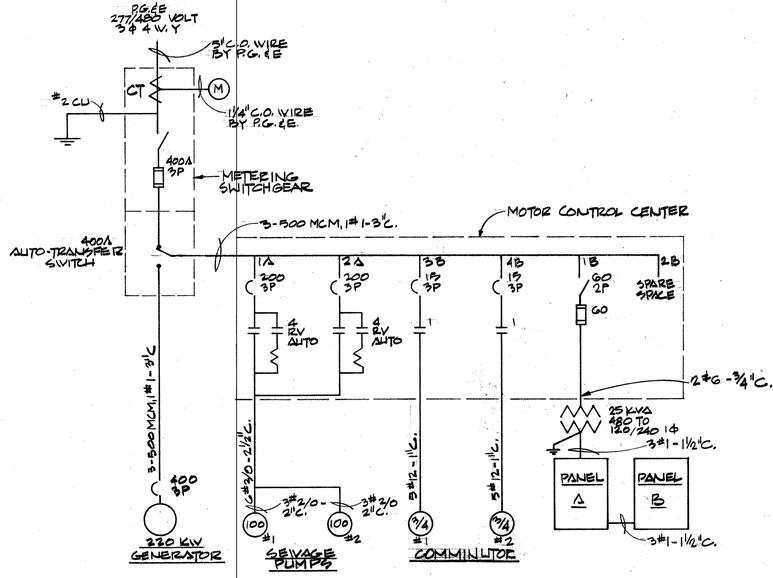
SECTION (A / E-1)

NO SCALE



LIGHTING PLAN

SCALE : 1/4" = 1'-0"



ONE LINE DIAGRAM

CITY CONTRACT NO. 176, PHASE II

CITY OF SAN JUAN B-1 TO B-10 F, C/ 1" RNI
MODIFICATIONS TO SAN JUAN PUMP STATION

ELECTRICAL- POWER AND LIGHTING PLANS
ONE LINE DIAGRAMS AND DETAILS

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE 3-9-77
DRAWN BY: BG MS
SCALE: AS NOTED

E-1

SANJUA1977-15

PANEL SCHEDULE: A

BUS: 100 AMP. 120/240 VOLT 3 ϕ 4 W

TYPE: SURFACE MAIN 70A CIRCUIT BREAKER

SUB-FEED LUGS

CIR. NO.	BKR. AMP.	BKR. POLE	DESCRIPTION	LOAD A	LOAD B
1	20	1	LIGHT EXTERIOR	350	
3	20	1	LIGHTS WET WELL		500
2	20	1	LIGHTS DRY WELL	600	
4	15	1	RECEPTACLE - RECORDER		60
5	20	1	RECEPTACLE - WET WELL	360	
7	15	1	RECEPTACLE - SUMP PUMP		600
6	15	1	EXHAUST FAN	500	
8	15	1	EXHAUST FAN		500
9	15	1	TELEMETERING PANEL	200	
11	15	1	" "		250
10	20	1	SPARE		
12	20	1	SPARE		
			TOTAL	2010	2010

TOTAL LOAD 4.0 KVA MAX. ϕ 16.8 AMPS

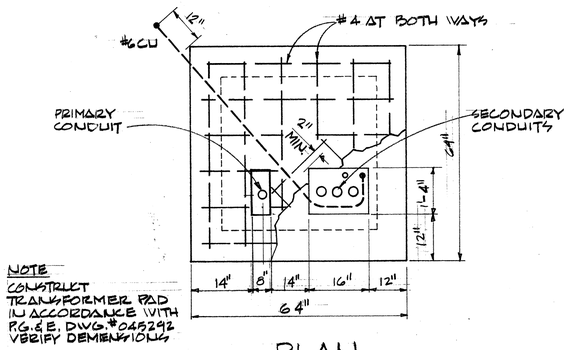
PANEL SCHEDULE: B

BUS: 100 AMP. 120/240 VOLT 1 ϕ 3 W

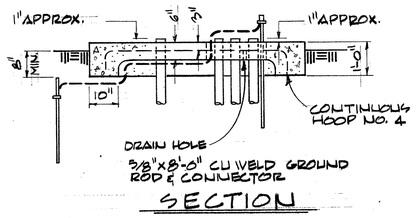
TYPE: SURFACE MAIN LUGS ONLY

CIR. NO.	BKR. AMP.	BKR. POLE	DESCRIPTION	LOAD A	LOAD B
1	20	1	LIGHTS	880	
3	15	1	IRRIGATION CONTROLLER		50
2	20	1	RECEPTACLES	360	
4	20	1	"		360
5	15	1	BATTERY CHARGER	100	
7	15	1	FUEL TRANSFER PUMP		300
6	20	1	ENGINE CRANKCASE HEATER	750	
8	15	1	EXHAUST FAN		400
9	50	2	WATER HEATER	4500	
11			" "		4500
10	20	2	FUEL TRANSFER PUMP RECEPTACLE	800	
12			" " " "		800
13	20	1	SPARE		
15	20	1	"		
14	20	1	"		
16	20	1	"		
			TOTAL	7390	6410

TOTAL LOAD 13.8 KVA MAX. ϕ 61.6 AMPS



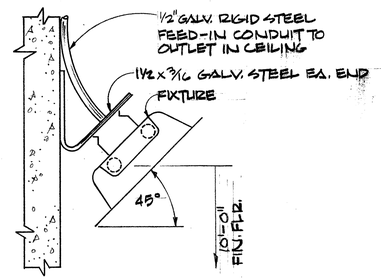
PLAN



SECTION

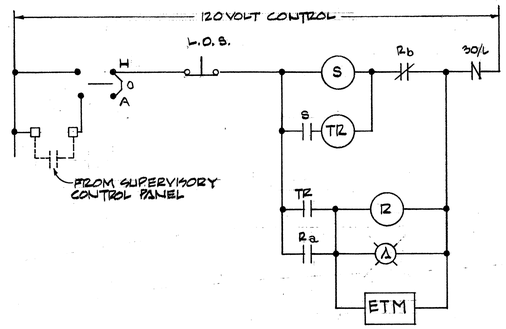
P.G.&E. TRANSFORMER PAD

NO SCALE

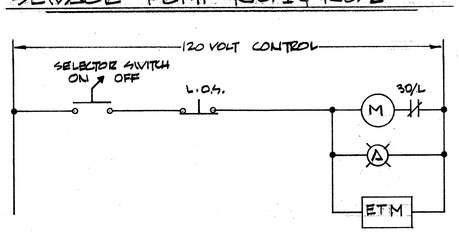


DETAIL Δ E-2

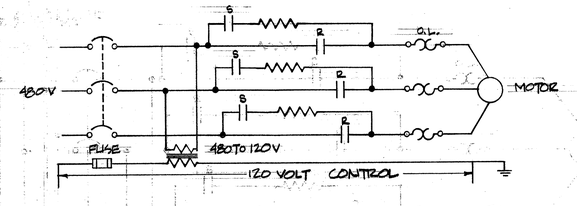
NO SCALE



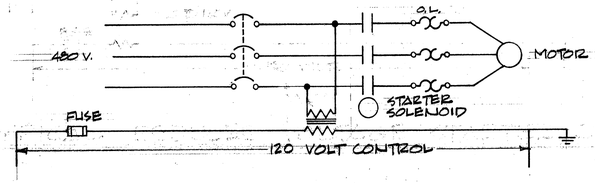
SEWAGE PUMP NO. 1 & NO. 2



COMMINUTOR NO. 1 & NO. 2



TYPICAL REDUCED VOLTAGE MOTOR CONTROL CIRCUIT



TYPICAL FULL VOLTAGE MOTOR CONTROL CIRCUIT

ELECTRICAL LEGEND

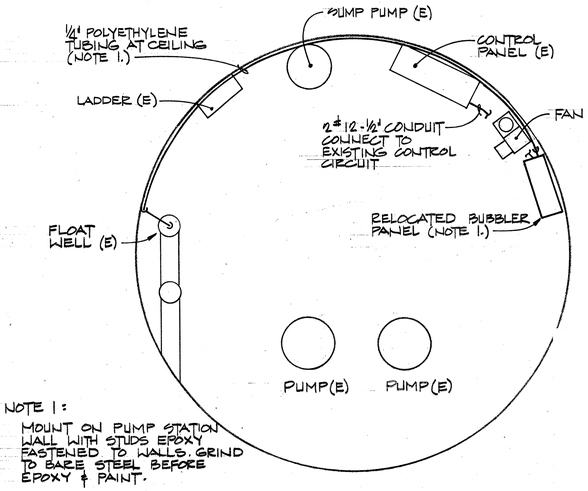
○	CEILING FIXTURE OUTLET; A INDICATES FIXTURE TYPE, "5" INDICATES CIRCUIT.
▭	FLUORESCENT FIXTURE, 2 OR MORE LAMPS, APPROXIMATELY TO SCALE, WITH OR WITHOUT INDICATIONS ABOVE.
S	WALL SWITCH, SINGLE POLE, +50", HUBBELL 1201.
S_3	WALL SWITCH, 3-WAY, +50", HUBBELL 1203.
⊜	DUPLEX CONVENIENCE OUTLET, +12", HUBBELL 5262.
□	LOCKOUT STOP PUSHBUTTON.
(J)	JUNCTION BOX, MAKE CONNECTIONS TO EQUIPMENT AS SHOWN.
(F)	FAN, CONNECT.
(T)	THERMOSTAT, LINE VOLTAGE, CONNECT.
——///	CONDUIT CONCEALED IN WALLS OR CEILING, EXPOSED INDOORS ON WALLS OR CEILING WHERE NOTED. WITH 2 #12 CONDUCTORS UNLESS NOTED OTHERWISE BY HASHMARKS. NUMBER BY HASHMARKS INDICATES LARGER SIZE WIRE. CODE TABLE 3C SIZE CONDUIT, 3/4" MINIMUM.
——/// ——	CONDUIT IN FLOOR OR UNDER SLAB OR UNDER GROUND; OTHERWISE SAME AS ABOVE.
←———	CONDUIT HOMERUN TO PANEL.
~~	WEATHERPROOF FLEXIBLE CONDUIT.
G———	CONDUIT DOWN.
O———	CONDUIT UP.
C	CONDUIT.
C.O.	CONDUIT ONLY.
WP	WEATHERPROOF.
(E)	EXISTING.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMPS
A	FLUORESCENT - INDUSTRIAL, TWO LAMP, HEAVY DUTY SMOOTH PORCELAIN ENAMELED REFLECTOR, SLOTTED FOR NOMINAL 10% UPLIGHT; CORROSION-RESISTANT UNDERCOATING; BACK CHANNEL FOR SLIDING CLAMP HANGER FOR STEM OR SPACER MOUNTING; HEAVY DUTY STEEL CLAD TURRET, 13-1/2"W X 48"L X 6-7/8"H; LAMPS 5" ON CENTER.	2-F40/WW
B	MERCURY VAPOR, RECESSED, WET LOCATION, 9-7/8" SQUARE PRISMATIC REGRESSED LENS, BLACK ANODIZED FINISH, 120 VOLT, 100 W, HPF BALLAST, MCPHILBEN 6W-308.	H38BP-100/DX
C	MERCURY VAPOR, CEILING, ENCLOSED AND GUARDED, NEMA 7 CLASS 1 GROUP D HAZARDOUS LOCATION, SELF CONTAINED BALLAST, PORCELAIN ENAMEL SHALLOW BOWL REFLECTOR. CROUSE-HINDS EVMCX 42100	100W H38-AY/DX

NOTES

1. PHOTOELECTRIC CONTROLS TO BE 120V CONDUIT MOUNTED WITH ADJUSTABLE LIGHT LEVEL CONTROL.
2. ALL MATERIALS AND INSTALLATION SHALL CONFORM TO REQUIREMENTS FOR CLASS 1, DIVISION 1 GROUP D HAZARDOUS LOCATION FOR THE ENCLOSED WET WELL.



NOTE 1:
MOUNT ON PUMP STATION WALL WITH STUDS EPOXY FASTENED TO WALLS. GRIND TO BARE STEEL BEFORE EPOXY & PAINT.

SANJUAI977-16

HASKINS PUMP STATION - PLAN

NOT TO SCALE

CITY CONTRACT NO. 176 PHASE II

CITY OF BALLINT CALIFORNIA

MODIFICATIONS TO SAN JUAN PUMP STATION

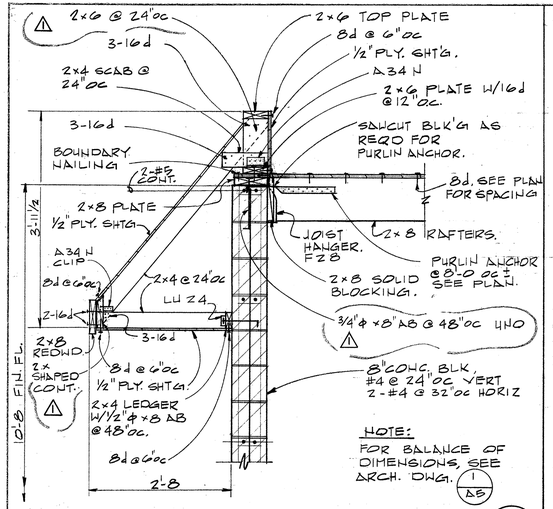
ELECTRICAL - LEGEND, SCHEMATICS, DETAILS

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

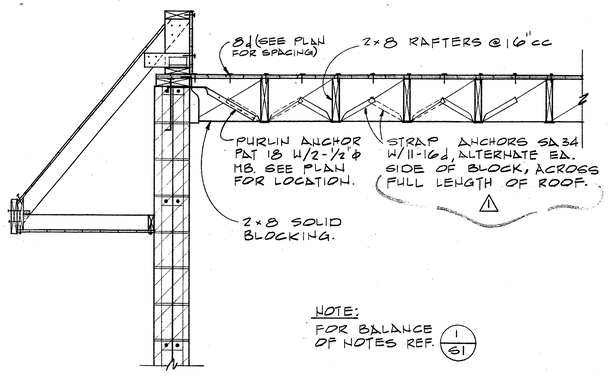
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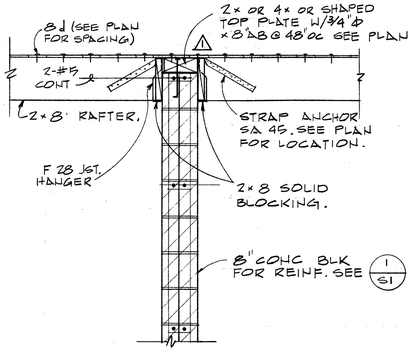
E-2



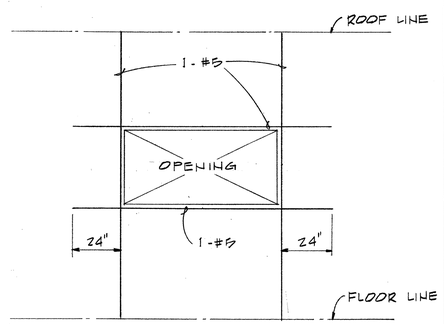
TYP. RAFTER TO WALL DETAIL — 1/S1
SCALE: 3/4"=1'-0



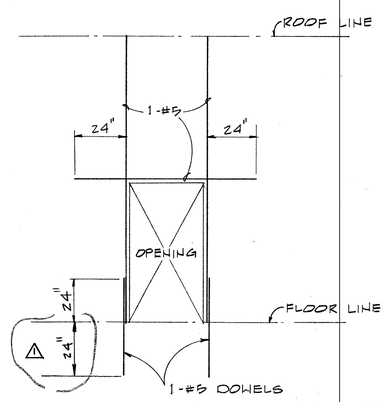
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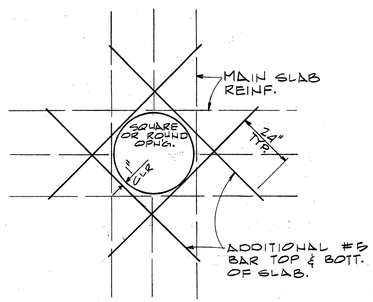
TYP. INTERIOR WALL — 3/S1
SCALE: 3/4"=1'-0



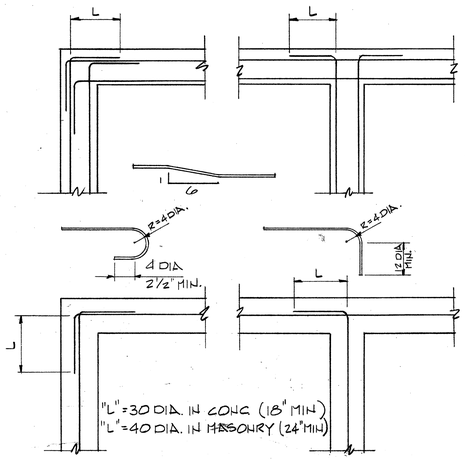
TYP. WINDOW REINFORCING — 4/S1
NO SCALE



TYP. DOOR REINFORCING — 5/S1
NO SCALE



TYP. REINFORCING AT SLAB OPENINGS — 6/S1
NO SCALE



TYP. WALL & FOOTING REINF. AT INTERSECTION AND HOOKS — 7/S1
NO SCALE

SOIL:
1. Foundation design is based on report of foundation investigation No. 481-3, PA 7510, by John V. Lowney, dated December 17, 1976.
2. Design soil pressure is 3000 P.S.F. for continuous footings and for mat foundations.
3. All footings shall extend a minimum of 1'-6" below the lowest adjacent final grade or 14" below interior finish slab. All excavations for footings shall be inspected by the soils engineer before pouring concrete.

STRUCTURAL GENERAL NOTES

GENERAL:
1. All new work shall conform to the requirements of the 1973 edition of the Uniform Building Code.
2. Contractor shall verify all new and existing dimensions and conditions. The contractor shall notify the architect or engineer of any discrepancies before proceeding with any part of the work.
3. Contractor shall verify location and size of floor, roof and wall openings with architectural, mechanical and electrical drawings, no unauthorized holes permitted.
4. Contractor shall verify all depressions and recesses for floor finishes with architectural drawings.
5. Contractor shall verify all inserts and embedded items with mechanical and electrical drawings before pouring concrete.
6. Typical details shown here shall be used where applicable, and when specific details are not shown elsewhere.

CONCRETE:
1. Concrete shall have a minimum ultimate compressive strength in 28 days as follows:
   a. Slabs on grade, wall footings.....f_c = 2,500 psi.
   b. Columns, walls, beams, mat foundation, structural slabs, grade beams.....f_c = 3,000 psi.

   Mix shall be designed by an approved testing laboratory or shall conform to mix design requirements established by the Uniform Building Code. Portland Cement shall conform to ASTM C-150.
2. Before concrete is poured, check with all trades for proper placement of sleeves, curbs, conduits, etc.

MASONRY:
1. Concrete block shall be Type N, ASTM C90. (f'_m = 1500 psi.)
2. Mortar shall be Type S with minimum compressive strength of 1800 psi at 28 days, as per table No. 24-A, 1973 UBC.
3. Grout shall attain a minimum compressive strength of 2000 psi at 28 days.
4. Masonry construction shall comply with Uniform Building Code. Continuous inspection is not required unless noted.
5. Grout lifts shall not exceed 4'-0" without clean-out holes.

REINFORCING:
1. All reinforcing steel shall be deformed bars conforming to A-615-68, Grade-40, tested and identified as required by code.
2. Lap bars 30 diameters in concrete and 40 diameters in masonry (2'-0" min.) at all splices unless noted otherwise.
3. Details of reinforcing steel shall conform to latest edition of "Manual of Standard Practice for Reinforcing Concrete Construction" by W.C.R.S.I.
4. Reinforcement Coverage:
   Concrete poured against earth.....3"
   Concrete poured in forms below grade.....2"
   Exterior face of exterior wall.....2"
   Other wall faces.....1"
   Beams, top, bottom and sides to main reinf.....1-1/2"
   Columns to main steel.....1-1/2"
   Bottom and top of supported concrete slabs.....3/4"
5. In addition to regular wall reinforcement provide 2 - #5 at the following locations: each side of openings, top of door openings, top and bottom of window and duct openings (extend 30 diameters beyond opening, 2'-0" min.)

STRUCTURAL STEEL:
1. All rolled shapes, plates and angles shall conform to A.S.T.M. A-36.
2. Pipe columns shall be wrought steel seamless pipe conforming to A.S.T.M. A-53 Grade B.
3. All fabrication and erection of structural steel shall be in accordance with A.I.S.C. standards currently approved by the Building Department and Chapter 27 of the Uniform Building Code.

WELDING:
1. All welding shall be done by the electric arc weld process and shall conform to the requirements of the Structural Welding Code - AWS D1.1 with latest revisions of the American Welding Society.

WOOD:
1. All framing lumber shall be Douglas Fir, grade marked as follows:
   4 x 4 and smaller.....No. 2
   2 x rafters.....No. 2
   4 x beams, stringers, ledgers.....No. 1
   Studs and vertical framing.....Standard grade or better
   Plywood sheathing (exterior glue).....C-DX, panel identification 32/16, conforming to PS 1-74.
2. Plywood roof sheathing shall be laid with the grain of the outer plies perpendicular to the framing members and panel joints staggered. Use 2 x 4 flat blocking or approved plywood cleats at all interior unsupported panel edges.
3. All lumber hardware (hangers, framing anchors, etc.) has been specified as that type as manufactured by Simpson Company, San Leandro, California. Approved equal hardware may be substituted if approved by the engineer.
4. Roof joists 8" and deeper shall have approved cross-bridging or full depth blocking @ 10'-0" maximum spacing.
5. All bolts through wood (including ledgers) shall have plate washers.
6. Minimum framing nailing shall conform to Table 25-P, of the 1973 UBC.

REVISIONS
1 7/21/77 MINOR REV

SANTUA1977-17

REGISTERED PROFESSIONAL ENGINEER — NEIL G. MOORE — No. 1640 — STRUCTURAL — STATE OF CALIFORNIA

Neil & Moore

NEIL G. MOORE & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
120 EL CAMINO REAL
SAN CARLOS, CALIFORNIA 94070 415 592-7216

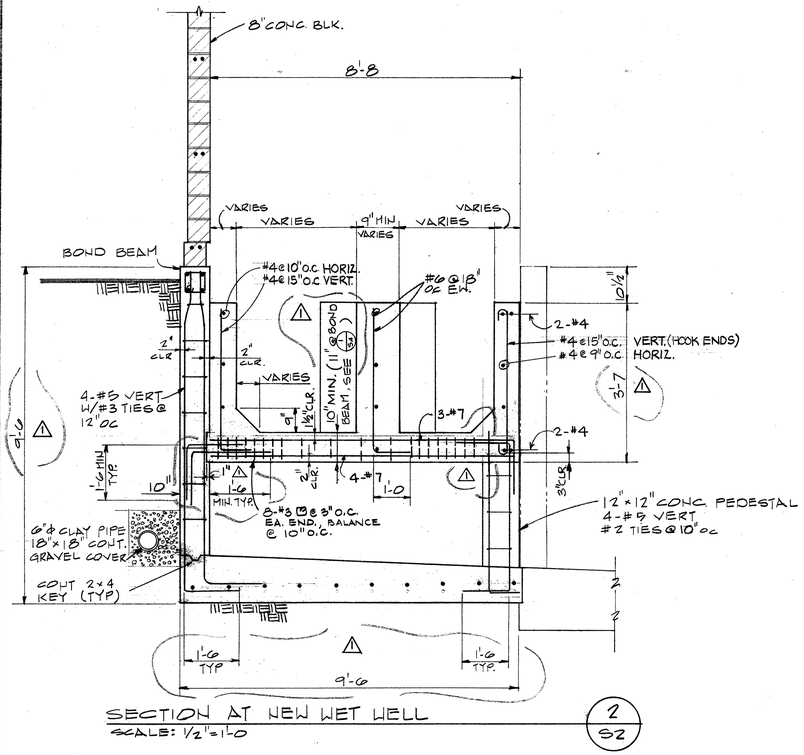
CITY CONTRACT NO. 178 PHASE II
CIT. BEL 10 T CALIFORNI
MODIFICATIONS T SAN JUAN PUMP STATION
DETAILS AND GENERAL NOTES

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

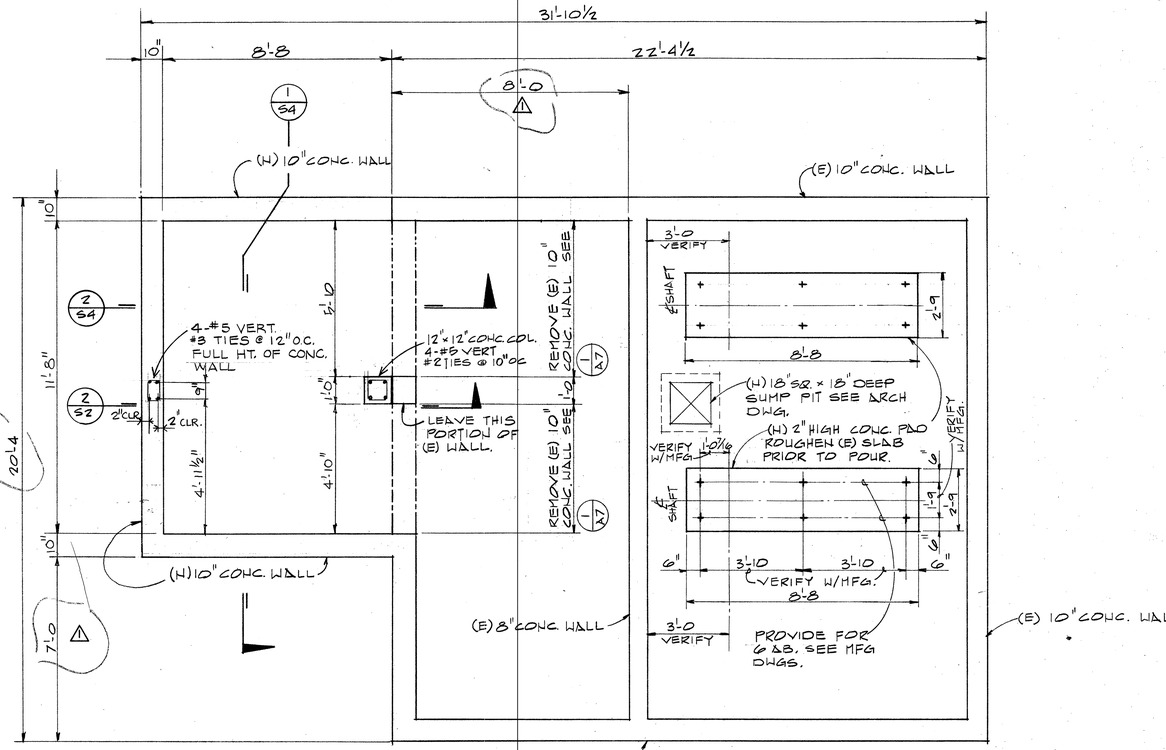
RMT ENGINEERS INCORPORATED

DATE: 5-9-77
DRAWN BY: J.C.
SCALE: AS SHOWN

S-1



SECTION AT NEW WET WELL (2/S2)
SCALE: 1/2"=1'-0



NOTES:
1. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS.
2. (E) DENOTES EXISTING.
3. (N) DENOTES NEW

LOWER LEVEL FLOOR AND FOUNDATION PLAN (1/S2)
SCALE: 3/8"=1'-0

N

SANJUA1977-18

REGISTERED PROFESSIONAL ENGINEER — N.G. MOORE — No. 1640 — STRUCTURAL — STATE OF CALIFORNIA

Neil G. Moore

REVISIONS
1 7/21/77 MINOR REV

NEIL G. MOORE & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
120 EL CAMINO REAL
SAN CARLOS, CALIFORNIA 94070 415 592-7216

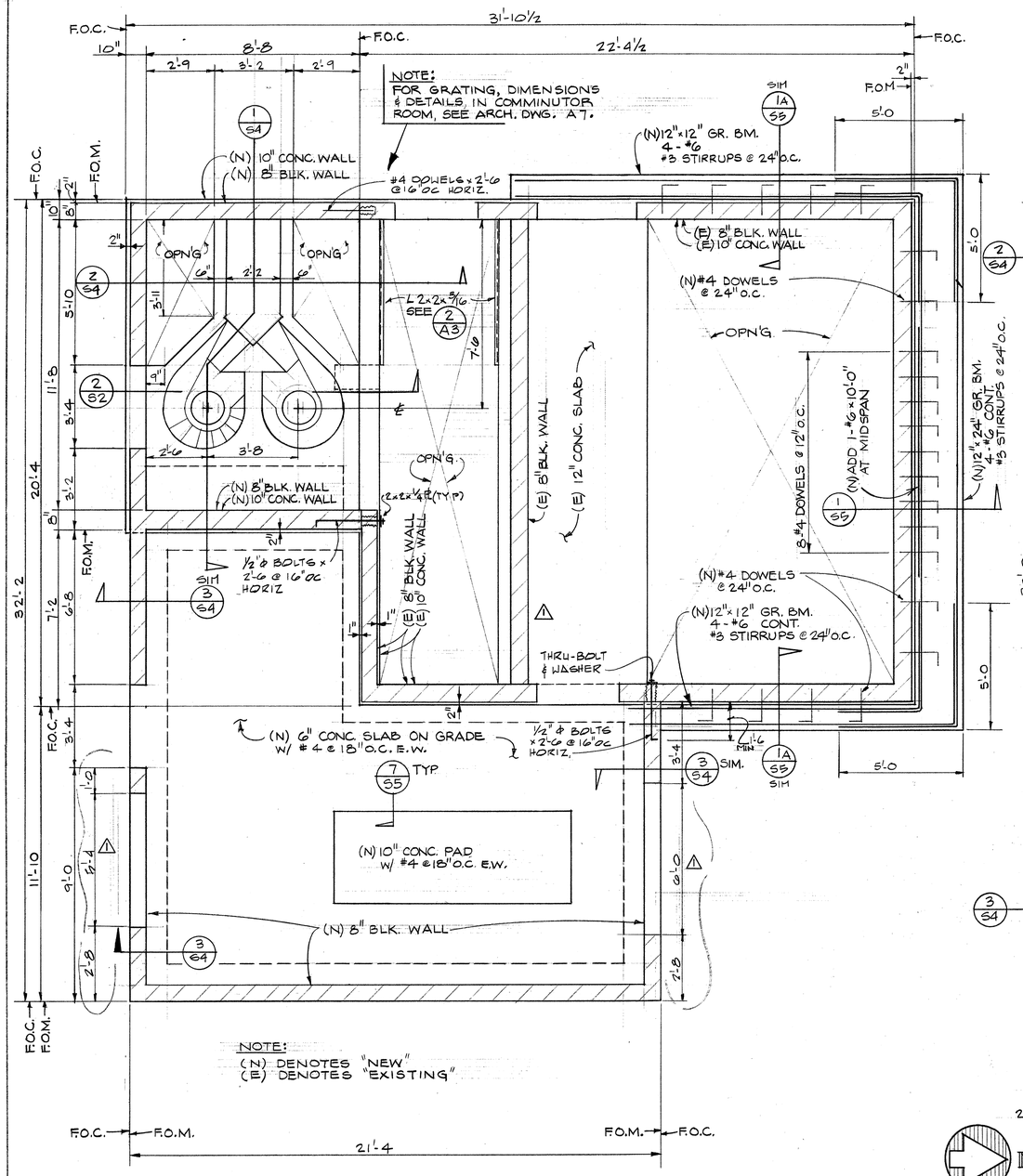
CITY CONTRACT NO. 176 PHASE II
CITY OF BELMONT CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION
LOWER LEVEL AND FOUNDATION PLAN

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3585

RMT ENGINEERS INCORPORATED

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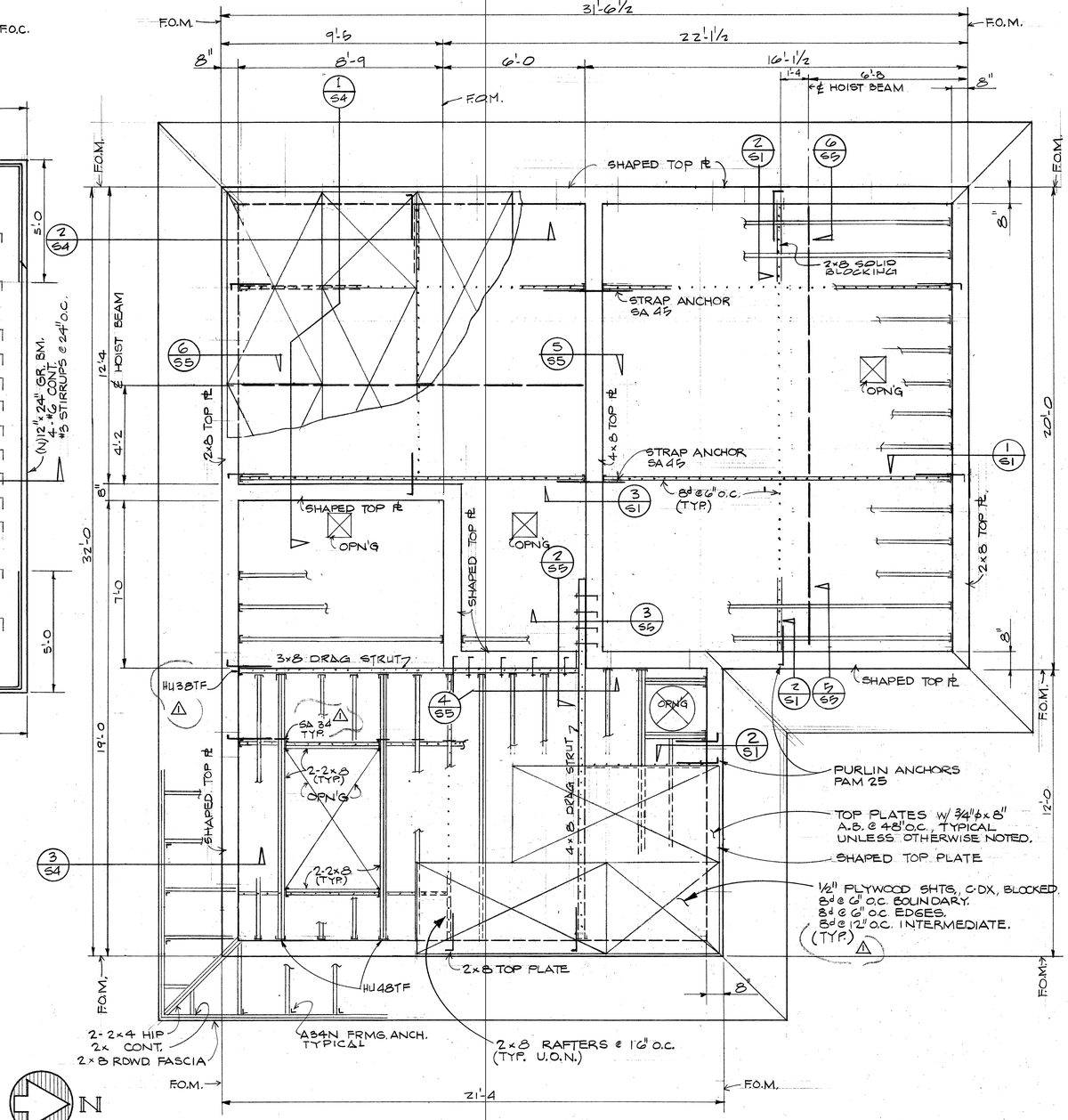
S-2



UPPER LEVEL FLOOR PLAN

SCALE: 3/8"=1'-0

(2/S3)



ROOF FRAMING PLAN

SCALE: 3/8"=1'-0

(1/S3)

NOTES:

1. F.O.M. DENOTES "FACE OF MASONRY."
2. SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR SIZE AND LOCATION OF OPENINGS.
3. CONTRACTOR TO VERIFY EXISTING AND NEW CONSTRUCTION. SEE GENERAL NOTES, SHEET S1.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXTENT OF NEW AND OLD CONSTRUCTION AND DEMOLITION REQUIREMENT.
5. F.O.C. DENOTES "FACE OF CONCRETE."

REVISIONS

△ 7/21/77 MINOR REV.

CONTRACT No. 176 PHASE II

CITY OF BELLEVUE CALIFORNIA

MODIFICATIONS OF JUL. PJW. STD.

UPPER LEVEL FLOOR PLAN; ROOF FRAMING PLAN

NEIL G. MOORE & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
120 EL CAMINO REAL
SAN CARLOS, CALIFORNIA 94070 415 592-7216

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

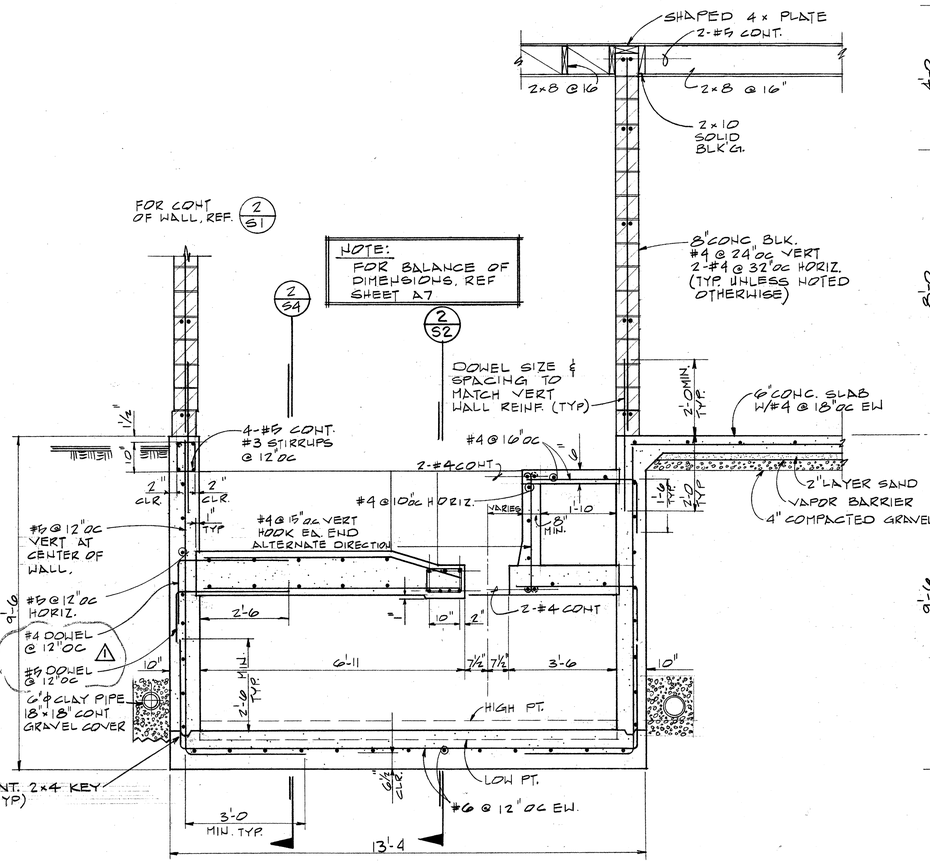
SANTUA 1977-19

DATE: 3-9-77
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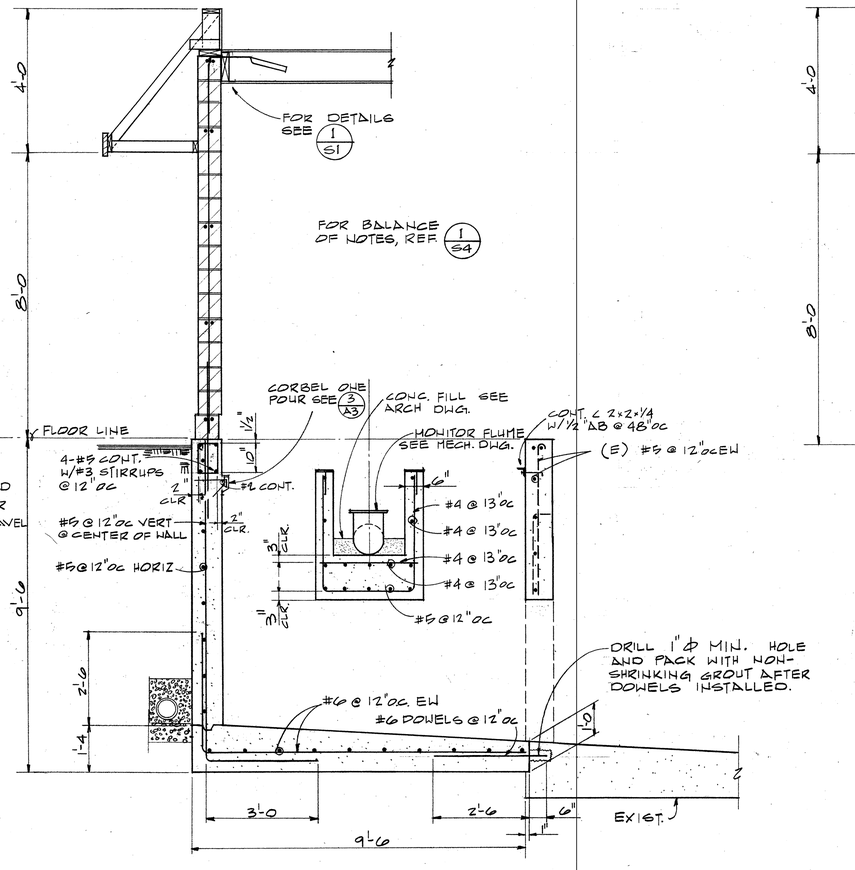
REGISTERED PROFESSIONAL ENGINEER NEIL G. MOORE No. 1640 STRUCTURAL STATE OF CALIFORNIA

Neil G. Moore

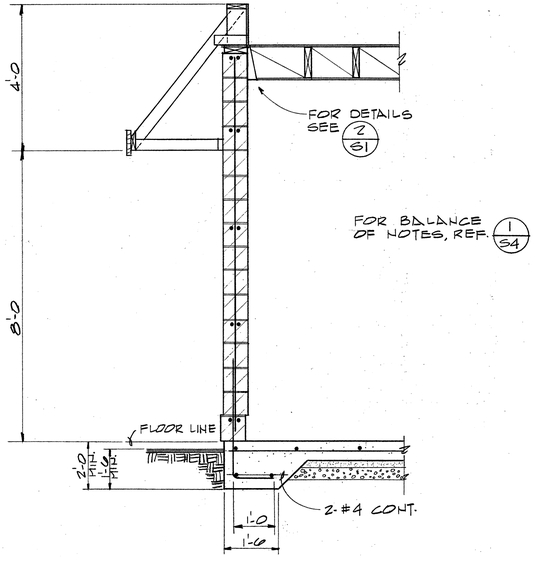
S-3



SECTION AT NEW WET WELL AND COMMINUTOR ROOM E/W (1/S4)
SCALE: 1/2"=1'-0



SECTION AT NEW WET WELL AND COMMINUTOR ROOM N/S (2/S4)
SCALE: 1/2"=1'-0



SECTION AT SOUTH WALL (3/S4)
SCALE: 1/2"=1'-0

REVISIONS
7/21/77 MINOR REV

NEIL G. MOORE & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
120 EL CAMINO REAL
SAN CARLOS, CALIFORNIA 94070 415 592-7216

CITY CONTRACT NO. 176 PHASE II
CITY OF BELMONT CALIFORNIA
MODIFICATION TO SAN JUAN PUMP STATION
SECTIONS

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3660

RMT ENGINEERS INCORPORATED

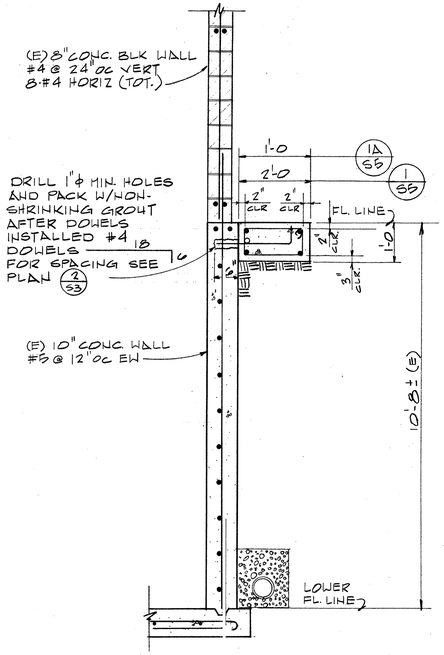
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S-4

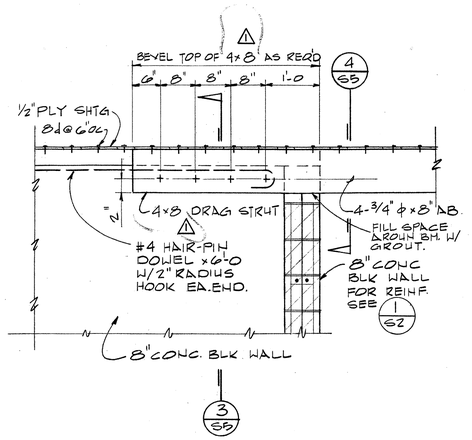
SANJUAN977-20

REGISTERED PROFESSIONAL ENGINEER
NEIL G. MOORE
No. 1640
STRUCTURAL
STATE OF CALIFORNIA

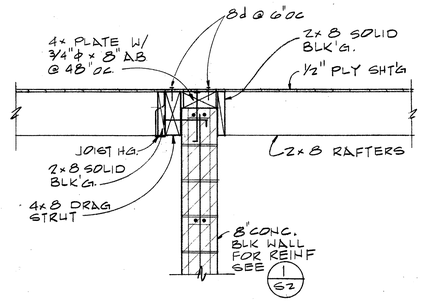
Neil G. Moore



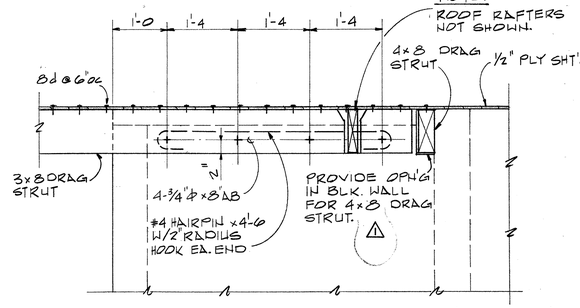
SECTION AT WALL
SCALE: 1/2" = 1'-0
1 / S5 — 1A / S5



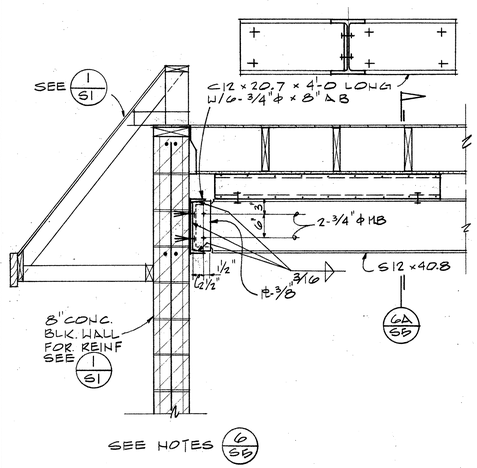
DRAG STRUT TO WALL
SCALE: 3/4" = 1'-0
2 / S5



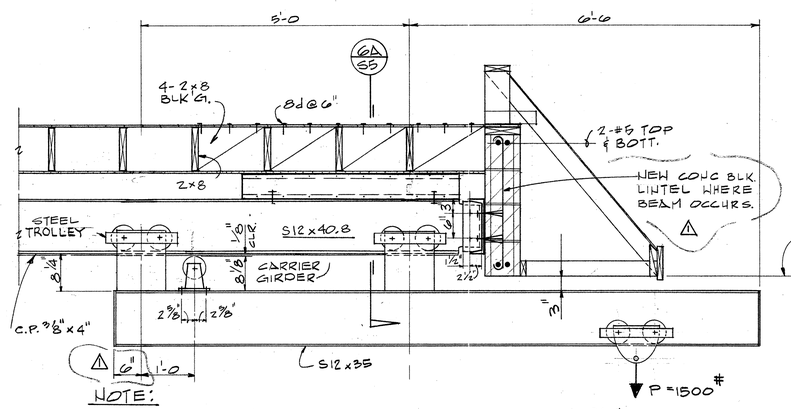
DRAG STRUT TO WALL
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3 / S5



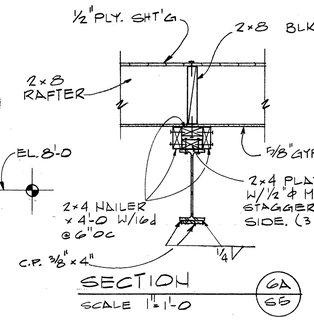
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4 / S5

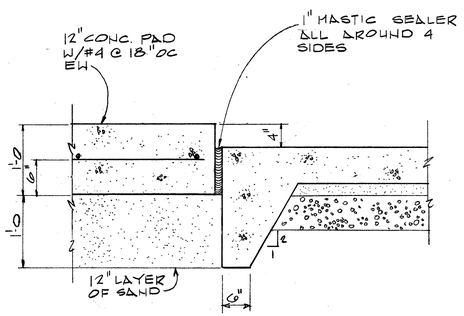


S12 TO BLOCK WALL
SCALE: 3/4" = 1'-0
5 / S5



S12 TO BLOCK WALL AT OPN'G
SCALE: 3/4" = 1'-0
6 / S5





GENERATOR PAD DETAIL
SCALE: 1" = 1'-0
7 / S5

REVISIONS
1 7/21/77 MINOR REV.

NEIL G. MOORE & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
1001 EL CAMINO REAL
SAN CARLOS, CALIFORNIA 94070 415 592-7216

CITY CONTRACT NO. 173 — HSE II

CITY OF BELMONT CALIFORNIA
MODIFICATIONS TO SAN JUAN SCHOOL
DETAILS

RMT ENGINEERS INCORPORATED
RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

SANJUA1977-21

REGISTERED PROFESSIONAL ENGINEER
NEIL G. MOORE
No. 1640
STRUCTURAL
STATE OF CALIFORNIA
Neil G. Moore

DATE: 3-9-77
DRAWN BY: JL
SCALE: AS SHOWN

S-5

CITY OF BELMONT, CALIFORNIA

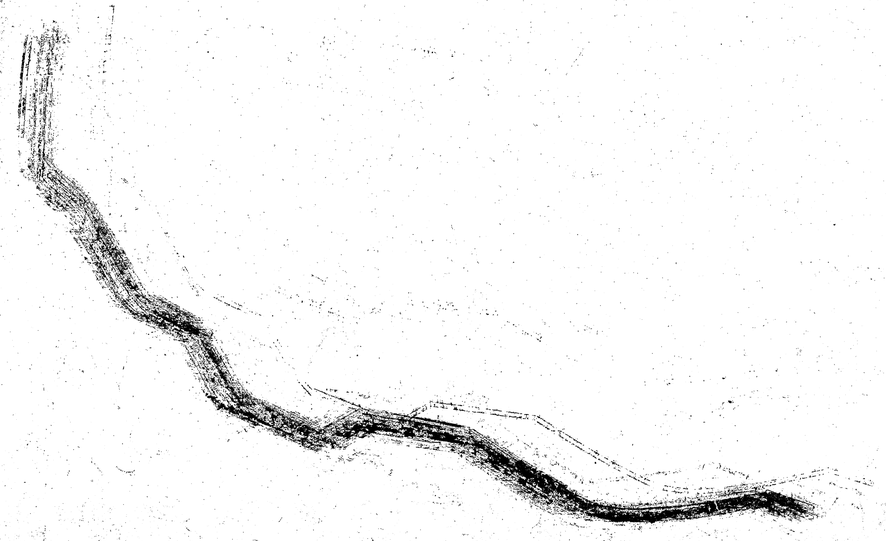
PLANS FOR MODIFICATION TO SAN JUAN SEWAGE PUMP STATION

CITY CONTRACT NO. 176 PHASE I

TO BE SUPPLEMENTED BY CITY OF BELMONT STANDARD DETAILS DATED APRIL 1972

INDEX

SHT. NO.	DESCRIPTION
C1	TITLE SHEET
C2	LEGEND & DETAILS
C3	STA. 0+00 – 6+00
C4	STA. 6+00 – 12+50
C5	STA. 12+50 – 18+50
C6	STA. 18+50 – 25+00
C7	STA. 25+00 – 31+50
C8	STA. 31+50 – 38+00
C9	STA. 38+00 – 44+97
C10	STA. 44+97 – 48+87



SAN JUA 1977-22

APPROVED BY:

CITY OF BELMONT, PUBLIC WORKS

James Doerksen — APRIL 4, 1977

JAMES DOERKSEN — DATE

DIRECTOR OF PUBLIC WORKS / CITY ENGINEER

CCN176

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
407 DEODARA DRIVE LOS ALTOS, CALIFORNIA 94022

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3688

EMT ENGINEERS INCORPORATED

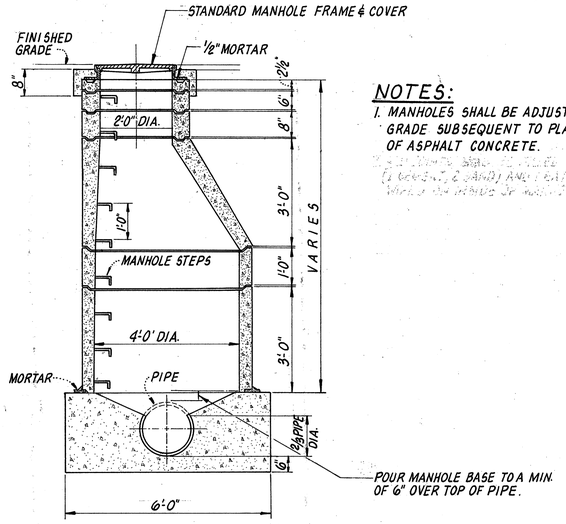
CITY CONTRACT NO. 176 PHASE I

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

TITLE SHEET

DATE: 5-9-77
DRAWN: M.SCHOUTEN
SCALE:

C1

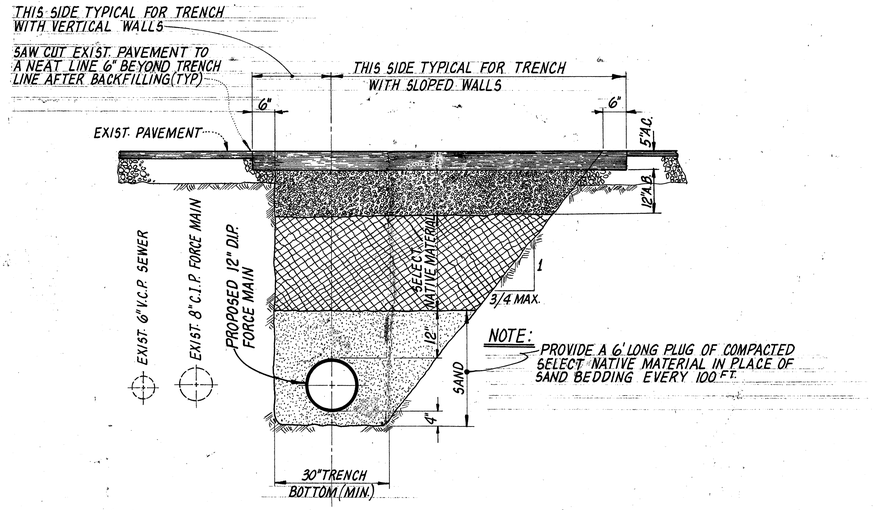


NOTES:

1. MANHOLES SHALL BE ADJUSTED TO GRADE SUBSEQUENT TO PLACING OF ASPHALT CONCRETE.

ECCENTRIC PRECAST MANHOLE

NO SCALE

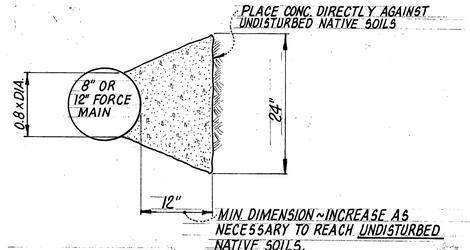


TYPICAL TRENCH DETAIL

NO SCALE

LEGEND:

GB	GRADE BREAK.
AC	ASPHALTIC CONCRETE
AB	AGGREGATE BASE
—FM—	EXISTING FORCE MAIN.
—FM—	PROPOSED 12" FORCE MAIN
—(G)—	ABANDONED GAS MAIN
—G—	GAS MAIN
—T—	TELEPHONE DUCT BANK
—W—	WATER MAIN
—SS—	SANITARY SEWER
—SD—	STORM DRAIN
RCP	REINFORCED CONCRETE PIPE
C&G	CURB AND GUTTER (CONCRETE)
PP◊	POWER POLE
VCP	VITRIFIED CLAY PIPE
CIP	CAST IRON PIPE
DIP	DUCTILE IRON PIPE
◎1	EXISTING SURVEY MONUMENT
NIC	NOT IN CONTRACT
—·—	CENTER OF EXISTING PAVED ROADWAY
○	EXISTING MANHOLE



TYPICAL THRUST BLOCK DETAIL

NO SCALE

PLAN-THRUST BLOCK

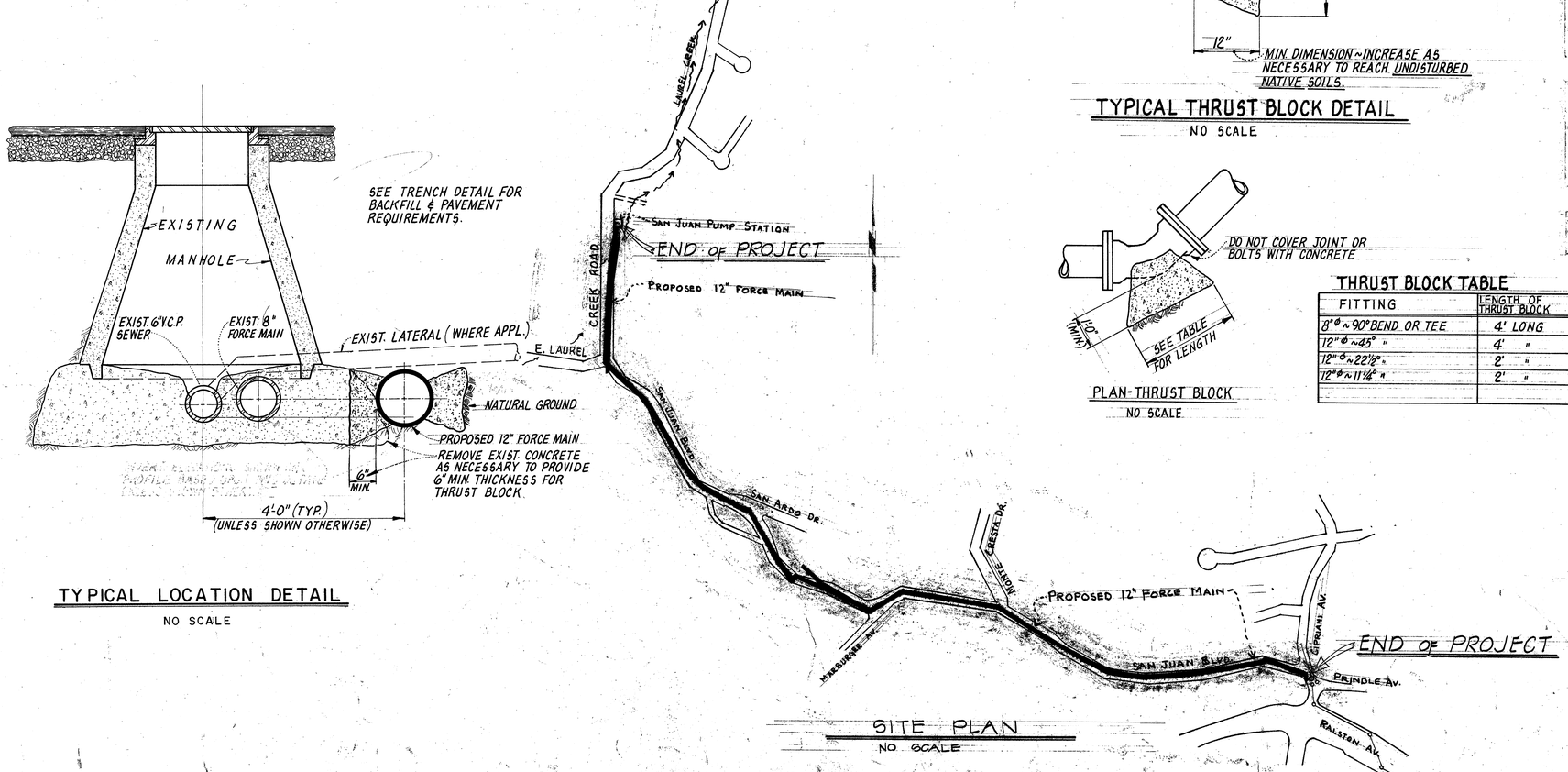
NO SCALE

THRUST BLOCK TABLE

FITTING	LENGTH OF THRUST BLOCK
8"ϕ ~ 90° BEND OR TEE	4' LONG
12"ϕ ~ 45° "	4' "
12"ϕ ~ 22½° "	2' "
12"ϕ ~ 11¼° "	2' "

TYPICAL LOCATION DETAIL

NO SCALE



SITE PLAN

NO SCALE

NOTES:

1. THE LOCATION OF THE EXISTING FACILITIES ARE FROM BEST AVAILABLE RECORDS AND FROM EXPOSURE IN SELECT LOCATIONS. IT IS ANTICIPATED THAT ACTUAL LOCATIONS WILL VARY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ACTUAL LOCATIONS AHEAD OF TRENCHING AND MAKE ADJUSTMENTS AS NECESSARY SUBJECT TO APPROVAL OF ENGINEER. ANY ADJUSTMENT UP TO 2' OFF CENTER LINE OF PROPOSED LOCATION SHALL BE CONSTRUCTED AT NO ADDITIONAL PAYMENT. THIS NEW LINE AND GRADE ONCE ESTABLISHED SHALL BE CONSIDERED THE LINE AND GRADE OF THESE PLANS AND NO ADDITIONAL PAYMENT WILL BE MADE. THESE SPECIAL NOTES AND DETAILS SHALL APPLY.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE TRENCH SHORING AND PROTECTION OF EXISTING UTILITIES BOTH ABOVE AND BELOW GROUND. THERE MAY BE AREAS WHERE SLOPED TRENCHES ARE NECESSARY, AND AREAS WHERE THE TRENCH BACKFILL OF EXISTING UNDERGROUND PIPES ARE ENCOUNTERED AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT HIMSELF, THE CITY AND THE OTHER UTILITY OWNERS FROM DAMAGE OR LOSS OF THESE FACILITIES AND THEIR BACKFILL, AT NO ADDITIONAL COST TO THE CITY.
3. THE CONTRACTOR WILL BE RESPONSIBLE TO PROVIDE AT NO ADDITIONAL COST TO THE CITY, STRUCTURE RESTORATION AND BACKFILL WITHIN THE MAXIMUM LIMITS OF THE TRENCH SECTION SHOWN ON THE PLANS.
4. SERVICE LATERALS FOR UTILITIES ARE NOT SHOWN. CONTRACTOR SHALL VERIFY LOCATION AHEAD OF TRENCHING AND SHALL REPAIR ALL THAT ARE BROKEN OR DAMAGED TO THE STANDARDS OF AGENCY INVOLVED.
5. CONTRACTOR SHALL NOTIFY ALL APPROPRIATE AGENCIES AND UTILITY COMPANIES PRIOR TO CONSTRUCTION AND COORDINATE WORK WITH THEM.
6. PIPE SHALL HAVE POSITIVE UPGRADIENT AT ALL TIMES. MINIMUM CLEARANCE TO EXISTING CROSSING UTILITIES IS 4 INCHES, EXCEPT MINIMUM CLEARANCE TO CROSSING WATER MAINS SHALL BE 3 FEET AND WATER SERVICE LATERALS SHALL BE 1 FOOT. FORCE MAIN SHALL BE BELOW WATER PIPELINES.

SANJUA1977-23

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
407 DEODARA DRIVE LOS ALTOS, CALIFORNIA 94022

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824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

CITY CONTRACT NO. 176, PHASE I

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

LEGEND & DETAILS

DATE 5-9-77
DRAWN M. SCHOUTEN
SCALE AS NOTED.

C 2

SCALE: 1"= 20'~HORIZ.
1"= 4' ~VERT.

51 L.F. 12"VCP STUB

PROVIDE MANHOLE

60'~12"ϕ C.M.P.

POTHOLE AHEAD TO CHECK DEPTH OF EXIST. 8" F.M., ADJUST DEPTH OF 12" F.M. TO PASS UNDER

EXIST. CONDUITS (2-3"ϕ, 2-4"ϕ, 1-5"ϕ & 4 I.C.)

45° BEND @ STA. 0+07.5 (G.B.)

188'~12"ϕ

EXIST. 12" C.M.P.

EXIST. 15" R.C.P.

EXIST. 24" C.M.P.

EXIST. 24" C.M.P. & HEADWALL

EXIST. C & G.

EXISTING PAVING

350'~12"ϕ

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

EXIST. 24" C.M.P.

EXIST. 18" R.C.P.

PROPOSED 8" WATER MAIN (N.I.C.)

60'~12"ϕ F.M.

EXIST. 21" R.C.P.

POTHOLE AHEAD TO CHECK FOR CLEARANCE

11¼° BEND

STA. 1+43
22½° BEND AND PULL
2 JOINTS 2½° EACH
TOTAL 27°-G.B.

6+00 MATCH LINE, SEE SHEET C-4 FOR CONTINUATION

B L O C K 105

B L O C K 80

S A N J U A N B O U L E V A R D

NOTE
STATIONING REFERS TO ROAD CENTERLINE.
SEE PLAN FOR PIPELINE LENGTHS.

PROVIDE MANHOLE
END FORCE MAIN

12" STUB SLOPE @ 4%

WATER
WATER
GAS
TELEPHONE
GAS

8" FORCE MAIN

S=0.023

I.E. 378.4

I.E. 377.0

S=0.077

EXIST. CLEAN OUT (END OF 6" V.C.P.)

362.5

EXIST. GRADE @ ℄

S=0.048

SAME POINT

345.7

385
380
375
370
365
360
355
350
345

0 1 2 3 4 5

SANJUA1977-24

NO. 1261 – PLAN PROFILE PLATE A
"CLEARPRINT PAPER CO."
MADE IN U.S.A.

CITY CONTRACT NO. 176, PHASE I
CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

STA. 0+00 – 6+00

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
807 DEODARA DRIVE, LOS ALTOS, CALIFORNIA 94022

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN: M. SCHOUTEN
SCALE: AS NOTED

C 3

SCALE: 1"= 20' ~ HORIZ.
1"= 4' ~ VERT.

BLOCK 105

BLOCK 80

SAN JUAN BOULEVARD

EXIST. C & G.

EXIST. C & G.(G)

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

EXIST. 18" CMP

EXIST. 12" CMP

EXIST. 21" R.C.P.

EXIST. 12" S.D.

EXISTING PAVING

PROPOSED 8" WATER MAIN (N.I.C.)

50'~12"ø

195'~12"ø

16'~12"ø

203'~12"ø

CURVE PIPELINE ON RADIUS, BEND @ 3° PER JOINT (DEFLECTION 11" PER JOINT)

POTHOLE AHEAD TO CHECK FOR CLEARANCE

6+00 FOR MATCH LINE CONTINUATION. SEE SHEET C3

7+88

7+97 G.B. BEGIN CURVATURE

8+48 END CURVATURE

9+24 BEGIN CURVATURE

9+70 ~ G.B.

10+43' END CURVATURE

11+50 ~ G.B.

12+40 ~ G.B.

12+30 MATCH LINE. SEE SHEET C5 FOR CONTINUATION

NOTE
STATIONING REFERS TO ROAD CENTERLINE.
SEE PLAN FOR PIPELINE LENGTHS

EXIST. GRADE @ ℄

S=0.034

337.1

6" V.C.P.
8" C.I.P. FORCE MAIN

15" R.C.P.

S=0.040

ABANDONED GAS MAIN

330.3

18" S.D.

6" V.C.P. & 8" C.I.P. FORCE MAINS

S=0.067

8" WATER MAIN

SAME POINT

312.3

SANJUA1977-25

NO. 1285 – PLAN PROFILE PLATE A
"CLEARPRINT PAPER CO."
MADE IN U.S.A.

NO. 1285 – PLAN PROFILE PLATE A
"CLEARPRINT PAPER CO."
MADE IN U.S.A.

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
107 DECODARA DRIVE LOS ALTOS, CALIFORNIA 94022

CITY CONTRACT NO. 176, PHASE I

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

STA. 6+00 – 12+50

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN: M.SCHOUTEN
SCALE: AS NOTED

C4

SCALE: 1"= 20'~ HORIZ.
1"= 4' ~ VERT.

MATCH LINE, SEE SHEET C4
12+50
FOR CONTINUATION

BLOCK 105

BLOCK 119

BLOCK 80

BLOCK 81

BLOCK 104

10' PATH

6"V.C.P.

8"V.C.P.

EXIST. 27" R.C.P.

EXIST. C & G.

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

312'~12"Ø

142'~12"Ø

83'~12"Ø

8" PROPOSED 8" WATER MAIN (N.I.C.)

13+43 ~ G.B.

F.H.

EXISTING PAVING

EXIST. 30" R.C.P.

PULL 2 JOINTS 2° EA

POTHOLE AHEAD TO CHECK FOR CLEARANCE

STA. 17+70
11¼° BEND, PULL 3 JOINTS 2° EACH, TOTAL 17° ~ G.B.

EXIST. 24" C.M.P.

EXIST. 48" C.M.P.

EXIST. 15" C.M.P.

MONTE CRESTA DRIVE

SAN JUAN BOULEVARD

MATCH LINE SEE SHEET C6
18+50
FOR CONTINUATION

NOTE
STATIONING REFERS TO ROAD CENTERLINE.
SEE PLAN FOR PIPELINE LENGTHS !

320
315
310
305
300
295
290
285
280
275
270
265

EXIST. GRADE @ ℄

S=0.038

S=0.092

S=0.113

308.4

273.3

15" S.D.

℄ WATER MAIN

SEWER

℄ GAS MAIN

SAME POINT

SAN JUAN 97-16

CITY CONTRACT NO. 176, PHASE I

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

STA. 12+50 — 18+50

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
407 DEODARA DRIVE LOS ALTOS, CALIFORNIA 94022

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
224 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE: 2-9-77
DRAWN: M. SCHOUTEN
SCALE: AS NOTED

C5

715

SCALE: 1"=20' ~ HORIZ.
1"=4' ~ VERT.

18+50 MATCH LINE, SEE SH C5 FOR CONTINUATION

18+77 ~ G.B.

EXIST. 30" R.C.P.

228'~12"ø

EXIST. C & G

EXISTING PAVING

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

110'~12"ø

POTHOLE AHEAD TO CHECK CLEARANCE

STA. 20+81
22½° BEND

STA. 21+81
11¼° BEND, PULL 1 JOINT 2½° ~ G.B.

PULL JOINTS @ 3° EACH

MARBURGER DRIVE

EXIST. 18" R.C.P.

23+17 ~ 4.5° END G.B.

130'~12"ø

183'~12"ø

EXIST. 33" R.C.P.

POTHOLE AHEAD TO CHECK FOR CLEARANCE

24+58 ~ G.B.

25+00 MATCH LINE, SEE SHEET C7 FOR CONTINUATION

BLOCK 119 (86, 87, 88, 89, 90, 91, 92)

BLOCK 104 (26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36)

BLOCK 2 (1, 2, 3, 4, 5)

SAN JUAN BOULEVARD

NOTE
STATIONING REFERS TO ROAD CENTERLINE, SEE PLAN FOR PIPELINE LENGTHS

19 20 21 22 23 24 25

270 265 260 255 250

261.1

S=0.034

EXIST. GRADE @ ℄

250.6

18" S.D.

247.9

18" CMP S.D.

S=0.029

SAME POINT

S=0.039

243.8

255 250 245 240

SANJUA1977-27

NO. [illegible] GRAPH PROFILE PLATE A
"CLEARWATER PAPER CO."
MADE IN U.S.A.

LEN H. EASLEY
CONSULTING CIVIL ENGINEER
407 DEODARA DRIVE LOS ALTOS, CALIFORNIA, 9402

CITY CONTRACT NO. 176, PHASE I

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

STA. 18+50 – 25+00

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3565

RMT ENGINEERS INCORPORATED

DATE 5-9-77
DRAWN M.I.SCHOUTEN
SCALE AS NOTED

C6

SCALE: 1"=20'~HORIZ.
1"= 4' ~ VERT.

B L O C K 118 — B L O C K 117 — B L O C K 104

EXIST. C & G.
PULL 3 JOINTS @ 2½° EACH:
44'~12"Ø FM
EXIST. 6"V.C.P. & 8"C.I.P. FORCE MAIN
EXIST. 39" R.C.P.
151'~12"Ø
POTHOLE AHEAD TO CHECK FOR CLEARANCE
EXISTING PAVING
115'~12"Ø
EXIST. 66" C.M. ARCH
64'~12"Ø
EXIST. 36" R.C.P.
20'~12"Ø
66'~12"Ø
25'~12"Ø
EXIST. 36" R.C.P.
136'~12"Ø
EXIST. 33" R.C.P.
32'~12"Ø
25+00 MATCH LINE. SEE SHEET C6 FOR CONTINUATION
31+50 MATCH LINE. SEE SHEET C8 FOR CONTINUATION
STA. 28+63
22½° BEND AND PULL 2 JOINTS 2° EACH.
TOTAL 26½°~ G.B.
27+12 22½° BEND
4'- TYPICAL UNLESS SHOWN OTHERWISE
PULL 1 JOINT 3° G.B.
25+30 G.B.
11¼° BEND
30+43± 11¼° BEND
30+63± 11¼° BEND
11¼° BEND G.B.
SAN ARDO WAY

S A N J U A N B O U L E V A R D

NOTE
STATIONING REFERS TO ROAD CENTERLINE.
SEE PLAN FOR PIPELINE LENGTHS.

25 26 27 28 29 30 31

245 240 235 230 225

6" V.C.P.
S=0.028
241.0
15" S.D.
238.7
EXIST. F.M.
EXIST. 6" V.C.P.
ABANDONED GAS MAIN
EXIST. 6" V.C.P.
EXIST. 8" F.M.
S=0.039
EXIST. GRADE @ ℄
ABANDONED GAS MAIN
229.1
S=0.017
60" ARCH S.D.
227.1
S=0.003
GAS MAIN
6" S
226.7

SANTUA1977-28

CITY CONTRACT NO. 176, PHASE I
CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION
STA. 25+00 – 31+50

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
307 DEODARA DRIVE LOS ALTOS, CALIFORNIA 9402

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3585

RMT ENGINEERS INCORPORATED

DATE: 3-9-77
DRAWN: M. SCHOUTEN
SCALE: AS NOTED

C7

PLAN & PROFILE PLATE #
"CLEARPRINT PAPER CO."
SAN FRANCISCO, CALIF. U.S.A.

SCALE: 1"=20'~HORIZ.
1"= 4'~VERT.

BLOCK 118 · BLOCK 117 · BLOCK 120 · BLOCK 116

SAN JUAN BOULEVARD

SAN ARDO WAY

3464~G.B.℄ 22½° BEND

10' PATH

EXIST. 36" C.I.P.

EXIST. C & G.

EXIST. 36" R.C.P.

EXISTING PAVING

314'~12"ϕ

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

206'~12"ϕ

EXIST. 24" R.C.P. DOUBLE BARREL

51A 36'D 11¼° BEND ℄ G.B.

EXIST. 42" R.C.P.

130'~12"ϕ

3336 G.B.

31+50 MATCH LINE, SEE SHEET C7 FOR CONTINUATION

38+00 MATCH LINE, SEE SHEET C9 FOR CONTINUATION

NOTE
STATIONING REFERS TO ROAD CENTERLINE, SEE PLAN FOR PIPELINE LENGTHS.

32 33 34 35 36 37 38

230 220 215 210 205 200

EXIST. GRADE @ ℄

S=0.004

S=0.005

S=0.024

S=0.0025

218.3

211.8

206.9

36" S.D.

8" C.I.P.

6" V.C.P.

6" V.C.P.

2~24" S.D.

15" S.D.

SAME POINT

SANJUA1977-29

CITY CONTRACT NO. 176, PHASE I
CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION
STA. 31+50 – 38+00

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
407 DEODARA DRIVE LOS ALTOS, CALIFORNIA 94022

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
224 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3585

RMT ENGINEERS INCORPORATED

DATE: 3-3-77
DRAWN: M. SCHOUTEN
SCALE: AS NOTED

C8

NO. 1185 - PLAN PROFILE PLATE V
"CLEARPRINT PAPER CO."
MADE IN U.S.A.

SCALE: 1"=20'~HORIZ.
1"=4'~VERT.

BLOCK 120

BLOCK C

SAN JUAN BOULEVARD

EAST LAUREL CREEK ROAD

MATCH LINE SEE SHEET C8 FOR CONTINUATION

38+00

EXIST. 4" LATERAL

EXIST. C. & G.

6.8

MAKE BEND BY DEFLECTING 3 JOINTS, 2½° EACH

74'~12"ϕ

39

116'~12"ϕ

40

6 DMH

EXIST. C. & G.

EXIST. 42" R.C.P.

STA. 39+88
22½° BEND
G.B.

EXIST. 36" C.M.P.

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

126'~12"ϕ

EXISTING PAVING

90'~12"ϕ

EXIST. 48" R.C.P.

G.B. STA. 41+13
22½° BEND

42+08±
22½° BEND

5' PATH

PULL 3 JOINTS @ 3" EACH
6.8'± MAINTAIN 8' DIST.
TO BACK OF CURB

42+94±
11¼° BEND

EXIST. 15" R.C.P.

75'~12"ϕ

EXIST. 48" R.C.P.

EXIST. 72" C.M.P.

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

202'~12"ϕ

EXIST. 2'x10" HEADERBOARD

P.P.

44+97
MATCH LINE SEE SHEET C10 FOR CONTINUATION

NOTE
STATIONING REFERS TO ROAD CENTERLINE.
SEE PLAN FOR PIPELINE LENGTHS.

36 37 38 39 40 41 42 43 44 45

MATCH LINE SEE BELOW

EXIST. LAT.

206.4

S=0.069

EXIST. 6" V.C.P. & 8" C.I.P. FORCE MAIN

EXIST. GRADE @ ℄

ABANDONED GAS MAIN

198.4

S=0.060

36"ϕ S.D.

210 200 190

195 190

WATER MAIN

GAS MAIN

188.0

S=0.011

185.4

SAME POINT

72"ϕ C.M.P.

MATCH LINE SEE ABOVE

190.9

15"ϕ S.D.

ABANDONED GAS MAIN

188.0

SANJUA1971-30

CITY CONTRACT NO. 176, PHASE I

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

STA. 38+00—44+97

LEN H. TEASLEY
CONSULTING CIVIL ENGINEER
807 DESDARA DRIVE LOS ALTOS, CALIFORNIA

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
824 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3665

RMT ENGINEERS INCORPORATED

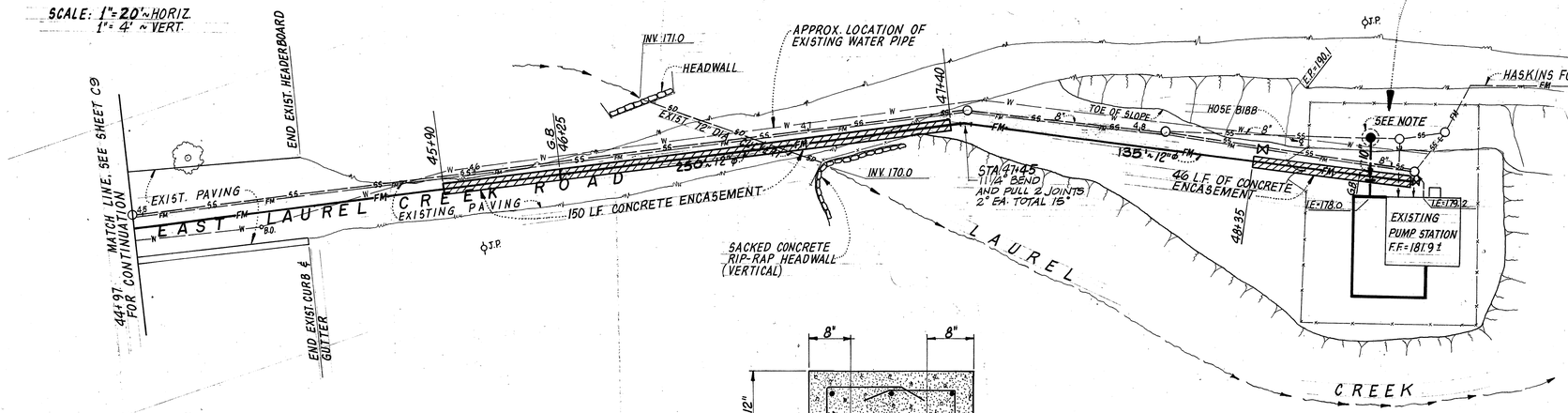
DATE 5-9-77
DRAWN M. SCHOUTEN
SCALE AS NOTED

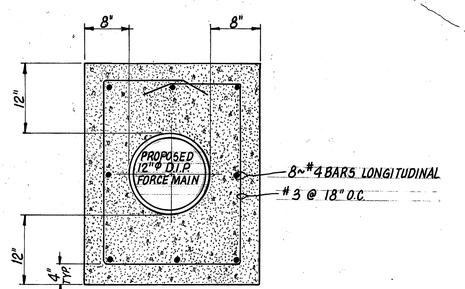
C 9

NO. 1205 - PHAM PRINTING PLATE A
"ICE-BLUEPRINT PAPER CO."
MADE IN U.S.A.

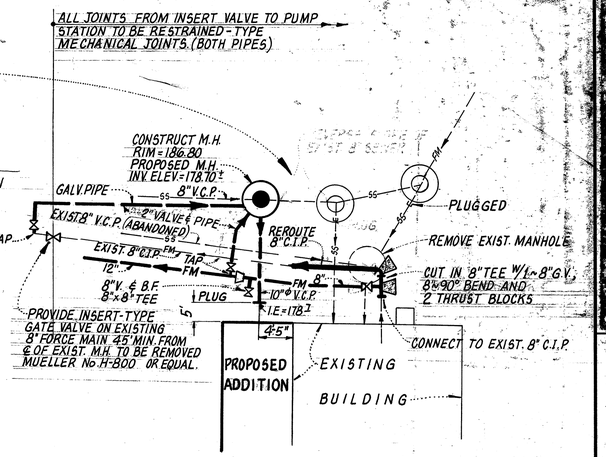
SCALE: 1"=20'~HORIZ.
1"= 4' ~ VERT.

NOTE:
PROVIDE 4 FT. DIA. MANHOLE ON EXIST. 8" SEWER.

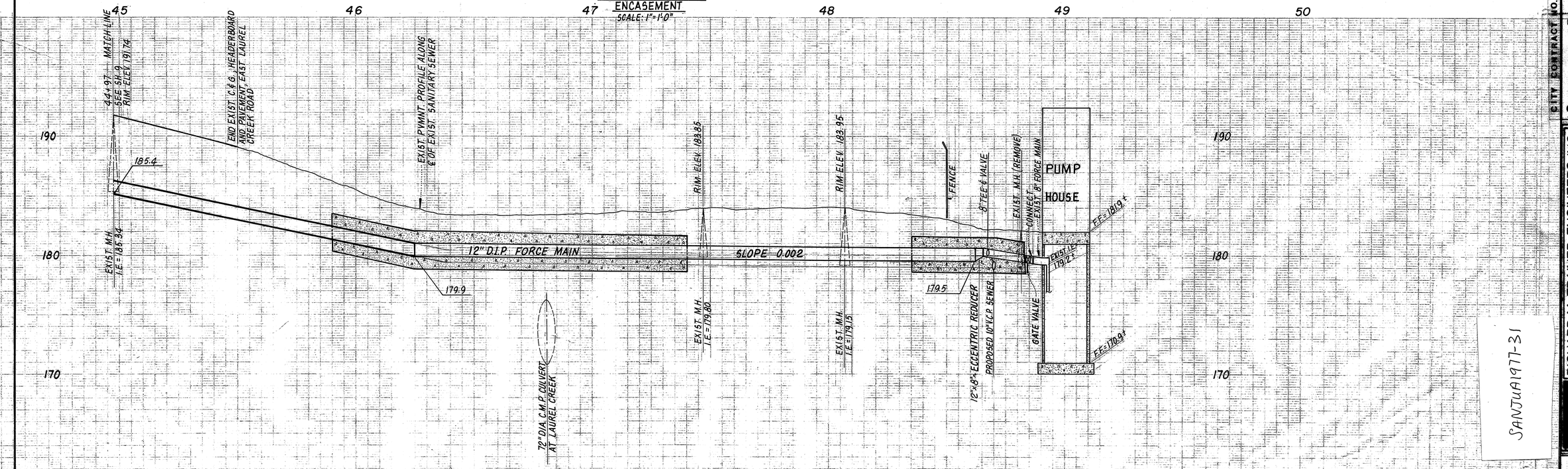




TYPICAL CONCRETE ENCASEMENT
SCALE: 1"=1'-0"



ENLARGED DETAIL
SCALE: 1"=10'



SANTUA1977-31

CITY CONTRACT NO. 176, PHASE I

CITY OF BELMONT, CALIFORNIA
MODIFICATIONS TO SAN JUAN PUMP STATION

STA. 44+97 – 48+87

LEN H. EASLEY
CONSULTING CIVIL ENGINEER
407 DEODARA DRIVE LOS ALTOS, CALIFORNIA 94022

RICHARD M. TRAINER ENGINEERS INC.
CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
524 SAN ANTONIO, PALO ALTO, CA 94303 (415) 494-3666

RMT ENGINEERS INCORPORATED

DATE 3-9-79
DRAWN SCHAALEN
SCALE: AS NOTED

720

APPENDIX E

2024 San Juan Blvd Sewer Capacity Improvements, May 2024

CITY OF BELMONT

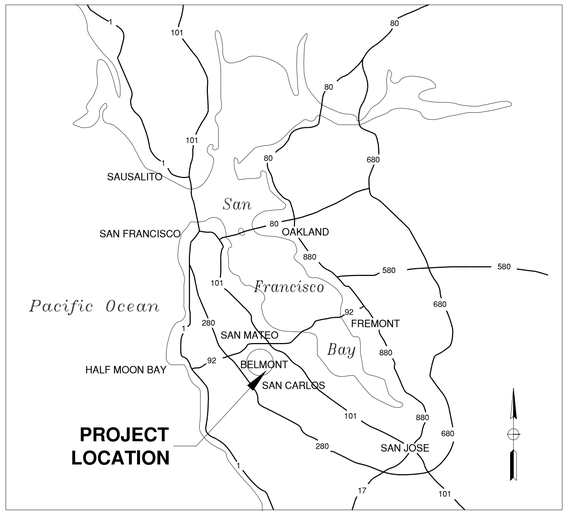
SAN MATEO COUNTY, CALIFORNIA

2024 SAN JUAN BLVD SEWER CAPACITY IMPROVEMENT PROJECT

CITY CONTRACT NUMBER 2024-631

DRAWING INDEX

TITLE	SHEET NO.	DRAWING NO.
TITLE SHEET	1	T1
NOTES, LEGEND, & ABBREVIATIONS	2	T2
MAP INDEX	3	T3
PLAN AND PROFILE	4	C1
PLAN AND PROFILE	5	C2
PLAN AND PROFILE	6	C3
PLAN AND PROFILE	7	C4
PLAN AND PROFILE	8	C5
PLAN AND PROFILE	9	C6
DETAILS	10	D1
DETAILS	11	D2



VICINITY MAP

NO SCALE

RECORD DRAWING

BASED ON FIELD INFORMATION
PROVIDED BY THE CONTRACTOR THRU THE
CITY OF BELMONT

CITY COUNCIL

MAYOR	JULIA MATES
VICE MAYOR	GINA LATIMERLO
COUNCILMEMBER	ROBIN PANG-MAGANARIS
COUNCILMEMBER	DAVINA HURT
COUNCILMEMBER	TOM MCCUNE

STAFF

CITY MANAGER	AFSHIN OSKOUI
INTERIM DIRECTOR OF PUBLIC WORKS	RAY TOWNE
CITY ATTORNEY	SCOTT RENNIE
CITY CLERK	JOZI PLUT

APPROVED BY CITY COUNCIL ON MAY 14, 2024

RAY TOWNE - INTERIM DIRECTOR OF PUBLIC WORKS

USA AGENCY INDEX

CITY OF BELMONT - PUBLIC WORKS	(650) 595-7427
CITY OF BELMONT - POLICE	(650) 595-7400
AT&T	(800) 210-2355
PACIFIC GAS & ELECTRIC	(800) 743-5000
MID PENINSULA WATER DISTRICT	(650) 591-8941
COMCAST	(800) 266-2278
RECOLOGY	(650) 595-3900
SAN MATEO COUNTY TRANSIT DISTRICT	(800) 660-4287

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
2			
3			
4			
5			
6			
7			

CITY OF BELMONT PUBLIC WORKS

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
2200 RANGE AVE, SUITE 201
SANTA ROSA, CA 95403
(707)548-4848

REGISTERED PROFESSIONAL ENGINEER — BRIAN L. PRICE — NO. 74918 — CIVIL — STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
TITLE SHEET

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

T1

SHEET: 1 OF 11

722

GENERAL NOTES

1. CONTRACTOR SHALL MAINTAIN A COPY OF THE PROJECT PLANS ON THE JOBSITE AT ALL TIMES.
2. ALL WORK SHALL CONFORM TO THE PROJECT PLANS AND THE CITY OF BELMONT STANDARD DETAIL DRAWINGS FOR CONSTRUCTION AND OTHER SPECIFICATIONS REFERENCED THEREIN.
3. CONTRACTOR SHALL CONDUCT WORK IN ACCORDANCE WITH THE GREENBOOK STANDARD SPECIFICATIONS, CALTRANS STANDARD SPECIFICATIONS, AND CITY'S SPECIFICATIONS.
4. NO CHANGE TO THE PROJECT IMPROVEMENT PLANS SHALL BE PERMITTED WITHOUT PRIOR APPROVAL BY THE CITY ENGINEER AND DESIGN ENGINEER.
5. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CITY AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT TO THE EXTENT ARISING FROM THE SOLE NEGLIGENCE OF THE CITY OR ENGINEER.
6. CONTRACTOR SHALL SECURE A NO FEE ENCROACHMENT PERMIT FROM THE CITY ENGINEERING DEPARTMENT PRIOR TO COMMENCEMENT OF WORK.
7. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, PIPE SIZES, MATERIAL, ETC. PRIOR TO CONSTRUCTION.
8. IF FIELD ELEVATIONS AND MEASUREMENTS ARE SIGNIFICANTLY DIFFERENT THAN WHAT IS SHOWN ON THE PLANS, CONTRACTOR SHALL NOTIFY THE CITY PRIOR TO PROCEEDING WITH CONSTRUCTION OF THE IMPROVEMENTS. FIELD ADJUSTMENTS MAY BE NECESSARY TO PROVIDE ADEQUATE PIPE SLOPE, PIPE COVER, AND TO CONSTRUCT THE IMPROVEMENTS.
9. NOT ALL EXISTING UTILITIES ARE SHOWN ON THE DRAWINGS. THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE AND BASED ON UTILITY MAPS PROVIDED BY THE CITY, AT&T, COMCAST, MPWD, AND PG&E. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCURATELY LOCATE ALL EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES THAT MAY BE AFFECTED BY NEW FACILITIES IN THIS CONTRACT. REPORT POTENTIAL CONFLICTS TO THE CITY ENGINEER PRIOR TO EXCAVATING FOR NEW FACILITIES.
10. CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY OWNERS 48 HOURS PRIOR TO COMMENCEMENT OF WORK ADJACENT TO THE UTILITY. CONTACT UNDERGROUND SERVICE ALERT (USA) AT 811 OR 1-800-227-2600. CONTRACTOR SHALL ENSURE UTILITIES ARE MARKED PRIOR TO START OF EXCAVATION ACTIVITIES. MARKINGS OF EXISTING WATER LINES AND FORCE MAINS MAY BE APPROXIMATE AND CONTRACTOR SHALL USE CAUTION WHEN EXCAVATING NEAR UTILITY MARKINGS.
11. THE CONTRACTOR SHALL NOTIFY, BY CIRCULAR, ALL BUSINESS ESTABLISHMENTS AND RESIDENCES LOCATED IN AREAS AFFECTED BY THE WORK ONE WEEK PRIOR TO START OF CONSTRUCTION. AT A MINIMUM, ALL RESIDENTS AND BUSINESS ESTABLISHMENTS WITHIN 100 FEET OF THE WORK AREAS SHALL BE NOTIFIED. A DRAFT OF THE CIRCULAR SHALL BE SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL.
12. ALL SURPLUS AND UNSUITABLE MATERIAL SHALL BE REMOVED FROM PUBLIC RIGHT-OF-WAY.
13. CONTRACTOR SHALL PROVIDE ADEQUATE DUST CONTROL AND KEEP MUD AND DEBRIS OFF THE PUBLIC RIGHT-OF-WAY AT ALL TIMES.
14. ALL TRENCHES AND EXCAVATIONS SHALL BE CONSTRUCTED IN STRICT COMPLIANCE WITH THE APPLICABLE SECTIONS OF CALIFORNIA AND FEDERAL O.S.H.A. REQUIREMENTS AND OTHER APPLICABLE SAFETY ORDINANCES. CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR TRENCH SHORING DESIGN AND INSTALLATION.
15. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT IN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE PERMITTED, EXCEPT AT LOCATION(S) APPROVED BY THE CITY TRAFFIC ENGINEER.
16. CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MEN, CONES OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH THE SPECIFICATIONS.
17. THE CONTRACTOR SHALL OBTAIN A PERMIT/WATER METER AND BACKFLOW FROM MID-PENINSULA WATER DISTRICT (MPWD) FOR CONSTRUCTION WATER OBTAINED FROM THE CITY HYDRANT, CALL (650) 591-8941, A FEE AND DEPOSIT WILL BE REQUIRED.
18. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY. ALL EXCAVATIONS SHALL BE PLATED WITH NON-SKID PLATES WHEN INACTIVE. BARRICADES WITH LIGHTS SHALL DELINEATE CONSTRUCTION ZONE.
19. CONTRACTOR SHALL COMPLY WITH BEST MANAGEMENT PRACTICES OF CITY'S NPDES PERMIT FOR PROTECTION OF STORM WATER QUALITY.
20. CONTRACTOR SHALL VISIT SITES WITHIN THE STREET RIGHT OF WAY PRIOR TO SUBMITTING BID.
21. ELEVATIONS, SLOPES, LENGTHS AND STATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND BASED ON GIS DATA, ORIGINAL UTILITY DRAWINGS, AND FIELD MEASUREMENTS. THE CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS AND DISTANCES AND CONSTRUCT (N) PIPES WITH CONTINUOUS SLOPE BETWEEN (E) MH INVERT ELEVATIONS.
22. EXISTING UTILITY SERVICE LINES ARE NOT SHOWN ON PLANS. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL POTENTIAL UTILITY CONFLICTS PRIOR TO SEWER REPLACEMENT.
23. CONTRACTOR SHALL RESTORE SURFACE TO PRE-CONSTRUCTION CONDITIONS.
24. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPLACE ALL STREET MONUMENTS, LOT CORNER PIPES, AND GRADE STAKES DISTURBED DURING THE PROCESS OF CONSTRUCTION AT THE DIRECTION OF THE CITY. LOCATIONS OF ANTICIPATED STREET MONUMENT REPLACEMENT IS INDICATED ON THE PLANS. STREET MONUMENT REPLACEMENT SHALL BE DONE IN CONFORMANCE W/ DETAIL 6/D2 & SPECIFICATION SECTION 02318-3.04.
25. CONTRACTOR SHALL PROVIDE RESIDENTS NOTICE OF ANY SEWER SHUT DOWNS.
26. SEWER SERVICE SHALL BE RESTORED BEFORE THE END OF EACH WORKING DAY. REFER TO SPECIFICATION SECTION 01531 FOR ADDITIONAL INFORMATION.
27. ALL DISTURBED PAVEMENT STRIPING AND MARKERS SHALL BE REPLACED BY THE CONTRACTOR. ALL DISTURBED MARKINGS AND STENCILS SHALL BE REPLACED IN FULL. ALL STRIPING, MARKINGS, AND STENCILS SHALL BE THERMOPLASTIC. PAVEMENT STRIPING AND MARKINGS SHALL ADHERE TO THE CALTRANS STANDARD SPECIFICATION SECTION 84 AND 85.

OPEN TRENCH SEWER CONSTRUCTION

1. OPEN TRENCH CONSTRUCTION SHALL BE DONE IN CONFORMANCE W/ DETAIL 1/D1 W/ A TRENCH CUTOFF CUTOFF WALL AT APPROXIMATELY 50-FOOT INTERVALS PER 3/D1. WHERE (N) SEWER PIPE IS 5-FEET OR LESS FROM WATER MAIN, BACKFILL W/ CDF PER DETAIL 2/D1.
2. SEWERS TO BE REPLACED USING TRENCHED METHODS SHALL HAVE LATERAL CONNECTIONS RECONNECTED PER DETAIL 5/D2. LATERALS THAT ARE CAPPED OR INACTIVE SHALL BE ABANDONED AND SHALL NOT BE RECONNECTED TO THE SEWER MAIN. CONTRACTOR SHALL INVESTIGATE AND CONFIRM IF EXISTING LATERALS ARE ACTIVE. EXISTING LATERALS ARE NOT SHOWN ON THE PLANS, BUT CONTRACTOR SHALL ASSUME THERE IS ONE ACTIVE LATERAL CONNECTION PER HOUSE.
3. ANY DAMAGED OR REMOVED CONCRETE CURB AND GUTTERS SHALL BE REPLACED PER 1/D2 & 2/D2

WATER NOTES

1. LOCATIONS WHERE NEW SEWER MAIN IS TO BE CONSTRUCTED MUST MEET THE FOLLOWING REQUIREMENTS WHERE HORIZONTAL SEPARATION WITH THE WATER MAIN IS LESS THAN 10 FEET:
   - 1.1. ALL PIPE SHALL EITHER BE INSTALLED WITH RUBBER RING JOINTS OR FUSED JOINTS IN ACCORDANCE WITH THE SPECIFICATIONS.
   - 1.2. CONTRACTOR SHALL POTHOLE LOCATIONS WHERE THE WATER MAIN CROSSES THE SEWER 5 DAYS PRIOR TO EXCAVATION OR BURSTING ACTIVITIES. CONTRACTOR SHALL NOTIFY MPWD PRIOR TO POTHOLING AND FORWARD RESULTS TO MPWD.
   - 1.3. LOCATIONS WHERE HORIZONTAL SEWER AND WATER MAIN SEPARATION DISTANCE IS LESS THAN 5 FEET: BACKFILL USING CDF PER DETAIL 2/D1.
   - 1.4. NOTIFY ENGINEER AND MPWD IF WATER MAIN IS BELOW OR LESS THAN 1 FT ABOVE SEWER MAIN, EXCEPT WHERE INDICATED ON DRAWINGS.
   - 1.5. BACKFILL EXPOSED WATER MAIN W/ CDF. WRAP EXPOSED PORTION OF WATER MAIN W/ V-BIO POLYETHYLENE PRIOR TO BACKFILLING W/ CDF.
   - 1.6. WATER MAIN SHUT DOWN REQUIREMENTS:
     - 1.6.1. IS TYPICALLY REQUIRED WHEN EXCAVATION OCCUR WITHIN 5 FEET OF THE WATER MAIN.
     - 1.6.2. CONTRACTOR SHALL CONTACT MPWD AT LEAST 3 WORKING DAYS PRIOR TO BURSTING OR EXCAVATION WITHIN 5 FEET OF WATER MAIN SO THE DISTRICT CAN SHUT DOWN THE WATER MAIN.
     - 1.6.3. CONTRACTOR SHALL LIMIT SHUT DOWNS TO RESIDENCES A MAXIMUM OF TWO TIMES FOR A MAXIMUM 6 HOUR PERIOD. CONTRACTOR SHALL CONTACT MPWD AT LEAST 3 DAYS IN ADVANCE TO SCHEDULE A TEMPORARY WATER SHUT DOWN. TEMPORARY WATER SHUT DOWNS ARE ONLY PERMITTED FROM TUESDAY THOUGH FRIDAY.
2. WATER SERVICE LATERALS WILL BE ENCOUNTERED DURING OPEN TRENCH CONSTRUCTION. WATER SERVICE LINES ARE NOT SHOWN ON THE PLANS. CONTRACTOR SHALL USE CARE WHEN WORKING AROUND WATER SYSTEMS. CONTRACTOR SHALL LOCATE, CAREFULLY EXPOSE, AND PROTECT WATER SERVICE CROSSINGS DURING CONSTRUCTION. ANY REPAIRS PERFORMED BY MPWD DUE TO A WATER MAIN OR SERVICE BREAK DUE TO CONTRACTOR ACTIVITIES WILL BE BILLED TO THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY REPAIRS TO PUBLIC AND PRIVATE IMPROVEMENTS INCLUDING, BUT NOT LIMITED TO PROPERTY DAMAGE AND LANDSCAPING THAT IS A RESULT OF THE CONTRACTOR'S CONSTRUCTION ACTIVITIES. IN THE EVENT THAT A WATER MAIN OR SERVICE IS DAMAGED, CONTRACTOR SHALL NOTIFY MID-PENINSULA WATER DISTRICT (MPWD) IMMEDIATELY.
3. **CONTRACTOR SHALL HAVE AT LEAST TWO (2) WATER SERVICE REPAIR CLAMPS, SMITH-BLAIR 244 FULL CIRCLE RED-CLAMP W/ 304 SS BAND AND SS BOLTS, ON SITE DURING ALL GROUND DISTURBING ACTIVITIES.** CONTRACTOR SHALL SUBMIT REPAIR CLAMP PRODUCT DATA AND RECEIVE APPROVAL PRIOR TO ANY POTHOLING OR EXCAVATION WORK. CONTRACTOR SHALL REPAIR ANY SERVICE LATERALS AND ALLOW MPWD TO INSPECT IT PRIOR TO BACKFILLING.

TRAFFIC CONTROL

1. CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL PRIOR TO THE PRE-CONSTRUCTION MEETING AS SPECIFIED IN SPECIFICATION SECTION 01120-1.10.
2. CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC TO THE MAXIMUM EXTENT POSSIBLE. CONTRACTOR MAY PERFORM TEMPORARY STREET SHUT DOWNS AND DETOUR TRAFFIC WHEN NECESSARY. NECESSARY ROAD CLOSURE IS LIMITED TO THE HOURS OF 9 AM TO 3 PM.
3. CONTRACTOR SHALL INSTALL A CHANGEABLE MESSAGE SIGN (CMS) ON SAN JUAN BLVD AT LEAST 2 WEEKS PRIOR TO CONSTRUCTION. THE CMS SHALL REMAIN ONSISTE UNTIL ALL WORK IS COMPLETE. ALL MESSAGES SHALL BE APPROVED BY THE CITY.

LEGEND

	EXISTING	PROPOSED
CONTOUR	200	
STORM DRAIN	SD	SD
SANITARY SEWER	SS	SS
LATERAL		
SANITARY SEWER FORCE MAIN	SSFM	
ABANDONED FORCE MAIN	/FM/	/FM/
WATER LINE	W	
GAS LINE	G	
ABANDONED GAS LINE	/G/	
UNDERGROUND ELECTRICAL	UE	UE
UNDERGROUND TELECOMMUNICATION	T	T
OVERHEAD ELECTRICAL/ TELECOMMUNICATION	OHE	OHE
EDGE OF PAVEMENT		
SIDEWALK		
FENCE	x x x	
SANITARY SEWER MANHOLE		
STORM DRAIN MANHOLE		
STORM DRAIN INLET		
WATER VALVE		
FIRE HYDRANT		
SURVEY MONUMENT		
PROPERTY LINE		
SEWER FLOW DIRECTION		

ABBREVIATIONS

AB	AGGREGATE BASE	HB	HOSE BIB	S	SOUTH, SLOPE
ABS	ACRYLONITRILE BUTADIENE STYRENE PIPE	HDPE	HIGH DENSITY POLYETHYLENE	SD	STORM DRAIN
AC	ASPHALTIC CONCRETE	HOR.	HORIZONTAL	SDE	STORM DRAIN EASEMENT
ACP	ASPHALTIC CONCRETE PIPE	I.D.	INSIDE DIAMETER	SDR	STANDARD DIMENSION RATIO
APPROX	APPROXIMATE	INV	INVERT	SIM	SIMILAR
APN	ASSESSORS PARCEL NUMBER	L	LENGTH	SPECS	SPECIFICATIONS
ASPH	ASPHALT	LF	LINEAR FOOT	SS	STAINLESS STEEL, SANITARY SEWER
CB	CATCH BASIN	LH	LAMPHOLE	SSMH	SANITARY SEWER MANHOLE
CCTV	CLOSED CIRCUIT TELEVISION	LT.	LEFT	SSLH	SANITARY SEWER LAMPHOLE
CONC	CONCRETE	MH	MANHOLE	STA	STATION
CDF	CONTROLLED DENSITY FILL	MAX	MAXIMUM	STD	STANDARD
CLR	CLEARANCE	MIN	MINIMUM	TFL	TOP OF FLOW LINE
CMP	CORRUGATED METAL PIPE	MPWD	MID-PENINSULA WATER DISTRICT	TG	TOP GRATE
CMU	CONCRETE MASONRY UNIT	(N)	NEW	TYP	TYPICAL
CVR	COVER	N	NORTH	U.N.O.	UNLESS NOTED OTHERWISE
CI	CAST IRON	NTS	NOT TO SCALE	UP	UPSTREAM
CIP	CAST IRON PIPE	OD	OUTSIDE DIAMETER	VCP	VITRIFIED CLAY PIPE
CIPP	CURED IN PLACE PIPE	(P)	PROPOSED	VER.	VERTICAL
CO	CLEANOUT	PCC	PORTLAND CEMENT CONCRETE	W	WEST, WATER
DEG	DEGREE	PDWF	PEAK DRY WEATHER FLOW	W/	WITH
DIA	DIAMETER	PH	POTHOLE	X-ING	CROSSING
DIP	DUCTILE IRON PIPE	PT	PRESSURE TREATED		
DE	DRAINAGE EASEMENT	PUE	PUBLIC UTILITY EASEMENT		
DEPT.	DEPARTMENT	PVC	POLYVINYL CHLORIDE PIPE		
DO	DOWN STREAM	PWWF	PEAK WET WEATHER FLOW		
E	EAST	Q	FLOW RATE		
ELEV, EL	ELEVATION	R	RADIUS		
EXIST, (E)	EXISTING	RCB	REINFORCED CONCRETE BOX		
FL	FLOW LINE	RCP	REINFORCED CONCRETE PIPE		
FM	FORCE MAIN	REINF.	REINFORCED, REINFORCING		
FRP	FIBER REINFORCED PLASTIC	REL	RELATIVE		
FT	FOOT	REQD	REQUIRED		
GND	GROUND	RT.	RIGHT		
GPM	GALLONS PER MINUTE				

RECORD DRAWING

BASED ON FIELD INFORMATION PROVIDED BY THE CONTRACTOR THRU THE CITY OF BELMONT

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
2			
3			
4			
5			
6			
7			

CITY OF BELMONT PUBLIC WORKS

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
2200 RANGE AVE, SUITE 201
SANTA ROSA, CA 95403
(707)548-4848

REGISTERED PROFESSIONAL ENGINEER — BRIAN L. PRIGGE — NO. 74916 — CIVIL — STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
NOTES, LEGEND, AND ABBREVIATIONS

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

T2

SHEET: 2 OF 11



INDEX MAP
SCALE: 1" = 200'

RECORD DRAWING
BASED ON FIELD INFORMATION
PROVIDED BY THE CONTRACTOR THRU THE
CITY OF BELMONT

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
2			
3			
4			
5			
6			
7			

CITY OF BELMONT PUBLIC WORKS

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
2200 RANGE AVE, SUITE 201
SANTA ROSA, CA 95403
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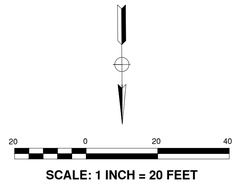
REGISTERED PROFESSIONAL ENGINEER
CIRIAN L. PRICE
NO. 74910
CIVIL
STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
MAP INDEX

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

T3

SHEET: 3 OF 11



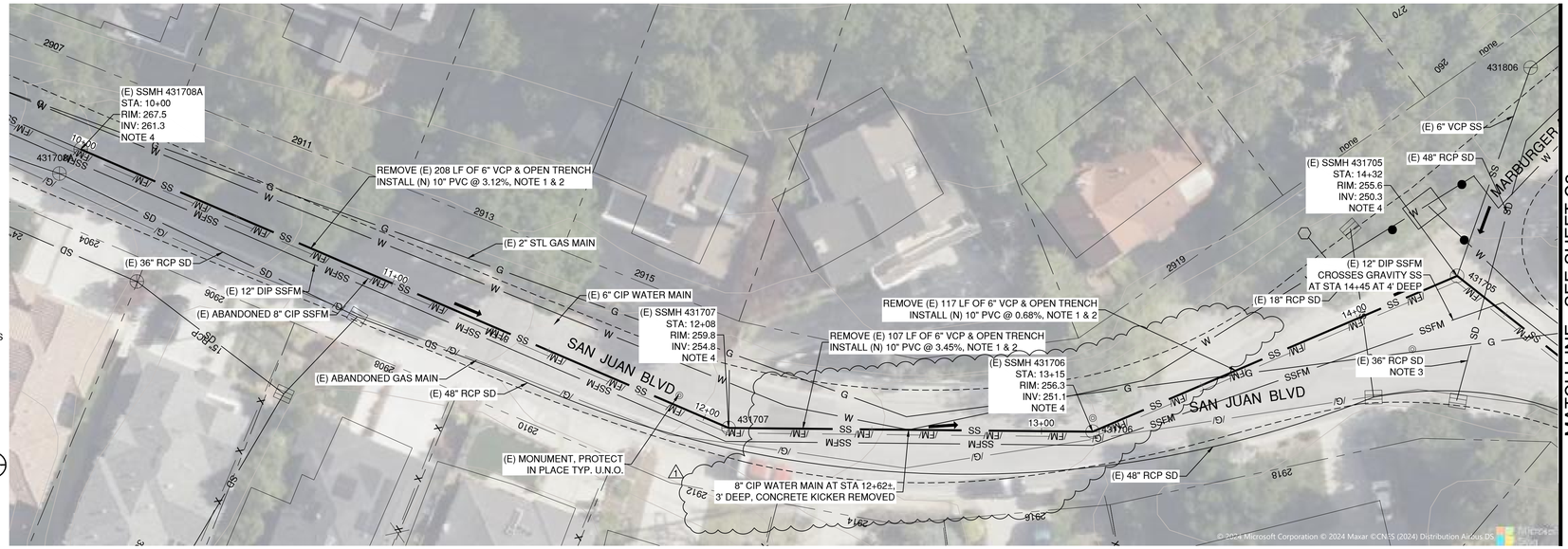
SCALE: 1 INCH = 20 FEET

NOTES

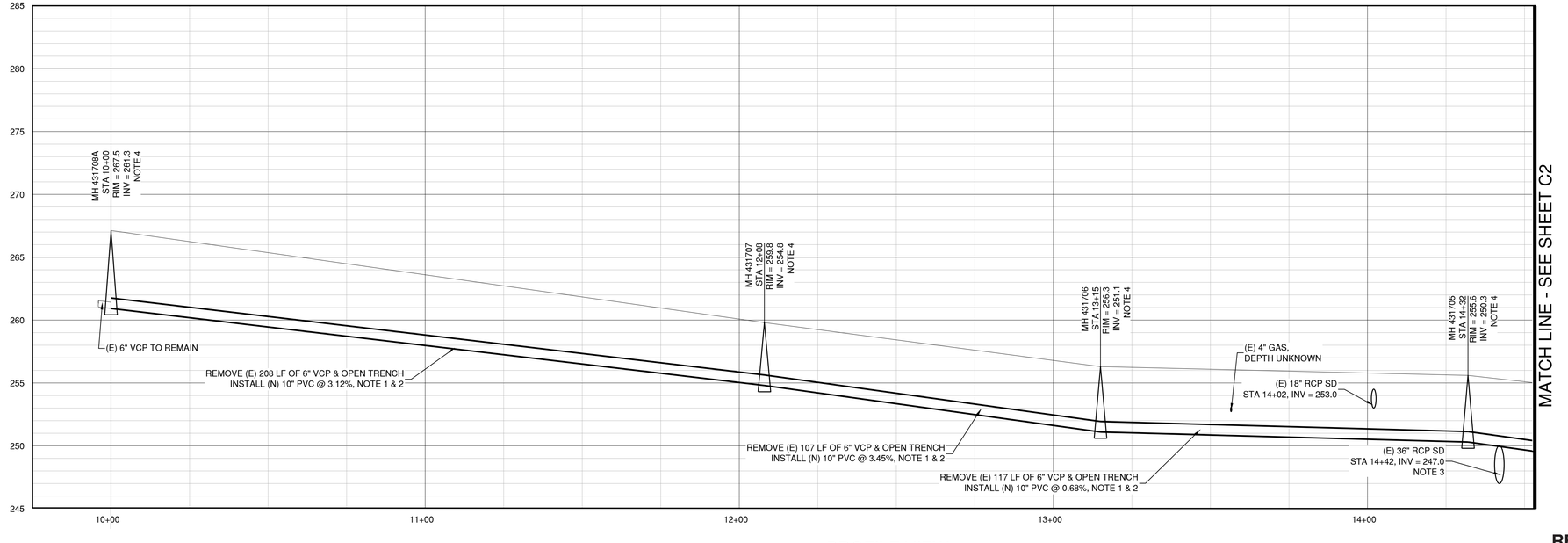
1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL INSTALL THE NEW SEWER PIPE ALONG THE EXISTING SEWER ALIGNMENT AT A CONSTANT GRADE FROM MANHOLE TO MANHOLE.
2. AN (E) ABANDON 8" CIP SSFM IS LOCATED 18" MIN. FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF ABANDONED SSFM ON THE NORTH TO EAST OF THE (E) 6" SS. THE (E) ABANONED SSFM IS AT THE SAME APPROXIMATE INVERT ELEVATION OF THE GRAVITY SEWER. SOME PORTIONS OF THE ABANDONED SSFM HAVE BEEN PREVIOUSLY REMOVED. CONTRACTOR SHALL REMOVE ANY REMAINING PORTIONS OF THE (E) ABANDONED 8" CIP THAT ARE WITHIN THE EXCAVATIONS AND INSTALL SHORING TO AVOID THE ABANDONED SSFM. THE ACTIVE (E) 12" SSFM IS TYPICALLY 28" TO 32" FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF (E) 12" SSFM.
3. CONTRACTOR SHALL DETERMINE VERTICAL CLEARANCE OF STORM DRAIN PIPE CROSSING EXISTING SEWER BY POTHOLING PRIOR TO SEWER REPLACEMENT. INSTALL A CONCRETE SADDLE BETWEEN (E) PIPE AND (N) PIPE WHERE CLEARANCE IS LESS THAN 6-INCHES PER DETAIL 8/D1.
4. CHIP AND REFORM MANHOLE INVERT AND BENCH TO ACCOMMODATE NEW PIPE DIAMETER PER 4/D1.

BYPASS PUMPING SYSTEMS MUST BE CAPABLE OF PUMPING OF PUMPING THE PWWF LISTED IN THE FOLLOWING TABLE:

UP MH	DO MH	PDWF (GPM)	PWWF (GPM)
431708A	431707	48	289
431707	431706	48	289
431706	431705	48	289
431705	431704	73	434



PLAN VIEW
SCALE: 1" = 20'



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

RECORD DRAWING
BASED ON FIELD INFORMATION PROVIDED BY THE CONTRACTOR THRU THE CITY OF BELMONT

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
2			
3			
4			
5			
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7			

CITY OF BELMONT PUBLIC WORKS

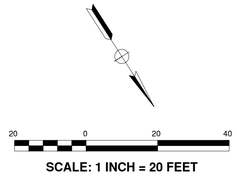
Schaaf & Wheeler
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REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
NO. 74918
CIVIL
STATE OF CALIFORNIA
05/10/24

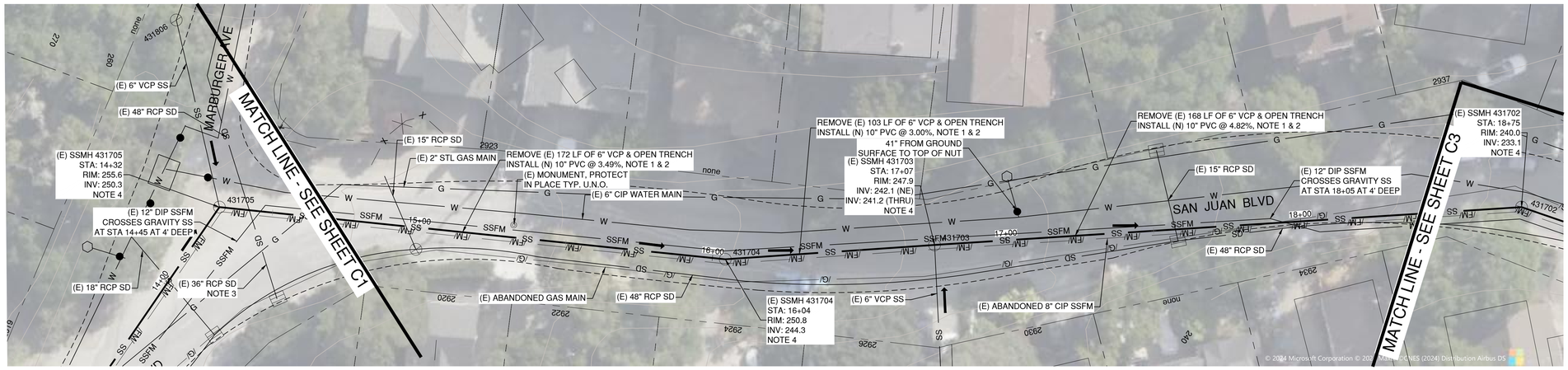
DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
PLAN AND PROFILE

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

C1
SHEET: 4 OF 11



SCALE: 1 INCH = 20 FEET



PLAN VIEW

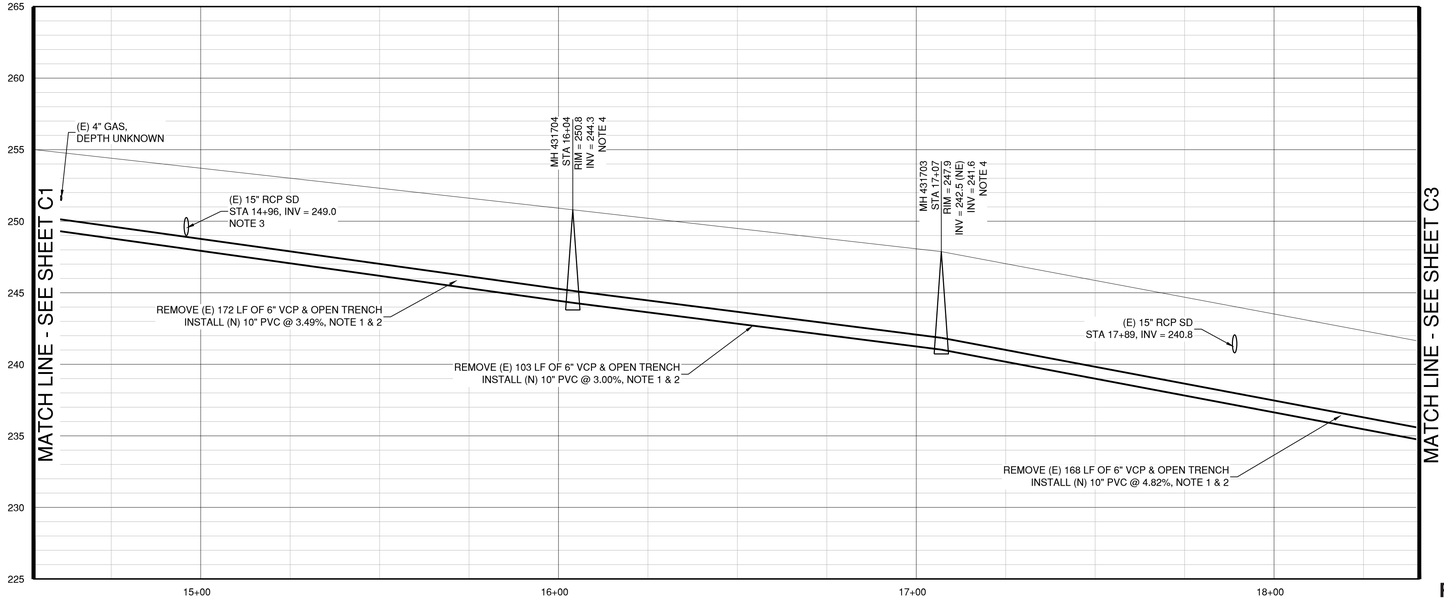
SCALE: 1" = 20'

NOTES

1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL INSTALL THE NEW SEWER PIPE ALONG THE EXISTING SEWER ALIGNMENT AT A CONSTANT GRADE FROM MANHOLE TO MANHOLE.
2. AN (E) ABANDON 8" CIP SSFM IS LOCATED 18" MIN. FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF ABANDONED SSFM ON THE NORTH TO EAST OF THE (E) 6" SS. THE (E) ABANONED SSFM IS AT THE SAME APPROXIMATE INVERT ELEVATION OF THE GRAVITY SEWER. SOME PORTIONS OF THE ABANDONED SSFM HAVE BEEN PREVIOUSLY REMOVED. CONTRACTOR SHALL REMOVE ANY REMAINING PORTIONS OF THE (E) ABANDONED 8" CIP THAT ARE WITHIN THE EXCAVATIONS AND INSTALL SHORING TO AVOID THE ABANDONED SSFM. THE ACTIVE (E) 12" SSFM IS TYPICALLY 28" TO 32" FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF (E) 12" SSFM.
3. CONTRACTOR SHALL DETERMINE VERTICAL CLEARANCE OF STORM DRAIN PIPE CROSSING EXISTING SEWER BY POTHOLING PRIOR TO SEWER REPLACEMENT. INSTALL A CONCRETE SADDLE BETWEEN (E) PIPE AND (N) PIPE WHERE CLEARANCE IS LESS THAN 6-INCHES PER DETAIL 8/D1.
4. CHIP AND REFORM MANHOLE INVERT AND BENCH TO ACCOMMODATE NEW PIPE DIAMETER PER 4/D1.

BYPASS PUMPING SYSTEMS MUST BE CAPABLE OF PUMPING OF PUMPING THE PWWF LISTED IN THE FOLLOWING TABLE:

UP MH	DO MH	PDWF (GPM)	PWWF (GPM)
431705	431704	73	434
431704	431703	73	434
431703	431702	81	480



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

RECORD DRAWING

BASED ON FIELD INFORMATION
PROVIDED BY THE CONTRACTOR THRU THE
CITY OF BELMONT

1 LOCATION AND CALLOUTS OF EXISTING12" SSFM ARE UPDATED ON THE PLAN AND PROFILE VIEWS.

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
2			
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CITY OF BELMONT PUBLIC WORKS

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
2200 RANGE AVE, SUITE 201
SANTA ROSA, CA 95403
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REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRIGMORE
NO. 74916
CIVIL
STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
PLAN AND PROFILE

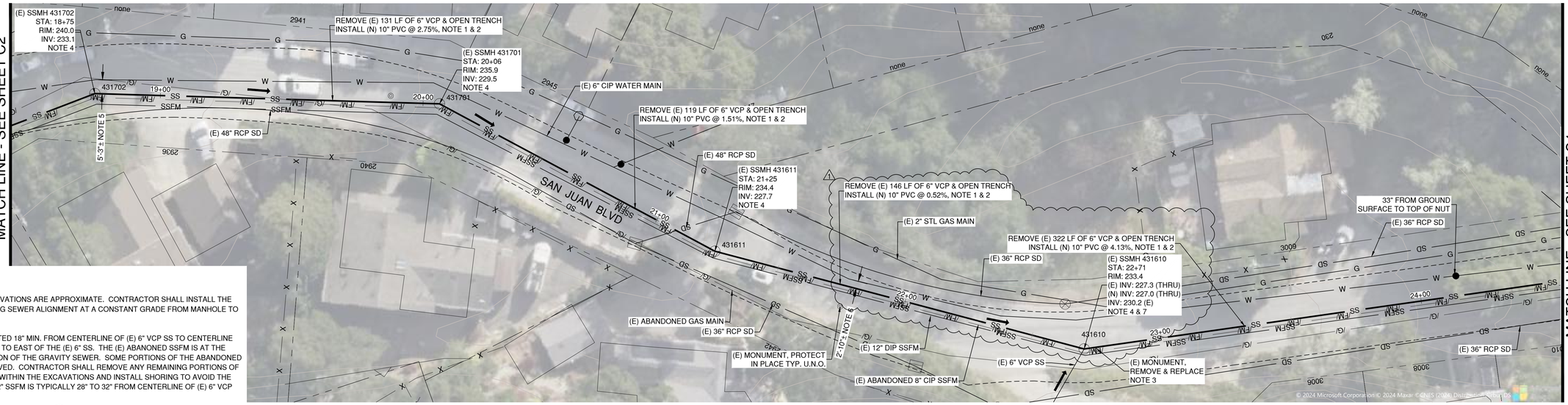
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CHECKED: BLS

C2

SHEET: 5 OF 11

20 0 20

SCALE: 1 INCH = 20 FEET



NOTES

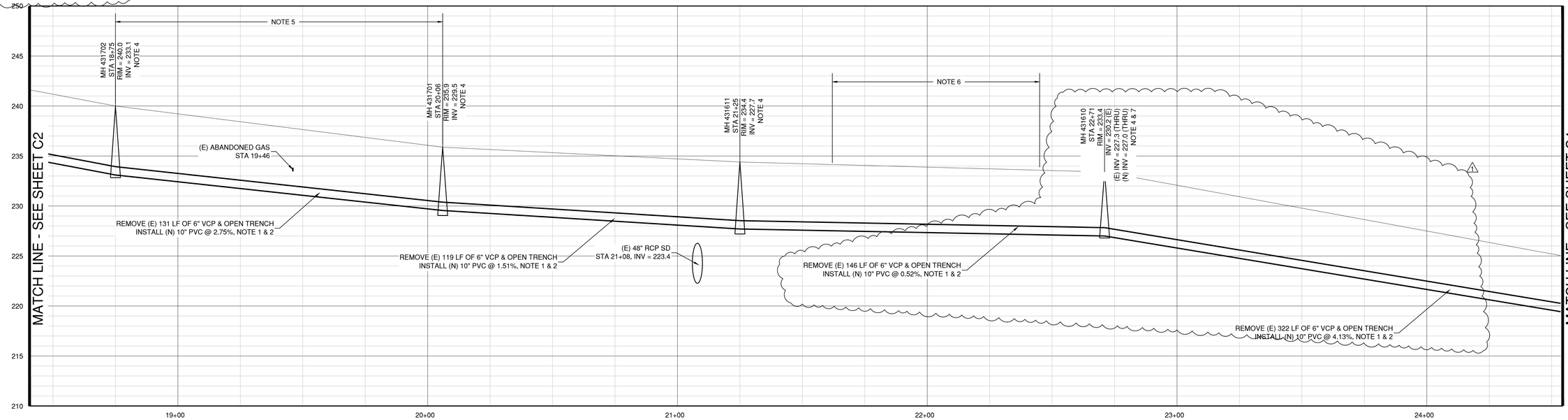
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2. AN (E) ABANDON 8" CIP SSFM IS LOCATED 18" MIN. FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF ABANDONED SSFM ON THE NORTH TO EAST OF THE (E) 6" SS. THE (E) ABANONED SSFM IS AT THE SAME APPROXIMATE INVERT ELEVATION OF THE GRAVITY SEWER. SOME PORTIONS OF THE ABANDONED SSFM HAVE BEEN PREVIOUSLY REMOVED. CONTRACTOR SHALL REMOVE ANY REMAINING PORTIONS OF THE (E) ABANDONED 8" CIP THAT ARE WITHIN THE EXCAVATIONS AND INSTALL SHORING TO AVOID THE ABANDONED SSFM. THE ACTIVE (E) 12" SSFM IS TYPICALLY 28" TO 32" FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF (E) 12" SSFM.
3. REMOVE AND REPLACE (E) MONUMENT PER DETAIL 6/D2 & SPECIFICATION SECTION 02318-3.04.
4. CHIP AND REFORM MANHOLE INVERT AND BENCH TO ACCOMMODATE NEW PIPE DIAMETER PER 4/D1.
5. STA 18+75± TO 19+95± WATER MAIN SEPARATION IS LESS THAN 5 FEET. COORDINATE W/ MPWD FOR WATER MAIN SHUT DOWN AND BACKFILL W/ CDF PER DETAIL 2/D1.
6. STA 21+62± TO 22+45± WATER MAIN SEPARATION IS LESS THAN 5 FEET. COORDINATE W/ MPWD FOR WATER MAIN SHUT DOWN AND BACKFILL W/ CDF PER DETAIL 2/D1.
7. CHIP OUT BOTTOM OF MANHOLE FOR REVISED SLOPE.

BYPASS PUMPING SYSTEMS MUST BE CAPABLE OF PUMPING OF PUMPING THE PWWF LISTED IN THE FOLLOWING TABLE:

UP MH	DO MH	PDWF (GPM)	PWWF (GPM)
431703	431702	81	480
431702	431701	81	480
431701	431611	81	480
431611	431610	81	480
431610	431609	104	610

PLAN VIEW

SCALE: 1" = 20'



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

RECORD DRAWING

BASED ON FIELD INFORMATION
PROVIDED BY THE CONTRACTOR THRU THE
CITY OF BELMONT

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
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CITY OF BELMONT PUBLIC WORKS

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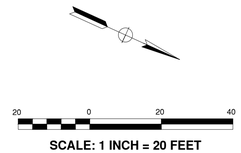
REGISTERED PROFESSIONAL ENGINEER
LAURAN L. PRICE
NO. 74912
CIVIL
STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
PLAN AND PROFILE

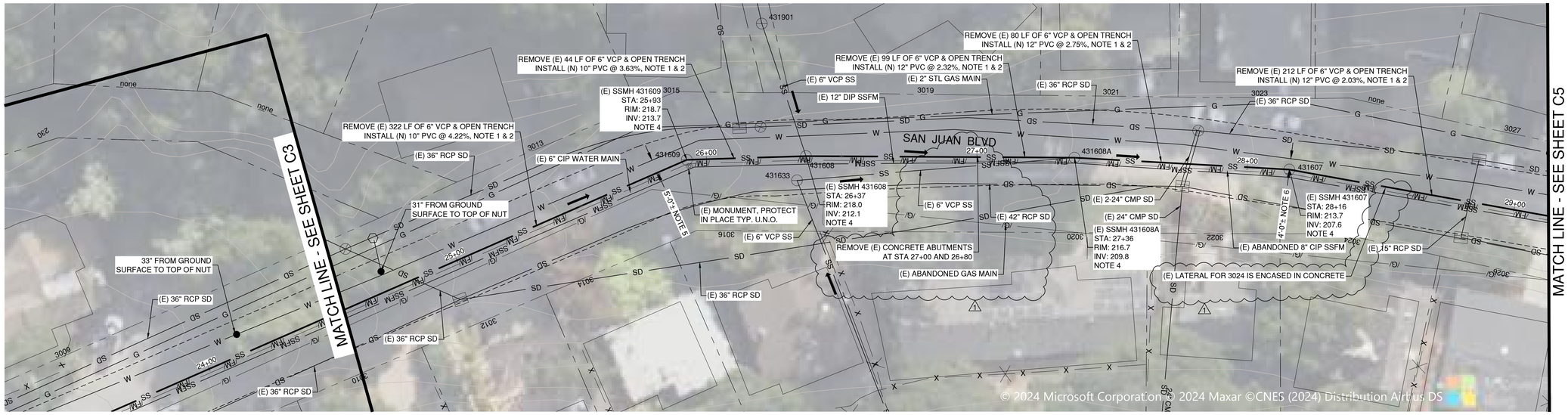
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SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

C3

SHEET: 6 OF 11



SCALE: 1 INCH = 20 FEET



PLAN VIEW
SCALE: 1" = 20'

NOTES

1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL INSTALL THE NEW SEWER PIPE ALONG THE EXISTING SEWER ALIGNMENT AT A CONSTANT GRADE FROM MANHOLE TO MANHOLE.

2. AN (E) ABANDON 8" CIP SSFM IS LOCATED 18" MIN. FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF ABANDONED SSFM ON THE NORTH TO EAST OF THE (E) 6" SS. THE (E) ABANONED SSFM IS AT THE SAME APPROXIMATE INVERT ELEVATION OF THE GRAVITY SEWER. SOME PORTIONS OF THE ABANDONED SSFM HAVE BEEN PREVIOUSLY REMOVED. CONTRACTOR SHALL REMOVE ANY REMAINING PORTIONS OF THE (E) ABANDONED 8" CIP THAT ARE WITHIN THE EXCAVATIONS AND INSTALL SHORING TO AVOID THE ABANDONED SSFM. THE ACTIVE (E) 12" SSFM IS TYPICALLY 28" TO 32" FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF (E) 12" SSFM.

3. CONTRACTOR SHALL EXPOSE EXISTING PIPE AND DETERMINE PIPE VERTICAL CLEARANCE W/ SEWER PIPE AND ANY POTENTIAL CONFLICT W/ NEW SEWER PIPE PRIOR TO INSTALLATION OF NEW PIPE. INSTALL A CONCRETE SADDLE BETWEEN (E) PIPE AND (N) PIPE WHERE CLEARANCE IS LESS THAN 6-INCHES PER DETAIL 8/D1.

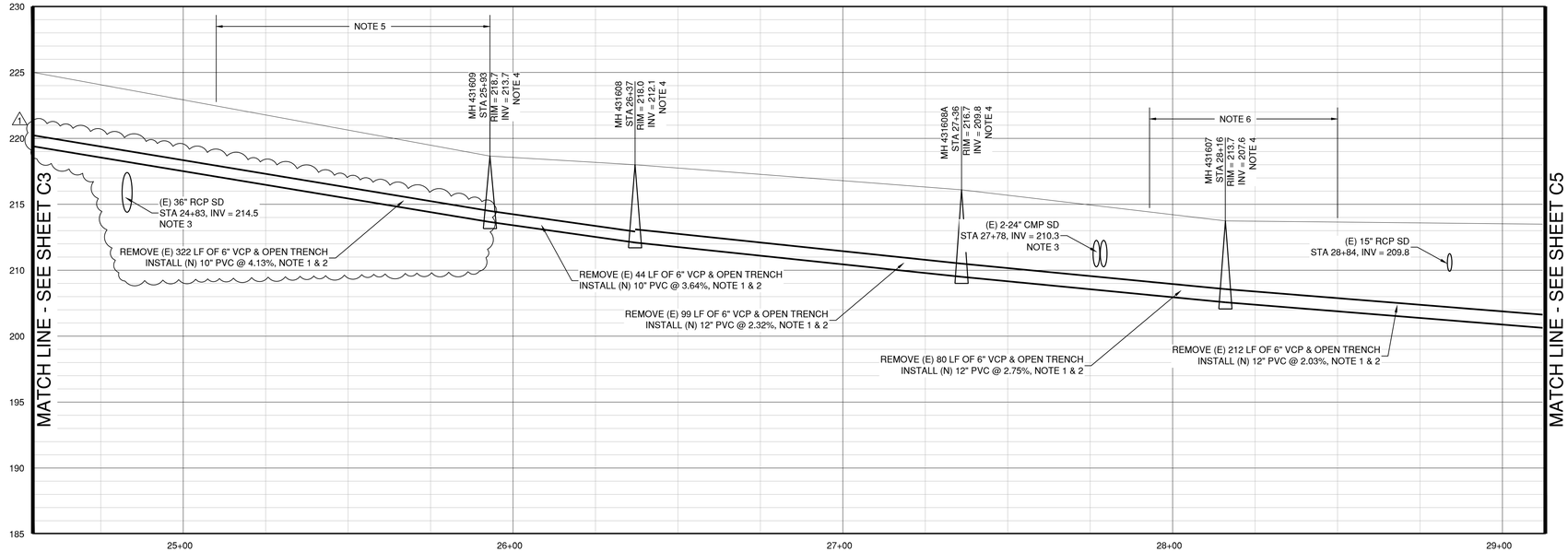
4. CHIP AND REFORM MANHOLE INVERT AND BENCH TO ACCOMMODATE NEW PIPE DIAMETER PER 4/D1.

5. STA 25+10± TO 25+93± WATER MAIN SEPARATION IS LESS THAN 5 FEET. COORDINATE W/ MPWD FOR WATER MAIN SHUT DOWN AND BACKFILL W/ CDF PER DETAIL 2/D1.

6. STA 27+93± TO 28+50± WATER MAIN SEPARATION IS LESS THAN 5 FEET. COORDINATE W/ MPWD FOR WATER MAIN SHUT DOWN AND BACKFILL W/ CDF PER DETAIL 2/D1.

BYPASS PUMPING SYSTEMS MUST BE CAPABLE OF PUMPING OF PUMPING THE PWWF LISTED IN THE FOLLOWING TABLE:

UP MH	DO MH	PDWF (GPM)	PWWF (GPM)
431609	431608	104	610
431608	431608A	129	755
431608A	431607	129	755
431607	431606	129	755



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

RECORD DRAWING
BASED ON FIELD INFORMATION
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NO	REVISIONS	DATE	APPR
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CITY OF BELMONT PUBLIC WORKS

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REGISTERED PROFESSIONAL ENGINEER
CURRAN L. PRICE JR.
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CIVIL
STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
PLAN AND PROFILE

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

C4

SHEET: 7 OF 11



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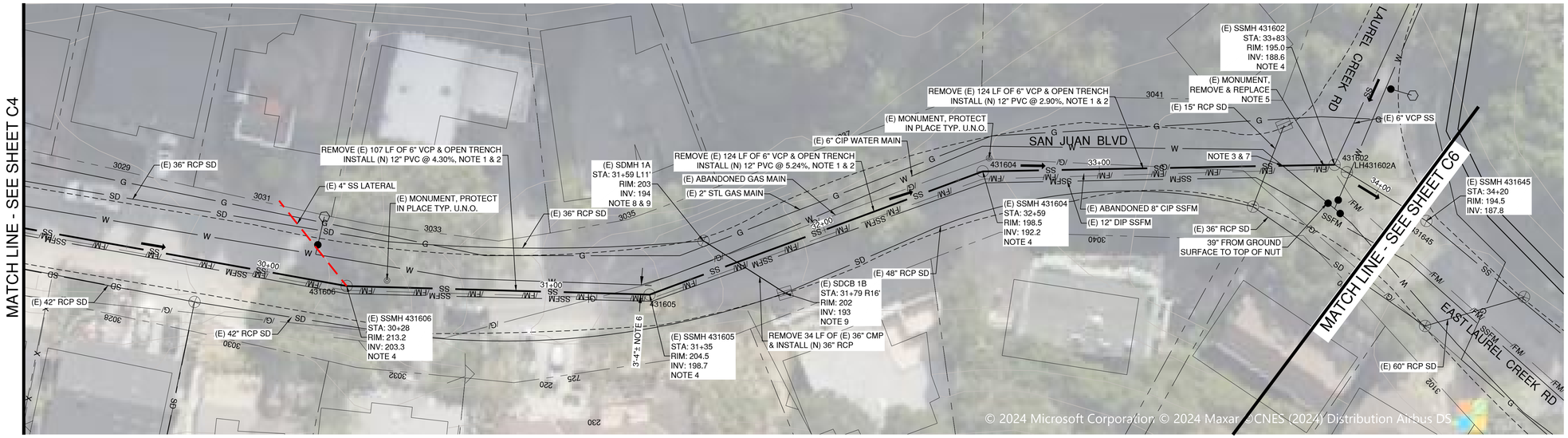
SCALE: 1 INCH = 20 FEET

NOTES

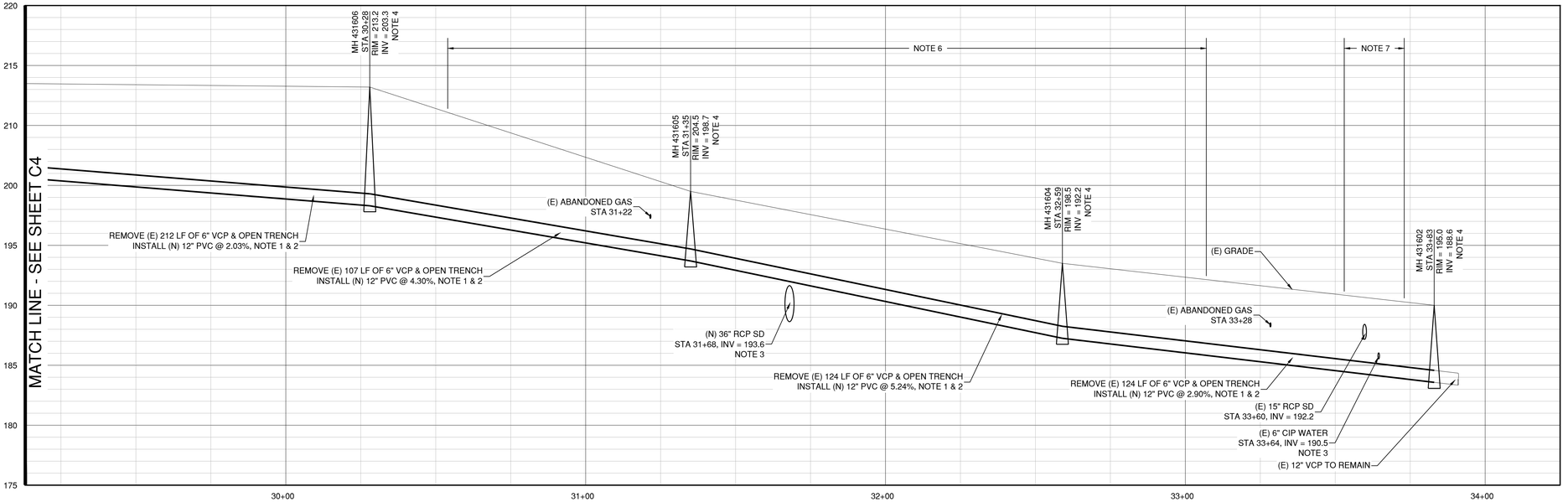
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2. AN (E) ABANDON 8" CIP SSFM IS LOCATED 18" MIN. FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF ABANDONED SSFM ON THE NORTH TO EAST OF THE (E) 6" SS. THE (E) ABANONED SSFM IS AT THE SAME APPROXIMATE INVERT ELEVATION OF THE GRAVITY SEWER. SOME PORTIONS OF THE ABANDONED SSFM HAVE BEEN PREVIOUSLY REMOVED. CONTRACTOR SHALL REMOVE ANY REMAINING PORTIONS OF THE (E) ABANDONED 8" CIP THAT ARE WITHIN THE EXCAVATIONS AND INSTALL SHORING TO AVOID THE ABANDONED SSFM. THE ACTIVE (E) 12" SSFM IS TYPICALLY 28" TO 32" FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF (E) 12" SSFM.
3. INSTALL A CONCRETE SADDLE BETWEEN (E) PIPE AND (N) PIPE WHERE CLEARANCE IS LESS THAN 6-INCHES PER DETAIL 8/D1.
4. CHIP AND REFORM MANHOLE INVERT AND BENCH TO ACCOMMODATE NEW PIPE DIAMETER PER 4/D1.
5. REMOVE AND REPLACE (E) MONUMENT PER DETAIL 6/D2 & SPECIFICATION SECTION 02318-3.04.
6. STA 30+54± TO 33+07± WATER MAIN SEPARATION IS LESS THAN 5 FEET. COORDINATE W/ MPWD FOR WATER MAIN SHUT DOWN AND BACKFILL W/ CDF PER DETAIL 2/D1.
7. STA 33+53± TO 33+73± WATER MAIN SEPARATION IS LESS THAN 5 FEET. COORDINATE W/ MPWD FOR WATER MAIN SHUT DOWN AND BACKFILL W/ CDF PER DETAIL 2/D1.
8. (E) SDMH IS LOCATED IN CONCRETE DRIVEWAY ENTRANCE. RESTORE (E) CONCRETE SURFACE AS NECESSARY FOR CONSTRUCTION. INSTALL #4X12" MIN. LONG DOWELS 6" MIN. INTO (E) CONCRETE AT 18" MAX O.C. WHEN INSTALLING NEW CONCRETE.
9. CONNECT (N) SD TO (E) INLET OR MANHOLE, REMOVE PORTIONS OF (E) INLET OR MANHOLE WALL AS NECESSARY TO ACCOMMODATE (N) SD PIPE, FILL VOIDS W/ NON-SHRINK GROUT.

BYPASS PUMPING SYSTEMS MUST BE CAPABLE OF PUMPING OF PUMPING THE PWWF LISTED IN THE FOLLOWING TABLE:

UP MH	DO MH	PDWF (GPM)	PWWF (GPM)
431607	431606	129	755
431606	431605	129	755
431605	431604	129	755
431604	431602	129	755



PLAN VIEW
SCALE: 1" = 20'



PROFILE VIEW
HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

RECORD DRAWING
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CITY OF BELMONT PUBLIC WORKS

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
2200 RANGE AVE, SUITE 201
SANTA ROSA, CA 95403
(707)548-4848

REGISTERED PROFESSIONAL ENGINEER
LAURAN L. PRICE
NO. 74918
CIVIL
STATE OF CALIFORNIA
05/10/24

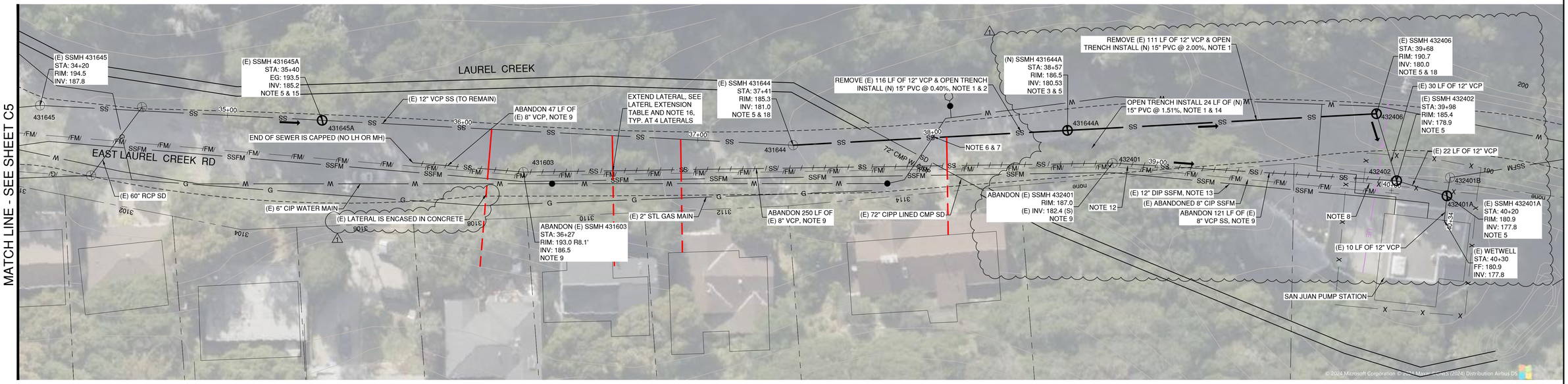
DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
PLAN AND PROFILE

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

C5

SHEET: 8 OF 11

MATCH LINE - SEE SHEET C5



BYPASS PUMPING SYSTEMS MUST BE CAPABLE OF PUMPING OF PUMPING THE PWWF LISTED IN THE FOLLOWING TABLE:

UP MH	DO MH	PDWF (GPM)	PWWF (GPM)
431607	431606	129	755
431606	431605	129	755
431605	431604	129	755
431604	431602	129	755

LATERAL EXTENSION LOCATIONS		
UP MH	DO MH	STATION
431603A	431603	36+11 R18.5
431603	432401	36+65 R14.8
431603	432401	36+94 R12.9
431603	432401	38+05 R12.2

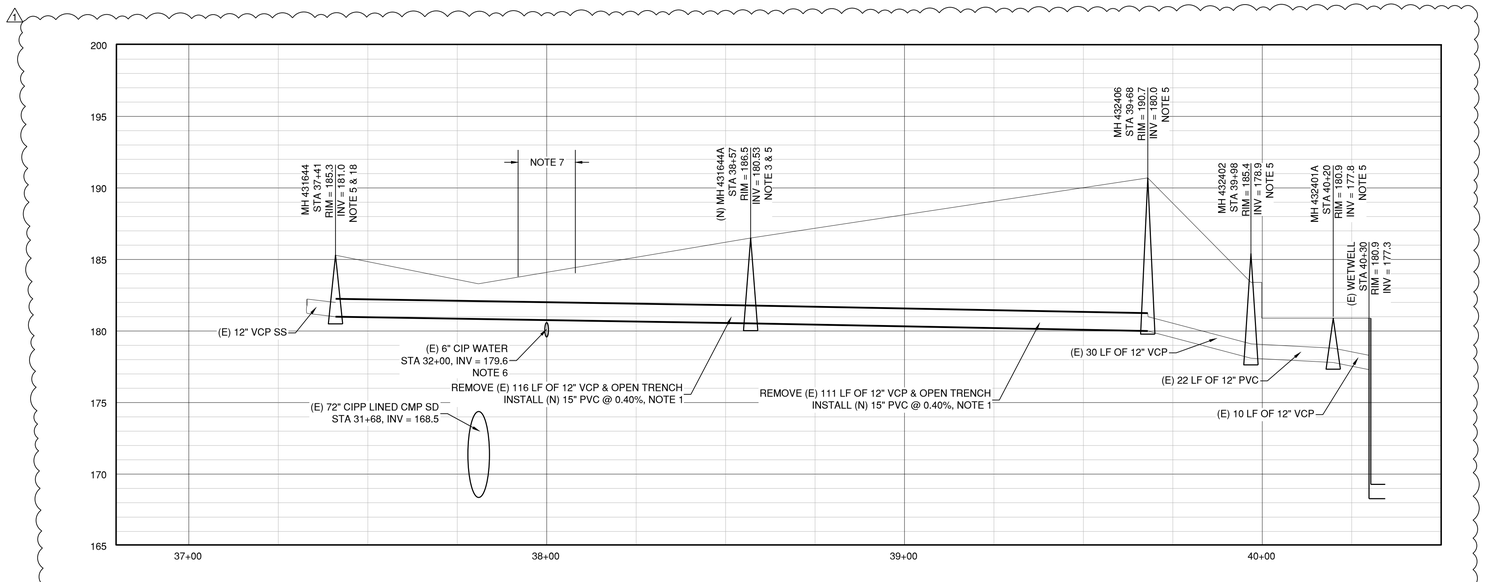
PLAN VIEW

SCALE: 1" = 20'

SCALE: 1 INCH = 20 FEET

NOTES

1. STATIONS, LENGTHS, SLOPE, AND ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHALL INSTALL THE NEW SEWER PIPE ALONG THE EXISTING SEWER ALIGNMENT AT A CONSTANT GRADE FROM MANHOLE TO MANHOLE OR WETWELL.
2. AN (E) ABANDON 6" CIP SSFM IS LOCATED 18" MIN. FROM CENTERLINE OF (E) 6" VCP SS TO CENTERLINE OF ABANDONED SSFM ON THE NORTH TO EAST OF THE (E) 6" SS.
3. INSTALL (N) SSMH PER (5/D1) & (7/D1).
4. REMOVE (E) SSMH & INSTALL (N) SSMH PER (5/D1) & (7/D1).
5. REMOVE ROOTS FROM MANHOLE AND COAT MANHOLE PER SPECIFICATION SECTION 09900 AND PERFORM THE FOLLOWING ADDITIONAL IMPROVEMENTS:
   5.1. MH 431644: REMOVE LADDER RUNGS (2 LADDER RUNGS)
   5.2. MH 431645A: REMOVE LADDER RUNGS (2 LADDER RUNGS)
6. CONTRACTOR SHALL DETERMINE VERTICAL CLEARANCE OF WATER PIPE CROSSING EXISTING SEWER PRIOR TO INSTALLATION OF NEW SEWER PIPE. INSTALL A CONCRETE SADDLE BETWEEN (E) PIPE AND (N) PIPE WHERE CLEARANCE IS LESS THAN 6-INCHES PER DETAIL (8/D1).
7. STA 37+92± TO 38+08± WATER MAIN SEPARATION IS LESS THAN 5 FEET. COORDINATE W/ MPWD FOR WATER MAIN SHUT DOWN AND BACKFILL W/ CDF PER DETAIL (2/D1).
8. (E) 30" TALL CMU RETAINING WALL. 8" THICK FOUNDATION UNDER 6" THICK AC EXTENDS 12" IN FRONT OF FACE OF (E) WALL.
9. ABANDON (E) SSMH AND (E) SS PIPE PER (3/D2).
10. CONTRACTOR SHALL POTHOLE (E) 2" WATER SERVICE TO DETERMINE IF WATER SERVICE NEEDS TO BE RE-ROUTED FOR NEW SEWER ALIGNMENT.
11. SEE DETAIL (4/D2) FOR (N) CONNECTION TO WETWELL.
12. REMOVE AND REPLACE (E) AC CURB IN KIND AND (E) CONCRETE CURB PER (2/D2) AS NECESSARY FOR CONSTRUCTION.
13. (E) 12" SSFM IS CONCRETE ENCASED W/ 8" OF CONCRETE ON EITHER SIDE AND 12" OF CONCRETE ABOVE AND BELOW THE FORCE MAIN PIPE FOR THE FIRST 46 LF OUT OF THE PUMP STATION.
14. PROVIDE A CONSTANT SLOPE BETWEEN (N) SSMH 431644A AND (E) SSMH 432401 AND A 0.2' DROP BETWEEN (N) INCOMING AND OUTGOING PIPE AT SSMH 432401A.
15. (E) MANHOLE IS BURIED, LOCATE MANHOLE AND RAISE MANHOLE TO GRADE PER (7/D2). CONTRACTOR SHALL ASSUME MANHOLE IS BURIED BY 12" FOR BID PURPOSES.
16. LOCATE (E) LATERALS IN SEWER MAIN TO BE ABANDON AND EXTEND (E) LATERALS TO 12" SEWER MAIN PER DETAIL (8/D2). APPROXIMATE LOCATION OF LATERALS IS PROVIDED IN THE LATERAL EXTENSION TABLE.
17. CONTRACTOR SHALL DETERMINE SIZE AND DEPTH OF ELECTRICAL CONDUIT PRIOR TO INSTALLATION OF NEW SEWER PIPE.
18. CHIP AND REFORM MANHOLE INVERT AND BENCH TO ACCOMMODATE NEW PIPE DIAMETER PER (4/D1).



PROFILE VIEW

HOR. SCALE: 1" = 20'
VER. SCALE: 1" = 5'

RECORD DRAWING

BASED ON FIELD INFORMATION
PROVIDED BY THE CONTRACTOR THRU THE CITY OF BELMONT

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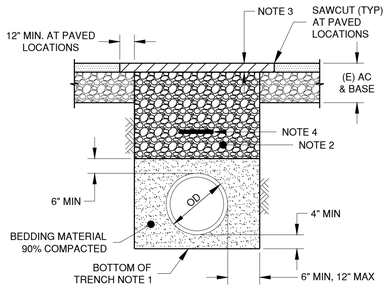
REGISTERED PROFESSIONAL ENGINEER
BRIAN L. PRICE
NO. 74918
CIVIL
STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
PLAN AND PROFILE

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

C6

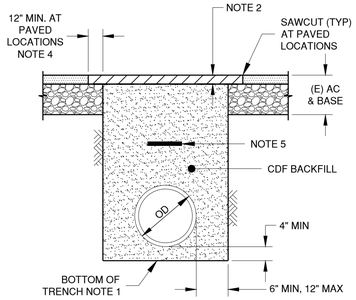
SHEET: 9 OF 11



NOTES:

1. IF SOFT SOILS ARE ENCOUNTERED EXCAVATE 12" BELOW PIPE AND INSTALL GEOTEXTILE FABRIC PER SPECIFICATION SECTION 02200.
2. STREET AREAS: CL 2 AB 95% COMPACTED. UNIMPROVED AREAS: CL 2 AB OR APPROVED NATIVE MATERIAL 90% COMPACTED.
3. IN PAVED AREAS: 4" AC OR MATCH EXISTING PAVEMENT THICKNESS WHICHEVER IS GREATER. UNIMPROVED AREAS: 12" NATIVE MATERIAL.
4. DETECTABLE WARNING TAPE 14" ABOVE PIPE.
5. INSTALL TRENCH CUTOFF WALL EVERY 50' PER 3/D1 AT ALL OPEN TRENCH LOCATIONS.

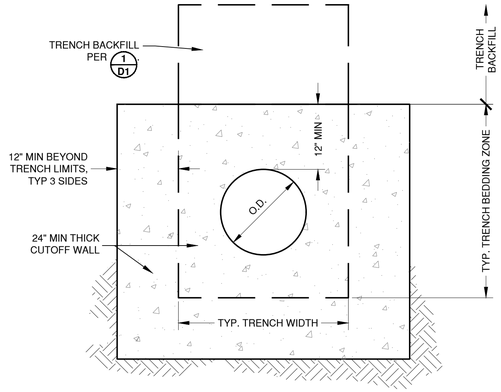
STANDARD TRENCH 1/D1
SCALE: NTS



NOTES:

1. IF SOFT SOILS ARE ENCOUNTERED EXCAVATE 12" BELOW PIPE AND INSTALL GEOTEXTILE FABRIC PER SPECIFICATION SECTION 02200.
2. IN PAVED AREAS: 4" AC OR MATCH EXISTING PAVEMENT THICKNESS WHICHEVER IS GREATER. UNIMPROVED AREAS: 12" NATIVE MATERIAL.
3. DETECTABLE WARNING TAPE 14" ABOVE PIPE.

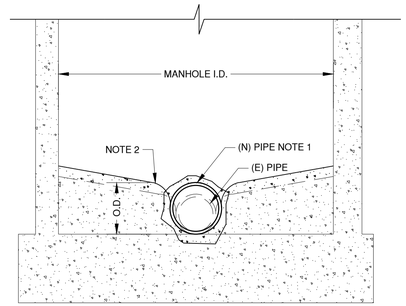
CDF TRENCH 2/D1
SCALE: NTS



CUTOFF WALL NOTES:

1. PLACE CUTOFF WALL EVERY 50' AT OPEN TRENCH LOCATIONS.
2. CUTOFF WALL TO EXTEND 12" PAST TRENCH LIMITS AND BE AT LEAST 24" THICK.
3. CUTOFF WALL SHALL BE A BLENDED MIXTURE OF 1-PART FREE DRAINING SAND AND 1-PART DRY MIX CEMENT MIXED WITH WATER. WATER TO CEMENT RATIO SHALL BE LESS THAN 0.3, RESULTING IN A "DRY" MIX THAT IS HAND COMPACTED AROUND THE PIPE.

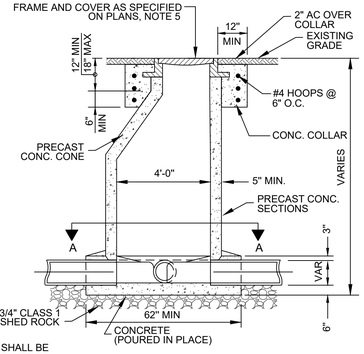
TRENCH CUTOFF WALL 3/D1
SCALE: NTS



NOTES:

1. REMOVE PORTION OF (E) MH WALL TO ALLOW INSERTION OF (N) PIPE. INSTALL WATERSTOP AROUND NEW CONNECTION. FILL VOIDS W/ NON-SHRINK GROUT.
2. REMOVE PORTION OF (E) TROUGH & BENCH TO ALLOW FOR (N) PIPE. CHIP AND REFORM MANHOLE TROUGH AND BUILD UP BENCH TO ACCOMMODATE NEW PIPE SIZE. SLOPE BENCH AT 1" PER FOOT TOWARDS CHANNEL, SEE DETAIL 5/D1 .

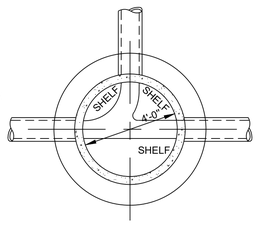
MANHOLE MODIFICATION 4/D1
SCALE: NTS



NOTES:

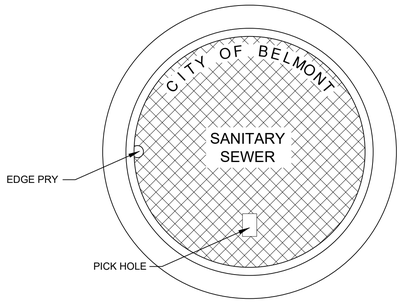
1. NEW MANHOLES SHALL BE ECCENTRIC WHEREVER POSSIBLE. EXISTING MANHOLES ARE CONCENTRIC UNLESS OTHERWISE NOTED ON THE PLANS.
2. TAPER "SHELF" 1" PER FOOT TOWARDS CHANNEL.
3. REFER TO SPECIFICATIONS FOR MANHOLE PIPE CONNECTION.
4. IN UNPAVED AREAS, MANHOLE RIM SHALL BE PLACED APPROXIMATELY 6" ABOVE GRADE W/ A 6" CONCRETE RING TAPERED AT 3:1 SLOPE FROM THE TOP TO THE OUTSIDE EDGE OF THE COLLAR TO THE GROUND SURFACE.
5. CONE SECTION SHALL MATCH THE DIMENSIONS OF THE MANHOLE FRAME AND COVER ON THE PLANS.

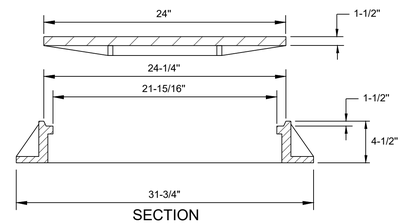
SECTIONAL ELEVATION



SECTION A-A

PRE-CAST MANHOLE 5/D1
SCALE: NTS

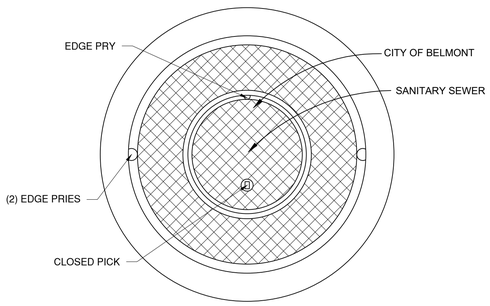


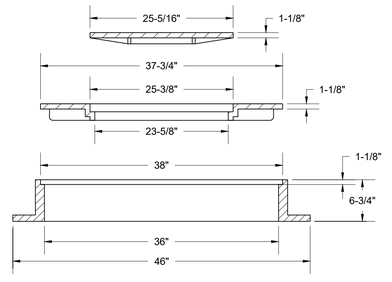


SECTION

NOTE: D& L FOUNDRY MODEL A-1024 OR APPROVED EQUAL.

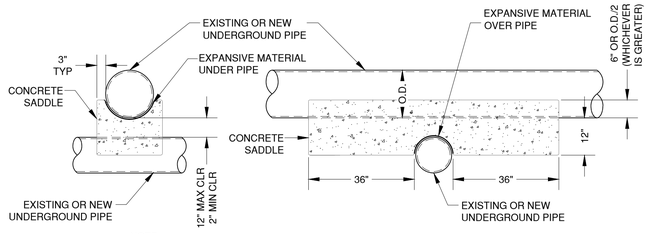
24" MANHOLE FRAME & COVER 6/D1
SCALE: NTS





FRAME: D&L A-1462 OR APPROVED EQUAL
OUTER COVER: D&L A-1462-R5 OR APPROVED EQUAL
INNER COVER: D&L A-1024 OR APPROVED EQUAL

36" MANHOLE FRAME & COVER 7/D1
SCALE: NTS



NOTE:
INSTALL CONCRETE SADDLE AT EACH LOCATION WHERE A NEW UNDERGROUND UTILITY CROSSES AN EXISTING UNDERGROUND UTILITY WITH LESS THAN 12" CLEARANCE. MINIMUM ALLOWABLE CLEARANCE IS 2". WRAP EXPOSED WATER MAIN PIPE W/ V-BIO POLYTHYLENE PRIOR TO BACKFILLING.

CONCRETE SADDLE 8/D1
SCALE: NTS

RECORD DRAWING
BASED ON FIELD INFORMATION PROVIDED BY THE CONTRACTOR THRU THE CITY OF BELMONT

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
2			
3			
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7			

CITY OF BELMONT PUBLIC WORKS

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
2200 RANGE AVE, SUITE 201
SANTA ROSA, CA 95403
(707)548-4848

REGISTERED PROFESSIONAL ENGINEER — BURRAN L. PRICE — NO. 74918 — CIVIL — STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
DETAILS

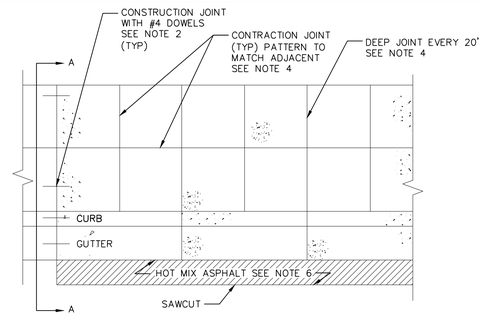
DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

D1

SHEET: 10 OF 11

RECORD DRAWING

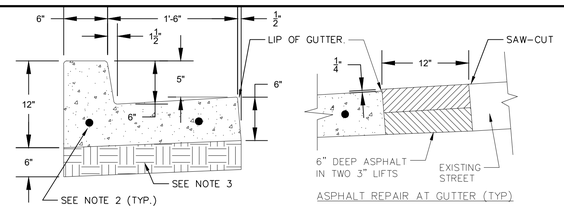
BASED ON FIELD INFORMATION
PROVIDED BY THE CONTRACTOR THRU THE
CITY OF BELMONT



SECTION A–A

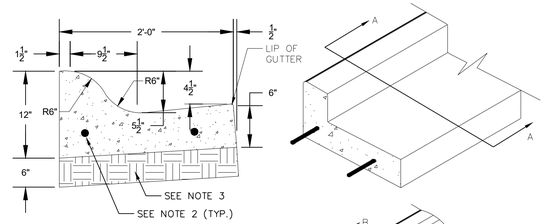
NOTES:
1. PRIOR TO BEGINNING ANY WORK, AN ENCROACHMENT PERMIT SHALL BE OBTAINED.
2. 12" #4 REBAR DOWELS, 6" MINIMUM DEPTH INTO EXISTING OR NEW SIDEWALK. DO NOT DOWEL PRIVATE IMPROVEMENTS INTO PUBLIC IMPROVEMENTS.
3. 6" MINIMUM CLASS 2 A.B. COMPACTED TO 90%.
4. 1/2" DEEP CONTRACTION JOINTS AT 20', 1/4" DEEP CONTRACTION JOINTS AT 10' SIDEWALK SHALL BE SCORED TO MATCH CONTIGUOUS EXISTING SIDEWALK.
5. ALL CONCRETE SHALL BE 6 SACK 3/4" WITH ONE POUND OF LAMP BLACK PER CUBIC YARD.
6. ASPHALT TO BE HOT MIX ASPHALT 1/2" FINE.
7. 4" THICK SIDEWALK FOR VERTICAL CURB, 6" THICK SIDEWALK FOR ROLLED CURB.

CURB, GUTTER, & SIDEWALK 1/D2
SCALE: NTS



TYPE A CURB
SECTION A–A

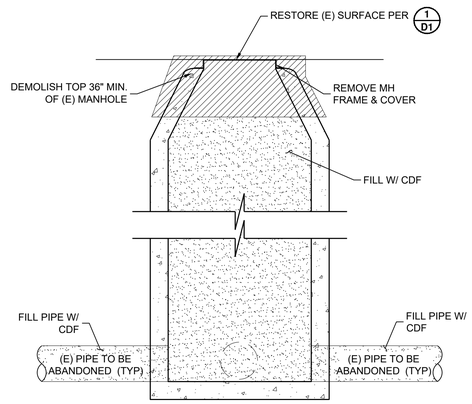
ASPHALT REPAIR AT GUTTER (TYP)



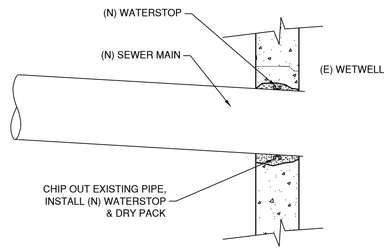
TYPE E CURB
SECTION B–B

NOTES:
1. PRIOR TO BEGINNING ANY WORK, AN ENCROACHMENT PERMIT SHALL BE OBTAINED.
2. 12" #4 REBAR DOWELS, 6" MINIMUM DEPTH INTO EXISTING SIDEWALK, CURB & GUTTER. DO NOT DOWEL PRIVATE IMPROVEMENTS INTO PUBLIC IMPROVEMENTS.
3. 6" MINIMUM CLASS 2 A.B. COMPACTED TO 90%.
4. 1/2" DEEP CONTRACTION JOINTS AT 20', 1/4" DEEP CONTRACTION JOINS AT 10'.
5. ALL CONCRETE SHALL BE 6 SACK 3/4" WITH ONE POUND LAMP BLACK PER CUBIC YARD. FINISH TO BE UNIFORM FINE BROOMED TEXTURE.
6. ASPHALT TO BE HOT MIX ASPHALT 1/2" FINE.
7. UNLESS OTHERWISE NOTED, ALL RADII TO BE 1/2".

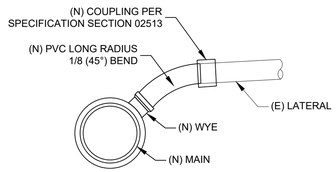
CURB & GUTTER 2/D2
SCALE: NTS



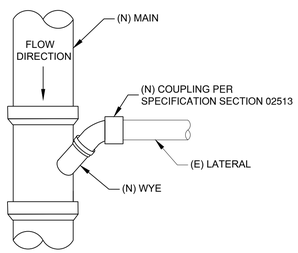
SEWER ABANDONMENT 3/D2
SCALE: NTS



WETWELL CONNECTION 4/D2
SCALE: NTS

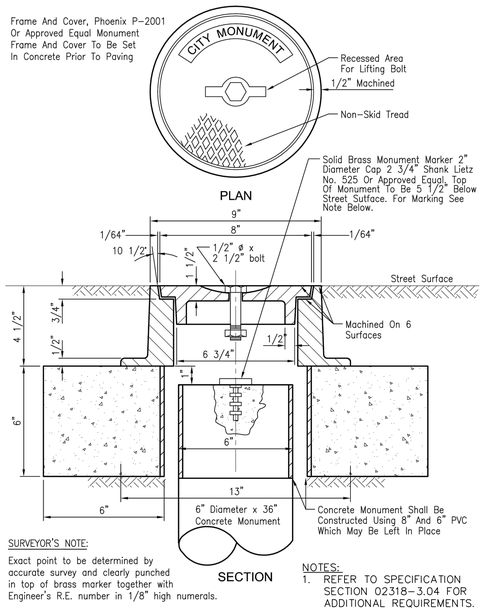


ELEVATION VIEW



PLAN VIEW

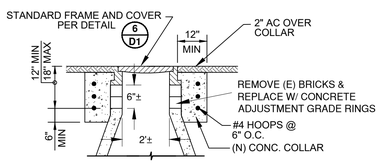
SEWER LATERAL 5/D2
SCALE: NTS



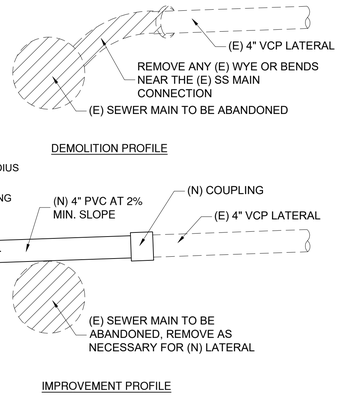
SURVEYOR'S NOTE:
Exact point to be determined by accurate survey and clearly punched in top of brass marker together with Engineer's R.E. number in 1/8" high numerals.

NOTES:
1. REFER TO SPECIFICATION SECTION 02318–3.04 FOR ADDITIONAL REQUIREMENTS.

STANDARD MONUMENT 6/D2
SCALE: NTS

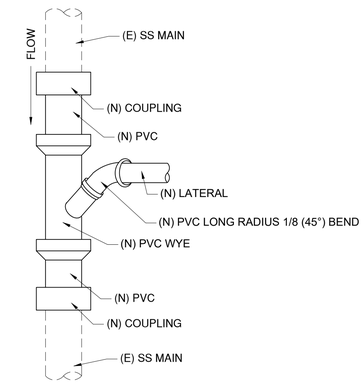


RAISE MANHOLE 7/D2
SCALE: NTS



NOTES:
1. EXCAVATIONS SHALL BE BACKFILLED PER DETAIL 1/D1.
2. REFER TO SPECIFICATION SECTION 02700 FOR COUPLINGS.
3. LATERAL SIZE AND MATERIAL IS BASED ON CCTV INSPECTION. CONTRACTOR SHALL CONFIRM (E) PIPE MATERIAL AND SIZE.

SEWER LATERAL EXTENSION 8/D2
SCALE: NTS



NOTES:
1. EXCAVATIONS SHALL BE BACKFILLED PER DETAIL 1/D1.
2. REFER TO SPECIFICATION SECTION 02700 FOR COUPLINGS.

LATERAL CONNECTION 9/D2
SCALE: NTS

NO	REVISIONS	DATE	APPR
1	RECORD DRAWINGS	4/17/25	CLP
2			
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CITY OF BELMONT PUBLIC WORKS

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
2200 RANGE AVE, SUITE 201
SANTA ROSA, CA 95403
(707)548-4848

REGISTERED PROFESSIONAL ENGINEER
DURRAN L. PRICE
NO. 74912
CIVIL
STATE OF CALIFORNIA
05/10/24

DEPT. OF PUBLIC WORKS CCN 2024-631
SAN JUAN BLVD
SEWER CAPACITY IMPROVEMENT PROJECT
DETAILS

DATE: 5/13/24
SCALE: AS SHOWN
DESIGN: CLP
DRAWN: CLP
CHECKED: BLS

D2

SHEET: 11 OF 11

APPENDIX F

Standardization of Major Pump Station Equipment for Sewer Pump Stations

STANDARDIZATION OF MAJOR EQUIPMENT COMPONENETS FOR SEWER PUMP STATIONS

The Engineer hereby finds that it is necessary to specify standardized equipment for installation in all of the City's sewer pump stations in order to field test or experiment to determine the equipment's suitability for future use and in order to match existing equipment already in use in other sewer pump stations.

The Engineer further finds that standardizing the specific major components of the sewer pump stations would result in more efficient and reliable equipment operations, faster repair time on incidents that could result in sanitary sewer overflows (SSOs) through the use of common parts, and a reduction in on-going training costs. Standardization will also minimize spare and critical replacement parts inventory and costs.

Based on the foregoing criteria, the following specified standardized equipment shall be required for sewer pump stations.

- Flygt Submersible and Dry-Pit Submersible Pumps
- Flygt 4620 Wetwell Mixer
- Siemens Sitrans F M MAG 5100 Flow Meter
- Flygt MultiSmart Pump Station Controller with Flygt Cloud Based SCADA System
- Hydroranger 200 with XPS-15F level transducer
- Flygt ENM-10 Float Switches
- Eaton S811 Starters
- TESCO Control Panel, Service Panel, and Pump Termination Cabinet

The following standardized equipment items for sewer pump station are included in this project. They are described in detail in the Project Technical Specifications as listed below:

• Flygt Pumps	Section 11312 – Submersible Pumps
• Flygt Wetwell Mixer	Section 11220 - Submersible Direct Drive Mixer
• Siemens Flow Meter	Section 13421 - Magnetic Flow Meters
• Flygt Pump Controller	Section 17100 – Control Panel and Panel Mounted Equipment
• Hydroranger Level Controller	Section 17100 – Control Panel and Panel Mounted Equipment
• Flygt Float Level Switches	Section 17100 – Control Panel and Panel Mounted Equipment
• Eaton Starters	Section 17100 – Control Panel and Panel Mounted Equipment
• TESCO Control Panel	Section 17100 – Control Panel and Panel Mounted Equipment
• TESCO Service Panel	Section 16402 – Service Panel
• TESCO Pump Termination Cabinet	Section 16411 – Pump Termination Cabinet

APPENDIX G

PG&E PM Drawings

(to be added once received)

STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Daniel Matthews, Assistant Civil Engineer, 650-637-2985, dmatthews@belmont.gov
Agenda Title:	Belmont Creek Habitat Maintenance and Monitoring Project– Amendment #1
Agenda Action:	Motion

Recommendation

Motion to authorize the City Manager to negotiate and execute Amendment #1 with Hanford ARC for the Belmont Creek Habitat Maintenance and Monitoring Project for the installation of animal exclusion caging around new plantings in the amount not to exceed $29,009, for a total contract amount not to exceed $96,809, and authorize the City Manager to negotiate and execute additional contract amendments up to a total contract amount not to exceed $106,809, if needed.

Strategic Focus Area

Infrastructure and Mobility

Background

The Belmont Creek Restoration Project, completed in late 2025, restored over 500 feet of Belmont Creek through Twin Pines Park. The project regraded and stabilized previously eroded and hazardous creek banks and included installation of over 2,000 plants to enhance habitat and ensure long-term bank stability. As a condition of the Urban Streams Restoration Program (USRP) grant funding from the Department of Water Resources, the City is required to implement a habitat monitoring and maintenance program to the project meets performance and plant establishment requirements.

In January, the City Council accepted the Belmont Creek Restoration Project and authorized initiation of the Belmont Creek Habitat Maintenance and Monitoring Project. Following a competitive solicitation of proposals from qualified vendors, the City entered into a contract with Hanford ARC for maintenance services, with monitoring provided by the original project designer, Restoration Design Group, in the amount of $67,800.

Analysis

Recent site inspections indicate the project site is performing well and as intended. However, both the maintenance vendor and monitoring team have observed signs of deer feeding on newly installed vegetation along the corridor. If left unaddressed, this could reduce plant survival, compromise the long-term stability of the bioengineered creek banks and affect the City's ability to meet USRP grant requirements.

To address this issue, staff recommends installing animal exclusion caging around new plantings until vegetation is fully established. The proposed work includes approximately 2,700 linear feet of caging along the length of the project corridor. Timely installation is critical to protect newly established vegetation during the current establishment period. This work was not included in the original project scope and exceeds the resource capacity of existing Parks maintenance resources. Staff requested a quote from Handford ARC, as the project contractor with the greatest familiarity with site conditions and the ability to complete the work efficiently.

Hanford ARC submitted a quote of $29,009 for labor and materials required for installation. Based on staff's review of unit costs and comparable work, the pricing is deemed reasonable. Therefore, staff requests that the City Council authorize the City Manager to execute a contract amendment in an amount not to exceed $29,009, bringing the total contract amount not to exceed $96,809.

To allow for a more expedient response to unforeseen field conditions found during regular monitoring and inspection, staff also request that the City Council authorize the City Manager to execute additional amendments up to a total contract amount not to exceed $106,809 to allow for a 10% contingency.

Alternatives

1. Refer back to staff for additional information
2. Do not install exclusion caging (risk to vegetation and grant compliance)

Attachments

A. Quote for Exclusion Caging

Fiscal Impact

☐ No Fiscal Impact

☒ Funding Source Confirmed: The initial five-year maintenance cost of $298,000 was budgeted under Capital Improvement Program (CIP) Belmont Creek Habitat Monitoring and Maintenance Plan Project No. 3246 to cover the anticipated cost of maintenance and monitoring. Staff will account for these unforeseen costs within the project budget as part of next fiscal year's budget and five-year CIP plan cycle.

Source:	**Purpose:**	**Public Outreach:**
Staff	Council Vision/Priority	Posting of Agenda

STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Daniel Matthews, Assistant Engineer, dmatthews@belmont.gov, (650)-637-2985
Agenda Title:	Parking and Traffic Safety Committee – Cipriani Elementary School Loading Zone
Agenda Action:	Motion

Recommendation

Motion to approve the Parking and Traffic Safety Committee (PTSC) recommendation to convert eight existing angled parking stalls and adjacent curb space in front of Cipriani Elementary School from unrestricted parking to a passenger loading zone (8:00 AM to 5:00 PM on school days), allow unrestricted parking at all other times, and reconfigure the curb space from angled to parallel parking to provide ten parking spaces.

Strategic Focus Area

Infrastructure and Mobility

Background

The Parking and Traffic Safety Committee (PTSC), composed of representatives from the Public Works, Police, and San Mateo Consolidated Fire Departments, receives and reviews traffic calming, traffic safety, and parking requests from members of the community. Belmont-Redwood Shores School District (BRSSD) requested that PTSC evaluate potential curb management improvements along Buena Vista Avenue in front of Cipriani Elementary School and to consider converting existing angled parking to a loading zone to improve traffic flow and enhance student pedestrian safety during school pick-up and drop-off periods.

Analysis

Traffic congestion during student pick-up and drop-off times at Cipriani Elementary School extends onto adjacent streets. In absence of a formal loading zone, vehicles stop in informal locations, creating conflicts between vehicles and pedestrians and reducing overall traffic flow.

The existing frontage consists of eight unrestricted angled parking stalls, which are primarily used by school employees during school hours. PTSC evaluated converting this frontage to a dedicated passenger loading zone from 8:00 AM to 5:00 PM on school days to better manage curb space during peak periods.

The proposed change would:

- Formalize student pick-up and drop-off activity
- Increase curb turnover during peak periods
- Improve traffic circulation along Buena Vista Avenue

- Reduce unsafe loading practices

As part of the project, the curb would be reconfigured from angled to parallel parking. This reconfiguration would provide ten parking spaces along the frontage during non-school hours, resulting in a net two parking spaces. The improvements would also include installation of appropriate signage and curb coloring to clearly designate the loading zone and support enforcement of the time-based restrictions.



Figure 1 - Aerial view of proposed changes to parking.

To offset the loss of employee parking during school hours, BRSSD has proposed expanding its rear employee parking lot by eight spaces. Staff recommends that implementation of the loading zone be contingent upon completion of these off-street improvements to minimize potential parking spillover onto nearby residential streets.

At a PTSC hosted community meeting on March 17, 2026, BRSSD's proposal and PTSC's recommendations received generally positive support from residents of the surrounding neighborhood. Residents acknowledged existing traffic conditions during school hours and generally supported efforts to improve student pedestrian safety and traffic circulation. Other community comments regarding potential safety improvements near the intersection of Monserat Avenue and Buena Vista Avenue will be evaluated separately by City staff.

If approved, improvements would be constructed during the school's summer break to minimize disruption. Staff will monitor operations during the 2026–2027 school year and return with recommendations if further adjustments are needed. Overall, the proposed loading zone and parking reconfiguration are expected to improve safety and traffic operations along the school frontage while maintaining and slightly increasing parking supply, with time-based restrictions ensuring efficient use of the curb during peak school periods and availability for general parking at other times.

Alternatives

1. Refer back to staff for information
2. Take no action

Attachments

A. None

Fiscal Impact

☐ No Fiscal Impact

☒ Funding Source Confirmed: Current fiscal year's operating budget in the Street Maintenance Fund (Account 231-3-701-8351) provides budget for minor improvements recommended by PTSC

Source:	**Purpose:**	**Public Outreach:**
Staff	Discretionary Action	Posting of Agenda

STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Bozhena Palatnik, Public Works, (650) 595-7463, bpalatnik@belmont.gov
Agenda Title:	Hillcrest Sinkhole Emergency Repair Project
Agenda Action:	Resolution

Recommendation

Adopt a resolution ratifying the existence of an emergency that required the immediate repair of four sinkholes and related stormwater infrastructure within an easement near Hillcrest Drive; ratifying the City Manager's authorization to proceed with the emergency work without competitive bidding; ratifying the City Manager's execution of a contract with Casey Construction, Inc. in the amount of $102,520; and authorizing payment for the completed emergency repair work..

Strategic Focus Area

Infrastructure and Mobility

Background

On January 6, 2026, the property owners at 3631 Hillcrest Drive notified the City of two rapidly developing sinkholes within the storm drain easement adjacent to their home. Public Works staff inspected the site and identified damage to the storm drain line at both locations, along with a third sinkhole further downhill. A fourth sinkhole was subsequently observed closer to Salson Trail Open Space, significantly increasing the urgency of the situation.

The adjacent property had recently completed foundation stabilization work in late 2025, including installation of steel push piers in close proximity to the storm drain line. While the work was permitted and finalized in December 2025, its proximity to the pipeline was noted during the assessment.

The City engaged Schaaf & Wheeler to evaluate the damage and prepare repair plans, while simultaneously contacting contractors for immediate availability. Design was completed on January 29, 2026, recommending slurry backfill of sinkholes, localized pipe repairs, and installation of a concrete collar at the downstream end. Casey Construction, Inc., a contractor experienced with similar local conditions, provided a proposal of $102,520 and was able to mobilize immediately to complete the work.

Staff determined that immediate repair of the storm drain line and four sinkholes was necessary to prevent ongoing subsurface erosion, pipe failure, and potential hillside collapse. The presence of active soil loss and voids around the pipe, combined with continued rain events, created a high risk of rapid sinkhole expansion, slope instability, and potential damage to adjacent properties at 3631 and 3627 Hillcrest Drive. Delaying repairs to complete a competitive bidding process would have significantly increased public safety risks and the likelihood of further system failure.

Based on these conditions, the City Manager determined that the emergency would not permit the delay associated with competitive bidding and authorized immediate repair work in accordance with the Consultant's design and the Contractor's proposal. The work required full and immediate completion to stabilize the system and eliminate active subsurface voids.

The Contractor completed the emergency repairs by February 5, 2026, within 30 days of initial notification, with final restoration, erosion control, and punch list work completed by February 13, 2026.

Analysis

Given the emergency nature of the project, its proximity to residential properties, and potential risk, staff relied on Belmont City Code Section 2-29(m)(1)(a), which authorizes the City Manager to enter into a contract without competitive bidding in the event of an emergency. Staff determined that all required findings were met, including the existence of an emergency, the need for immediate action, a direct nexus between the work and the emergency, and that the situation would not permit delay associated with the City's purchasing requirements.

The City Manager approved proceeding with the emergency work on January 27, 2026. Due to the urgency and rapid completion of the work within nine calendar days, a formal written contract with the Contractor was not completed prior to completion.

Accordingly, staff recommends that the City Council ratify the existence of the emergency, ratify the City Manager's authorization to proceed without competitive bidding, authorize execution of a contract with Casey Construction, Inc. for the completed work, and authorize payment to the contractor in accordance with Public Contract Code 22050.

Alternatives

1. Take no action.
2. Refer back to staff for additional information

Attachments

A. Resolution
B. Proposal from Casey Construction, Inc. to complete the emergency project.
C. Project Plans

Fiscal Impact

☐ No Fiscal Impact

☒ Funding Source Confirmed: Funding in the amount of $102,520 comes from the Capital Improvement Program (CIP) Hillcrest Sinkhole Emergency Repair Project #6060, funded by the Storm Drainage Fund.

Source:	**Purpose:**	**Public Outreach:**
Staff	Statutory/Contractual Requirement	Posting of Agenda

RESOLUTION NO. 2026 –

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BELMONT RATIFYING EMERGENCY SINKHOLE REPAIRS AND AUTHORIZING CONTRACT FOR HILLCREST DRIVE EASEMENT

WHEREAS, on January 6, 2026, multiple sinkholes were discovered along a storm drain alignment within an easement near 3631 Hillcrest Drive, posing an immediate threat to public health, safety, and critical infrastructure; and,

WHEREAS, storm drain failure and the associated four sinkholes created an urgent condition involving active soil loss and potential ground instability, posing a risk to adjacent properties and to the integrity of the storm drain system; and,

WHEREAS, staff contacted an on-call civil engineering design firm, Schaaf & Wheeler, ("Consultant") to visit the location of sinkholes and provide civil and geotechnical recommendations to repair them; and,

WHEREAS, in late January 2026, the Consultant completed the design, and staff contacted local contractor ("Contractor") with experience in emergency work who provided a proposal to conduct these repairs in the amount of $102,520; and

WHEREAS, on January 27, 2026, the City Manager determined that an emergency existed that required immediate action to prevent further failure of the storm drainage system and potential damage to public and private property, the contract action proposed to be taken was directly related to resolving the emergency, and that the emergency would not permit a delay resulting from compliance with the Purchasing System;

WHEREAS, under California Public Contract Code Section 22050 a public agency may repair or replace a public facility, take any directly related and immediate action required by that emergency, and procure the necessary equipment, services, and supplies for those purposes, without giving notice for bids to let contracts; and,

WHEREAS, delaying repairs to complete a competitive bidding process would have increased the risk of further sinkhole formation, slope instability, and potential public safety hazards, particularly during ongoing and forecasted rain event; and,

WHEREAS, the emergency would not permit the delay associated with a competitive bid process as immediate action was necessary to respond to the emergency and prevent it from worsening; and,

WHEREAS, the emergency work could not be deferred or partially completed, as full repair of the sinkholes and stabilization of the storm drain system was necessary to address the underlying conditions and prevent continued erosion and potential failure of the surrounding hillside; and,

WHEREAS, the Contractor completed the emergency repair work by February 5, 2026, which is 30 calendar days from the day that staff was notified by the property owner of the initial

issue, with final restoration, erosion control, and punch list work completed by February 13, 2026.

NOW, THEREFORE, the City Council of the City of Belmont resolves as follows:

SECTION 1. The need to prevent further failure of the storm drainage system and potential damage to public and private property was an emergency requiring immediate action, the repairs to the storm drain system were necessary to respond to the emergency and could not be delayed by the time to complete the competitive bid process without exacerbating active soil loss, potential for ground instability, risk to adjacent properties, and further risk to the integrity of the storm drain system.

SECTION 2. The City Manager was authorized to proceed with the work as provided in Public Contract Code section 22050(b) without giving notice for bids to let contracts as the emergency would not permit a delay resulting from a competitive solicitation for bids and the action was necessary to respond to the emergency.

SECTION 3. The City Manager is authorized to execute a contract with Casey Construction, Inc. for the emergency repair work in the amount of $102,520, and pay for the completed emergency work.

* * *

ADOPTED April 14, 2026 by the City of Belmont City Council by the following vote:

Ayes:

Noes:

Absent:

Abstain:

ATTEST:

_____
City Clerk

_____
Mayor

APPROVED AS TO FORM:

_____
City Attorney

CASEY CONSTRUCTION
INC.
619 Sylvan Way
Emerald Hills, CA 94062
Tel: (650) 369-1876, Fax: (650) 366-8578
Email: office@caseyconstructioninc.com

City of Belmont

Revised Quote
January 26, 2026

Dear Bozhena and Ryan,

Re: Slip line 16” @ 3631 Hillcrest Dr

Please find attached cost to install approx. 308LF of 16” DR17 HDPE inside Ex. 18” deteriorated CMP. It appears there are no factory bends on the run however in the absence of CCTV we are unable to verify. Quote is based on this information. Revised cost to include approx. 74 yds CLSM per plan and details provided. Also, included cut off wall.

Total Cost = $95,150

Note: Please let me know asap as we have pipe on hold with a 2-day lead for delivery.

Thank you,
Gerry McGrillen
Casey Construction Inc.

CASEY CONSTRUCTION
INC.
619 Sylvan Way
Emerald Hills, CA 94062
Tel: (650) 369-1876, Fax: (650) 366-8578
Email: office@caseyconstructioninc.com

City of Belmont

February 4, 206

Dear Bozhena and Ryan,

Re: Slip line 16” @ 3631 Hillcrest Dr: Revised Extra Cost

Please find revised extra cost to install an extra 25LF completed quicker than expected.

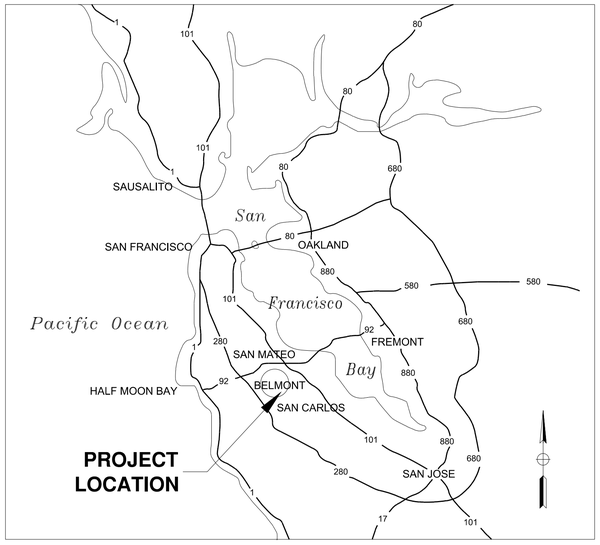
Total Extra Cost = $7,370

Thank you,
Gerry McGrillen
Casey Construction Inc.

CITY OF BELMONT

SAN MATEO COUNTY, CALIFORNIA

HILLCREST SINKHOLE EMERGENCY REPAIR PROJECT



VICINITY MAP

NO SCALE

DRAWING INDEX

SHEET #	DRAWING #	TITLE
1	T1	TITLE SHEET
2	T2	NOTES, LEGEND, & ABBREVIATIONS
3	C1	SITE PLAN
4	D1	DETAILS

CITY COUNCIL

MAYOR	JULIA MATES
VICE MAYOR	CATHY JORDAN
COUNCILMEMBER	ROBIN PANG-MAGANARIS
COUNCILMEMBER	GINA LATIMERLO
COUNCILMEMBER	TOM MCCUNE

STAFF

CITY MANAGER	AFSHIN OSKOUI
DIRECTOR OF PUBLIC WORKS	EDRIC KWAN, PE
CITY ATTORNEY	SCOTT RENNIE
CITY CLERK	JOZI PLUT

APPROVED BY CITY COUNCIL ON _____

_____

EDRIC KWAN, PE - DIRECTOR OF PUBLIC WORKS

USA AGENCY INDEX

CITY OF BELMONT - PUBLIC WORKS	(650) 595-7427
CITY OF BELMONT - POLICE	(650) 595-7400
AT&T	(800) 210-2355
PACIFIC GAS & ELECTRIC	(800) 743-5000
MID PENINSULA WATER DISTRICT	(650) 591-8941
COMCAST	(800) 266-2278
RECOLOGY	(650) 595-3900
SAN MATEO COUNTY TRANSIT DISTRICT	(800) 660-4287

CONTACT 811 BEFORE YOU DIG — 811 — SAFE DIGGING PARTNER

REGISTERED PROFESSIONAL ENGINEER — BENJAMIN L. SCHAAF — No. 86410 — CIVIL — STATE OF CALIFORNIA

NO	REVISIONS	DATE	APPR
1			
2			
3			
4			

SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
(707) 523-4846

HILLCREST EMERGENCY SINKHOLE REPAIR

TITLE SHEET

DATE: 01/29/2026
SCALE: AS SHOWN
DESIGN: JTV
DRAWN: JTV
CHECKED: BLS

SHEET 1 OF 4

GENERAL NOTES

1. CONTRACTOR SHALL MAINTAIN A COPY OF THE PROJECT PLANS ON THE JOBSITE AT ALL TIMES.
2. ALL WORK SHALL CONFORM TO THE PROJECT PLANS AND THE CITY OF BELMONT STANDARD DETAIL DRAWINGS FOR CONSTRUCTION AND OTHER SPECIFICATIONS REFERENCED THEREIN.
3. CONTRACTOR SHALL CONDUCT WORK IN ACCORDANCE WITH THE GREENBOOK STANDARD SPECIFICATIONS, CALTRANS STANDARD SPECIFICATIONS, AND CITY'S SPECIFICATIONS.
4. NO CHANGE TO THE PROJECT IMPROVEMENT PLANS SHALL BE PERMITTED WITHOUT PRIOR APPROVAL BY THE CITY ENGINEER AND DESIGN ENGINEER.
5. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CITY AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT TO THE EXTENT ARISING FROM THE SOLE NEGLIGENCE OF THE CITY OR ENGINEER.
6. CONTRACTOR SHALL SECURE A NO FEE ENCROACHMENT PERMIT FROM THE CITY ENGINEERING DEPARTMENT PRIOR TO COMMENCEMENT OF WORK.
7. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, PIPE SIZES, MATERIAL, ETC. PRIOR TO CONSTRUCTION.
8. IF FIELD ELEVATIONS AND MEASUREMENTS ARE SIGNIFICANTLY DIFFERENT THAN WHAT IS SHOWN ON THE PLANS, CONTRACTOR SHALL NOTIFY THE CITY PRIOR TO PROCEEDING WITH CONSTRUCTION OF THE IMPROVEMENTS. FIELD ADJUSTMENTS MAY BE NECESSARY TO PROVIDE ADEQUATE PIPE SLOPE, PIPE COVER, AND TO CONSTRUCT THE IMPROVEMENTS.
9. NOT ALL EXISTING UTILITIES ARE SHOWN ON THE DRAWINGS. THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE AND BASED ON UTILITY MAPS PROVIDED BY THE CITY, AT&T, COMCAST, AND PG&E. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCURATELY LOCATE ALL EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES THAT MAY BE AFFECTED BY NEW FACILITIES IN THIS CONTRACT. REPORT POTENTIAL CONFLICTS TO THE CITY ENGINEER PRIOR TO EXCAVATING FOR NEW FACILITIES.
10. CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY OWNERS 48 HOURS PRIOR TO COMMENCEMENT OF WORK ADJACENT TO THE UTILITY. CONTACT UNDERGROUND SERVICE ALERT (USA) AT 1-800-227-2600.
11. THE CONTRACTOR SHALL NOTIFY, BY CIRCULAR, ALL BUSINESS ESTABLISHMENTS AND RESIDENCES LOCATED IN AREAS AFFECTED BY THE WORK ONE WEEK PRIOR TO START OF CONSTRUCTION. AT A MINIMUM, ALL RESIDENTS AND BUSINESS ESTABLISHMENTS WITHIN 100 FEET OF THE WORK AREAS SHALL BE NOTIFIED. A DRAFT OF THE CIRCULAR SHALL BE SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL.
12. ALL SURPLUS AND UNSUITABLE MATERIAL SHALL BE REMOVED FROM PUBLIC RIGHT-OF-WAY.
13. CONTRACTOR SHALL PROVIDE ADEQUATE DUST CONTROL AND KEEP MUD AND DEBRIS OFF THE PUBLIC RIGHT-OF-WAY AT ALL TIMES.
14. ALL TRENCHES AND EXCAVATIONS SHALL BE CONSTRUCTED IN STRICT COMPLIANCE WITH THE APPLICABLE SECTIONS OF CALIFORNIA AND FEDERAL O.S.H.A. REQUIREMENTS AND OTHER APPLICABLE SAFETY ORDINANCES. CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR TRENCH SHORING DESIGN AND INSTALLATION.
15. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT IN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE PERMITTED, EXCEPT AT LOCATION(S) APPROVED BY THE CITY TRAFFIC ENGINEER.
16. CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MEN, CONES OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH THE SPECIFICATIONS.
17. THE CONTRACTOR SHALL OBTAIN A PERMIT/WATER METER AND BACKFLOW FROM MID-PENINSULA WATER DISTRICT (MPWD) FOR CONSTRUCTION WATER OBTAINED FROM THE CITY HYDRANT, CALL (650) 591-8941, A FEE AND DEPOSIT WILL BE REQUIRED.
18. CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL PRIOR TO THE PRE-CONSTRUCTION MEETING.
19. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY. ALL EXCAVATIONS SHALL BE PLATED WITH NON-SKID PLATES WHEN INACTIVE. BARRICADES WITH LIGHTS SHALL DELINEATE CONSTRUCTION ZONE.
20. CONTRACTOR SHALL COMPLY WITH BEST MANAGEMENT PRACTICES OF CITY'S NPDES PERMIT FOR PROTECTION OF STORM WATER QUALITY.
21. VIDEOS OF THE PIPES TO BE REHABILITATED ARE ON FILE WITH THE DEPARTMENT OF PUBLIC WORKS.
22. RIM AND INVERT ELEVATIONS AND LENGTHS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND BASED ON UTILITY MAPS PROVIDED BY THE CITY, CCTV INSPECTION, AND FIELD MEASUREMENTS. THE CONTRACTOR SHALL VERIFY EXISTING GRADES AND CONSTRUCT (N) PIPES WITH CONTINUOUS SLOPE BETWEEN (E) MH INVERT ELEVATIONS.
23. CONTRACTOR SHALL RESTORE SURFACE TO PRE-CONSTRUCTION CONDITIONS.
24. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPLACE ALL STREET MONUMENTS, LOT CORNER PIPES, AND GRADE STAKES DISTURBED DURING THE PROCESS OF CONSTRUCTION AT THE DIRECTION OF THE CITY.
25. LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE. LOCATION OF WATER SERVICES ARE NOT SHOWN ON THE DRAWINGS BUT SHALL BE ASSUMED TO EXIST AT EACH PROPERTY. LOCATION OF GAS SERVICE CROSSINGS ARE NOT SHOWN ON THE PROFILES.
26. STATIONING AND DISTANCES IN PROFILES ARE APPROXIMATE BASED ON STRAIGHT HORIZONTAL DISTANCES FROM CENTER OF MANHOLE/INLET COVER.

LIMITED SITE ACCESS

1. SITE ACCESS IS EXTREMELY LIMITED IN LOCATIONS WHERE WORK IS OCCURRING IN BACKYARDS AND OUTSIDE OF THE STREET RIGHT OF WAY. ACCESS IS GENERALLY LIMITED TO FOOT TRAFFIC AND HAND HELD EQUIPMENT AT THESE LOCATIONS. CONTRACTOR SHALL VISIT ALL SITES AND OBSERVE EXISTING CONDITIONS FROM THE STREET RIGHT OF WAY DURING BIDDING TO REVIEW PROJECT LOCATIONS AND ACCESS RESTRICTIONS. CONTRACTOR SHALL CONSIDER ACCESS ISSUES AND LIMITATIONS WHEN BIDDING. NO ADDITIONAL COMPENSATION WILL BE MADE FOR DIFFICULT AND LIMITED SITE ACCESS ISSUES.

POTHOLING

1. THE CONTRACTOR SHALL POTHOLE ALL UTILITIES THAT MAY CONFLICT WITH STORM ALIGNMENT AS FIRST ORDER OF WORK.

MATERIALS

1. ALL DISTURBED PAVEMENT STRIPING AND MARKERS SHALL BE REPLACED BY THE CONTRACTOR. ALL DISTURBED MARKINGS AND STENCILS SHALL BE REPLACED IN FULL. ALL STRIPING, MARKINGS AND STENCILS SHALL BE THERMOPLASTIC. PAVEMENT STRIPING AND MARKINGS SHALL ADHERE TO THE CALTRANS STANDARD SPECIFICATIONS SECTIONS 84 AND 85.
2. NEW HDPE STORM DRAIN PIPE SHALL HAVE A NOMINAL IRON PIPE SIZE (IPS) OUTSIDE DIAMETER. PIPE SHALL BE DIMENSION RATIO (DR) 17. PIPE SHALL BE PRODUCED TO THE SPECIFICATIONS OF ASTM F714. ALL JOINTS AND FITTINGS SHALL BE JOINED WITH BUTT HEAT FUSION. ALL INTERNAL BEADS FOR NEWLY JOINED HDPE PIPE SHALL BE REMOVED.
3. CONTROLLED LOW STRENGTH MATERIAL (CLSM) SHALL COMPLY WITH CALTRANS STANDARD SPECIFICATION SECTION 19-3 AND SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH BETWEEN 50 AND 100 PSI.

LEGEND

	EXISTING	PROPOSED
STORM DRAIN	(E)SD	SD
SANITARY SEWER	(E)SS	
WATER LINE	W	
GAS LINE	G	G
UNDERGROUND ELECTRICAL	UE	UE
FENCE		
SANITARY SEWER MANHOLE OR LAMPHOLE		
STORM DRAIN MANHOLE		
STORM DRAIN INLET		
PROPERTY LINE		
EASEMENT		
FLOW DIRECTION		
SINKHOLE		
EXCAVATION		
DETAIL REFERENCE		X / XX

ABBREVIATIONS

AB	AGGREGATE BASE
ABS	ACRYLONITRILE BUTADIENE STYRENE PIPE
AC	ASPHALTIC CONCRETE
ACP	ASPHALTIC CONCRETE PIPE
APPROX	APPROXIMATE
APN	ASSESSORS PARCEL NUMBER
ASPH	ASPHALT
CB	CATCH BASIN
CCTV	CLOSED CIRCUIT TELEVISION
CONC	CONCRETE
CDF	CONTROLLED DENSITY FILL
CLR	CLEARANCE
CMP	CORRUGATED METAL PIPE
CVR	COVER
CI	CAST IRON
CIP	CAST IRON PIPE
CIPP	CURED IN PLACE PIPE
CO	CLEANOUT
DEG	DEGREE
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DE	DRAINAGE EASEMENT
DEPT.	DEPARTMENT
DO	DOWN STREAM
E	EAST
ELEV, EL	ELEVATION
EXIST, (E)	EXISTING
FL	FLOW LINE
FM	FORCE MAIN
FRP	FIBER REINFORCED PLASTIC
FT	FOOT
GND	GROUND
GPM	GALLONS PER MINUTE
HB	HOSE BIB
HDPE	HIGH DENSITY POLYETHYLENE
HOR.	HORIZONTAL
I.D.	INSIDE DIAMETER
INV	INVERT
L	LENGTH
LF	LINEAR FOOT
LH	LAMPHOLE
LT.	LEFT
MH	MANHOLE
MAX	MAXIMUM
MIN	MINIMUM
MPWD	MID-PENINSULA WATER DISTRICT
(N)	NEW
N	NORTH
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
(P)	PROPOSED
PCC	PORTLAND CEMENT CONCRETE
PDWF	PEAK DRY WEATHER FLOW
PH	POTHOLE
PT	PRESSURE TREATED
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE PIPE
PWWF	PEAK WET WEATHER FLOW
Q	FLOW RATE
R	RADIUS
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
REINF.	REINFORCED, REINFORCING
REL	RELATIVE
REQD	REQUIRED
RT.	RIGHT
S	SOUTH, SLOPE
SD	STORM DRAIN
SDE	STORM DRAIN EASEMENT
SDR	STANDARD DIMENSION RATIO
SIM	SIMILAR
SPECS	SPECIFICATIONS
SS	STAINLESS STEEL, SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
SSLH	SANITARY SEWER LAMPHOLE
STA	STATION
STD	STANDARD
TFL	TOP OF FLOW LINE
TG	TOP GRATE
TYP	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
UP	UPSTREAM
VCP	VITRIFIED CLAY PIPE
VER.	VERTICAL
W	WEST, WATER
W/	WITH
X-ING	CROSSING

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN L. SCHAAF
No. 86430
CIVIL
STATE OF CALIFORNIA

NO	REVISIONS	DATE	APPR
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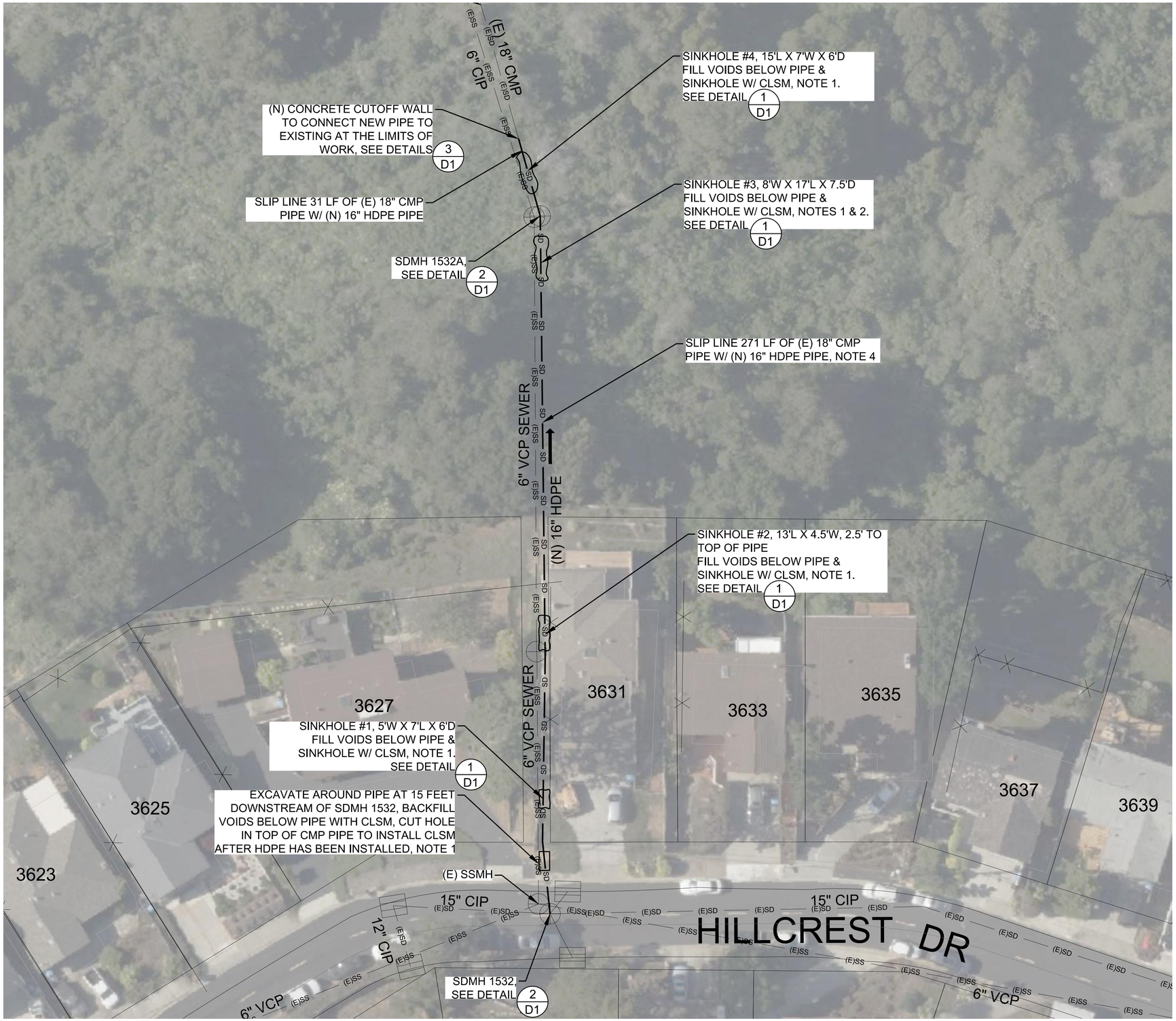
SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
(707) 523-4846

HILLCREST EMERGENCY SINKHOLE REPAIR

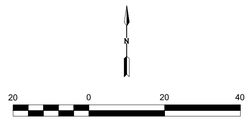
NOTES, LEGEND, AND ABBREVIATIONS

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SHEET
2 OF 4



PLAN
SCALE: 1" = 20'



SCALE: 1 INCH = 20 FEET

SHEET NOTES:

1. FILL SINKHOLE AND ALL VOIDS WITH CLSM TO 6" BELOW FINISH GRADE. MONITOR DOWNSTREAM SINKHOLES AND MANHOLES TO ENSURE FLOW OF CLSM IS CONTROLLED. CONTRACTOR SHALL POUR CLSM IN SHALLOW LIFTS TO AVOID PIPE FLOTATION AND UNCONTROLLED FLOW.
2. CONTRACTOR SHALL ADJUST EXISTING PIPE ALIGNMENT IN SINKHOLE #3 TO PROVIDE CONSTANT LINE & GRADE. INSTALL CMP PIPE COUPLING AS NECESSARY.
3. CONTRACTOR SHALL REMOVE TOP OF CMP PIPE IN ALL SINKHOLE AND EXCAVATION LOCATIONS TO PUMP CLSM INTO THE VOIDS BETWEEN THE CMP AND HDPE PIPE AND TO FILL THE VOIDS BELOW THE CMP PIPE. SEE NOTE 1.
4. CONTRACTOR SHALL PERFORM POST CONSTRUCTION CCTV INSPECTION OF ALL NEW PIPE. CCTV INSPECTION DATA SHALL BE SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL PRIOR TO FINAL PAYMENT.
5. CONTRACTOR SHALL INSTALL NATIVE SEED MIX AND BIODEGRADABLE EROSION CONTROL FABRIC ON ALL DISTURBED SURFACES UPON COMPLETION OF THE WORK.
6. CONTRACTOR SHALL PROVIDE SUBMITTALS FOR ALL MATERIALS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN L. SHUCK
No. 84157
CIVIL
STATE OF CALIFORNIA

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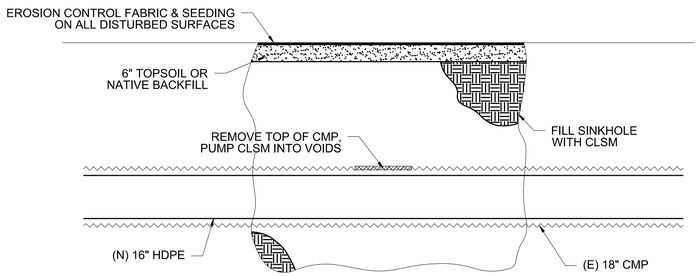
SCHAAF & WHEELER
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2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
(707) 523-4846

HILLCREST EMERGENCY SINKHOLE REPAIR

SITE IMPROVEMENT PLAN

DATE: 01/29/2026
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SHEET
3 OF 4

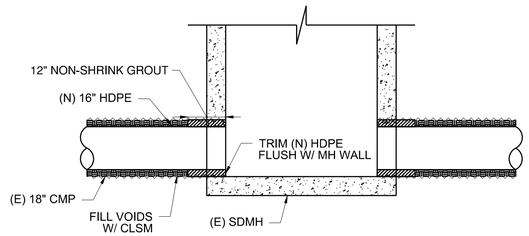


SINKHOLE REPAIR NOTES:

1. CONTRACTOR SHALL MONITOR THE DOWNSTREAM SINKHOLES & VOIDS DURING CLSM INSTALLATION.

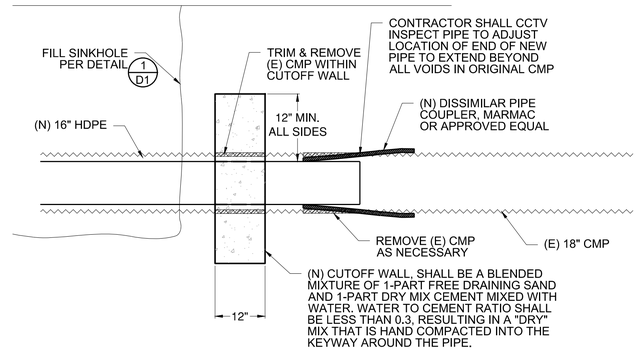
SINKHOLE REPAIR DETAIL 1/D1

NO SCALE



MANHOLE CONNECTION DETAIL 2/D1

NO SCALE



DISSIMILAR PIPE CONNECTION DETAIL 3/D1

NO SCALE

750

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN L. SHUCK
No. 86430
CIVIL
STATE OF CALIFORNIA

NO	REVISIONS	DATE	APPR
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SCHAAF & WHEELER
CONSULTING CIVIL ENGINEERS
2200 RANGE AVENUE, SUITE #201
SANTA ROSA, CA 95403
(707) 528-4448

HILLCREST EMERGENCY SINKHOLE REPAIR

DETAILS

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SHEET 4 OF 4

STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Tobi Liebermann, Housing and Economic Development Manager, tliebermann@belmont.gov
Agenda Title:	730 El Camino Real – Termination of 1995 Regulatory Agreement
Agenda Action:	Resolution

Recommendation

Adopt a resolution terminating the Regulatory Agreement and Declaration of Restrictive Covenants (Regulatory Agreement) dated March 1, 1995, and recorded March 13, 1995, between The Belmont Redevelopment Agency and Mercy Housing California for the property at 730 El Camino Real, and authorize the City Manager to execute all documents necessary to effectuate its termination.

Strategic Focus Area

Economic Development and Housing

Background

On February 24, 2026, City Council adopted Resolution 2026-07, making the required findings to authorize the transfer of 730 El Camino Real (Property) to Kainos Home and Training Center (Kainos). The action included approval of the Reuse Appraisal (33433 Report) and authorization for the City Manager to execute the necessary agreements to convey the property to Kainos for nominal purchase price of one dollar.

730 El Camino Real History

In 1995 the Belmont Redevelopment Agency (RDA) and Mercy Housing California (Mercy) entered into an agreement to purchase the Property from the RDA and rehabilitate it into a six-bed AIDS hospice project. The agreements included a Disposition and Development Agreement (DDA), the Regulatory Agreement, and a Development Loan Agreement in which the Agency made a loan of $325,000 to Mercy.

Mercy experienced difficulty in maintaining a service provider for the Property and requested that the Agency terminate its obligations under the DDA and the Loan Agreement by reconveying the Property back to the RDA. The RDA then exercised its right under the DDA and repurchased the Property and forgave the Loan upon reconveyance of the Project from Mercy to the Agency, subject to a County Loan. The County consented to the reconveyance of the Property to the Agency subject to the County Loan Documents, under certain terms and conditions. The County Loan and associated covenants were subsequently forgiven in 2025 based upon the City's request.

Upon reacquiring the Property, the Agency leased the Property to Kainos, who operates the property as a group home for independent living intellectually disabled individuals. Kainos has continuously leased the

property since 1999. At this time, the City is preparing to take the final steps to transfer the property to Kainos.

Analysis

The 1995 Regulatory Agreement for Property contains provisions which are no longer applicable, such as restricting the use to a licensed residential care facility for the chronically ill and requiring the project be operated for persons who have AIDS, or if no longer needed, for persons who are terminally ill.

Due to the inapplicability of certain provisions in the existing Regulatory Agreement, Staff recommends its termination. A new Regulatory Agreement will be recorded against the Property prior to its transfer to Kainos. The new agreement will include restrictions consistent with the continued use of the property as an independent living group home for developmentally disabled individuals, and will incorporate the requirements of Section 33433, including affordability and use restrictions for a term of 55 years.

Alternatives

1. Take no action, thereby keeping the 1995 Regulatory Agreement in place.
2. Return to staff for additional information.

Attachments

A. Resolution
B. 1995 Regulatory Agreement
C. Termination and Release of Regulatory Agreement Draft

Fiscal Impact

☒ No Fiscal Impact
☐ Funding Source Confirmed:

Source:	**Purpose:**	**Public Outreach:**
Staff	Statutory/Contractual Requirement	Posting of Agenda

RESOLUTION NO. 2026 –

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BELMONT AUTHORIZING THE TERMINATION OF A REGULATORY AGREEMENT DATED MARCH 1, 1995 REGARDING THE PROPERTY LOCATED AT 730 EL CAMINO REAL (APN 044-222-140)

WHEREAS, In 1995 the Belmont Redevelopment Agency (RDA) and Mercy Housing California (Mercy) entered into an agreement to purchase 730 El Camino Real (the "Property") from the RDA and rehabilitate it into a six-bed AIDS hospice project. The agreements included a Disposition and Development Agreement (DDA), a Regulatory Agreement, and a Development Loan Agreement to Mercy; and,

WHEREAS, Mercy experienced difficulty in maintaining a service provider for the Property and requested that the Agency terminate its obligations under the DDA and the Loan Agreement by reconveying the Property back to the RDA; and,

WHEREAS, On June 22, 1999, The RDA passed and adopted Resolution Number R.A. 330, approving execution and implementation of a repurchase agreement and lease; and,

WHEREAS, On June 22, 1999, City Council passed and adopted Resolution Number 8558, approving execution and implementation of a repurchase agreement and lease; and,

WHEREAS, Upon reacquiring the Property, the Agency leased the Property to Kainos Home and Training Center (Kainos), who operates the property as a group home for independent living intellectually disabled individuals; and,

WHEREAS, Kainos has continuously leased the property since 1999; and

WHEREAS, On February 24, 2026 City Council adopted Resolution 2026-07 which made findings to allow for the transfer of 730 El Camino Real (Property) to Kainos Home and Training Center (Kainos) including approval of a Reuse Appraisal (33433 Report) and granting authority to the City Manager to execute agreements necessary to sell the property for one dollar to Kainos; and,

WHEREAS, The Regulatory Agreement for the Property, executed in 1995, contains certain provisions which are no longer applicable or to the benefit of the City; and

WHEREAS, The City Council approved a new Regulatory Agreement for the property to be recorded at the time of transfer to Kainos which will restrict the property to its current use for a period of 55-years.

NOW, THEREFORE, the City Council of the City of Belmont resolves as follows:

SECTION 1. Adopt a resolution terminating the Regulatory Agreement and Declaration of Restrictive Covenants dated March 1, 1995 and recorded March 13, 1995 between the RDA and Mercy Housing California, regarding the 730 El Camino Real property and Authorize the City Manager to execute all documents necessary to terminate the Regulatory Agreement and

release it from title.

* * *

ADOPTED [Click to enter a date.] by the City of Belmont City Council by the following vote:

Ayes:

Noes:

Absent:

Abstain:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

City Attorney

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:

City of Belmont
Belmont City Hall
One Twin Pines Lane
Belmont, California 94002
Attn: City Manager

No fee document pursuant to
Government Code Section 27383 and 27388.1

THIS SPACE FOR RECORDERS USE ONLY

TERMINATION AND RELEASE OF REGULATORY AGREEMENT

(730 El Camino Real)

This Termination and Release of Regulatory Agreement (the "Release"), dated as of March ___, 2026, and effective as of recordation, is made by the City of Belmont, as the housing successor to the former Redevelopment Agency of the City of Belmont (the "City"). This Release pertains to that certain real property located at 730 El Camino Real, in the City of Belmont, County of San Mateo, State of California (the "Property") described in Exhibit A attached hereto, which exhibit is hereby incorporated herein by this reference.

WHEREAS, the City and Mercy Housing Corporation, a California nonprofit public benefit corporation ("Mercy") previously entered into that certain Disposition and Development Agreement dated February 15, 1995 ("DDA"), pursuant to which the City conveyed the Property to Mercy to rehabilitate and develop a six-bed AIDS-Hospice project. The City and Mercy also entered into that certain Development Loan Agreement dated as of March 1, 1995, pursuant to which the City made a loan in the amount of $325,000 to Mercy (the "Loan"), evidenced by a promissory note and secured by a Deed of Trust dated March 1, 1995 and recorded against the Property on March 13, 1995 as instrument number 95024961 in the Official Records of San Mateo County ("Official Records"), and entered into that certain Regulatory Agreement and Declaration of Restrictive Covenants dated March 1, 1995 and recorded on March 13, 1995 against the Property as Instrument Number 95024962 in the Official Records (the "Regulatory Agreement");

WHEREAS, pursuant to that certain Repurchase Agreement and Modification and Assignment of County Loan Agreement and County Promissory Note dated October 8, 1999 by and among the City, the County of San Mateo, a subdivision of the State of California, and Mercy and recorded as instrument number 1999-207804 in the Official Records (the "Repurchase Agreement"), Mercy terminated its obligations under the DDA pursuant to a no-fault termination and the City reacquired the Property, terminated Mercy's obligations under the DDA, forgave the Loan, and, pursuant to Section 2.3 thereof, agreed to execute any document necessary to remove the liens of the DDA and the Regulatory Agreement from the title of the Property;

WHEREAS, pursuant to the Repurchase Agreement, the City desires to enter into this Release to release the existing Regulatory Agreement as an encumbrance from the Property;

WHEREAS, concurrently herewith the City is selling the Property to Kainos Home & Training Center for the Developmentally Disabled, a California nonprofit public benefit corporation ("Kainos"), and City and Kainos will enter into a Regulatory Agreement and Declaration of Restrictive Covenants to restrict the use of the property, on which is located a single family home, to use by developmentally disabled individuals who are low-income households, and enter into certain related documents; and

WHEREAS, notwithstanding anything to the contrary, the City, as housing successor, determines that the sale of the Property does not make this an "assisted housing development" under California Government Code Section 65863.10 and that the Regulatory Agreement may be terminated without regard to the noticing requirements therein.

NOW, THEREFORE, the City hereby acknowledges and agrees that the Regulatory Agreement is terminated and the City hereby releases the Property from the restrictions of the Regulatory Agreement and directs that the Regulatory Agreement be removed as an encumbrance on the Property.

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IN WITNESS WHEREOF, the City hereby executes this Release as of the date first written above.

CITY:

CITY OF BELMONT,
a municipal corporation

By: _____
Afshin Oskoui, City Manager

Dated: _____

ATTEST:

By: _____
Jozi Plut, City Clerk

Dated: _____

APPROVED AS TO FORM:

By: _____
Scott Rennie, City Attorney

Dated: _____

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of _____)

On _____, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

EXHIBIT A

For APN/Parcel ID(s): 044-222-140

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF BELMONT, COUNTY OF SAN MATEO, STATE OF CALIFORNIA AND IS DESCRIBED AS FOLLOWS:

LOT 5, AS DELINEATED UPON THAT CERTAIN MAP ENTITLED "SWIFTS SUBDIVISION OF LOT NO. 13 AND A PORTION OF LOT 13, MEZES RANCH, NEAR BELMONT, SAN MATEO COUNTY, CALIFORNIA", FILED FOR RECORD IN THE OFFICE OF THE RECORDER OF THE COUNTY OF SAN MATEO, STATE OF CALIFORNIA, ON FEBRUARY 15TH, 1897 IN BOOK "A" OF MAPS, AT PAGE 57, AND COPIED INTO BOOK 2 OF MAPS, AT PAGE 86.

EXCEPTING THEREFROM THE NORTHEASTERLY PORTION OF SAID LOT DESCRIBED IN DEED TO THE STATE OF CALIFORNIA FOR HIGHWAY PURPOSES, DATED AUGUST 22, 1934 AND RECORDED SEPTEMBER 12, 1932, IN BOOK 632, AT PAGE 184, OF OFFICIAL RECORDS.

J.P.N. 044-022-222-14a

If this document contains any restriction based on age, race, color, religion, sex, gender, gender identity, gender expression, sexual orientation, familial status, marital status, disability, veteran or military status, genetic information, national origin, source of income as defined in subdivision (p) of Section 12955, or ancestry, that restriction violates state and federal fair housing laws and is void, and may be removed pursuant to Section 12956.2 of the Government Code by submitting a "Restrictive Covenant Modification" form, together with a copy of the attached document with the unlawful provision redacted to the county recorder's office. The "Restrictive Covenant Modification" form can be obtained from the county recorder's office and may be available on its internet website. The form may also be available from the party that provided you with this document. Lawful restrictions under state and federal law on the age of occupants in senior housing or housing for older persons shall not be construed as restrictions based on familial status. Gov. Code Sec. 12956.1(b)(1)

Any person who believes that this document contains an unlawful restrictive covenant as described above may submit to the County Recorder a completed Restrictive Covenant Modification form. A complete copy of the original document must be attached to the Restrictive Covenant Modification form, with the unlawful language redacted. After submission to the Recorder, the form and attached document will be reviewed by County Counsel, and if the attached document properly redacts an unlawful covenant, the form and attached document will be recorded. If you submit a request to record a modification document, you must provide a return address in order for the County Recorder to notify you of the action taken by the County Counsel regarding the form. Gov. Code Sec. 12956.2(a)(1), (b)(1), (c)

RECORDING REQUESTED BY:

WHEN RECORDED MAIL TO:

THIS SPACE FOR RECORDER'S USE ONLY

RESTRICTIVE COVENANT MODIFICATION

The following reference document contains a restriction based on age, race, color, religion, sex, gender, gender identity, gender expression, sexual orientation, familial status, marital status, disability, veteran or military status, genetic information, national origin, source of income as defined in Section 12955 of the Government Code, or ancestry, that violates state and federal fair housing laws and is void. Pursuant to Section 12956.2 of the Government Code, this document is being recorded solely for the purpose of redacting and eliminating that restrictive covenant as shown on page(s) ___ of the document recorded on _____(date) in book _____ and page _____ or instrument number _____ of the official records of the County of _____, State of California.

Attached hereto is a true, correct and complete copy of the document referenced above, with the unlawful restrictive covenant redacted.

This modification document shall be indexed in the same manner as the original document being modified, pursuant to subdivision (d) of Section 12956 of the Government Code.

The effective date of the terms and conditions of the modification document shall be the same as the effective date of the original document.

Signature of Submitting Party: _____ Date: _____

Print Name: _____

_____ County Counsel, or their designee, pursuant to paragraph (1) of subdivision (b) of Section 12956.2 of the Government Code, hereby states that it has determined that the original document referenced above contains an unlawful restriction and this modification may be recorded.
Or
_____County Counsel, or their designee, pursuant to paragraph (1) of subdivision (b) of Section 12956.2 of the Government Code, finds that the original document does not contain an unlawful restriction, or the modification document contains modifications not authorized, and this modification may not be recorded.

_____
County Counsel
By:
Date:

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:

Belmont Redevelopment Agency
1365 Fifth Street
Belmont, California 94002
Attention: Executive Director

No fee for recording pursuant to
Government Code Section 27383

OFFICIAL RECORDS OF
SAN MATEO COUNTY
ASSESSOR-COUNTY CLERK-RECORDER
WARREN SLOCUM

Recorded at Request of
OLD REPUBLIC TITLE INSURANCE COMP

95-024962 03/13/95 02:51

Recording Fee: 0 BDUANE

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REGULATORY AGREEMENT AND DECLARATION OF RESTRICTIVE COVENANTS

This Regulatory Agreement and Declaration of Restrictive Covenants (the "Agreement") is made and entered into as of this 1st day of March, 1995 by and between the Belmont Redevelopment Agency, a public body corporate and politic ("Agency") and Mercy Housing California, a California nonprofit public benefit corporation ("Developer").

RECITALS

A. Capitalized terms used in these Recitals shall have the meanings set forth in Article 1 of this Agreement, or in the Disposition and Development Agreement ("DDA"), as applicable.

B. The Agency and the Developer entered into a DDA under which the Agency will convey the Property to the Developer in connection with the Project.

C. The Agency and the Developer entered into that certain Development Loan Agreement dated as of March 1, 1995 ("Development Loan Agreement") in which the Agency agreed to loan to the Developer funds to finance the construction and development of the Project ("Development Loan").

D. The Loan is being provided to the Developer from funds obtained from a portion of the tax increment generated within the Los Costanos Community Development Project Area (the "Project Area") and deposited in the Agency's Low and Moderate Income Housing Fund (the "Housing Fund").

E. The proceeds of the Loan will help achieve financial feasibility for the renovation of the improvements on the Property and will enable the six units to be affordable to Very Low Income Persons ("Assisted Units"). This Agreement is entered into in fulfillment of the requirements of: (1) Health and Safety Code Sections 33334.2 and 33334.3, regarding use of money from the Housing Fund; and (2) Health and Safety Code Section 33413(b)(2), regarding satisfaction of the Agency's project area housing production obligation for the Project Area.

F. As further consideration for the DDA and the Loan and to further the interests of the Agency, the Developer has agreed to enter into and record this Agreement. The purpose of this Agreement is to regulate and restrict the occupancy, rents, operation, ownership, and management of the Project. The covenants in this Agreement are intended to run with the land and be binding on the Developer and its successors and assigns in the Property.

THEREFORE, the Agency and the Developer hereby agree as follows.

ARTICLE 1
DEFINITIONS

1.1 Definitions

When used in this Agreement, the following terms shall have the respective meanings assigned to them in this Article 1.

(a) "Adjusted Income" shall mean the total anticipated annual income of all persons in a household, as calculated in accordance with 25 California Code of Regulations Section 6914 or pursuant to a successor State housing program that utilizes a reasonably similar method of calculation of adjusted income. In the event that no such program exists, the Agency shall provide the Developer with a reasonably similar method of calculation of adjusted income as provided in 25 California Code of Regulations Section 6914.

(b) "Agency" shall mean the Belmont Redevelopment Agency.

(c) "Agency Deed of Trust" shall mean the deed of trust in favor of the Agency recorded against the Property which secures repayment of the Loan and performance of this Agreement and the DDA.

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(d) "Agency Note" shall mean the promissory note from the Developer to the Agency evidencing all or any part of the Loan.

(e) "Agreement" shall mean this Regulatory Agreement and Declaration of Restrictive Covenants.

(f) "City" shall mean the City of Belmont, California, a municipal corporation.

(g) "Closing Date" shall mean the date of close of escrow for disposition of the Property from the Agency to the Developer and recordation against the Project of this Agreement.

(h) "County" shall mean the County of San Mateo, California.

(i) "DDA" shall mean the Disposition and Development Agreement entered into by the Agency and the Developer as of February 15, 1995.

(j) "Developer" shall Mercy Housing California, a California nonprofit public benefit corporation, and its successors and assigns to the Project.

(k) "HCD" shall mean the State of California Department of Housing and Community Development.

(l) "Housing Fund" shall mean the Low and Moderate Housing Fund established by the Agency pursuant to California Health and Safety Code Section 33334.3, and into which the Agency makes periodic deposits of tax increment revenue in accordance with the requirements of Health and Safety Code Section 33334.2(a).

(m) "HUD" shall mean the United States Department of Housing and Urban Development.

(n) "Loan" means the loan for an amount not to exceed Three Hundred Twenty-Five Thousand Dollars ($325,000) by the Agency to the Developer, which loan is the subject of this Agreement.

(o) "Loan Documents" shall mean the DDA, the Development Loan Agreement, the Agency Note, the Agency Deed of Trust, this Agreement, and such other agreements as are executed in connection therewith.

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(p) "Median Income" shall mean the median gross yearly income adjusted for actual household size, in the County, as prepared by HUD for the metropolitan area in which the County is located, and as published from time to time by HCD. In the event that such income determinations are no longer published, or are not updated for a period of at least eighteen (18) months, the Agency shall provide the Developer with other income determinations which are reasonably similar with respect to methods of calculation to those previously prepared by HUD and published by HCD.

(q) "Project" shall mean a residential care facility licensed for use as a Residential Care Facility for the Chronically Ill pursuant to the licensing requirements of California Code of Regulations Title 22, Division 6, Chapter 8.5, §§ 87801-87924, as amended by Health & Safety Code sections 1568.01-1568.092 (the "Licensing Requirements"), consisting of six bedrooms, which shall be suitable for housing patients who are terminally ill with Acquired Immune Deficiency Syndrome (AIDS). The beds will be reserved for persons who have very low income.

(r) "Property" shall mean the real property described in Attachment No. 1 attached hereto and incorporated herein.

(s) "Rent" shall mean the total of monthly payments by the tenants of a Unit for the following: use and occupancy of the Unit and land and associated facilities, including parking, including reasonable utility and service allowance; and any separately charged fees or service charges assessed by the Developer which are required of all Tenants, other than security deposits.

(t) "Tenant" shall mean a household occupying a Unit.

(u) "Tenant Lease" shall mean a lease between the Developer and Tenant for a Unit, which Tenant Lease must meet the requirements of Section 2.4.

(v) "Term" shall mean the term of this Agreement, which shall commence on the Closing Date and shall continue until the forty-seventh (47th) anniversary of the Closing Date.

(w) "Unit" shall mean one of the six units within the Project.

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(x) "Very Low Income Household" shall mean a household with an Adjusted Income that does not exceed the lesser of (1) thirty-five percent (35%) of Median Income, adjusted for actual household size, or (2) the qualifying limits for very low income households, adjusted for actual household size, as established and amended from time to time pursuant to Section 8 of the United States Housing Act of 1937, and as prepared by the HUD for the metropolitan area in which the County is located and published by HCD.

(y) "Very Low Income Rent" shall mean Rent in an amount that does not exceed one-twelfth (1/12th) of thirty percent (30%) of thirty-five percent (35%) of Median Income, adjusted for household size.

(z) "Very Low Income Units" shall mean the Units which, pursuant to Section 2.1 below, are required to be occupied by Very Low Income Households.

ARTICLE 2
AFFORDABILITY AND OCCUPANCY COVENANTS

2.1 Occupancy Requirement. All of the Units shall be rented to and occupied by or, if vacant, available for rental and occupancy by Very Low Income Households.

2.2 Allowable Rent. The Rent charged to Tenants of the Very Low Income Units shall not exceed Very Low Income Rent.

2.3 Increased Income of Tenants. If, upon recertification of a Tenant's income, the Developer determines that a former Very Low Income Household has an Adjusted Income exceeding the qualifying income limit for a Very Low Income Household, then, such Tenant may remain in the Project, provided, however, upon vacation, the vacated Unit shall be rented to a Very Low Income Household, at a Very Low Income Rent level.

2.4 Lease Provisions. The Developer shall include in leases or rental agreements for all Units provisions which authorize the Developer to immediately terminate the tenancy of any household one or more of whose members misrepresented any fact material to the household's qualification as a Very Low Income Household. Each lease or rental agreement shall also provide that the household is subject to annual certification in accordance with Section 4.1 below, and that, if the household's income increases above the applicable limits for a Very Low Income Household such household may remain in the Project,

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provided, upon vacation the Unit will be rented to a Very Low Income Household.

ARTICLE 3
OPERATION AND MAINTENANCE OF THE Project

3.1 Residential Use. The Development shall be operated as a Project for persons who have AIDS. No part of the Project shall be operated as transient housing. Notwithstanding the above, the parties agree that, subject the Agency's approval, if the need for treatment of AIDS patients decreases to the degree that the Project is no longer needed for this purpose, or there are insufficient funds for the continued treatment of AIDS patients from local, state or federal sources then: i) the Developer may offer the bedrooms within the Project to other persons who are terminally ill, provided such persons meet the affordability restrictions of this Agreement, or ii) the Developer may also seek Agency approval of another use authorized by law as housing for persons with low to moderate income.

3.2 Compliance with Loan Documents. The Developer shall comply with all the terms and provisions of the Loan Documents. The Developer shall operate the Project and select tenants in accordance with the terms of this Agreement and the DDA.

3.3 Taxes and Assessments. The Developer shall pay all real and personal property taxes, assessments and charges and all franchise, income, employment, old age benefit, withholding, sales, and other taxes assessed against it, or payable by it, at such times and in such manner as to prevent any penalty from accruing, or any lien or charge from attaching to the Property; provided, however, that the Developer shall have the right to contest in good faith, any such taxes, assessments, or charges. In the event the Developer exercises its right to contest any tax, assessment, or charge against it, the Developer, on final determination of the proceeding or contest, shall immediately pay or discharge any decision or judgment rendered against it, together with all costs, charges and interest.

3.4 Maintenance. At all times, the Project shall be well maintained by the Developer in the manner set forth in Section 5.2 of the DDA.

3.5 Nondiscrimination. All of the Units shall be available for occupancy on a continuous basis to members of the general public who are income eligible. The Developer shall not give preference to any particular class or group of persons in renting or selling the Units, except to the extent that the Units are

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required to be leased to Very Low Income Households and used for AIDS patients as provided in Section 3.1. There shall be no discrimination against or segregation of any person or group of persons, on account of race, color, creed, religion, sex, sexual orientation, marital status, familial status, national origin, source of income (e.g., AFDC or SSI), ancestry, or disability, in the leasing, subleasing, transferring, use, occupancy, tenure, or enjoyment of any Unit nor shall the Developer or any person claiming under or through the Developer, establish or permit any such practice or practices of discrimination or segregation with reference to the selection, location, number, use, or occupancy, of tenants, lessees, sublessees, subtenants, or vendees of any Unit or in connection with the employment of persons for the construction, operation and management of any Unit. All deeds, leases or contracts made or entered into by the Developer as to the Units or the Project or portion thereof, shall contain covenants concerning discrimination as prescribed by the DDA.

3.6 Tenant Selection and Performance. The Developer shall not discriminate against Tenant applicants on the basis of source of income (e.g., AFDC or SSI), and the Developer shall consider a prospective Tenant's previous rent history of at least one year as evidence of the ability to pay the applicable Rent (ability to pay shall be demonstrated if the prospective Tenant can show that the Tenant has paid the same percentage or more of the Tenant's income for Rent as the Tenant would be required to pay for the Rent applicable to the Unit to be occupied).

ARTICLE 4
INCOME CERTIFICATION AND REPORTING

4.1 Income Certification. The Developer will obtain, complete and maintain on file, immediately prior to initial occupancy and annually thereafter, income certifications from each Tenant renting any of the Units, in substantially the form as the Agency may reasonably require. The Developer shall make a good faith effort to verify that the income provided by an applicant or occupying household in an income certification is accurate by taking two or more of the following steps as a part of the verification process: (a) obtain a pay stub for the most recent pay period; (b) obtain an income tax return for the most recent tax year; (c) conduct a credit agency or similar search; (d) obtain an income verification form from the applicant's current employer; (e) obtain an income verification form from the Social Security Administration and/or the California Department of Social Services if the applicant receives assistance from either of such agencies; or (f) if the applicant is unemployed and has no such tax return, obtain another form of independent

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verification. Copies of Tenant income certifications shall be made available to the Agency upon request.

4.2 Reports to Agency. The Developer shall submit to the Agency at the following times, a report setting forth the number of vacant Units and Units meeting the definition of a Very Low Income Unit and the Rents being charged for such Very Low Income Units as of the end of the reporting period. The report shall be provided within thirty (30) days after the end of each calendar year and shall cover the most recently completed calendar year.

In addition, the Developer shall provide to the Agency, within twenty-one (21) days after receipt of a written request, any other information or completed forms reasonably requested by the Agency.

4.3 Additional Information. The Developer shall provide any additional information reasonably requested by the Agency. The Agency shall have the right to examine and make copies of all books, records or other documents of the Developer which pertain to the Project.

4.4 Records. The Developer shall maintain complete, accurate and current records pertaining to the Project, and shall permit any duly authorized representative of the Agency to inspect such records at reasonable times, including records pertaining to income and household size of Tenants. All Tenant lists, applications and waiting lists relating to the Project shall at all times be kept separate and identifiable from any other business of the Developer and shall be maintained as required by the Agency, in a reasonable condition for proper audit and subject to examination during business hours by representatives of the Agency. The Developer shall retain copies of all records related to the Project (including occupancy of the Project) for a given Fiscal Year for a period of not less than three (3) years following delivery to the Agency of the audited annual report for such Fiscal Year required pursuant to the Development Loan Agreement.

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ARTICLE 5
MISCELLANEOUS

5.1 Term. The provisions of this Agreement shall apply to the Property for the entire Term even if the entire Loan is paid in full prior to the end of the Term. This Agreement shall bind any successor, heir or assign of the Developer, whether a change in interest occurs voluntarily or involuntarily, by operation of law or otherwise, except as expressly released by the Agency.

The Agency makes the Loan on the condition, and in consideration of, this provision, and would not do so otherwise.

5.2 Notice of Expiration of Term. At least six months prior to the expiration of the Term, the Developer shall provide by first-class mail, postage prepaid, a notice to all Tenants containing (a) the anticipated date of the expiration of the Term, (b) any anticipated rent increase upon the expiration of the Term, (c) a statement that a copy of such notice will be sent to the Agency, and (d) a statement that a public hearing may be held by the Agency on the issue and that the Tenant will receive notice of the hearing at least fifteen (15) days in advance of any such hearing. The Developer shall also file a copy of the above-described notice with the Executive Director of the Agency.

5.3 Covenants to Run With the Land. The Agency and the Developer hereby declare their express intent that the covenants and restrictions set forth in this Agreement shall run with the land, and shall bind all successors in title to the Property, provided, however, that on the expiration of the Term of this Agreement said covenants and restrictions shall expire and thereafter shall be of no further force of effect. Each and every contract, deed or other instrument hereafter executed covering or conveying the Property or any portion thereof shall be held conclusively to have been executed, delivered and accepted subject to such covenants and restrictions, regardless of whether such covenants or restrictions are set forth in such contract, deed or other instrument, unless the Agency expressly releases such conveyed portion of the Property from the requirements of this Agreement.

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5.4 Enforcement by the Agency. If the Developer fails to perform any obligation under this Agreement, and fails to cure the default within thirty (30) days after the Agency has notified the Developer in writing of the default or, if the default cannot be cured within thirty (30) days, failed to commence to cure within thirty (30) days and thereafter diligently pursue such cure, the Agency shall have the right to enforce this Agreement by any or all of the following actions, or any other remedy provided by law:

(a) Acceleration of the Loan. The Agency may declare a default under the Agency Note, accelerate the indebtedness evidenced by the Note, and proceed with foreclosure under the Deed of Trust.

(b) Action to Compel Performance or for Damages. The Agency may bring an action at law or in equity to compel the

Developer's performance of its obligations under this Agreement, and/or for damages.

(c) Remedies Provided Under DDA. The Agency may exercise any other remedy provided under the Loan Documents.

5.5 Attorneys Fees and Costs. In any action brought to enforce this Agreement, the prevailing party shall be entitled to all costs and expenses of suit, including attorneys' fees. This section shall be interpreted in accordance with California Civil Code Section 1717 and judicial decisions interpreting that statute.

5.6 Recording and Filing. The Agency and the Developer shall cause this Agreement, and all amendments and supplements to it, to be recorded in the Official Records of the County of San Mateo.

5.7 Governing Law. This Agreement shall be governed by the laws of the State of California.

5.8 Waiver of Requirements. Any of the requirements of this Agreement may be expressly waived or modified by the Agency in writing, but no waiver or modification by the Agency of any requirement of this Agreement shall, or shall be deemed to, extend to or affect any other provision of this Agreement.

5.9 Amendments. This Agreement may be amended only by a written instrument executed by all the parties hereto or their successors in title, and duly recorded in the real property records of the County of San Mateo.

5.10 Notices. Any notice requirement set forth herein shall be deemed to be satisfied three (3) days after mailing of the notice first-class United States certified mail, postage prepaid, addressed to the appropriate party as follows:

Developer: Mercy Housing California
1028 A Howard Street
San Francisco, CA 94103
Attention: President

Agency: Belmont Redevelopment Agency
1365 Fifth Street
Belmont, California 94002
Attention: Executive Director

Such addresses may be changed by notice to the other party given in the same manner as provided above.

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5.11 General Indemnification. Except as otherwise provided in the Loan Documents, the Developer agrees to indemnify, protect, hold harmless and defend (by counsel reasonably satisfactory to the Agency) the Agency, its board members, officers and employees, from all suits, actions, claims, causes of action, costs, demands, judgments and liens arising out of the Developer's performance or non-performance under this Agreement, the DDA or any other agreement executed pursuant thereto, or arising out of acts or omissions of any of the Developer's contractors, subcontractors, or persons claiming under any of the aforesaid, except as directly caused by the Agency's willful conduct or gross negligence.

5.12 Severability. If any provision of this Agreement shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining portions of this Agreement shall not in any way be affected or impaired thereby.

5.13 No Third-Party Beneficiaries. All of the provisions of this Agreement are intended to bind and benefit only the Agency, and the Developer and their respective permitted successors and assigns. It is not intended that any provisions of this Agreement benefit, and it shall not be construed that any provisions of this Agreement benefit or are enforceable by, any Tenant, prospective Tenant, creditor, contractor, or other third party.

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IN WITNESS WHEREOF, the Agency and the Developer have executed this Agreement by duly authorized representatives, all on the date first written above.

DEVELOPER:

MERCY HOUSING CALIFORNIA, a California nonprofit public benefit corporation

By: _____
~~Executive Director~~ President

ATTEST:

AGENCY:

BELMONT REDEVELOPMENT AGENCY, a public body corporate and politic

By: _____
Agency Secretary

By: _____
Executive Director

APPROVED AS TO FORM:

By: _____
Agency Counsel

95024962

STATE OF CALIFORNIA)
)ss.
COUNTY OF SAN FRANCISCO)

On March 10, 1995 before me, Stephanie S. Ballenger, personally appeared Jane M. Graf, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the person or the entity upon behalf of which the person acted, executed the instrument.

MGC1 Stephanie S. Ballenger Comm. #1034107 NOTARY PUBLIC - CALIFORNIA City & County of San Francisco Comm Expires Nov 15 1998 MGC1

WITNESS my hand and official seal.

Stephanie S Ballenger

95024962

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN MATEO)

On March 10, 1995 before me, Gwenevere D. Mitchell, Notary Public, personally appeared Damon B. Edwards, personally known to me (or proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

OFFICIAL SEAL
GWENEVERE D. MITCHELL
NOTARY PUBLIC - CALIFORNIA
COUNTY OF SAN MATEO
My Commission expires Sept. 26, 1995

WITNESS my hand and official seal.

Gwenevere D. Mitchell
SIGNATURE OF NOTARY

95024962

ATTACHMENT 1

PROPERTY DESCRIPTION

The land referred to is situated in the State of California, County of San Mateo, City of Belmont, and is described as follows:

LOT 5, as delineated upon that certain Map entitled "SWIFTS SUBDIVISION OF LOT NO. 13 AND A PORTION OF LOT 13, MEZES RANCH, NEAR BELMONT, SAN MATEO COUNTY, CALIFORNIA", filed for record in the Office of the Recorder of the County of San Mateo, State of California, on February 15th, 1897 in Book "A" of Maps, at Page 57, and copied into Book 2 of Maps at Page 86.

EXCEPTING therefrom the Northeasterly portion of said Lot described in Deed to the State of California for Highway Purposes, dated August 22, 1934 and recorded September 12, 1932, in Book 632, at Page 184 of Official Records.

A.P.N. 044-222-140 J.P.N. 044-022-222-14

95024962

STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Edric Kwan, Public Works, (650) 595-7459, ekwan@belmont.gov
Agenda Title:	Comprehensive Sewer Rate Study and Proposed Sewer Charges for Fiscal Years 2026-27, 2027-28, and 2028-29
Agenda Action:	Resolution

Recommendation

Adopt a resolution proposing sewer charges for fiscal years 2026-27, 2027-28, and 2028-29, setting a Proposition 218 hearing for June 9, 2026, directing staff to provide notice of the hearing as required by law, and adopting protest procedures.

Strategic Focus Area

Fiscal and Organizational Sustainability

Background

The City's sewer operation is a revenue-neutral utility, with sewer fees reflect only those charges necessary to support the community's sewer conveyance and treatment services. The sewer rate revenue is used to fund operations, maintenance, and debt service for the capital improvements associated with the City's sewer utility systems, as well as the City's share of wastewater treatment costs at the plant managed by Silicon Valley Clean Water (SVCW).

In October 2025, the City retained HDR Engineering, Inc. (HDR) to update the comprehensive sewer rate study for fiscal years (FYs) 2026-27, 2027-28, and 2028-29. The study reviews the adequacy of existing sewer rates to meet system improvement needs and provide the basis for appropriate rate structures for each customer classification.

In developing the sewer revenue requirement, the assumption is that the utility must financially "stand on its own" and be properly funded. As a result, the revenue requirement analysis assumes full funding to operate and maintain the system on a financially sound and prudent basis.

Analysis

Based on the City's sewer operational needs, HDR prepared a rate analysis covering a multi-year period. Evaluating multiple years is recommended to identify any major expenses that may be on the horizon. By anticipating future financial requirements, the City can plan ahead, minimizing short-term rate impacts while addressing long-term needs. The City's working group, consisting of Public Works and Finance staff, reviewed the analysis and concurs with HDR's assessment that rate adjustments of 0.0%, 0.0%, and 3.0% in fiscal years 2026-27, 2027-28, and 2028-29, respectively, are sufficient to generate revenues needed to meet expenditure obligations and fund the planned capital improvement program.

The City has two primary classes of service: low-strength and high-strength customers. Most of the City's rate revenues are derived from low-strength customers. The sewer rate structure includes a fixed component, as well as a variable component based on each customer's average winter water consumption. Each year, the City obtains water consumption data from the Mid-Peninsula Water District (MPWD) to develop the proposed sewer rates and revenue forecasts.

Expense

Operation and maintenance (O&M) expenses are incurred by the City to operate and maintain the existing system. Escalation factors were developed for key expense categories, including labor, benefits, materials and supplies, utilities, insurance, and miscellaneous costs.

A major cost for the sewer utility is wastewater treatment by SVCW. These costs have been increasing due to their recent capital projects and rising regulatory and utility costs. SVCW costs are allocated proportionally among the JPA member agencies based on their capacity rights, average annual flow rates, and strength of the sewer generated by each member agency.

Total O&M expenses for the City are projected to be approximately $8.3 million in FY 2026-27, of which approximately $3.6 million is attributed to SVCW treatment costs. These treatment costs are purchased services and thus are not a "locally controlled" sewer cost.

Capital Funding Needs

A key component in developing the City's sewer revenue requirement is properly funding capital improvement needs. The City's capital and capacity improvement needs are estimated at $55.2 million over the next five fiscal years. This study updated the capital improvement funding analysis based on the City's current capital plan and funding approach, which is informed by the 2025 update to the Sanitary Sewer Master Plan. A key consideration in establishing rates is that they be set at levels sufficient to meet debt covenants associated with outstanding debt, including reserve requirements and minimum debt service coverage ratios.

Debt Service

In FY 2015-16 and FY 2018-19, the City issued long-term debt to fund capital project needs. The level of annual debt service payments resulting from the FY 2015-16 issue is approximately $1.4 million a year. In FY 2019-20, the City issued additional long-term borrowing to fund capital improvements. This debt issuance results in an additional $1.1 million in annual debt service payments.

Revenue Requirement

For this study, minimal rate adjustments are necessary to meet the annual O&M, renewal, replacement, and capital needs of the sewer system as outlined in the rate study. The proposed rate adjustments will allow the City to meet three key prudent financial objectives, including:

- Meeting Debt Service Coverage Ratios – During the prior rate study, this was a key driver in the results of the proposed rate adjustments. The proposed rate adjustments in this study allow the City to maintain a strong debt service coverage ratio.
- Adequate Renewal and Replacement Funding – The need to maintain the system is key to minimizing future deferred capital needs. This study continued to increase annual renewal and

replacement funding over the 5-year planning period.

- Maintaining Prudent Reserve Fund Levels – The study has continued to increase reserve fund ending balances to typical industry levels. Given that the City receives semi-annual payments for services, it is important to have sufficient reserves (cash on hand) to fund operations between payments.

Table 1 below shows the total deficiency of revenues before any sewer rate adjustments, which ranges from $0 in FY 2026-27 to $1.7 million by FY 2030-31. The rate adjustments needed to meet the above criteria are 0.0% in FY 2026-27, 0.0% in FY 2027-28, and 3.0% in FY 2028-29.

Table 1 – Summary of Sewer Revenue Requirement ($000s)

Table 1 Summary of Sewer Revenue Requirement ($000s)	Budget	Projected				
	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31
Revenues						
Retail Rate Revenues	$16,983	$17,153	$17,325	$17,498	$17,673	$17,850
Other Revenues	309	1,231	1,130	951	958	973
Total Revenues	**$17,293**	**$18,384**	**$18,455**	**$18,449**	**$18,631**	**$18,823**
Expenses						
Collection O&M Expenses	$4,556	$4,744	$4,936	$5,123	$5,302	$5,489
Treatment O&M Expenses	3,220	3,562	3,704	3,852	4,006	4,167
Repair & Replace. Funding	6,500	6,575	6,625	6,675	6,725	6,775
I/I Capital Funding	350	450	450	450	450	450
Total Debt Service	2,498	2,501	2,501	2,497	2,496	2,499
Change in Working Capital +/-	169	552	239	377	728	1,098
Total Expenses	**$17,293**	**$18,384**	**$18,455**	**$18,974**	**$19,708**	**$20,478**
Balance/(Deficiency) of Funds	$0	$0	$0	($525)	($1,076)	($1,655)
Cumulative as a % of Rates	0.0%	0.0%	0.0%	3.0%	6.1%	9.3%
Proposed Rate Adjustments	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**3.0%**	**3.0%**
Debt Service Coverage Ratio						
Before Rate Adjustment	3.69	3.91	3.80	3.67	3.61	3.55
After Rate Adjustment	3.69	3.91	3.80	3.88	4.04	4.21

For illustrative purposes, Table 2 below shows how the present and proposed monthly sewer rates will change on a monthly bill, assuming an average of eight hundred cubic feet (HCF). It is important to note that the Drought Regulation Adjustment (DRA) is being reset to 0.0% for the upcoming three-year rate setting period as winter water consumption levels have continued to reflect levels prior to the drought and implementation of the DRA. As a result of the study and removal of the DRA, while the volume charge has increased, the customer bill will remain essentially the same in FY 2026-27 and FY 2027-28.

Table 2 – Present and Proposed Sewer Rates (Monthly)

Table 2 Present and Proposed Sewer Rates (Monthly)	Proposed FY 2026-27	Proposed FY 2027-28	Proposed FY 2028-29	Forecasted FY 2029-30	Forecasted FY 2030-31
Proposed Revenue Adjustment	*0.0%*	*0.0%*	*3.0%*	*3.0%*	*3.0%*
Present Average Monthly Bill	$146.43				
After Proposed Rate Adj.	$146.42	$146.42	$150.83	$155.38	$159.99
Monthly Bill Difference	(0.01)	0.00	4.41	4.55	4.61
Cumulative Bill Difference	(0.01)	(0.01)	4.40	8.95	13.56
% Change to Monthly Bill	*0.0%*	*0.0%*	*3.0%*	*3.0%*	*3.0%*

For this three-year rate setting period, the proposed rates have set the DRA at 0.0%. The City implemented the DRA in 2016 in order to adjust for the revenue shortfall as a result of the ongoing drought and water conservation impacts on the related fixed costs of the system and revenues received by the City through the consumption component of the City's sewer rate. It should also be noted that a majority of the City's collection costs are fixed and do not vary depending on the level of sewer flows. The one cost that does vary is the cost of wastewater treatment from SVCW.

Table 3 below shows the side-by-side comparison of the present and proposed sewer rates for FY 2026-27, FY 2027-28, and FY 2028-29. Staff is recommending that the City Council set the maximum sewer rates with a 0.0% drought regulation adjustment as noted below for FY 2026-27, FY 2027-28, and FY 2028-29

Table 3 – Present and Proposed Sewer Rates

Table 3 Present and Proposed Sewer Rates	Present Rates	Proposed Rates FY 2026-27	Proposed Rates FY 2027-28	Proposed Rates FY 2028-29
COLLECTION				
Low Strength				
Base Charge	$465.80	$465.80	$465.80	$479.77
Flow Charge ($/HCF)	6.63	7.29	7.29	7.51
High Strength				
Base Charge	$465.80	$465.80	$465.80	$479.77
Flow Charge ($/HCF)	12.88	14.17	14.17	14.60
TREATMENT				
Low Strength				
Base Charge	$244.81	$244.81	$244.81	$252.15
Flow Charge ($/HCF)	3.28	3.61	3.61	3.72
High Strength				
Base Charge	$244.81	$244.81	$244.81	$252.15
Flow Charge ($/HCF)	6.38	7.02	7.02	7.23
COMBINED				
Low Strength				

Base Charge	$710.61	$710.61	$710.61	$731.92
Flow Charge ($/HCF)	9.91	10.90	10.90	11.23
High Strength				
Base Charge	$710.61	$710.61	$710.61	$731.92
Flow Charge ($/HCF)	19.26	21.19	21.19	21.83

Note: The present 11Drought Regulation Adjustment (DRA) is Hundred Cubic Feet (HCF) X 1.10 X $/HCF

In developing the revenue requirement analysis, consideration was given to the financial planning considerations of the City. In particular, emphasis was placed on attempting to minimize rates, yet still having adequate funds to support the operational activities and capital projects throughout the projected time period.

Upon City Council review and direction on Staff's recommendation for the proposed rate adjustments, Staff is requesting Council direction to provide notice for setting a hearing date for the consideration of the maximum rates per the Proposition 218 process as described below. Based on Council direction, Staff will prepare a notice for distribution to customers and an authorizing resolution stating the City's intention to increase sewer rates effective FY 2026-27, FY 2027-28, and FY 2028-29, and schedule a public hearing for June 9, 2026, for the proposed rates.

Proposition 218

Charges for sewer services are property-related charges subject to Proposition 218. These charges need not be submitted to an election of voters or property owners, but they are subject to a majority protest proceeding. That process is summarized as follows:

(1) The City calculates a budget sufficient to cover the cost of service and determines how to spread that budget as rates across different kinds of customers (e.g., single-family, multi-family, non-residential),
(2) The City provides 45 days mailed notice of a public hearing on the proposed new rates to every property owner or customer of record who will pay the new rates,
(3) The City conducts the hearing and accepts written protests from property owners and customers of record, and

The City tallies the protests; if more than half of the affected property owners and customers of record protest the new rates in writing before the end of the hearing, the agency cannot impose the new rates; otherwise, it may impose the rates at any level which does not exceed the rates stated in the notice. Majority protests under these rules are not common except when a very small number of ratepayers are involved.

Alternatives Refer to Staff for additional information

2. Take no action

Attachments

A. Resolution
B. HDR Comprehensive Sewer Rate Study

Fiscal Impact

☐ No Fiscal Impact

☒ Funding Source Confirmed: Sewer rates are accounted for in the Sewer Collections Fund and incorporated into the budget development process.

Source:	**Purpose:**	**Public Outreach:**
Staff	Statutory/Contractual Requirement	Posting of Agenda

RESOLUTION NO. 2026 –

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BELMONT STATING ITS INTENTION TO REVISE THE CITY'S SEWER CHARGES EFFECTIVE TAX YEAR 2026-27, 2027-28, AND 2028-29

WHEREAS, Belmont City Code Section 21.93 and California Health and Safety Code Section 5470 et seq. authorize the City of Belmont to levy charges for sewer services; and

WHEREAS, the City Council desires to conduct a proceeding to revise the rate and methodology for the sewer charges, to be effective beginning the 2026-27, 2027-28, and 2028-29 tax years.

NOW, THEREFORE, the City Council of the City of Belmont resolves as follows:

SECTION 1. The City Council proposes the imposition of the sewer charges and rate methodology generally described in Exhibit "A" to this Resolution.

SECTION 2. The City Council will hold a public hearing under California Constitution Article XIIID, Section 6, subdivision (a)(2) on June 9, 2026, at 7:00 PM or as soon thereafter as may be practicable in the City Council Chambers located at One Twin Pines Lane, Belmont, California to consider the proposed sewer charges and protests against the proposed charges.

SECTION 3. The City Council directs staff to give notice of the hearing in the manner required by law.

SECTION 4. The City will accept and tabulate protests against the proposed rate revision pursuant to the procedures set forth in Exhibit "B" to this Resolution.

* * *

ADOPTED April 14, 2026 by the City of Belmont City Council by the following vote:

Ayes:

Noes:

Absent:

Abstain:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

City Attorney

EXHIBIT A

Proposed Sewer Charge Rate Schedule

Each parcel's sewer charge will be the sum of the base charges and flow charges for both collection and treatment.

	FY 2026-27	FY 2027-28	FY 2028-29
Collection			
Low Strength			
Base Charge - Annual	$465.80	$465.80	$479.77
Flow Charge ($/HCF x 1.0 DRA)	7.29	7.29	7.51
High Strength			
Base Charge - Annual	$465.80	$465.80	$479.77
Flow Charge ($/HCF x 1.0 DRA)	14.17	14.17	14.60
Treatment			
Low Strength			
Base Charge - Annual	$244.81	$244.81	$252.15
Flow Charge ($/HCF x 1.0 DRA)	3.61	3.61	3.72
High Strength			
Base Charge - Annual	$244.81	$244.81	$252.15
Flow Charge ($/HCF x 1.0 DRA)	7.02	7.02	7.23

DRA=Drought Regulation Adjustment

Standby Charge

For non-metered parcels:

- $245.40 per dwelling unit per year

Wastewater Discharge Fee

Wastewater discharge fee will be the sum of the flow charges for both collection and treatment for each user classification in the table above.

EXHIBIT B

GUIDELINES FOR THE SUBMISSION AND TABULATION OF PROTESTS

Submission of Protests

1. Any property owner may submit a written protest to the City Clerk, either by delivery to the office of the City Clerk or by submitting the protest at the public hearing. Protests must be received by the end of the public hearing. No postmarks will be accepted.

2. Each protest must identify the affected property (by assessor's parcel number or street address) and include the signature of the record property owner. Email protests cannot be accepted. Although oral comments at the public hearing will not qualify as a formal protest unless accompanied by a written protest, the City Council welcomes input from the community during the public hearing on the proposed charges.

3. If a parcel served by the City is owned by more than a single record owner, each owner may submit a protest, but only one protest will be counted per parcel and any one protest submitted in accordance with these rules will be sufficient to count as a protest for that property.

4. In order to be valid a protest must bear the original signature of the record owner with respect to the property identified on the protest. Protests not bearing the original signature of a record owner shall not be counted.

5. Any person who submits a protest may withdraw it by submitting to the City Clerk a written request that the protest be withdrawn. The withdrawal of a protest shall contain sufficient information to identify the affected parcel and the name of the record owner or record customer who submitted both the protest and the request that it be withdrawn.

6. A charge protest proceeding is not an election.

7. To ensure transparency and accountability in the charge protest tabulation, protests shall constitute disclosable public records from and after the time they are received.

Tabulation of Protests

1. The City Clerk shall determine the validity of all protests. The City Clerk shall not accept as valid any protest if the City Clerk determines that any of the following conditions exist:

    a. The protest does not identify a property served by the City.
    b. The protest does not bear an original signature of a record owner of the parcel identified on the protest.
    c. The protest does not state its opposition to the proposed charges.

d. The protest was not received by the City Clerk before the close of the public hearing on the proposed charges.
e. A request to withdraw the protest is received prior to the close of the public hearing on the proposed charges.

2. The City Clerk's decision that a protest is not valid or does not apply to a specific charge shall constitute a final action of the City and shall not be subject to any internal appeal.

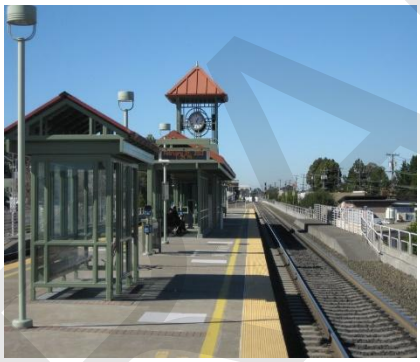
3. A majority protest exists if written protests are timely submitted and not withdrawn by the record owners of a majority of the properties subject to the proposed charge.

4. At the conclusion of the public hearing, the City Clerk shall complete the tabulation of all protests received, including those received during the public hearing and shall report the results of the tabulation to the City Council upon completion. If review of the protests received demonstrates that the number received is manifestly less than one-half of the parcels served by the City with respect to the charge which is the subject of the protest, then the Clerk may advise the City Council of the absence of a majority protest without determining the validity of all protests.

Fiscal & Organizational Sustainability

Draft Report







City of Belmont Comprehensive Sewer Rate Study

April 2026

DRAFT

April 2, 2026

Mr. Edric Kwan, P.E.
Public Works Director
City of Belmont
One Twin Pines Lane
Belmont, California 94002

Subject: City of Belmont 2026 Comprehensive Sewer Rate Study Draft Report

Dear Mr. Kwan:

HDR Engineering, Inc. (HDR) is pleased to present the draft report for the comprehensive sewer rate study (Study) conducted for the City of Belmont (City). The overall objective in conducting the rate study was to establish cost-based and proportional rates that provide adequate and sustainable funding for the operating and capital needs of the sewer utility. This report outlines the approaches, methodologies, findings, and conclusions of the rate study process undertaken for the City's sewer utility.

This report was developed utilizing the City's specific accounting, operating, and historical customer billing records. HDR utilized this information to develop the analyses, which shaped the findings, conclusions, and recommendations contained within the report. At the same time, the Study was developed utilizing generally accepted rate setting principles as outlined in the Water Environment Federation Manual of Practice No. 27 manual to meet the proportionality requirements of Proposition 218. The conclusions and recommendations presented within this report provide the City with cost-based and proportional rates for its sewer customers.

We appreciate the assistance provided by City staff, management, and City Council in the development of the Study.

Sincerely yours,
HDR Engineering, Inc.

Shawn Koorn
Associate Vice President

555 110th Ave NE, Suite 1200
Bellevue, WA 98004

DRAFT

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Technical Appendix

Proposition 218 Notice

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Executive Summary

Introduction

HDR Engineering, Inc. (HDR) was retained by the City of Belmont (City) to perform a comprehensive sewer rate study (Study), which is an update to the prior rate studies completed by HDR, with the latest study having been completed in 2024. The 2024 study set rates for the two-year period of Fiscal Years (FY) 2024-25 and 2025-26. The City's sewer treatment services are provided through its participation in Silicon Valley Clean Water (SVCW), which owns and operates a sub-regional wastewater treatment plant and related conveyance facilities that serve the City of Belmont, as well as the cities of Redwood City, San Carlos, and the West Bay Sanitary District. SVCW allocates its costs between the agencies based on their capacity rights, average annual flow rates, and strength of the sewer generated by each member agency. The collection system component is based on the City's costs to operate and maintain the City's sewer system.

The City's sewer rate is comprised of two components, a collection system component and a treatment system component. The collection system component is based on the costs to operate the City's sewer collection system. The treatment costs are based on the current treatment cost projections and are adjusted as the City is notified of cost changes by SVCW. The City bills customers on the tax rolls where each parcel's sewer charge is the sum of the base charge and flow charges for both collection and treatment.

The City has two major classes of service: low strength and high strength customers. The vast majority of the City's rate revenues are derived from low strength customers. The City's sewer rate structure includes a fixed component, as well as a volume (flow) based component, which is based on customer winter water average consumption. Annually, the City requests water consumption data from Mid-Peninsula Water District to develop the proposed sewer rates and resulting revenue forecast for the rate setting period. In the 2016 rate study, it was recommended that the City make adjustments to the winter water calculation to take into account the mandated conservation on the City's sewer customers. This resulted in the City adopting a drought adjustment factor, or a multiplier, on each customer's winter period consumption to develop the consumption for rate setting purposes. Based on a review of the customer consumption data from Mid-Peninsula Water District, and in discussions with City staff, the Study has set the drought adjustment factor to 0.0% given consumption levels reflect pre-drought levels.

This Study is based on the previous sewer rate study methodologies and analyses completed by HDR over the past 10 years and continues rate recommendations and proposed rates to fund an adequate level of renewal and replacement. This Study reviews the adequacy of the existing sewer rates to meet identified system improvement needs and provides the basis for the appropriate rate levels for each customer class of service.

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The results and recommendations of the Study will allow the City to meet three key prudent financial criteria, which are as follows:

- **Meeting Debt Service Coverage Ratios (DSC) –** DSC ratios are the measurement of a utility's ability to repay outstanding debt. As noted in the City's 2019 JPFA Sewer Revenue Bond issuance, a minimum debt service coverage ratio of 2.0 is targeted. The proposed rate adjustments in this Study allow the City to maintain a debt service coverage ratio greater than 2.0.
- **Adequate Renewal and Replacement Funding –** Maintaining the City's sewer collection system is key to minimizing future capital needs. This Study has continued to maintain the City's annual renewal and replacement funding, which exceeds the City's level of depreciation over the rate planning period.
- **Maintaining Prudent Reserve Fund Levels –** The Study has continued to provide ending reserve fund balances that are in line with industry best practices. Given that the City receives semi-annual revenue payments for its services, it is important to have sufficient cash reserves on hand to fund operations between revenue payments.

Meeting these three key criteria is critical for the City to be able to fund or finance future capital through the issuance of long-term debt. By reviewing and adjusting rates as necessary, the City is demonstrating to the outside financial community its willingness and commitment to maintain a strong financial position. This willingness to address identified financial shortfalls and adjust rates accordingly is beneficial when issuing future long-term debt for the sewer system's capital needs. As a point of reference, HDR is not acting as the City's municipal advisor in calculating or verifying the debt service coverage ratios for the City, but rather identifying the existing annual debt service payments and projection of future long-term funding needs while utilizing conservative assumptions for modeling purposes only.

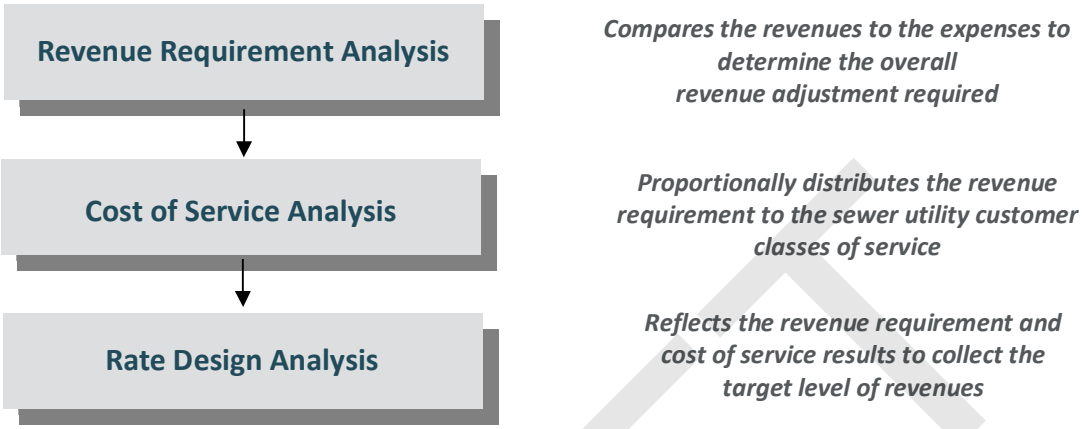
The development of the Study examines the adequacy and proportionality of the current sewer rates for the City's sewer utility and provides the cost-basis for the recommended sewer rate revenue adjustments. This report describes the overall methodology used to analyze the City's sewer rates along with the findings, conclusions, and recommendations.

Overview of the Rate Study Process

A comprehensive sewer rate study uses three interrelated analyses to address the adequacy and proportionality of a utility's rates. These three analyses are a revenue requirement analysis, a cost of service analysis, and a rate design analysis. These three analyses are illustrated below in Figure ES – 1.

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Figure ES – 1
Overview of the Comprehensive Rate Analyses



For the City's sewer rate study, HDR completed each of the three analyses, a revenue requirement analysis, cost of service analysis, and rate design analysis. The results from each analysis were used as the basis for establishing cost-based and proportional rates for the City's sewer customers.

Key Study Results

The City's sewer utility was evaluated on a stand-alone basis. By reviewing the sewer utility individually, the revenues required to adequately fund both O&M and capital infrastructure must be balanced against the rate impacts to customers. Likewise, future rate impacts should be considered and evaluated as part of the Study projections. For example, delaying capital improvement projects in the current time period could result in higher future costs and in turn, increased rate adjustments as well as risk associated with catastrophic system failures. It is challenging to balance the desire for least cost rates with the operating and capital needs required to provide a high level of service to customers.

Based on the technical analyses undertaken as part of the Study, the following findings, conclusions, and recommendations were noted.

- The revenue requirement analysis for the sewer utility was developed for FY 2025-26 – 2033-34
- The starting point for the revenue requirement was the City's FY 2025-26 adopted sewer budget and sewer utility capital improvement plan
- Wastewater treatment is provided by Silicon Valley Clean Water (SVCW) and is included within the City's operation and maintenance expenses. The SVCW FY 2025-26 operating budget along with the projection for FY 2026-27 was escalated annually based on the projections provided by SVCW
- The flow adjustment factor was reset to 0.0% from 10.0% as part of the rate design analysis

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- Escalation factors were developed to project operating expenses in future years based on the inflationary increases experienced by the City in the past. These factors ranged from 2% to 7% per year depending on the specific expense
- A cost of service analysis was developed to review the proportionality of the existing rates. The results of the cost of service analysis indicated minimal cost differences between the customer classes of service. Given these results, it is recommended that no adjustments in the cost relationships between the classes of service be made at this time
- Proposed rates were developed for consideration by the City Council for the three-year period of FY 2026-27, FY 2027-28, and FY 2028-29
- Rate projections were developed for a five-year period, through FY 2030-31, to provide the City Council with a projection of the rates necessary to meet future operating and capital needs
- The proposed rate adjustments are necessary for the City to adequately fund its operating needs and maintain prudent financial metrics, such as:
    - ✓ Maintain a healthy financial outlook for future long-term borrowing by targeting a 2.0 minimum debt service coverage ratio
    - ✓ Adequate funding of capital improvements from rates to prudently maintain the City's existing infrastructure (i.e., renewal and replacement programs) as well as I&I improvements
    - ✓ Maintain adequate minimum reserve levels for routine operating and capital needs as well as emergency situations

Provided below is a summary of the technical analyses undertaken for the City's sewer utility as well as the findings, conclusions, and recommendations of the Study.

Overview of the Sewer Rate Study

The sewer rate study determines the overall adequacy of the existing sewer rates, on a stand-alone basis, at current rate levels. That is, no funding sources other than those generated by the sewer utility are used to fund sewer utility operating and capital expenses. For the Study, a concerted effort was made to minimize rate impacts over the five-year review period while also maintaining the City's financial targets for debt service coverage ratios, capital improvement funding, as well as operating and capital cash reserve levels.

Summary of the Revenue Requirement Analysis

The development of the revenue requirement analysis is used to determine the overall adequacy of the City's sewer utility rates. The starting point of the sewer revenue requirement analysis was the City's FY 2025-26 adopted sewer utility budget. HDR and City staff developed a projection of revenues and expenses for future years based on assumed escalation (inflationary) factors. The Study was developed to project future rate needs based on projected operating costs and identified capital needs over the multi-year period. However, the focus for purposes of rate setting was the next three-year period (FY 2026-27 – FY 2028-29). The summary of the sewer revenue requirement is shown below in Table ES – 1.

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Table ES – 1
Summary of Sewer Revenue Requirement ($000s)

	Budget	Projected				
	FY 2025-26[1]	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31
Revenues						
Retail Rate Revenues	$16,983	$17,153	$17,325	$17,498	$17,673	$17,850
Other Revenues	309	1,231	1,130	951	958	973
Total Revenues	**$17,293**	**$18,384**	**$18,455**	**$18,449**	**$18,631**	**$18,823**
Expenses						
Collection O&M Expenses	$4,556	$4,744	$4,936	$5,123	$5,302	$5,489
Treatment O&M Expenses	3,220	3,562	3,704	3,852	4,006	4,167
Repair & Replace. Funding	6,500	6,575	6,625	6,675	6,725	6,775
I/I Capital Funding	350	450	450	450	450	450
Total Debt Service	2,498	2,501	2,501	2,497	2,496	2,499
Change in Working Capital +/-	169	552	239	377	728	1,098
Total Expenses	**$17,293**	**$18,384**	**$18,455**	**$18,974**	**$19,708**	**$20,478**
Balance/(Deficiency) of Funds	$0	$0	$0	($525)	($1,076)	($1,655)
Cumulative as a % of Rates	0.0%	0.0%	0.0%	3.0%	6.1%	9.3%
Proposed Rate Adjustments	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**3.0%**	**3.0%**
Debt Service Coverage Ratio						
Before Rate Adjustment	3.69	3.91	3.80	3.67	3.61	3.55
After Rate Adjustment	3.69	3.91	3.80	3.88	4.04	4.21

[1] Note: FY 2025-26 includes the revenues at the adopted rate levels from the prior rate study. Therefore, no rate adjustment is included in FY 2025-26.

Table ES – 1 shows that the total deficiency of revenues, before the proposed sewer rate adjustments, range from $0 in FY 2026-27 to $1.7 million by FY 2030-31. No rate adjustments are proposed for the rate setting periods of FY 2026-27 and FY 2027-28. However, adjustments of 3.0% annually are forecasted for FY 2028-29 through FY 2030-31. The projected rate adjustments forecasted to start in FY 2028-29 allow the City to meet three key prudent financial criteria, which are as follows:

- Meet Prudent Debt Service Coverage Ratios – Minimum DSC target of 2.0
- Adequate Renewal and Replacement Funding – Annual renewal and replacement funding exceeds depreciation over the five-year plan as well as addresses I&I capital funding needs
- Maintain Prudent Reserve Fund Levels – The operating reserve balance meets or exceeds the annual minimum of 180 days of O&M and the capital project reserve target equal to two years of annual depreciation is exceeded over the time period reviewed

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The revenue requirement developed in this Study will allow the City to develop cost-based rates that meet the City's goals and objectives for maintaining the existing system as well as funding future capital needs. While the revenue requirement analysis projected operating and capital needs over a five-year period, the focus of the proposed rates for Proposition 218 purposes is the next three fiscal years of FY 2026-27, FY 2027-28, and FY 2028-29.

Summary of the Cost of Service Analysis

A cost of service analysis determines the proportional distribution of the previously developed revenue requirement to each of the customer classes of service. The objectives of the cost of service analysis are different from determining revenue requirement. A revenue requirement analysis determines the utility's overall financial needs, while the cost of service study determines the proportional manner in which to collect the revenue requirement from the customer classes of service (e.g., rate schedules). The City has two rate schedules, one for low strength customers and one for high strength customers. Table ES – 2 provides a summary of the cost of service analysis for the FY 2026-27 test year.

Table ES – 2
Summary of the FY 2026-27 Sewer Cost of Service Analysis ($000's)

Classes of Service	Present Rate Revenues	Distributed Costs	$ Difference	% Difference
Low Strength	$16,674	$16,691	($16)	0.0%
High Strength	479	463	16	0.0%
Total	**$17,153**	**$17,153**	**($0)**	**0.0%**

The results of the cost of service analysis indicate very minimal cost differences between the customer classes of service. It should be noted that the cost of service analysis developed by HDR is not a simple fixed/variable analysis. Rather, the cost of service analysis distributes costs between the customer classes of service based on each customer class's proportional share of volume, strength, and customer-related costs. Given this, no adjustments to the cost relationships between the customer classes of service are recommended at this time.

Summary of the Rate Design Analysis

The final step of the comprehensive sewer rate study process is the design of sewer rates to collect the desired level of revenue, based on the results of the revenue requirement and cost of service analyses. The individual allocated totals were then distributed to each customer class. The distributed expenses were then aggregated to determine the overall responsibility of each customer class of service.

Developing proportional rates is of paramount importance in developing the proposed sewer rates. Given this, the City's proposed sewer rates have been developed with the intent of meeting the legal requirements of California Constitution Article XIII D, Section 6 (Article XIII D), commonly referred to as Proposition 218. A key component of Article XIII D is the development of rates

which reflect the costs of providing service and are proportionally distributed to the customer classes of service. HDR would point out that there is no single methodology for proportionally assigning costs to the various customer groups. The Water Environment Federation (WEF) Manual of Practice No. 27 clearly delineates various methodologies which may be used to establish cost-based rates. Article XIII D does not prescribe a particular methodology for establishing rates. Consequently, HDR developed the City's proposed sewer rates based on the WEF MOP #27 methodology and the City's specific sewer system operating and customer characteristics to provide an administrative record of the steps taken to establish the City's proposed sewer rates to meet the requirements of Article XIII D.

HDR is of the opinion that the proposed rates comply with the legal requirements of Article XIII D. HDR reaches this conclusion based on the following:

- **The revenue derived from sewer rates does not exceed the funds required to provide the property related service (i.e., sewer service).** The proposed rates are designed to collect the overall revenue requirement of the City's sewer utility.
- **The revenues derived from sewer rates shall not be used for any purpose other than that for which the fee or charge is imposed.** The revenues derived from the City's sewer rates are used exclusively to operate and maintain the City's sewer system.
- **The amount of a fee or charge imposed upon a parcel or person as an incident of property ownership shall not exceed the proportional costs of the service attributable to the parcel.** The cost of service analysis was specifically developed to focus on the issue of the proportional assignment of costs.

The City's sewer rate is comprised of two components, a collection system component and a treatment system component. The collection system component is based on the costs to operate the City's sewer system, less treatment costs. The treatment costs are based on the current treatment cost projections provided by SVCW and are adjusted as the City is notified of cost changes. Each parcel's sewer charge is the sum of the base charges and flow charges for both collection and treatment. The proposed sewer rates maintain the current rate structure.

As part of the rate design analysis, the flow adjustment factor for FY 2026-27 was reset to 0.0% from 10.0% as maintained in the last rate study. After reviewing the Mid-Peninsula Water District consumption billing data, it was determined in discussion with City staff that the flow adjustment factor should be reset due to consumption increasing since the last rate study to pre-drought levels. As a result of this analysis and the cost of service analysis results, the proposed flow charges for FY 2026-27 are increased to account for the elimination of the flow adjustment charge. However, customer bills will not be impacted as the flow charges were only increased by the flow adjustment factor percentage to reset it moving forward.

Table ES – 3 provides the present and proposed rates for the low strength and high strength customers for the next five fiscal years.

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Table ES – 3 Present and Proposed Sewer Rates (Annual)						
	Present Rates	Proposed Rates FY 2026-27	Proposed Rates FY 2027-28	Proposed Rates FY 2028-29	Forecasted Rates FY 2029-30	Forecasted Rates FY 2030-31
COLLECTION						
Low Strength						
Base Charge	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge ($/HCF)	6.63	7.29	7.29	7.51	7.74	7.97
High Strength						
Base Charge	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge ($/HCF)	12.88	14.17	14.17	14.60	15.04	15.49
TREATMENT						
Low Strength						
Base Charge	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge ($/HCF)	3.28	3.61	3.61	3.72	3.83	3.94
High Strength						
Base Charge	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge ($/HCF)	6.38	7.02	7.02	7.23	7.45	7.67
COMBINED						
Low Strength						
Base Charge	$710.61	$710.61	$710.61	$731.92	$753.87	$776.48
Flow Charge ($/HCF)	9.91	10.90	10.90	11.23	11.57	11.91
High Strength						
Base Charge	$710.61	$710.61	$710.61	$731.92	$753.87	$776.48
Flow Charge ($/HCF)	19.26	21.19	21.19	21.83	22.49	23.16

At present rates, a typical low-strength customer with 8 hundred cubic feet of winter water average consumption would have a monthly bill of $146.43 (8 HCF X 1.10 = 8.80 HCF). Under the proposed rates and the flow adjustment factor being reset to 0.0%, the same customer would have a monthly bill of $146.42 in FY 2026-27. Table ES – 4 shows the average low strength bill for FY 2026-27 through FY 2030-31.

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Table ES – 4 Present and Proposed Sewer Rates (Monthly)					
	Proposed FY 2026-27	**Proposed FY 2027-28**	**Proposed FY 2028-29**	**Forecasted FY 2029-30**	**Forecasted FY 2030-31**
Proposed Revenue Adjustment	*0.0%*	*0.0%*	*3.0%*	*3.0%*	*3.0%*
Present Average Monthly Bill [1]	$146.43				
After Proposed Rate Adj. [2]	$146.42	$146.42	$150.83	$155.38	$159.99
Monthly Bill Difference	(0.01)	0.00	4.41	4.55	4.61
Cumulative Bill Difference	(0.01)	(0.01)	4.40	8.95	13.56
% Change to Monthly Bill	*0.0%*	*0.0%*	*3.0%*	*3.0%*	*3.0%*

[1] – Present average bill assumes 10% flow adjustment factor and 8 HCF monthly consumption

[2] –Proposed average bill assumes 0% flow adjustment factor and 8 HCF monthly consumption

The following sections of the report provide a more detailed discussion of the sewer rate study revenue requirement, cost of service, and rate design analyses undertaken for the City.

City Council Review

Proposition 218 outlines the process to adopt and implement the proposed sewer rates. This includes the establishment of the cost basis and proportionality of the sewer rates, which is the purpose of the Study and is summarized in this report. At the time of this report's writing, the Study results were anticipated to be presented to the City Council on April 14, 2026. If approved and moved by the City Council, a public hearing will be set and a customer notification sent to the City's sewer customers.

Summary

The adequacy and proportionality of the City's sewer rates were reviewed by HDR through the development of a comprehensive sewer rate study. Based on the analyses developed herein, HDR has proposed a comprehensive set of rate recommendations for the sewer utility. The following sections of the report will provide a more detailed discussion of the technical analyses undertaken, along with the findings, conclusions, and recommendations of the Study.

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1.0 Overview of the Rate Setting Process

1.1 Introduction

HDR Engineering, Inc. (HDR) was retained by the City of Belmont (City) to conduct a comprehensive sewer rate study. The objective in conducting a comprehensive sewer rate study is to develop cost-based and proportional rates which adequately fund the City's operation and maintenance (O&M) needs, along with the necessary capital improvements (i.e., capital infrastructure) to provide service. This Study determines the adequacy of the existing sewer rates and provides the analytical framework for any needed future adjustments.

1.2 Generally Accepted Rate Setting Principles

As a practical matter, utilities should consider setting their rates around generally accepted or global principles and guidelines. Utility rates should be:

- ✓ Cost-based, proportional, and set at a level that meets the utility's full revenue requirement
- ✓ Easy for the customer to understand and easy for the utility to administer
- ✓ Designed to conform with generally accepted rate setting techniques
- ✓ Stable in the ability to provide adequate revenues to meet the utility's financial, operating, capital infrastructure and regulatory requirements
- ✓ Established at a level that is, from the customer's perspective, stable from year-to-year

These general principles and guidelines have historically been used by the City to establish the current sewer rates. For this Study, they were again applied in the rate analyses developed for the City.

1.3 Prudent Financial Planning

Financial rate-setting policies and guidelines are integral to the process of developing a utility rate study. Financial policies are intended to provide guidance in the financial planning and rate-setting process as well as in the day-to-day financial management of the City's sewer utility. Adoption of financial policies provides a strong foundation for the long-term financial sustainability of the utility and provides the outside financial community with a better understanding as to the City's commitment to managing the utility in a financially prudent manner. As part of the City's previous rate studies, key financial and rate-setting policies/targets were developed and established. These key financial policies address issues such as maintaining minimum reserves for cash flow and capital improvement purposes, minimum debt service coverage (DSC) ratios, and consistent and adequate rate funding of capital

> ***"Financial policies are intended to provide guidance in the financial planning and rate-setting process…Adoption of financial policies provides a strong foundation for the long-term financial sustainability of the utility…"***

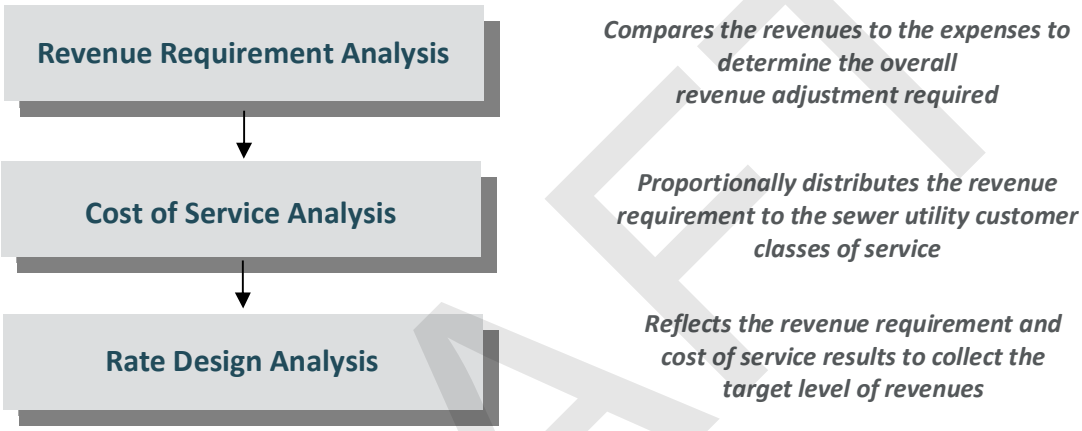
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projects for the City. Each of the key financial planning and rate setting objectives were carried forward from the City's prior sewer rate studies.

1.4 Overview of the Rate Study Process

A comprehensive rate study generally consists of three interrelated analyses. Figure 1 – 1 provides an overview of these analyses.

Figure 1 – 1
Overview of the Comprehensive Rate Analyses



In a comprehensive rate study, the revenue requirement analysis is concerned with the overall funding sources (revenues) and expenses (both operating and capital) of the utility. From this analysis, a determination can be made as to the overall *level* of adjustment to rate revenues. Next, a cost of service analysis is performed to proportionally distribute the revenue requirement to the various types of customers served (e.g., low strength, high strength). Finally, given the overall level of revenues to be collected, along with the proportional distribution of those costs, the last step of the rate study process is the designing of rates to collect the appropriate level of revenues while considering the other rate design goals and objectives of the utility (e.g., revenue stability, conservation, ease of administration, customer understanding). However, a key component of the Study is supporting the requirements of Proposition 218 for the proposed rates while considering the rate design goals and objectives.

In the case of the City's Study, all three analyses (revenue requirement, cost of service, rate design) were conducted for the sewer utility. The results from each task of the rate study were used as the basis for establishing cost-based and proportional rates for the City's customers.

In developing this Study, HDR utilized generally accepted cost of service and rate setting techniques as well as industry best practices in the development of the City's sewer rate study.

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1.5 Determining the Revenue Requirement

Most public utilities use the "cash basis" methodology for establishing their revenue requirement and setting rates. This revenue requirement methodology conforms to most public utility budgetary requirements and the calculation is easy to understand. Under the cash basis revenue requirement methodology, a public utility:

- ✓ Adds operation and maintenance (O&M) expenses to applicable taxes or transfer payments to determine total operating expenses. Operation and maintenance expenses include the materials, electricity, labor, supplies, etc., needed to keep the utility functioning.
- ✓ Calculates capital costs by adding debt service payments (principal and interest) to capital improvements financed with rate revenues. In lieu of including capital improvements financed with rate revenues, a utility sometimes includes (i.e., substitutes) annual depreciation expense to stabilize the annual revenue requirement from year-to-year.

Note that the two portions of the capital expense component (debt service and capital improvements financed from rates) are necessary under the cash basis methodology because utilities generally cannot finance all of their capital facilities with strictly rates or long-term debt.

Under the cash basis revenue requirement methodology, the sum of the operating expenses and capital costs equals the utility's total revenue requirement during any period of time (see Table 1 – 1).

Table 1 – 1
Overview of the Sewer Utility Cash Basis Revenue Requirement

+	Sewer Operation and Maintenance Expenses
	✓ Planning and Project Management
	✓ Sanitary Sewer Operations
+	Repair and Replacement Funded from Rates
+	Debt Service (P + I) – Existing and Future
±	Change in Working Capital
=	Total Sewer Revenue Requirement
–	Miscellaneous Revenues
=	Net Revenue Requirement (Balance Required from Rates)

The analyses developed within this report utilized the cash basis methodology. This is consistent with past practices of the City's utility rate-setting.

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1.6 Analyzing the Sewer Cost of Service

After the total revenue requirement is determined, it is then distributed to the users (i.e., customers) receiving sewer service. The proportional distribution, as analyzed through a cost of service analysis, reflects the cost relationships for collecting and conveying wastewater along with the costs from SVCW to treat the wastewater. The approach for establishing the cost of service analysis is based on the Water Environment Federation Manual of Practice No. 27 (WEF MOP #27). As discussed in the manual, a cost of service analysis requires three analytical steps, which are:

1. Costs are ***functionalized*** or grouped into the various cost categories related to providing service (e.g., pumping; treatment, collection). This step is largely accomplished by the utility's accounting system
2. The functionalized costs are then ***allocated*** to the appropriate cost component(s). Allocation refers to the arrangement of the functionalized data into cost components. For example, sewer utility costs are typically allocated as volume, strength (BOD/SS), customer-related, or a combination of the cost components
3. Once the costs are allocated to the cost components, they are proportionally ***distributed*** to the customer classes of service (e.g., low-strength, high-strength). The distribution is based on each customer class's relative contribution to the cost component (i.e., benefits received from and burdens placed on the system and its resources). For example, customer-related costs are distributed to each class of service based on the total number of customers in that class of service. Once the costs are distributed, the revenues from each customer class of service required to achieve cost-based rates can be determined

At the conclusion of the cost of service analysis, two key pieces of information are provided. First, the cost of service provides an understanding of the total revenues to be collected from each class of service. In other words, the revenue requirement is, for example, $10.0 million and the cost of service provides a proportional method to distribute that total cost of $10.0 million between the sewer customer classes of service (e.g., low-strength, high-strength). The other important piece of information provided by the cost of service analysis is the average unit costs. Average unit costs are the distributed costs divided by the appropriate consumption (billing) units. This provides an understanding of the cost on a $/customer/month and $/hundred cubic feet (HCF) basis.

1.7 Designing Sewer Rates

The design of the proposed sewer rates for adoption by the City concludes the analytical or technical analysis portion of the rate study process. In designing proposed sewer rates, the results from both the revenue requirement and cost of service analyses are used to develop rates that achieve the overall goals and objectives of the City. These goals and objectives may include the consideration of cost-based rates, but may also consider items such as ability to pay, continuity of past rate philosophy, conservation (efficient use), encouragement of economic development, ease of customer understanding and billing administration, legal requirements, etc. It is important to understand that cost of service is only one goal or objective in designing final sewer rates. However, it is an important one, and necessary to meet the proportionality requirements of Proposition 218.

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2.0 Development of the Sewer Revenue Requirement

2.1 Introduction

This section of the City's rate study report discusses the development of the sewer revenue requirement analysis and proposed sewer rate revenue transition plan. The main objective of the revenue requirement is to develop cost-based sewer rates while attempting to minimize the impact to the utility's customers. Provided below is a detailed discussion of the revenue requirement, along with our findings, conclusions and recommendations.

2.2 Determining the Sewer Utility Revenue Requirement

The starting point of the sewer revenue requirement analysis was the FY 2025-26 adopted sewer budget. HDR and the City developed a projection of revenues and expenses for future years based on assumed escalation (inflationary) factors. The Study developed future rate needs based on operating and capital expenses over a five-year period, through FY 2030-31. However, the focus for purposes of rate setting was on the next three-year period (FY 2026-27 – FY 2028-29). A rate transition plan was developed to provide a smooth transition to prudently fund the sewer utility over the long-term.

The sewer capital funding plan was developed based on the sewer utility capital improvement plan (CIP) as developed by the City. This plan does not assume additional issuances of long-term debt at this time and continues to increase the level of renewal and replacement capital funding over the five-year planning period.

2.2.1 Determining the Time Period and Methodology

The first step in calculating the revenue requirement for the sewer utility was to establish a time frame for the analysis. For this Study, the revenue requirement was developed for FY 2025-26 through FY 2030-31, with the focus for rate setting purposes on the three-year period of FY 2026-27 – FY 2028-29. Reviewing a multi-year time period is recommended to allow for the identification of significant expenses that may be on the horizon. By anticipating future financial requirements, the City can begin planning for these changes sooner, thereby minimizing short-term rate impacts and overall long-term rates.

The second step in determining the revenue requirement for the City was to determine the basis of accumulating costs. For the City's revenue requirement, the "cash basis" approach was utilized. The cash basis approach is the most typical methodology used by municipal utilities to set their revenue requirement and is the method used in previous rate studies developed for the City by HDR. The actual revenue requirement developed for the City was customized to follow the City's system of accounts (budget documents). However, even with these modifications, the City's sewer revenue requirement still contains the basic cost components of the cash basis methodology. Table 2 – 1 provides a summary of the cash basis approach used to develop the City's sewer revenue requirement.

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Table 2 – 1
Overview of the Cash Basis Revenue Requirement

+	Collection O&M Expenses
+	Treatment O&M Expenses
+	Repair & Replacement Funded from Rates
+	I/I Capital Funding
+	Debt Service (P + I) – Existing and Future
±	Change in Working Capital
=	Total Sewer Revenue Requirement
−	Miscellaneous Revenues
=	Net Revenue Requirement (Balance Required from Rates)

Given a time period around which to develop the revenue requirement and a method to accumulate the costs, the focus shifts to the development and projection of the revenues and expenses of the sewer utility.

The primary financial inputs in the development of the revenue requirement were the City's 2025-26 adopted sewer budget, historical winter customer characteristics data (e.g., number of customers and winter water average consumption), and the current adopted sewer rates. Presented below is a detailed discussion of the steps and key assumptions used in the development of the projections of the City's sewer revenues and expenses.

2.2.2 Flow Impacts on Calculating Revenues

The City has a sewer rate structure that includes a fixed component as well as a volumetric component based on each customer's winter water average consumption. Each year, the City requests the water consumption data from Mid-Peninsula Water District to develop the proposed sewer rates and resulting revenue forecast for the next fiscal year. The City adopted a drought regulation factor during the 2016 rate study, which is now called the flow adjustment factor. This adjustment factor has been in place since that time. During the comprehensive rate study process, the factor is reviewed and updated as necessary to reflect current and projected consumption levels.

This Study has reset the present flow adjustment factor of 10.0% to 0.0%. Based on the winter water consumption data provided by Mid-Peninsula Water District, consumption has increased since the last rate study to pre-drought levels. Due to this, the flow adjustment factor was reset, and proposed rates were set at adequate levels assuming no flow adjustment factor. The need for a flow adjustment factor will be reviewed again during the next rate study and adjusted as necessary depending on the conditions at that time.

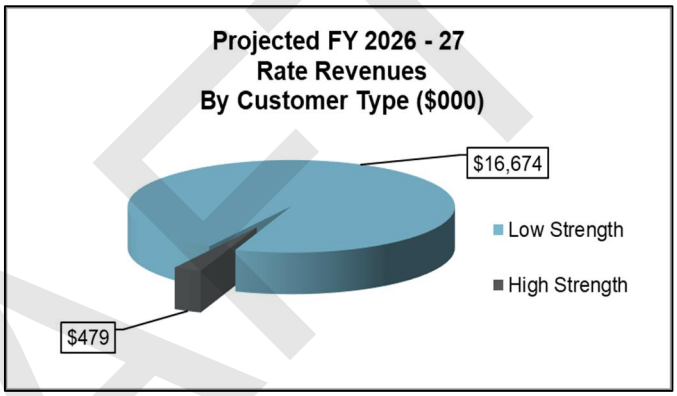
It should also be noted that the majority of the City's costs are fixed and do not vary depending on the level of sewer flows. The one cost that can vary is the cost of treatment from Silicon Valley Clean Water (SVCW). The cost of treatment is flow-based and would change as a result of increased or decreased sewer flows. Given the above, a change in annual winter water

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consumption, which is the basis for establishing sewer billing units and subsequent sewer rate revenues, will have an impact on the rate adjustments necessary to prudently fund the City's operating and capital expenses.

2.2.3 Projection of Sewer Revenues

Once the billing units were developed based on the winter water data, the next step in developing the revenue requirement was to develop a projection of rate revenues at present rate levels. In general, this process involved developing projected billing units for each customer class of service. The billing units for each customer group were then multiplied by the applicable current sewer rates. This method of independently calculating revenues assures the projected revenues used within the analysis tie to the projected billing units.



The vast majority of the City's rate revenues are derived from low strength customers. Currently, the City has two major classes of service: low strength customers and high strength customers. High strength customers reflect the customers with higher strength wastewater flows given the type of business activity which impacts the costs of treatment. This is an important distinction as SVCW allocates costs in part between member agencies based on the strength of the wastewater flows from each agency. In total, and at currently adopted rate levels, the City is projected to receive approximately $17.2 million in rate revenue in FY 2026-27. This is based on the projected winter water billing data, plus the present flow adjustment factor of 10%. Future year revenues are projected at an additional 1.0% annual customer growth.

In addition to rate revenues, the City also receives a variety of miscellaneous revenues, which include interest on investments, standby fees, and other miscellaneous revenues. The sewer utility is projected to annually receive an average of approximately $925,000 in miscellaneous revenues over the projected planning horizon.

On a combined basis, taking into account the rate revenues along with the miscellaneous revenues, the City's total projected revenues are expected to be approximately $18.4 million in FY 2026-27, increasing to approximately $18.8 million by FY 2030-31, prior to any projected rate adjustments.

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2.2.4 Projection of Sewer Operation and Maintenance Expenses

Operation and maintenance (O&M) expenses are incurred by the City to operate and maintain the existing collection and conveyance system as well as treatment charges associated with wastewater treatment from SVCW. In general, O&M expenses are grouped into a number of different major functional categories (see Table 2 – 1). For each major functional category, the City maintains a number of subaccounts. To begin the process of projecting O&M expenses over the planning horizon, escalation factors were developed.

Escalation factors were developed for the basic types of expenses the City incurs: labor, benefits, materials and supplies, utilities, insurance, and miscellaneous expenses. The escalation factors used were in the range of two to seven percent per year, depending on the type of cost and recent inflationary trends. A major cost for the sewer utility is the cost of wastewater treatment from Silicon Valley Clean Water (SVCW). SVCW's costs have been increasing due to operating costs associated with regulatory and utility cost increases. SVCW costs are allocated between the members based on their capacity rights, average annual flow rates and strength of the sewer generated by each member agency. Based on the SVCW budget for FY 2025-26, Belmont's share of $3.2 million in treatment costs were included in the Study. The SVCW treatment costs were based on the SVCW planning document and are increasing at approximately 5.3% annually on average over the five-year period.

Provided below in Table 2 – 2 is a summary of the escalation factors used to develop the projected O&M expenses for FY 2026-27 through FY 2030-31.

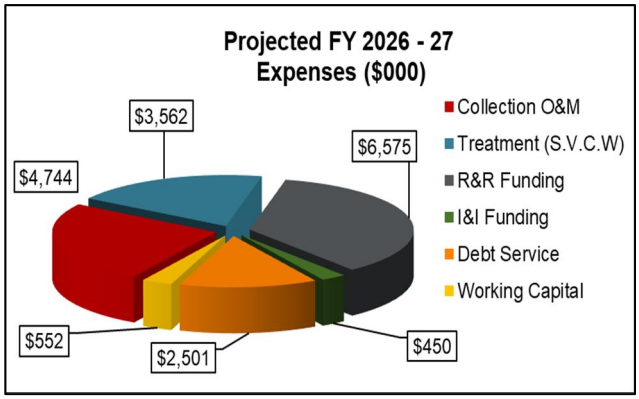
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Table 2 – 2
Overview of the Sewer Utility Escalation Factors

	FY 2026-27[1]	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31
Revenues					
Rate Revenues (Growth)	1.0%	1.0%	1.0%	1.0%	1.0%
Other Revenues	Flat	Flat	Flat	Flat	Flat
Expense					
Labor	5.0%	5.0%	4.0%	3.0%	3.0%
Professional/Contractual	2.0%	2.0%	2.0%	2.0%	2.0%
Data Processing	3.0%	3.0%	3.0%	3.0%	3.0%
Benefits – Medical	7.0%	7.0%	7.0%	7.0%	7.0%
Benefits – Other	5.3%	5.3%	5.3%	5.3%	5.3%
Materials & Supplies	3.0%	3.0%	3.0%	3.0%	3.0%
Equipment/Vehicles	3.0%	3.0%	3.0%	3.0%	3.0%
Education/Training	2.0%	2.0%	2.0%	2.0%	2.0%
Indirect Expense	3.0%	3.0%	3.0%	3.0%	3.0%
Miscellaneous	3.0%	3.0%	3.0%	3.0%	3.0%
Utilities	5.0%	5.0%	5.0%	5.0%	5.0%
SVCW Treatment	10.6%	4.0%	4.0%	4.0%	4.0%
Inflation Factor	2.7%	2.7%	2.7%	2.7%	2.7%

[1] Rate revenue for FY 2026-27 was based on the projected billing units and current adopted sewer rates. Other revenues were calculated.

The development of the revenue requirement was based on the City's FY 2025-26 adopted sewer budget. Using the escalation factors as shown in Table 2 – 3, a forecast of future O&M expenses was developed. As noted, the SVCW treatment costs were based on the projections provided by SVCW. The revenue requirement maintained the overall functional nature of the City's system of accounts (i.e., salaries and wages, benefits, supplies). It should be noted that no other significant changes or extraordinary increases over the FY 2025-26 budget levels for operating expenses were assumed.



Total operation and maintenance expenses for the City are projected to be approximately $8.3 million in FY 2026-27. Of this amount, approximately 43% or $3.6 million is related to SVCW wastewater treatment costs. The SVCW wastewater treatment costs are purchased services and thus are not a "locally controlled" sewer cost. Over the planning horizon, the O&M

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expenses are projected to increase to approximately $9.7 million by FY 2030-31.

2.2.5 Projection of Sewer Capital Improvement Projects and Funding

A key component in the development of the City's sewer revenue requirement was properly funding capital improvement needs. The sewer capital funding plan was developed from the City's sewer capital improvement plan and master plan identified projects.

As noted in prior rate studies, a key objective is setting proposed rates at a level that establishes prudent funding for renewal and replacement needs. This Study includes increasing levels of renewal and replacement and capital funding over the five-year planning period. Renewal and replacement funding is approximately $6.6 million in FY 2026-2027, increasing to $6.8 million by FY 2030-2031.

In addition to the sewer capital plan, additional capital improvements have been outlined to reduce inflow and infiltration (I&I) in the sewer system. I&I rate funded capital is $450,000 in FY 2026-27, which remains at this level throughout the rate setting period. Provided below in Table 2 – 3 is a summary of the sewer capital improvement plan and funding.

Table 2 – 3
Summary of the Sewer Capital Improvement Plan ($000s)

	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31
Total Sewer Capital Projects	$6,500	$12,132	$18,541	$10,575	$7,154	$6,775
Less: Funding Sources						
Operating Fund Reserves	$0	$0	$0	$0	$0	$0
Capital Fund Reserves	0	5,557	9,216	0	0	0
Connection Fee Reserves	0	0	2,700	3,900	429	0
Grants	0	0	0	0	0	0
Total Funding Sources	$0	$5,557	$11,916	$3,900	$429	$0
Sewer Capital from Rates	**$6,500**	**$6,575**	**$6,625**	**$6,675**	**$6,725**	**$6,775**
I&I Capital Funding	**$350**	**$450**	**$450**	**$450**	**$450**	**$450**

The City, based on the rate transition plan developed as part of the revenue requirement, is projected to have adequate resources to provide funding for the capital projects as shown above. Prior rate study capital funding analyses have included the periodic issuance of long-term debt to fund identified capital improvement needs. However, for this Study no new long-term debt is planned to be issued given the availability of existing reserves and adequate rate (renewal and replacement) funding. Provided below is an overview of the funding sources the City has used and will continue to use to fund the planned improvements over the next five-year period.

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Rate Funding **–** A general financial guideline states that at a minimum, a utility should annually fund from rates an amount equal to or greater than annual depreciation expense for renewal and replacement funding. In this case, annual depreciation expense reflects the City's current investment in the sewer collection plant being depreciated or "losing" its useful life. Therefore, this portion of plant investment needs to be replaced to maintain the existing level of infrastructure. More importantly, for a sewer utility, failure to maintain the collection system infrastructure could lead to infiltration and inflow (I&I) issues. With increased flows, the City's overall cost of wastewater treatment would in turn also increase. That being the case, it becomes very cost-effective to properly and adequately maintain the collection system to minimize I&I issues. The City has taken a proactive approach in past studies as well as in this analysis to maintain capital funding equal to or greater than annual depreciation.

Capital Reserve Funding **–** The capital reserve can serve different purposes, but capital reserves are primarily a means to set aside funds for larger capital projects that may require funding greater than the annual rate funding component provides. Maintaining adequate capital reserves helps to smooth out the fluctuations in capital improvement spending, but it also provides the City with greater financial flexibility during the planning and construction of projects. As part of the capital funding plan, there will be approximately $55.2 million in capital projects over the five-year period, with an annual average ending cash balance of $26.4 million in capital reserves used as a funding source over the five-year rate setting period (FY 2026-27 – FY 2030-31). Over the planning horizon, close attention should be given to the capital reserve balance as to not reduce fund balances below minimum targets. The target minimum capital reserve amount is typically set equal to two years of annual depreciation expense.

Long-Term Debt **–** Another funding source for capital projects is the issuance of long-term debt (e.g., low-interest loans, revenue bonds). While there are certain advantages and disadvantages with the issuance of long-term debt, it is important to weigh all of them when deciding whether to issue new debt or fund a project by other means. Long-term debt is often issued for major capital projects which have an immediate impact on rates while also being a financing mechanism to smoothly finance / fund the major capital project. For this rate setting period, the City is not anticipating issuing any additional long-term debt.

2.2.6 Projection of Debt Service

The final component of the City's revenue requirement is annual debt service payments. The City currently has three outstanding debt obligations: the 2016 refunding and the 2016 and 2019 revenue bonds, which amount to a total annual debt service payment of approximately $2.5 million for FY 2026-27. As mentioned previously, the City is not anticipating issuing additional long-term debt at this time. As a result, the three outstanding debt issuances will comprise the debt service payments for the planning period.

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2.2.7 Reserve Funding

Reserve funds can be drawn down to mitigate the need for rate adjustments or increased to replenish reserves if they have been drawn down in prior years. In this Study, change in working capital is primarily used to balance funds between the operating and capital reserves and to fund the capital improvement plan during the rate setting period.

2.2.8 Summary of the Sewer Revenue Requirement

Given the above projections of revenues and expenses, a summary of the revenue requirement for the sewer utility can be developed. In developing the final revenue requirement, consideration was given to the financial planning objectives of the City. In particular, emphasis was placed on attempting to minimize rates yet still have adequate funds to support the operational and capital expenses while maintaining the City's target financial metrics throughout the projected time period. Presented below in Table 2 – 4 is a summary of the sewer revenue requirement. A detailed analysis of the sewer revenue requirement can be found in the Technical Appendix.

Table 2 – 4
Summary of Sewer Revenue Requirement ($000s)

	Budget	Projected				
	FY 2025-26[1]	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31
Revenues						
Retail Rate Revenues	$16,983	$17,153	$17,325	$17,498	$17,673	$17,850
Other Revenues	309	1,231	1,130	951	958	973
Total Revenues	**$17,293**	**$18,384**	**$18,455**	**$18,449**	**$18,631**	**$18,823**
Expenses						
Collection O&M Expenses	$4,556	$4,744	$4,936	$5,123	$5,302	$5,489
Treatment O&M Expenses	3,220	3,562	3,704	3,852	4,006	4,167
Repair & Replace. Funding	6,500	6,575	6,625	6,675	6,725	6,775
I/I Capital Funding	350	450	450	450	450	450
Total Debt Service	2,498	2,501	2,501	2,497	2,496	2,499
Change in Working Capital +/-	169	552	239	377	728	1,098
Total Expenses	**$17,293**	**$18,384**	**$18,455**	**$18,974**	**$19,708**	**$20,478**
Balance/(Deficiency) of Funds	$0	$0	$0	($525)	($1,076)	($1,655)
Cumulative as a % of Rates	0.0%	0.0%	0.0%	3.0%	6.1%	9.3%
Proposed Rate Adjustments	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**3.0%**	**3.0%**
Debt Service Coverage Ratio						
Before Rate Adjustment	3.69	3.91	3.80	3.67	3.61	3.55
After Rate Adjustment	3.69	3.91	3.80	3.88	4.04	4.21

[1] Note: FY 2025-26 includes the revenues at the adopted rate levels from the prior rate study. Therefore, no rate adjustment is included in FY 2025-26.

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It is important to note that the "Balance/(Deficiency) of Funds" row in Table 2 – 4 is cumulative. That is, any adjustments in the initial years will reduce the deficiency in later years. Rates need to be adjusted approximately 9.3% over the five-year period to adequately fund annual O&M expenses, annual repair and replacement funding, and the system's capital needs over the five-year period. The size and timing of the adjustments is critical as it is proposed that the City set rates for a three-year period. This is important as the rate transition plan, or proposed rate adjustments, have been developed for a 5-year period. Adjustments to the proposed rate adjustments shown in the initial years will result in the need to adjust rates, more or less, in later years. The graph on the right illustrates the projected revenues, expenses, and reserve funds. As can be seen, the level of revenues meet the level of expenses in FY 2026-27 and FY 2027-28, but rate adjustments are necessary in FY 2028-29 through FY 2030-31.

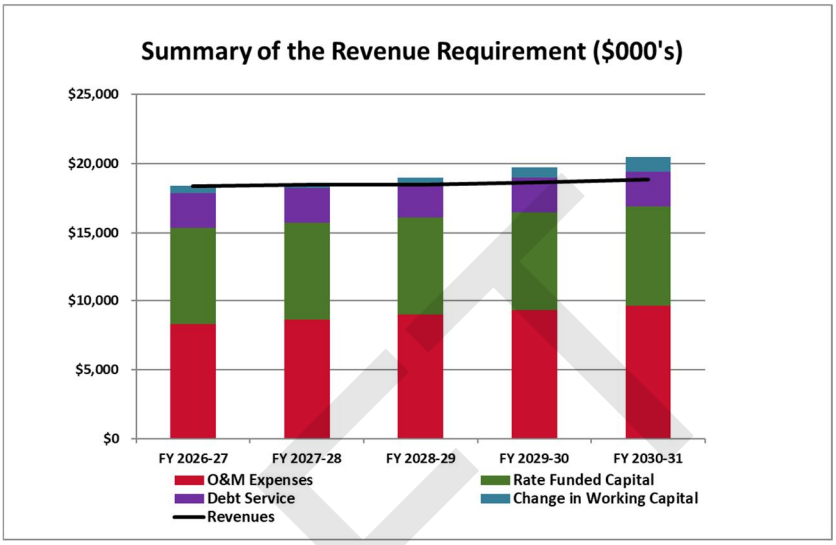


Table 2 – 4 shows the total deficiency of revenues before sewer rate adjustments ranges from $0 in FY 2026-27 to $1.7 million in FY 2030-31. No rate adjustments are proposed for FY 2026-27 or FY 2027-28. Rate adjustments of 3.0% annually are proposed for FY 2028-29 – FY 2030-31. As noted previously, the projected rate adjustments proposed to start in FY 2028-29 allow the City to meet three key prudent financial criteria, which are as follows:

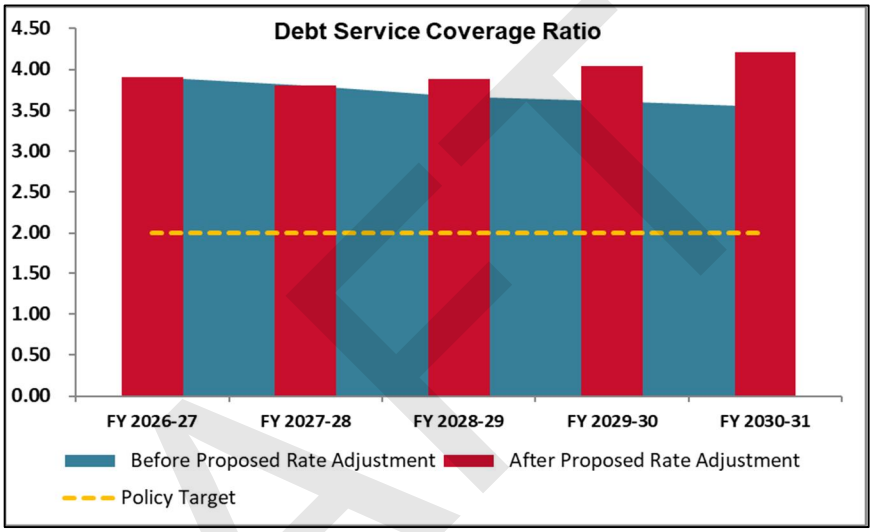
- Debt Service Coverage Ratios – DSC target of 2.0
- Adequate Renewal and Replacement Funding – Annual renewal and replacement funding exceeds depreciation over the five-year plan
- Maintain Prudent Reserve Fund Levels – Operating reserve target equal to or greater than annual minimum of 180 days of O&M and capital reserve target equal to or greater than two years of annual depreciation expense

Meeting these three key criteria are critical to the City being able to fund/finance capital projects with long-term debt in the future by demonstrating to the outside financial community its willingness and commitment to maintain a strong financial position. The revenue requirement developed in this Study will allow the City to develop cost-based rates that meet the City's goals and objectives for maintaining the existing system and funding capital projects.

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2.2.9 Debt Service Coverage Ratios

Generally, revenue bonds contain covenants requiring rates to be set at an adequate level to ensure repayment of the annual principal and interest debt obligations. The financial measure of rate adequacy is typically determined using a debt service coverage ratio (DSC). The DSC ratio is a financial measure of the utility's ability to repay the debt. Based on the City's approach, the DSC ratio is set at a level such that revenues less operating expenses will be 2.0 times greater than the maximum annual debt service payment on the outstanding debt. That is, rates will be sufficient to pay projected O&M and have an additional annual debt service payment.



As noted above, the City has established a target of maintaining a 2.0 DSC ratio. At present rate levels, the sewer utility is meeting the policy minimum.

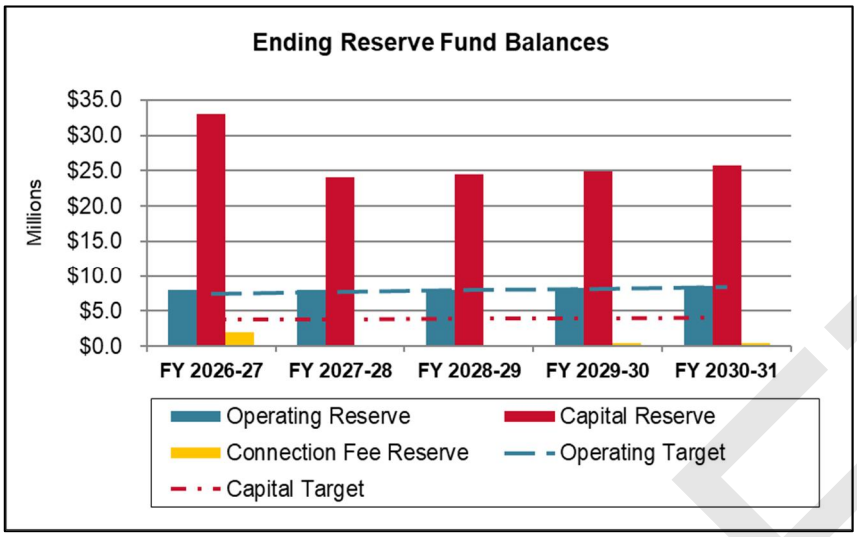
While the City is not planning on issuing additional long-term debt for this rate setting period, the DSC ratio decreases before the proposed rate adjustments due to O&M costs increasing while rate revenues remain relatively flat. Due to this, the proposed rate adjustments are necessary to maintain strong coverage ratios and continue to remain above the target of a 2.0 DSC ratio.[1] This is an important financial target as planning around the absolute minimum level (e.g., 1.25 bond requirement) can result in a technical default on the bonds if unplanned expenditures occur or revenues are lower than anticipated in a given year. Planning a minimum DSC target of 2.0 was recommended by the City's financial advisors during the most recent bond issuance process. A higher DSC ratio can result in a higher bond rating and lower interest rates and overall borrowing costs. As noted, for purposes of the Study, HDR is not acting as a municipal advisor to the City or calculating DSC ratios for reporting or verification purposes.

2.2.10 Review of the Sewer Reserve Levels

There can be many different purposes for reserves, and they can also be a good indicator of the long-term financial health of the utility. The City's sewer utility currently has one reserve fund, however, for rate setting purposes, it was split into three reserve funds: an operating reserve fund, capital reserve fund, and connection fee reserve fund. The operating fund reserve has a minimum ending fund balance target of 180 days of O&M expenses plus an emergency reserve

[1] A debt service coverage (DSC) ratio is an indicator of the amount of funds available to pay debt service after O&M expenses and other pre-debt obligations have been met. A DSC ratio of 1.25 means the utility has 25% more funds available to pay debt service than the amount of the debt service payment(s). For example, assuming a utility has a $1.0 million debt service payment, a DSC of 1.25 means that the utility has $1.25 million available to pay debt service (i.e. $1.25 million ÷ $1.0 million = 1.25 DSC).

of $2.0 million, which is approximately $7.5 million for FY 2026-27. The capital fund reserve has a target minimum of approximately two years of annual depreciation expense, or approximately $3.7 million for FY 2026-27. The connection fee reserve does not have a specific target minimum as connection fees may only be used for system expansion, or debt service issued for the expansion of the system. Combined, the City's target minimum reserve is approximately $11.2 million for FY 2026-27, increasing to $12.4 million by FY 2030-31. Over the planning period, the City is projected to maintain adequate operating and capital reserves and not fall below the recommended minimum reserve levels. The annual cash flow and ending reserve balances should be reviewed each year to make sure that the uses of funds do not place the reserve balance below the minimum level. Additionally, as the sewer reserves approach the minimums, the need for rate adjustments should be evaluated to avoid future large rate adjustments for customers.



2.2.11 Consultant's Conclusions

Based on the City's revenue requirement analysis, no rate revenue adjustments are projected in FY 2026-27 or FY 2027-28. Starting in FY 2028-29, annual rate revenue adjustments of 3.0% are necessary through FY 2030-31 to prudently fund annual O&M and capital expenses. HDR has reached this conclusion for the following reasons:

- Rate adjustments are necessary to fund the City's annual renewal and replacement needs
- Rate adjustments are necessary to maintain prudent financial metrics for debt service coverage ratios and reserve levels
- The proposed rate adjustments maintain the City's sewer system strong financial health, which is important as the City continues to maintain the existing system

The rate transition plan presented in this Study provides the City with the ability to meet the goals and objectives for the City's sewer system.

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3.0 Development of the Sewer Cost of Service Analysis

3.1 Introduction

The purpose of a cost of service analysis is to proportionally distribute the total revenue requirement to the sewer customer classes of service. For the City's Study, the customer classes of service are low strength and high strength customers. The previously developed revenue requirement for FY 2026-27 was utilized in the development of the cost of service analysis.

In order to determine the proportional distribution of costs to each customer class of service on the sewer system, a cost of service analysis is conducted. As outlined in the WEF MOP #27, and to meet the requirements of Proposition 218, the cost of service functionalizes, allocates, and distributes the sewer revenue requirement to each class of service in a proportional manner. In recent years, increasing emphasis has been placed on cost of service studies by government agencies, customers, utility regulatory commissions, and other parties. This interest has been generated in part by continued inflationary trends, increased operating and capital expenditures, as well as concerns of proportionality in rates among customers. Following the generally accepted guidelines and principles of a cost of service analysis will inherently lead to rates which are proportional, cost-based, and not viewed as arbitrary or capricious in nature. Provided below is a detailed discussion of the cost of service analysis for the sewer utility.

3.2 Objectives of a Cost of Service Study

There are two primary objectives in conducting a cost of service study:

- Proportionally distribute the allocated revenue requirement to the customer classes of service
- Derive average unit costs for subsequent rate designs

The objectives of a cost of service analysis are different from determining the revenue requirement. As noted previously, a revenue requirement analysis determines the utility's overall financial (revenue) needs, while the cost of service study determines the proportional manner in which to collect the revenue requirement.

The second rationale for conducting a cost of service analysis is to design the rates such that they properly reflect the costs incurred by the City to provide sewer service. For example, the City may incur costs related to flow or total volume, the strength of wastewater flow, and customer cost components. Each of these types of costs may be collected in a slightly different manner to allow for the development of a rate that collects costs in the same manner as they are incurred.

To determine the cost to serve each customer class on a system, three basic analytical tasks are completed: functionalization, allocation, and distribution of the FY 2026-27 revenue requirement. Each of these steps in the cost of service analysis is discussed in detail below.

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3.3 Determining the Customer Classes of Service

One of the first tasks of a cost of service analysis is to determine the classes of service for the analysis. In determining classes of service, the objective is to group customers together into similar or homogeneous groups based on wastewater flow and strength characteristics and/or sewer facility requirements. Based on the current rate schedules, the classes of service used within the sewer study are:

- Low Strength
- High Strength

The City is billed by SVCW based on the strength of the wastewater. In developing these customer classes of service, the costs of treatment can be distributed proportionately to reflect the impacts placed on the system.

Terminology of a Cost of Service Analysis

Functionalization – The arrangement of the cost data by functional category (e.g. treatment, collection).

Allocation – The assignment of functionalized costs to cost components (e.g. volume, strength, and customer related).

Distribution – Distributing the allocated costs to each customer class based on the proportional contribution to that specific cost component.

Volume Costs – Costs that are classified as volume related vary with the total flow of sewer (e.g. chemical use at the treatment facility).

Strength Costs – Costs classified as strength related refer to the wastewater treatment function. Typically, strength-related costs are further defined as biochemical oxygen demand (BOD) and suspended solids (SS). Customers with higher wastewater strength characteristics cost more to treat. Facilities are often designed and sized around meeting these costs.

Direct Assignment – Costs that can be clearly identified as belonging to a specific customer class.

3.4 General Cost of Service Procedures

A cost of service study utilizes a three-step approach to review costs, which take the form of functionalization, allocation, and distribution. Provided below is a detailed discussion of the sewer cost of service study conducted for the City, and the specific steps taken within the analysis.

3.4.1 Functionalization of Costs

The first analytical step of the sewer cost of service study is called functionalization. Functionalization is the arrangement of sewer expenses and assets (infrastructure) data by major operating functions. This is generally accomplished through the utility's system of accounts. In this study, the City's system of accounts was used to functionalize sewer plant assets and operating expenses.

3.4.2 Allocation of Costs

The second analytical task performed is the allocation of the functionalized expenses to cost components. This task reviews each cost and attempts to determine why the sewer cost was incurred and what type of need was met (e.g. volume, strength, customer). The cost allocators used for the sewer utility cost of service study are as follows:

- **Volume Related Costs**: Volume-related costs are those that tend to vary according to the quantity of wastewater collected and treated. An example of a volume related cost is electricity used

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for pumping wastewater.

- **Strength Related Costs**: Strength related costs are those costs associated with the additional handling and treatment of high "strength" wastewater. Wastewater strength is typically measured in biochemical oxygen demand (BOD) and total suspended solids (SS). Increased levels of BOD or SS generally equate to increased treatment costs. Pre-treatment is generally required if the discharge is known to regularly exceed the typical (i.e., domestic level) waste strength. For the City's Study, portions of the SVCW treatment related costs are allocated to the strength component.
- **Customer Related Costs**: Customer-related costs vary with the addition or deletion of a customer. Customer related costs typically include the costs of billing, collecting, and accounting. Customer-related costs may also be further categorized as actual or weighted.
- **Revenue Related**: Some costs associated with the sewer utility may vary with the amount of revenue received by the utility. An example of a revenue related cost would be a utility tax, which is based on gross utility revenue.
- **Direct Assignment**: Certain costs associated with operating the utility may be directly traced to a specific sewer customer or class of service. These costs are then directly assigned to that specific class of service. It should be noted that there were no costs that were directly assigned during the development of the City's cost of service analysis.

Once the costs have been allocated, the next step is to distribute the costs proportionally between the customer classes of service. Provided in the next section is a summary of the development of the distribution factors.

3.4.3 Development of Distribution Factors

Once the allocation process is complete, and the customer groups have been defined, the allocated costs are distributed to the customer classes of service. The City's allocated costs were distributed using the following distribution factors:

- **Volume Distribution Factor:** Volume-related costs are distributed on the basis of contribution to wastewater flows. In order to develop this distribution factor, some knowledge of the contribution to flows must be determined. The assumed wastewater contribution by customer class for FY 2026-27 was the basis for the development of the volume distribution factor. Sewer flows were projected based on historical winter water billing for low strength and high strength customers.
- **Strength Distribution Factor:** Strength-related costs are allocated between biochemical oxygen demand (BOD) and suspended solids (SS). Both of these types of costs are distributed to the various classes of service based on the relative estimated strengths that each class of service contributed to the overall flow at the plant. Strength factors for the low strength and high strength customers were based on industry standard data.
- **Customer Distribution Factor:** Customer costs within the cost of service study are distributed to the customer classes of service based on their respective customer counts. Two types of customer distribution factors were developed, actual and weighted. The

actual customer distribution factor was based on the actual number of accounts for each customer class. The weighted customer factor reflects the disproportionate costs associated with serving different types of customers. For purposes of the City's Study, no cost differences were determined for the weighted customer factor.

- **Revenue Related Distribution Factor:** The revenue related distribution factor was developed from the projected rate revenues for FY 2026-27 for each customer group. As a point of reference, no costs were allocated to the revenue component and therefore, the revenue distribution factor was not used.

The development of the distribution factors is based on generally accepted principles as developed in the WEF MOP #27 to meet the proportionality requirements of Proposition 218. Given the development of the distribution factors, the final step in the cost of service analysis is to distribute the allocated costs to the various customer classes of service.

3.4.4 Functionalization and Allocation of Sewer Plant in Service

The next step of the cost of service is the functionalization and allocation of sewer plant in service. In performing the functionalization of plant in service, HDR utilized the City's historical plant records. The allocation process included reviewing each group of assets and determining which cost classifiers the assets were related to. For example, the City's assets were allocated as: volume-related, strength-related, customer-related, or revenue-related. Provided below is a brief discussion of the allocation process used.

The City's system assets are mostly collection related in nature. In this Study, the collection plant was classified as 75% volume and 25% actual customer to reflect a portion of the assets being in place to simply move wastewater from the customer to the treatment system as well as a portion being related to providing service based on the number of customers on the system. Table 3 – 1 shows the detail of the allocation for the City's sewer plant in service. A more detailed exhibit of the City's functionalization and allocation of plant investment can be found in the Technical Appendix.

Table 3 – 1
Summary of the Allocation of Sewer Plant in Service

Category	Volume Related	BOD Related	SS Related	Actual Customer	Direct Assign
Sewer Operations	100.0%	0.0%	0.0%	0.0%	0.0%
Sewer Capital	75.0%	0.0%	0.0%	25.0%	0.0%

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3.4.5 Functionalization and Allocation of Operating Expenses

Operating expenses are generally functionalized and allocated in a manner similar to the corresponding plant account. For example, maintenance of collection lines is typically allocated in the same manner (allocation percentages) as the plant account for collection lines. This approach to the allocation of operating expenses was used for this analysis.

Table 3 – 2
Summary of the Allocation of Sewer Expenses

Category	Volume Related	BOD Related	SS Related	Actual Customer	Weighted Customer
SVCW Treatment	45.0%	25.6%	29.5%	0%	0%
Planning and Project Management, Sewer Operations (Overall)	74.4%	0.5%	0.5%	23.8%	0.8%
Administrative Charge	0%	0%	0%	0%	100%

For the City's Study, the revenue requirement for FY 2026-27 was functionalized, allocated, and distributed. As noted earlier, the City utilized a cash basis revenue requirement, which was comprised of operation and maintenance expenses, debt service, and capital additions funded from rates. The SVCW treatment costs were allocated based on the SVCW wholesale billing contract. A more detailed review of the allocation of the revenue requirement can be found in the Technical Appendix.

3.4.6 Major Assumptions of the Cost of Service Analysis

A number of key assumptions were used within the City's cost of service analysis. Below is a brief discussion of the major assumptions used.

- The methodology used within the sewer cost of service analysis was based on generally accepted industry standard approaches and is consistent with the methodology used in the City's prior sewer rate studies
- The test period used for the sewer cost of service analysis was FY 2026-27. The revenue and expense data were previously developed within the revenue requirement analysis
- The cash basis approach was utilized, which conforms to generally accepted sewer cost of service approaches and methodologies
- The allocation of plant in service was developed based on generally accepted cost allocation techniques and the City's specific asset data
- Customer volumes used within the Study were provided for each class of service by the City through Mid Peninsula's average winter billing data
- Strength distribution factors were based on overall strength levels at the treatment plant within the City's records

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3.5 Summary of the Cost of Service Analysis

Given the allocation and distribution of the FY 2026-27 revenue requirement, a summary of the distributed costs as compared to the current revenues can be developed. Provided in Table 3 – 3 is a summary of the City's sewer cost of service analysis.

Table 3 – 3
Summary of the FY 2026-27 Sewer Cost of Service Analysis ($000's)

Classes of Service	Present Rate Revenues	Distributed Costs	$ Difference	% Difference
Low Strength	$16,674	$16,691	($16)	0.0%
High Strength	479	463	16	0.0%
Total	**$17,153**	**$17,153**	**$0**	**0.0%**

The results of the cost of service analysis indicate very minimal cost differences between the customer classes of service. It should be noted that the cost of service analysis developed by HDR is not a simple fixed/variable analysis. Rather, the cost of service analysis distributes costs between the customer classes of service based on each customer class's proportional share of volume, strength, and customer-related costs. As the City continues to monitor rates and cost of service results through future studies, cost of service adjustments may be made as the results are driven by customer consumption. Given that, no adjustments in the cost relationships between the customer classes of service are recommended at this time.

3.6 Consultant's Conclusions and Recommendations

The overall distribution of costs between low strength and high strength customers reflects the overall system average increase, which is 0.0% for FY 2026-27. In addition, it was noted that customers have been adjusting their water consumption habits and consumptive use has changed over the last several years, which has a direct impact on the rates charged in future years. As the City continues to monitor rates and cost of service results through future studies, cost of service adjustments may be made as the results are driven by customer consumption. Given these results, no adjustments in the cost relationships between the customer classes of service are recommended for the proposed three-year rate setting period. As a result, the overall proposed revenue/rate adjustments will be applied equally across all customers and rate components.

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4.0 Development of the Sewer Rate Design

4.1 Introduction

The final step of the City's comprehensive sewer rate study is the design of sewer rates to collect the desired levels of revenues, based on the results of the revenue requirement and cost of service analyses. In reviewing sewer rate designs, consideration is given to the level of the rates and the structure of the rates.

4.2 Rate Design Goals and Objectives

Prudent rate administration dictates that several criteria must be considered when setting utility rates. Some of these rate design criteria are listed below:

- ✓ Rates which are easy to understand from the customer's perspective
- ✓ Rates which are easy for the utility to administer
- ✓ Consideration of the customer's ability to pay
- ✓ Continuity, over time, of the rate making philosophy
- ✓ Policy considerations (encourage efficient use, economic development, etc.)
- ✓ Provide revenue stability from month to month and year to year
- ✓ Promote efficient allocation of the resource
- ✓ Proportional and non-discriminatory (cost-based)

Many industry experts and regulatory agencies recognize that the last consideration, proportional and cost-based rates, should be of paramount importance and provide the primary guidance to utilities on rate structure and policy. It is important that the City provide its customers with a proper price signal as to what their consumption or usage is costing. This goal may be approached through rate level and structure. When developing the proposed rate designs, all of the above listed criteria can be taken into consideration. However, it should be noted that it is difficult, if not impossible, to design a rate that meets all the goals and objectives listed above. For example, it may be difficult to design a rate that takes into consideration the customer's ability to pay and one which is cost-based. In designing rates, there are always trade-offs between these various goals and objectives.

4.3 Development of Cost Based Sewer Rates

As mentioned, developing cost-based and proportional rates is of paramount importance in developing proposed sewer rates. While it is always a key consideration in developing rates, meeting the legal requirements and documenting the steps taken to meet the requirements has been in the forefront with the recent legal challenges in the State of California on utility rates. Given this, the City's proposed sewer rates have been developed to meet the requirements of California Constitution Article XIII D, Section 6 (Article XIII D). A key component of Article XIII D is the development of rates which reflect the cost of providing service and are proportionally distributed between the various customer classes of service. HDR would point out that there is no single methodology for proportionally assigning costs to the customer classes of service. The Water Environment Federation Manual of Practice No. 27 provides various methodologies which

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may be used to establish cost-based rates. Unfortunately, Article XIII D is not prescriptive and does not provide a specific methodology for establishing rates. Given that, HDR developed the City's proposed sewer rates based on generally accepted rate setting methodologies to meet the requirements of Article XIII D.

HDR is of the opinion that the proposed rates meet the legal requirements of Article XIII D. HDR reached this conclusion based on the following:

- **The revenue derived from sewer rates does not exceed the funds required to provide the property related service (i.e., sewer service).** The proposed rates are designed to collect the overall revenue requirement of the City's sewer system as identified in this Study.
- **The revenues derived from sewer rates shall not be used for any purpose other than that for which the fee or charge is imposed.** The revenues derived from the City's sewer rates are used exclusively to operate and maintain the City's sewer system.
- **The amount of a fee or charge imposed upon a parcel or person as an incident of property ownership shall not exceed the proportional costs of the service attributable to the parcel.** The cost of service analysis focused exclusively on the issue of proportional assignment of costs to customer classes of service. The proposed rates have appropriately grouped customers into customer classes of service (low strength and high strength) that reflect the varying wastewater volumes and system requirements (i.e., the benefits they receive from and burdens they place on the system) of each customer class of service. The grouping of customers and rates into these classes of service creates the proportionality expected under Proposition 218 by having differing rates by customer class of service, which reflects both the level of revenue to be collected by the utility, and the manner in which these costs are incurred. As a result, these costs are assigned to customer classes of service based on their proportional impacts.

4.4 Present and Proposed Sewer Rates

The City's sewer rate is comprised of two components, a collection system component and a treatment system component. Each parcel's sewer charge is the sum of the base charges and flow charges for both collection and treatment. The proposed sewer rates maintain the current rate structure.

As part of the rate design analysis, the flow adjustment factor for FY 2026-27 was reset to 0.0% from 10.0% as maintained in the last rate study. After reviewing the Mid-Peninsula Water District consumption billing data, it was determined in discussion with City staff that the flow adjustment factor should be reset due to consumption increasing since the last rate study to pre-drought levels. As a result of this analysis and the cost of service analysis results, the proposed flow charges for FY 2026-27 are increased to account for the elimination of the flow adjustment charge, but customer bills will not be impacted as the flow charges were only increased by the flow adjustment factor percentage in order to reset it.

Table 4 – 1 provides the present and proposed rates for the low strength and high strength customers for the next five fiscal years.

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Table 4 – 1
Present and Proposed Sewer Rates (Annual)

	Present Rates	Proposed Rates FY 2026-27	Proposed Rates FY 2027-28	Proposed Rates FY 2028-29	Forecasted Rates FY 2029-30	Forecasted Rates FY 2030-31
COLLECTION						
Low Strength						
Base Charge	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge ($/HCF)	6.63	7.29	7.29	7.51	7.74	7.97
High Strength						
Base Charge	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge ($/HCF)	12.88	14.17	14.17	14.60	15.04	15.49
TREATMENT						
Low Strength						
Base Charge	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge ($/HCF)	3.28	3.61	3.61	3.72	3.83	3.94
High Strength						
Base Charge	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge ($/HCF)	6.38	7.02	7.02	7.23	7.45	7.67
COMBINED						
Low Strength						
Base Charge	$710.61	$710.61	$710.61	$731.92	$753.87	$776.48
Flow Charge ($/HCF)	9.91	10.90	10.90	11.23	11.57	11.91
High Strength						
Base Charge	$710.61	$710.61	$710.61	$731.92	$753.87	$776.48
Flow Charge ($/HCF)	19.26	21.19	21.19	21.83	22.49	23.16

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The above rates are based on the rate transition plan developed in the revenue requirement analysis and the proportional distribution of costs in the cost of service analysis. As noted above, the rate is split between collection and treatment to allow the City to pass through any increases in the wholesale treatment costs. In FY 2026-27 and FY 2027-28, no rate increases are proposed, however, the flow charges are increased to reflect the resetting of the flow adjustment factor to 0.0%. Starting in FY 2028-29, each component of the rate structure – fixed and variable – are proposed to be increased to meet the target revenue levels based on the rate transition plan.

At present rates, a typical low-strength customer with 8 hundred cubic feet of winter water average consumption would have a monthly bill of $146.43 (8 HCF X 1.10 = 8.80 HCF). Under the proposed rates and the flow adjustment factor being reset to 0.0%, the same customer would have a monthly bill of $146.42 in FY 2026-27. Table 4 – 2 shows the average low strength bill for the three-year rate setting period of FY 2026-27 through FY 2030-31.

Table 4 – 2 Present and Proposed Sewer Rates (Monthly)					
	Proposed FY 2026-27	Proposed FY 2027-28	Proposed FY 2028-29	Forecasted FY 2029-30	Forecasted FY 2030-31
Proposed Revenue Adjustment	*0.0%*	*0.0%*	*3.0%*	*3.0%*	*3.0%*
Present Average Monthly Bill [1]	$146.43				
After Proposed Rate Adj. [2]	$146.42	$146.42	$150.83	$155.38	$159.99
Monthly Bill Difference	(0.01)	0.00	4.41	4.55	4.61
Cumulative Bill Difference	(0.01)	(0.01)	4.40	8.95	13.56
% Change to Monthly Bill	*0.0%*	*0.0%*	*3.0%*	*3.0%*	*3.0%*

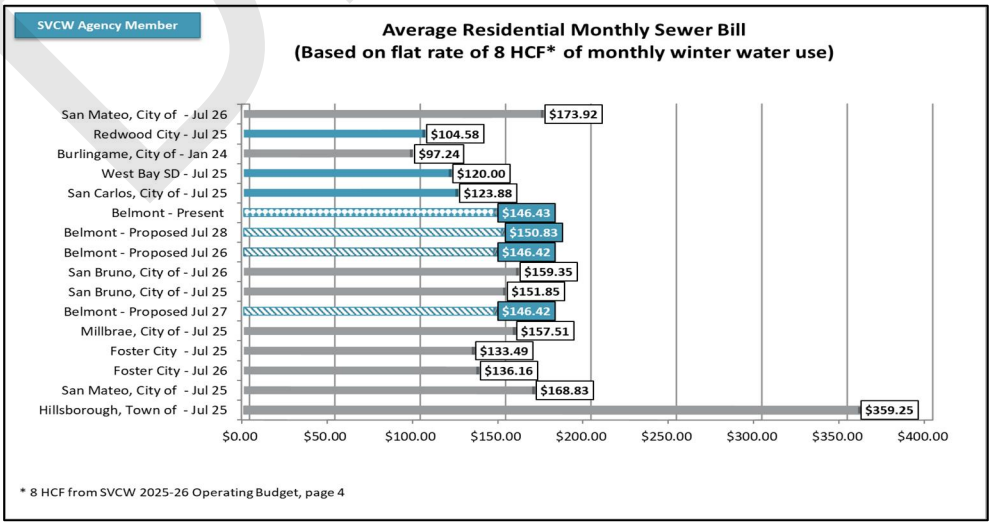
[1] – Current average bill assumes 10.0% flow adjustment factor and 8 HCF monthly consumption

[2] –Proposed average bill assumes 0.0% flow adjustment factor and 8 HCF monthly consumption

As a point of reference, the proposed rates for the three-year rate setting period of FY 2026-27, FY 2027-28, and FY 2028-29 are the focus of this Study and are the only rates proposed. The forecasted rates are for information only to provide the City with the expected future rates for planning purposes based on the assumptions of this Study. Proposed rates for future periods will be developed as part of future comprehensive sewer rate studies and may be revised based on the study assumptions at that time.

4.5 Average Residential Local Bill Comparison

A comparison of the City's current average residential rate to other local surrounding sewer utilities has been developed. Provided in the chart below is a comparison of the City's present and proposed rates compared to other SVCW member agencies and other local utilities.
As can be seen in the above graph, with the potential adjustments, the City's sewer rates remain very competitive while funding the identified O&M and capital needs of the sewer utility for this Study.



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4.6 City Council Review

Proposition 218 outlines the process to adopt and implement the proposed sewer rates. This includes the establishment of the cost basis and proportionality of the sewer rates, which is the purpose of the Study and is summarized in this report. At the time of this report's writing, the Study results were anticipated to be presented to the City Council on April 14, 2026. If approved and moved by the City Council, a public hearing will be set and a customer notification sent to the City's sewer customers.

4.7 Summary of the Sewer Rate Study

This completes the analysis for the City's sewer rate study. The proposed sewer rates were developed using generally accepted rate making methods and principles as well as the City's specific system customer data and information. The proposed sewer rate adjustments for the three-year rate setting period of FY 2026-27, FY 2027-28, and FY 2028-29 are needed to adequately support the operating and capital needs of the City's sewer system. Adoption of the proposed sewer rates for this three-year period (FY 2026-27 through FY 2028-29) are projected to provide adequate funding for the sewer utility over this time period, while financially positioning the utility for anticipated future capital and operation needs. Even with these proposed annual adjustments, it is prudent for the City to annually revisit the sewer rates to confirm their ability to cover expenses and maintain the identified financial metrics (e.g., reserve targets, debt service coverage ratios, etc.).

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City of Belmont
Sewer Cost of Service Study - Rate Transition Plan
Summary of Revenue Requirement
Exhibit 1

	Budget	Projected							
	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	FY 2032-33	FY 2033-34
Sources of Funds									
Operating Revenues	$16,983,326	$17,153,159	$17,324,690	$17,497,937	$17,672,917	$17,849,646	$18,028,142	$18,208,424	$18,390,508
Other Revenue	309,428	1,230,582	1,130,482	950,944	958,485	973,038	995,003	1,024,982	1,063,316
Total Sources of Funds	**$17,292,754**	**$18,383,741**	**$18,455,172**	**$18,448,881**	**$18,631,402**	**$18,822,684**	**$19,023,145**	**$19,233,406**	**$19,453,824**
Applications of Funds									
Collection O&M Expense	$4,555,544	$4,744,382	$4,936,205	$5,122,620	$5,302,205	$5,489,445	$5,684,713	$5,888,398	$6,100,914
Treatment O&M Expenses	3,219,973	3,561,658	3,704,124	3,852,289	4,006,381	4,166,636	4,333,302	4,506,634	4,686,899
Repair and Replacement Funding	6,500,000	6,575,000	6,625,000	6,675,000	6,725,000	6,775,000	6,825,000	6,875,000	6,925,000
I/I Capital Funding	350,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000
Total Debt Service	2,498,196	2,501,071	2,501,071	2,496,846	2,496,446	2,498,531	2,493,831	2,496,806	2,501,081
Change in Working Capital +/-	169,040	551,629	238,772	377,064	727,651	1,098,215	1,498,990	1,916,697	2,358,650
Total Revenue Requirements	**$17,292,753**	**$18,383,740**	**$18,455,172**	**$18,973,820**	**$19,707,683**	**$20,477,828**	**$21,285,836**	**$22,133,535**	**$23,022,544**
Total Balance/(Deficiency)	**$0**	**$0**	**$0**	**($524,938)**	**($1,076,281)**	**($1,655,144)**	**($2,262,690)**	**($2,900,129)**	**($3,568,720)**
Cumulative Balance as a % of Rate Revenues	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**6.1%**	**9.3%**	**12.6%**	**15.9%**	**19.4%**
Proposed Rate Adjustment	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**
Additional Revenue from Adjustment	**$0**	**$0**	**$0**	**$524,938**	**$1,076,281**	**$1,655,144**	**$2,262,691**	**$2,900,130**	**$3,568,720**
Total Balance/(Deficiency)	**$0**	**$0**	**$0**	**($0)**	**($0)**	**$0**	**$0**	**$0**	**$0**
Additional Rate Adjustment Required	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Residential Bill Comparison (8 HCF X Adjustment Factor)									
Monthly									
After Proposed Rate Adjustment	$146.43	$146.42	$146.42	$150.83	$155.38	$159.99	$164.79	$169.73	$174.83
Monthly Bill Difference		(0.01)	0.00	4.41	4.55	4.61	4.80	4.94	5.09
Cumulative Bill Difference		(0.01)	(0.01)	4.40	8.95	13.56	18.36	23.31	28.40
Debt Service Coverage Ratio (Revenue Bonds Only)									
Before Proposed Rate Adjustment	3.69	3.91	3.80	3.67	3.61	3.55	3.49	3.42	3.34
After Proposed Rate Adjustment	3.69	3.91	3.80	3.88	4.04	4.21	4.40	4.58	4.77
Ending Reserve Balances	**$46,057,697**	**$41,052,694**	**$32,075,797**	**$32,452,861**	**$33,180,512**	**$34,278,727**	**$35,777,717**	**$37,694,415**	**$40,053,065**
Target Minimum (Operating + Capital)	$10,852,000	$11,235,000	$11,530,000	$11,826,000	$12,114,000	$12,413,000	$12,724,000	$13,057,000	$13,391,000

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City of Belmont
Sewer Cost of Service Study
Exhibit 2
Data Assumptions

	Budget	Projected							
	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	FY 2032-33	FY 2033-34
Escalation Factors									
Revenues									
Rate Revenue	Estimated	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Other Revenues	Budget	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Interest	0.4%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Flat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expenses									
Labor	Budget	5.0%	5.0%	4.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Profess/Contractual	Budget	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Data Processing	Budget	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Benefits - Medical	Budget	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Benefits - Other	Budget	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
Materials & Supplies	Budget	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Equipment/Vehicles	Budget	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Education/Training	Budget	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Indirect Expense	Budget	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Miscellaneous	Budget	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Utilities	Budget	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
SVCW Treatment	Budget	10.6%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Inflation	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Revenue Bond Issue									
Term in Years	30	30	30	30	30	30	30	30	30
Rate	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

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City of Belmont
Sewer Cost of Service Study
Exhibit 3
Sources and Applications of Funds

		Budget	Projected							
		FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	FY 2032-33	FY 2033-34	*Notes*
	REVENUES										
	Operating Revenues										
6805	Sewer Use Fees - Rate Revenues	$16,983,326	$17,153,159	$17,324,690	$17,497,937	$17,672,917	$17,849,646	$18,028,142	$18,208,424	$18,390,508	As Rate Revenue
	Total Rate Revenues	**$16,983,326**	**$17,153,159**	**$17,324,690**	**$17,497,937**	**$17,672,917**	**$17,849,646**	**$18,028,142**	**$18,208,424**	**$18,390,508**	
	Miscellaneous Revenues										
6705	Public Works Service Charges	$0	$0	$0	$0	$0	$0	$0	$0	$0	As Flat
6706	City CIP Chargeback	176,566	176,566	176,566	176,566	176,566	176,566	176,566	176,566	176,566	As Flat
6850	Sewer Lateral Certificate Fee	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	As Flat
7111	Interest Earnings - Investments	0	921,154	821,054	641,516	649,057	663,610	685,575	715,554	753,888	As Interest
7112	Other Interest Earnings	0	0	0	0	0	0	0	0	0	As Flat
7113	Interest Revenue - Change	0	0	0	0	0	0	0	0	0	As Flat
7252	Reimbursements	0	0	0	0	0	0	0	0	0	As Flat
	Standby Charges	130,062	130,062	130,062	130,062	130,062	130,062	130,062	130,062	130,062	As Flat
	Total Miscellaneous Revenues	**$309,428**	**$1,230,582**	**$1,130,482**	**$950,944**	**$958,485**	**$973,038**	**$995,003**	**$1,024,982**	**$1,063,316**	
	TOTAL REVENUES	**$17,292,754**	**$18,383,741**	**$18,455,172**	**$18,448,881**	**$18,631,402**	**$18,822,684**	**$19,023,145**	**$19,233,406**	**$19,453,824**	
	EXPENSES										
	Planning and Project Management (701)										
	Personnel										
8101	Regular Salaries	$437,297	$459,162	$482,120	$501,405	$516,447	$531,940	$547,898	$564,335	$581,266	As Labor
8102	Permanent Part-Time	0	0	0	0	0	0	0	0	0	As Labor
8103	Temporary Part-Time	13,000	$13,650	14,333	14,906	15,353	15,814	16,288	16,777	17,280	As Labor
8111	Overtime	0	0	0	0	0	0	0	0	0	As Labor
8112	Standby/Unscheduled	0	0	0	0	0	0	0	0	0	As Labor
8114	Acting Pay	0	0	0	0	0	0	0	0	0	As Labor
8119	Termination Pay	0	0	0	0	0	0	0	0	0	As Labor
8211	P.E.R.S. Retirement	118,447	124,725	131,335	138,296	145,626	153,344	161,471	170,029	179,040	As Benefits - Other
8221	F.I.C.A Social Security	806	849	894	941	991	1,043	1,099	1,157	1,218	As Benefits - Other
8231	Health Insurance	0	0	0	0	0	0	0	0	0	As Benefits - Medical
8232	Medicare	6,801	7,277	7,786	8,332	8,915	9,539	10,206	10,921	11,685	As Benefits - Medical
8233	Life & Disability Insurance	1,897	2,030	2,172	2,324	2,487	2,661	2,847	3,046	3,259	As Benefits - Medical
8235	State Unemployment Insurance	0	0	0	0	0	0	0	0	0	As Benefits - Other
8241	Dental Plan	2,751	2,944	3,150	3,370	3,606	3,858	4,129	4,418	4,727	As Benefits - Medical
8242	Vision Plan	707	756	809	866	927	992	1,061	1,135	1,215	As Benefits - Medical
8253	Allowances	1,200	1,264	1,331	1,401	1,475	1,554	1,636	1,723	1,814	As Benefits - Other
8259	Deferred Compensation	12,175	12,820	13,500	14,215	14,969	15,762	16,597	17,477	18,403	As Benefits - Other
8271	SEC 125 Benefits	81,507	87,212	93,317	99,850	106,839	114,318	122,320	130,882	140,044	As Benefits - Medical
8281	Benefit Prefunding	34,344	36,164	38,081	40,099	42,224	44,462	46,819	49,300	51,913	As Benefits - Other
8283	GASB 68 Pension Expense	0	0	0	0	0	0	0	0	0	As Benefits - Other
8284	GASB 75 OPEB Expense	0	0	0	0	0	0	0	0	0	As Benefits - Other
8285	Workers' Compensation	11,910	12,541	13,206	13,906	14,643	15,419	16,236	17,097	18,003	As Benefits - Other
	Total Personnel	**$722,842**	**$761,394**	**$802,033**	**$839,910**	**$874,501**	**$910,705**	**$948,607**	**$988,297**	**$1,029,868**	
	Supplies & Services										
8351	Other Professional/Technical	$86,000	$87,686	$89,406	$91,159	$92,946	$94,769	$96,627	$98,521	$100,453	As Profess/Contractual
8356	EOC - Disaster Preparedness	0	0	0	0	0	0	0	0	0	As Education/Training
8359	Computer Software License	0	0	0	0	0	0	0	0	0	As Materials & Supplies
8442	Equipment/Vehicle Rental	0	0	0	0	0	0	0	0	0	As Equipment/Vehicles
8522	Liability Insurance Charge	13,472	13,876	14,292	14,721	15,163	15,618	16,086	16,569	17,066	As Miscellaneous
8531	Postage/Delivery Service	0	0	0	0	0	0	0	0	0	As Materials & Supplies
8532	Telephone	0	0	0	0	0	0	0	0	0	As Utilities
8550	Printing & Binding	0	0	0	0	0	0	0	0	0	As Materials & Supplies
8580	Travel & Training	1,500	1,530	1,561	1,592	1,624	1,656	1,689	1,723	1,757	As Education/Training
8591	Membership & Dues	4,000	4,080	4,162	4,245	4,330	4,416	4,505	4,595	4,687	As Education/Training
8599	Miscellaneous	3,000	3,090	3,183	3,278	3,377	3,478	3,582	3,690	3,800	As Miscellaneous
8610	General Supplies	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	As Materials & Supplies
8612	Small Tools	0	0	0	0	0	0	0	0	0	As Miscellaneous
8680	Books/Manuals/Subscriptions	0	0	0	0	0	0	0	0	0	As Miscellaneous
	Total Supplies & Services	**$108,972**	**$111,292**	**$113,664**	**$116,087**	**$118,564**	**$121,096**	**$123,683**	**$126,328**	**$129,030**	

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		Budget	Projected							
		FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	FY 2032-33	FY 2033-34	*Notes*
	Administrative & Other										
8307	Vehicle Usage Charge	$11,268	$11,606	$11,954	$12,313	$12,682	$13,063	$13,455	$13,858	$14,274	As Equipment/Vehicles
8308	Computer Usage Charge	57,281	58,999	60,769	62,592	64,470	66,404	68,397	70,448	72,562	As Data Processing
8309	Building Maintenance Charge	45,518	46,884	48,290	49,739	51,231	52,768	54,351	55,981	57,661	As Miscellaneous
8310	Administrative Support	142,536	146,812	151,216	155,753	160,426	165,238	170,195	175,301	180,560	As Miscellaneous
8314	Equipment Allocation - IT Charge	3,618	3,727	3,838	3,953	4,072	4,194	4,320	4,450	4,583	As Equipment/Vehicles
8315	Equipment Allocation Charge	525	541	557	574	591	609	627	646	665	As Equipment/Vehicles
	Total Administrative & Other	**$260,746**	**$268,568**	**$276,625**	**$284,924**	**$293,472**	**$302,276**	**$311,344**	**$320,685**	**$330,305**	
	Total Planning and Project Management (701)	**$1,092,560**	**$1,141,255**	**$1,192,322**	**$1,240,922**	**$1,286,537**	**$1,334,077**	**$1,383,635**	**$1,435,309**	**$1,489,203**	
	Sanitary Sewer Operations (710)										
	Personnel										
8101	Regular Salaries	$833,589	$875,268	$919,032	$955,793	$984,467	$1,014,001	$1,044,421	$1,075,754	$1,108,026	As Labor
8103	Temporary Part-Time	0	0	0	0	0	0	0	0	0	As Labor
8111	Overtime	12,000	12,600	13,230	13,759	14,172	14,597	15,035	15,486	15,951	As Labor
8112	Standby/Unscheduled	24,649	25,881	27,176	28,263	29,110	29,984	30,883	31,810	32,764	As Labor
8114	Acting Pay	0	0	0	0	0	0	0	0	0	As Labor
8119	Termination Pay	0	0	0	0	0	0	0	0	0	As Labor
8211	P.E.R.S. Retirement	219,689	231,333	243,593	256,504	270,098	284,413	299,487	315,360	332,074	As Benefits - Other
8221	F.I.C.A. Social Security	0	0	0	0	0	0	0	0	0	As Benefits - Other
8231	Health Insurance	0	0	0	0	0	0	0	0	0	As Benefits - Medical
8232	Medicare	13,101	14,018	14,999	16,049	17,173	18,375	19,661	21,037	22,510	As Benefits - Medical
8233	Life & Disability Insurance	3,572	3,822	4,090	4,376	4,682	5,010	5,361	5,736	6,137	As Benefits - Medical
8235	State Unemployment Insurance	0	0	0	0	0	0	0	0	0	As Benefits - Other
8241	Dental Plan	8,115	8,683	9,291	9,941	10,637	11,382	12,178	13,031	13,943	As Benefits - Medical
8242	Vision Plan	2,021	2,162	2,314	2,476	2,649	2,835	3,033	3,245	3,472	As Benefits - Medical
8251	Uniform Allowance	0	0	0	0	0	0	0	0	0	As Benefits - Other
8253	Allowances	480	505	532	560	590	621	654	689	726	As Benefits - Other
8259	Deferred Compensation	26,744	28,161	29,654	31,226	32,881	34,623	36,458	38,391	40,425	As Benefits - Other
8271	SEC 125 Benefits	225,344	241,118	257,996	276,056	295,380	316,057	338,181	361,853	387,183	As Benefits - Medical
8281	Benefit Prefunding	71,775	75,579	79,585	83,803	88,244	92,921	97,846	103,032	108,493	As Benefits - Other
8282	Compensated Absences	0	0	0	0	0	0	0	0	0	As Labor
8285	Workers' Compensation	107,977	113,700	113,700	113,700	113,700	113,700	113,700	113,700	113,700	As Benefits - Other
	Total Personnel	**$1,549,056**	**$1,632,832**	**$1,715,191**	**$1,792,505**	**$1,863,784**	**$1,938,519**	**$2,016,899**	**$2,099,124**	**$2,185,404**	
	Supplies & Services										
8305	After Hours Dispatch Service	$10,000	$10,196	$10,396	$10,600	$10,808	$11,020	$11,236	$11,456	$11,681	As Profess/Contractual
8311	Property Tax Admin Fee	46,857	47,326	47,799	48,277	48,760	49,247	49,740	50,237	50,739	As Rate Revenue
8351	Other Professional/Tech	115,000	117,255	119,554	121,898	124,288	126,725	129,210	131,744	134,327	As Profess/Contractual
8359	Computer Software License	0	0	0	0	0	0	0	0	0	As Materials & Supplies
8411	Water	11,500	12,075	12,679	13,313	13,978	14,677	15,411	16,182	16,991	As Utilities
8417	Other Waste Water Treatment	250,000	262,500	275,625	289,406	303,877	319,070	335,024	351,775	369,364	As Utilities
8418	S.V.C.W. Sewer Treatment	3,219,973	3,561,658	3,704,124	3,852,289	4,006,381	4,166,636	4,333,302	4,506,634	4,686,899	As SVCW Treatment
8430	Repair & Maintenance Service	10,000	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	As Miscellaneous
8441	Land/Building Rentals	56,000	57,680	59,410	61,193	63,028	64,919	66,867	68,873	70,939	As Miscellaneous
8442	Equipment/Vehicle Rental	0	0	0	0	0	0	0	0	0	As Equipment/Vehicles
8522	Liability Insurance Charge	69,648	71,737	73,890	76,106	78,389	80,741	83,163	85,658	88,228	As Equipment/Vehicles
8530	Communications	8,000	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	As Materials & Supplies
8532	Telephone	0	0	0	0	0	0	0	0	0	As Materials & Supplies
8580	Travel And Training	11,500	11,730	11,965	12,204	12,448	12,697	12,951	13,210	13,474	As Education/Training
8590	Street Access Fee	204,204	204,204	204,204	204,204	204,204	204,204	204,204	204,204	204,204	As Flat
8591	Memberships & Dues	8,500	8,670	8,843	9,020	9,201	9,385	9,572	9,764	9,959	As Education/Training
8599	Miscellaneous	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	As Miscellaneous
8610	General Supplies	8,000	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	As Materials & Supplies
8612	Small Tools	15,000	15,450	15,914	16,391	16,883	17,389	17,911	18,448	19,002	As Materials & Supplies
8613	Safety Equipment	25,000	25,750	26,523	27,318	28,138	28,982	29,851	30,747	31,669	As Miscellaneous
8632	Natural Gas & Electricity	89,100	93,555	98,233	103,144	108,302	113,717	119,403	125,373	131,641	As Utilities
8639	Gasoline	25,000	26,250	27,563	28,941	30,388	31,907	33,502	35,178	36,936	As Utilities
8641	Repair & Maintenance Supplies	45,000	46,350	47,741	49,173	50,648	52,167	53,732	55,344	57,005	As Miscellaneous
8680	Books/Manuals/Subscriptions	500	515	530	546	563	580	597	615	633	As Materials & Supplies
	Total Supplies & Services	**$4,229,782**	**$4,600,711**	**$4,773,635**	**$4,953,527**	**$5,140,671**	**$5,335,364**	**$5,537,915**	**$5,748,647**	**$5,967,894**	

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		Budget	Projected							
		FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	FY 2032-33	FY 2033-34	*Notes*
	Administrative & Other										
8307	Vehicle Usage Charge	$284,617	$293,156	$301,950	$311,009	$320,339	$329,949	$339,848	$350,043	$360,544	As Equipment/Vehicles
8308	Computer Usage Charge	152,457	157,031	161,742	166,594	171,592	176,739	182,042	187,503	193,128	As Data Processing
8309	Building Maintenance Charge	121,147	124,781	128,525	132,381	136,352	140,443	144,656	148,996	153,465	As Miscellaneous
8310	Administrative Support	194,380	200,211	206,218	212,404	218,776	225,340	232,100	239,063	246,235	As Miscellaneous
8314	Equipment Allocation - IT Charge	9,628	9,917	10,214	10,521	10,836	11,161	11,496	11,841	12,196	As Equipment/Vehicles
8315	Equipment Allocation Charge	1,890	1,947	2,005	2,065	2,127	2,191	2,257	2,324	2,394	As Equipment/Vehicles
	Total Administrative & Other	**$764,119**	**$787,043**	**$810,654**	**$834,973**	**$860,023**	**$885,823**	**$912,398**	**$939,770**	**$967,963**	
	Total Sanitary Sewer Operations (710)	**$6,542,957**	**$7,020,585**	**$7,299,480**	**$7,581,006**	**$7,864,477**	**$8,159,706**	**$8,467,212**	**$8,787,541**	**$9,121,262**	
	Sanitary Sewer Capital Operations (730)										
	Supplies & Services										
8331	Engineering/Architecture	$0	$0	$0	$0	$0	$0	$0	$0	$0	As Miscellaneous
8351	Other Professional/Tech	10,000	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	As Miscellaneous
8354	Bond Issuance Costs	0	0	0	0	0	0	0	0	0	As Miscellaneous
8361	Bond Amortization Expense	0	0	0	0	0	0	0	0	0	As Miscellaneous
8368	City Project Management & Services	0	0	0	0	0	0	0	0	0	As Miscellaneous
8531	Postage/Delivery Service	0	0	0	0	0	0	0	0	0	As Miscellaneous
8550	Printing and Binding	0	0	0	0	0	0	0	0	0	As Miscellaneous
8599	Miscellaneous	0	0	0	0	0	0	0	0	0	As Miscellaneous
8610	General Supplies	0	0	0	0	0	0	0	0	0	As Miscellaneous
	Total Supplies & Services	**$10,000**	**$10,300**	**$10,609**	**$10,927**	**$11,255**	**$11,593**	**$11,941**	**$12,299**	**$12,668**	
	Administrative & Other										
8310	Administrative Support	$130,000	$133,900	$137,917	$142,055	$146,316	$150,706	$155,227	$159,884	$164,680	As Miscellaneous
	Total Administrative & Other	**$130,000**	**$133,900**	**$137,917**	**$142,055**	**$146,316**	**$150,706**	**$155,227**	**$159,884**	**$164,680**	
	Capital Outlay										
9030	Improvement Other Than Building	$0	$0	$0	$0	$0	$0	$0	$0	$0	As Miscellaneous
	Total Capital Outlay	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	
	Total Sanitary Sewer Capital Operations (730)	**$140,000**	**$144,200**	**$148,526**	**$152,982**	**$157,571**	**$162,298**	**$167,167**	**$172,182**	**$177,348**	
	Total Operating & Maintenance Expense	**$7,775,517**	**$8,306,040**	**$8,640,329**	**$8,974,909**	**$9,308,585**	**$9,656,081**	**$10,018,014**	**$10,395,032**	**$10,787,813**	
			6.8%	*4.0%*	*3.9%*	*3.7%*	*3.7%*	*3.7%*	*3.8%*	*3.8%*	
	Repair and Replacement Funding	$6,500,000	$6,575,000	$6,625,000	$6,675,000	$6,725,000	$6,775,000	$6,825,000	$6,875,000	$6,925,000	FY 2024-25 Approx. Depr. $1,874,151
	I/I Capital Funding Transfer	$350,000	$450,000	$450,000	$450,000	$450,000	$450,000	$450,000	$450,000	$450,000	
	Deferred Capital Funding (Debt Service)	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Debt Service										
	2016 Sewer Revenue Refunding	$768,505	$764,505	$769,255	$771,455	$773,355	$773,950	$771,550	$298,150	$295,200	Debt Schedule
	2016 Sewer Revenue	620,191	628,941	621,941	619,141	616,341	618,331	617,531	1,091,531	1,097,631	Debt Schedule
	2019 Sewer Revenue	1,109,500	1,107,625	1,109,875	1,106,250	1,106,750	1,106,250	1,104,750	1,107,125	1,108,250	Debt Schedule
	New Low Interest Loan	0	0	0	0	0	0	0	0	0	
	New Revenue Bond 2024/2025	0	0	0	0	0	0	0	0	0	
	New Revenue Bond 2027/2028	0	0	0	0	0	0	0	0	0	
	Total Debt Service	**$2,498,196**	**$2,501,071**	**$2,501,071**	**$2,496,846**	**$2,496,446**	**$2,498,531**	**$2,493,831**	**$2,496,806**	**$2,501,081**	

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	Budget	Projected								
	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	FY 2032-33	FY 2033-34	*Notes*
Change in Working Capital +/-										
Operating (Cash) Reserve Transfer	$0	$0	$0	$0	$227,651	$348,215	$98,990	$316,697	$158,650	
Capital Reserve Transfer	169,040	551,629	238,772	377,064	500,000	750,000	1,400,000	1,600,000	2,200,000	
Connection Fee Transfer	0	0	0	0	0	0	0	0	0	
Change in Working Capital +/-	**$169,040**	**$551,629**	**$238,772**	**$377,064**	**$727,651**	**$1,098,215**	**$1,498,990**	**$1,916,697**	**$2,358,650**	
TOTAL REVENUE REQUIREMENT	**$17,292,753**	**$18,383,740**	**$18,455,172**	**$18,973,820**	**$19,707,683**	**$20,477,828**	**$21,285,836**	**$22,133,535**	**$23,022,544**	
Total Balance/(Deficiency) of Funds	**$0**	**$0**	**$0**	**($524,938)**	**($1,076,281)**	**($1,655,144)**	**($2,262,690)**	**($2,900,129)**	**($3,568,720)**	
Total Incr. as a % of Current Rates	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**6.1%**	**9.3%**	**12.6%**	**15.9%**	**19.4%**	
Proposed Rate Adjustment	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	
Additional Revenue from Rate Increase	**$0**	**$0**	**$0**	**$524,938**	**$1,076,281**	**$1,655,144**	**$2,262,691**	**$2,900,130**	**$3,568,720**	
Balance/(Deficiency) of Funds	**$0**	**$0**	**$0**	**($0)**	**($0)**	**$0**	**$0**	**$0**	**$0**	
Deficiency as a % of Retail Rate Revenues	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	
Residential Bill Comparison (8 HCF X Adjustment Factor)										
Monthly										
After Proposed Rate Adjustment	$146.43	$146.42	$146.42	$150.83	$155.38	$159.99	$164.79	$169.73	$174.83	
Monthly Bill Difference		(0.01)	0.00	4.41	4.55	4.61	4.80	4.94	5.09	
Cumulative Bill Difference		(0.01)	(0.01)	4.40	8.95	13.56	18.36	23.31	28.40	
Percentage Overall Change		0.0%	0.0%	3.0%	5.9%	8.7%	11.5%	14.1%	16.7%	
		0.0%	0.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	
Debt Service Coverage Ratio (Revenue Bonds Only)										
Before Proposed Rate Adjustment	3.69	3.91	3.80	3.67	3.61	3.55	3.49	3.42	3.34	Minimum 1.0/Min Target 1.25
After Proposed Rate Adjustment	3.69	3.91	3.80	3.88	4.04	4.21	4.40	4.58	4.77	Minimum 1.0/Min Target 1.25
Reserve Balances	$47,822,277									
Operating (Cash) Reserve										
Beginning Reserve Balance	$8,000,000	$8,000,000	$8,000,001	$8,000,001	$8,000,001	$8,227,652	$8,575,867	$8,674,857	$8,991,555	
Plus: To Reserves	0	0	0	0	227,651	348,215	98,990	316,697	158,650	
Less: Transfers to Capital Reserve	0	0	0	0	0	0	0	0	0	Needs to be (-)
Less: Other Uses of Funds	0	0	0	(0)	(0)	0	0	0	0	
Ending Reserve Balance	$8,000,000	$8,000,001	$8,000,001	$8,000,001	$8,227,652	$8,575,867	$8,674,857	$8,991,555	$9,150,205	
Target Minimum = 180 Days of O&M	$5,180,000	$5,490,000	$5,710,000	$5,930,000	$6,140,000	$6,360,000	$6,590,000	$6,840,000	$7,090,000	
Emergency/Litigation Reserve	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	
Target Minimum	$7,180,000	$7,490,000	$7,710,000	$7,930,000	$8,140,000	$8,360,000	$8,590,000	$8,840,000	$9,090,000	
Capital Project Reserve										
Beginning Reserve Balance	$37,888,657	$38,057,697	$33,052,693	$24,075,796	$24,452,860	$24,952,860	$25,702,860	$27,102,860	$28,702,860	
Plus: To Reserves	169,040	551,629	238,772	377,064	500,000	750,000	1,400,000	1,600,000	2,200,000	
Plus: Bond Funds Year 1	0	0	0	0	0	0	0	0	0	Input from City Projections
Plus: Bond Funds Year 2	0	0	0	0	0	0	0	0	0	
Plus: Transfers from Operating Reserve	0	0	0	0	0	0	0	0	0	
Plus: From CIP	0	0	0	0	0	0	0	0	0	
Less: CIP	0	(5,556,633)	(9,215,669)	0	0	0	0	0	0	
Less: Other Uses of Funds	0	0	0	0	0	0	0	0	0	
Ending Reserve Balance	$38,057,697	$33,052,693	$24,075,796	$24,452,860	$24,952,860	$25,702,860	$27,102,860	$28,702,860	$30,902,860	
Target Minimum = 2 Yr's of Ann Depr Exp	$3,672,000	$3,745,000	$3,820,000	$3,896,000	$3,974,000	$4,053,000	$4,134,000	$4,217,000	$4,301,000	FY 2024-25 Approx. Depr. $1,874,151 X 2
Connection Fee Reserve (Restricted)										
Beginning Reserve Balance	$1,933,620	$1,933,620	$1,933,620	$13,620	$13,620	$424,620	$424,620	$424,620	$424,620	
Plus: To Reserves	0	0	780,000	3,900,000	840,000	0	0	0	0	
Less: Use of Funds	0	0	(2,700,000)	(3,900,000)	(429,000)	0	0	0	0	
Ending Reserve Balance	$1,933,620	$1,933,620	$13,620	$13,620	$424,620	$424,620	$424,620	$424,620	$424,620	
Ending Reserve Balances	**$46,057,697**	**$41,052,694**	**$32,075,797**	**$32,452,861**	**$33,180,512**	**$34,278,727**	**$35,777,717**	**$37,694,415**	**$40,053,065**	
Target Minimum (Operating + Capital)	$10,852,000	$11,235,000	$11,530,000	$11,826,000	$12,114,000	$12,413,000	$12,724,000	$13,057,000	$13,391,000	
	$35,205,697	$29,817,694	$20,545,797	$20,626,861	$21,066,512	$21,865,727	$23,053,717	$24,637,415	$26,662,065	

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City of Belmont
Sewer Cost of Service Study
Exhibit 4
Capital Improvement Projects

Capital Improvement Projects	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	FY 2032-33	FY 2033-34	Total	*Notes*
Fund 503 Condition Related Capital Improvement Projects											
Sewer Rehabilitation - Annual	$110,000	$100,000	$100,000	$100,000	$100,000	$0	$0	$0	$0	$510,000	
Pump Station Rehabilitation	48,870	10,000	0	10,000	0	0	0	0	0	68,870	
Hiller Pump St. Rehabilitation	645,000	15,000	0	0	0	0	0	0	0	660,000	
Basin Rehabilitation Projects	283,000	15,000	0	0	0	0	0	0	0	298,000	
Residential Gravity Replacement	2,380,400	4,135,000	2,887,600	3,170,542	4,019,491	0	0	0	0	16,593,033	
Sanitary and Storm Sewer Infrastructure Repair Project	0	800,000	0	0	0	0	0	0	0	800,000	
Island Parkway Pump Station Rehabilitation	0	700,000	5,000,000	0	0	0	0	0	0	5,700,000	
San Juan Pump Station Rehabilitation	200,000	5,683,853	0	0	0	0	0	0	0	5,883,853	
Sewer System Capacity Study Update	3,000	0	0	0	0	0	0	0	0	3,000	
HIA Cost of Sewer Service Annexation	0	30,000	677,500	0	0	0	0	0	0	707,500	
Sports Complex FM	0	44,160	51,520	0	0	0	0	0	0	95,680	
Hiller FM	0	0	0	0	200,000	0	0	0	0	200,000	
Total Fund 503 Condition Related Capital Improvement Projects	**$3,670,270**	**$11,533,013**	**$8,716,620**	**$3,280,542**	**$4,319,491**	**$0**	**$0**	**$0**	**$0**	**$31,519,936**	
Fund 505 Capital Improvement Projects (Capacity Related)											
San Juan Pump Station Rehabilitation	$0	$0	$4,000,000	$0	$0	$0	$0	$0	$0	$4,000,000	
HIA Cost of Sewer Service Annexation	0	0	4,182,500	4,182,500	249,000	0	0	0	0	8,614,000	
Lyall Way Sewer Capacity Improvement Project (CCIP 3)	0	199,740	0	0	0	0	0	0	0	199,740	
Elmer Street and Ralston Avenue Sewer Capacity Improvement Project (CCIP 6)	0	321,120	749,280	0	0	0	0	0	0	1,070,400	
Waltermire Street Sewer Capacity Improvement Project (CCIP 7)	0	77,760	181,440	0	0	0	0	0	0	259,200	
Harbor Blvd and Karen Rd Sewer Capacity Improvement Project (CCIP 8)	0	0	710,829	2,153,051	0	0	0	0	0	2,863,880	
Tahoe Dr. and Bryce Ct Sewer Capacity Improvement Project (CCIP 4)	0	0	0	0	80,000	0	0	0	0	80,000	
Kedith St and Ralston Ave Sewer Capacity Improvement Project (CCIP 5)	0	0	0	0	100,000	0	0	0	0	100,000	
Total Fund 505 Capital Improvement Projects	**$0**	**$598,620**	**$9,824,049**	**$6,335,551**	**$429,000**	**$0**	**$0**	**$0**	**$0**	**$17,187,220**	
Total Capital Improvement Projects	**$3,670,270**	**$12,131,633**	**$18,540,669**	**$9,616,093**	**$4,748,491**	**$0**	**$0**	**$0**	**$0**	**$48,707,156**	
Future Unidentified Capital Needs	$2,829,730	$0	$0	$958,907	$2,405,509	$6,775,000	$6,825,000	$6,875,000	$6,925,000	$33,594,146	
To Capital Reserve Fund	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Total Sewer Capital	**$6,500,000**	**$12,131,633**	**$18,540,669**	**$10,575,000**	**$7,154,000**	**$6,775,000**	**$6,825,000**	**$6,875,000**	**$6,925,000**	**$82,301,302**	
Less: Funding Sources											
Grants	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Capital Reserve	0	5,556,633	9,215,669	0	0	0	0	0	0	14,772,302	
Connection Fee Reserve	0	0	2,700,000	3,900,000	429,000	0	0	0	0	7,029,000	
Additional Long-Term Debt	0	0	0	0	0	0	0	0	0	0	
Total Funding Sources	$0	$5,556,633	$11,915,669	$3,900,000	$429,000	$0	$0	$0	$0	$21,801,302	
Total Capital Improvement Funded Through Rates	**$6,500,000**	**$6,575,000**	**$6,625,000**	**$6,675,000**	**$6,725,000**	**$6,775,000**	**$6,825,000**	**$6,875,000**	**$6,925,000**	**$60,500,000**	FY 2024-25 Approx. Depr. $1,874,151
I/I Capital Funding	**$350,000**	**$450,000**	**$450,000**	**$450,000**	**$450,000**	**$450,000**	**$450,000**	**$450,000**	**$450,000**	**$3,950,000**	

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City of Belmont
Sewer Cost of Service Study
Exhibit 5F
Revenue At Present Rates for 2024-2025

Use Description	Billing Units	0.10	Rate Per Billing Unit	Total
Standby Charge	522		$245.40	**$128,098.80**
Low Strength				
Collection				
Base Charge $/Unit	10,821		$447.89	$4,846,617.69
Flow Charge $/HCF	768,061		6.38	4,900,232.31
Total				$9,746,850.00
Treatment				
Base Charge $/Unit	10,821		$235.39	$2,547,155.19
Flow Charge $/HCF	768,061		3.15	2,419,393.69
Total				$4,966,548.88
Total Low Strength Revenue				**$14,713,398.88**
High Strength				
Collection				
Base Charge $/Unit	28		$447.89	$12,540.92
Flow Charge $/HCF	24,404		12.39	302,360.48
Total	**792,465**	**0**		$314,901.40
Treatment				
Base Charge $/Unit	28		$235.39	$6,590.92
Flow Charge $/HCF	24,404	0	6.14	149,838.04
Total				$156,428.96
Total High Strength Revenue				**$471,330.36**

Summary of Revenues at Present Rates	
Total Number of Billing Units	
Standby	522
Low Strength	10,821
High Strength	28
Total	**11,371**
Total Annual Flow	
Residential	768,061
High Strength	24,404
Total	**792,465**
Total Revenue	
Standby Charge Revenue	$128,099
Low Strength Revenue	$14,713,399
High Strength Revenue	471,330
Total	**$15,184,729**
Total Revenue	**$15,312,828**

	2021-22	2022-23	2023-24	Average	2024-25
Billed HCF	807,524	722,463	689,108	739,698	792,465
% Adjustment Factor	0.09	0.10	0.10		0.10
Total HCF	880,202	794,710	765,675	813,529	792,465

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City of Belmont
Sewer Cost of Service Study
Exhibit 5G
Projected Revenue At Present Rates for 2025-2026

Use Description	Billing Units	0.00	Rate Per Billing Unit	Total
Standby Charge	530		$245.40	**$130,062.00**
Low Strength				
Collection				
Base Charge $/Unit	11,264		$465.80	$5,246,771.20
Flow Charge $/HCF	858,218		6.63	5,689,986.33
Total				$10,936,757.53
Treatment				
Base Charge $/Unit	11,264		$244.81	$2,757,539.84
Flow Charge $/HCF	858,218		3.28	2,814,955.53
Total				$5,572,495.37
Total Low Strength Revenue				**$16,509,252.91**
High Strength				
Collection				
Base Charge $/Unit	28		$465.80	$13,042.40
Flow Charge $/HCF	23,581		12.88	303,727.02
Total	**881,799**	**0**		$316,769.42
Treatment				
Base Charge $/Unit	28		$244.81	$6,854.68
Flow Charge $/HCF	23,581	0	6.38	150,448.63
Total				$157,303.31
Total High Strength Revenue				**$474,072.73**

Summary of Revenues at Present Rates	
Total Number of Billing Units	
Standby	530
Low Strength	11,264
High Strength	28
Total	**11,822**
Total Annual Flow	
Residential	858,218
High Strength	23,581
Total	**881,799**
Total Revenue	
Standby Charge Revenue	$130,062
Low Strength Revenue	$16,509,253
High Strength Revenue	474,073
Total	**$16,983,326**
Total Revenue	**$17,113,388**

	2022-23	2023-24	2024-25	Average	2025-26
Billed HCF	722,463	689,108	792,465	734,679	881,799
% Adjustment Factor	0.10	0.10	0.10		0.00
Total HCF	794,710	765,675	792,465	784,283	881,799

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City of Belmont
Sewer Cost of Service Study
Exhibit 6
Development of the Volume Distribution Factor

	FY 2026-27 Annual Wastewater Flow (CCF) [1]	12.0% Inflow and Infiltration [2] [3]	Total Annual Flow at Plant (CCF)	Avg. Daily Flow At Plant (MGD) [4]	% of Total
Low Strength	772,396	92,688	865,084	1.77	97.3%
High Strength	21,223	2,547	23,770	0.05	2.7%
Total Consumption	**793,619**	**95,234**	**888,854**	**1.82**	**100.0%**
			Estimated Plant Flow [4]	*1.82*	

Distribution Factor **(VOL)**

Note:
[1] Based on 2025/26 customer's winter period consumption
[2] Calculated based on billing report versus total plant flow.
- Inflow represents external groundwater that can enter the sewer at service connections where the pipe is broken, at defective joints, at connections to manholes, etc.
- Infiltration is water discharged to sewer from sources such as roof leaders, cellar, yard and drains from springs and other wet areas, storm sewers, catch basins, surface water runoff, etc
[3] Total I&I allocated to each class of service based on flow.
[4] City provided total flow for FY 2024/25.

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City of Belmont
Sewer Cost of Service Study
Exhibit 7
Development of the Customer Distribution Factor

	Actual Customer		Customer Service & Accounting			
	Number of Units	% of Total	Number of Bills [1]	Weighting Factor	Weighted Customer	% of Total
Low Strength	11,264	99.8%	11,264	1.0	11,264	99.8%
High Strength	28	0.2%	28	1.0	28	0.2%
Total Customers	**11,292**	**100.0%**	**11,292**		**11,292**	**100.0%**
Distribution Factor		**(AC)**				**(WCA)**

Note:
[1] Number of Residential bills from billing records.

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City of Belmont
Sewer Cost of Service Study
Exhibit 8
Development of the Strength Distribution Factor

		Biochemical Oxygen Demand			Suspended Solids		
	Annual Flow (CCF)	Avg. Factor (mg/l) [1]	Calculated Pounds [2]	% of Total	Avg. Factor (mg/l) [1]	Calculated Pounds [2]	% of Total
Low Strength	865,084	250	1,349,976	92.9%	220	1,187,979	92.9%
High Strength	23,770	700	103,861	7.1%	616	91,398	7.1%
Total Strength	**888,854**		**1,453,838**	**100.0%**		**1,279,377**	**100.0%**
Distribution Factor				**(BOD)**			**(SS)**

Note:
[1] Average BOD and SS strength factors based on typical low strength customer from similar studies. High strength based on 2.8 times low strength based on WA State Dept Health, Rule Development Committee Issue Research Report, Wastewater Quality/Strength/Content, page 6 of 18.
[2] Calculated pounds equals (annual flow (x) 748 (x) strength factor mg/l (x) 8.34 /1,000,000)

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City of Belmont
Sewer Cost of Service Study
Exhibit 9
Development of the Revenue Related Distribution Factor

	Projected Year FY 2026-27	% of Total
Low Strength	$16,674,345	97.2%
High Strength	478,813	2.8%
Total Rate Revenues	**$17,153,159**	**100.0%**
Distribution Factor		**(RR)**

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City of Belmont
Sewer Cost of Service Study
Exhibit 10
Functionalization and Allocation of Plant in Service

	Total Plant FY 2025	Operating Volume (VOL)	Biochemical Oxygen Demand (BOD)	Suspended Solids (SS)	Customer Related Weighted for: Actual Customer (AC)	Customer Related Weighted for: Customer Acct/Svcs (WCA)	Revenue (RR)	Direct (DA)	*Basis of Allocation*
Sewer Operations (501)									
Machinery and Equipment	$261,761	$261,761	$0	$0	$0	$0	$0	$0	100.0% VOL
Total Sewer Operations (501)	**$261,761**	**$261,761**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	
Sewer Capital (503)									
Improvements	$27,172,676	$20,379,507	$0	$0	$6,793,169	$0	$0	$0	75.0% VOL 25.0% AC
Pump Station Rehabilitation	788,220	591,165	0	0	197,055	0	0	0	75.0% VOL 25.0% AC
Sewer Rehabilitation - Annual	194,673	146,005	0	0	48,668	0	0	0	75.0% VOL 25.0% AC
San Juan Sewer Main Capacity Impr	1,614,627	1,210,970	0	0	403,657	0	0	0	75.0% VOL 25.0% AC
Total Sewer Capital (503)	**$29,770,197**	**$22,327,648**	**$0**	**$0**	**$7,442,549**	**$0**	**$0**	**$0**	
TOTAL PLANT IN SERVICE	**$30,031,958**	**$22,589,409**	**$0**	**$0**	**$7,442,549**	**$0**	**$0**	**$0**	
Less: Accumulated Depreciation									
Sewer Operations (501)									
Machinery and Equipment	($261,761)	($261,761)	$0	$0	$0	$0	$0	$0	As Machinery and Equipment
Total Accum Depr Sewer Operations (501)	**($261,761)**	**($261,761)**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	
Sewer Capital (503)									
Improvements	($12,828,769)	($9,621,577)	$0	$0	($3,207,192)	$0	$0	$0	As Improvements
Pump Station Rehabilitation	(63,058)	(47,293)	0	0	(15,764)	0	0	0	As Pump Station Rehabilitation
Sewer Rehabilitation - Annual	(13,290)	(9,967)	0	0	(3,322)	0	0	0	As Sewer Rehabilitation - Annual
San Juan Sewer Main Capacity Impr	(64,585)	(48,439)	0	0	(16,146)	0	0	0	As San Juan Sewer Main Capacity Impr
Total Accum Depr Sewer Capital (503)	**($12,969,702)**	**($9,727,276)**	**$0**	**$0**	**($3,242,425)**	**$0**	**$0**	**$0**	
Total Accumulated Depreciation	**($13,231,463)**	**($9,989,037)**	**$0**	**$0**	**($3,242,425)**	**$0**	**$0**	**$0**	
Net Plant in Service	**$16,800,496**	**$12,600,372**	**$0**	**$0**	**$4,200,124**	**$0**	**$0**	**$0**	

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	Total FY 2026-27	Volume (VOL)	Strength Related: Biochemical Oxygen Demand (BOD)	Strength Related: Suspended Solids (SS)	Weighted for: Actual Customer (AC)	Weighted for: Customer Acct/Svcs (WCA)	Revenue (RR)	Direct (DA)	*Basis of Allocation*
EXPENSES									
Planning and Project Management (701)									
Personnel									
Regular Salaries	$459,162	$344,371	$0	$0	$114,790	$0	$0	$0	As Net Plant In Svc
Permanent Part-Time	0	0	0	0	0	0	0	0	As Net Plant In Svc
Temporary Part-Time	13,650	10,238	0	0	3,413	0	0	0	As Net Plant In Svc
Overtime	0	0	0	0	0	0	0	0	As Net Plant In Svc
Standby/Unscheduled	0	0	0	0	0	0	0	0	As Net Plant In Svc
Acting Pay	0	0	0	0	0	0	0	0	As Net Plant In Svc
Termination Pay	0	0	0	0	0	0	0	0	As Net Plant In Svc
P.E.R.S. Retirement	124,725	93,544	0	0	31,181	0	0	0	As Net Plant In Svc
F.I.C.A Social Security	849	637	0	0	212	0	0	0	As Net Plant In Svc
Health Insurance	0	0	0	0	0	0	0	0	As Net Plant In Svc
Medicare	7,277	5,458	0	0	1,819	0	0	0	As Net Plant In Svc
Life & Disability Insurance	2,030	1,522	0	0	507	0	0	0	As Net Plant In Svc
State Unemployment Insurance	0	0	0	0	0	0	0	0	As Net Plant In Svc
Dental Plan	2,944	2,208	0	0	736	0	0	0	As Net Plant In Svc
Vision Plan	756	567	0	0	189	0	0	0	As Net Plant In Svc
Allowances	1,264	948	0	0	316	0	0	0	As Net Plant In Svc
Deferred Compensation	12,820	9,615	0	0	3,205	0	0	0	As Net Plant In Svc
SEC 125 Benefits	87,212	65,409	0	0	21,803	0	0	0	As Net Plant In Svc
Benefit Prefunding	36,164	27,123	0	0	9,041	0	0	0	As Net Plant In Svc
GASB 68 Pension Expense	0	0	0	0	0	0	0	0	As Net Plant In Svc
GASB 75 OPEB Expense	0	0	0	0	0	0	0	0	As Net Plant In Svc
Workers' Compensation	12,541	9,406	0	0	3,135	0	0	0	As Net Plant In Svc
Total Personnel	$761,394	$571,046	$0	$0	$190,349	$0	$0	$0	
Supplies & Services									
Other Professional/Technical	$87,686	$65,765	$0	$0	$21,922	$0	$0	$0	As Net Plant In Svc
EOC - Disaster Preparedness	0	0	0	0	0	0	0	0	As Net Plant In Svc
Computer Software License	0	0	0	0	0	0	0	0	As Net Plant In Svc
Equipment/Vehicle Rental	0	0	0	0	0	0	0	0	As Net Plant In Svc
Liability Insurance Charge	13,876	10,407	0	0	3,469	0	0	0	As Net Plant In Svc
Postage/Delivery Service	0	0	0	0	0	0	0	0	As Net Plant In Svc
Telephone	0	0	0	0	0	0	0	0	As Net Plant In Svc
Printing & Binding	0	0	0	0	0	0	0	0	As Net Plant In Svc
Travel & Training	1,530	1,148	0	0	383	0	0	0	As Net Plant In Svc
Membership & Dues	4,080	3,060	0	0	1,020	0	0	0	As Net Plant In Svc
Miscellaneous	3,090	2,318	0	0	773	0	0	0	As Net Plant In Svc
General Supplies	1,030	773	0	0	258	0	0	0	As Net Plant In Svc
Small Tools	0	0	0	0	0	0	0	0	As Net Plant In Svc
Books/Manuals/Subscriptions	0	0	0	0	0	0	0	0	As Net Plant In Svc
Total Supplies & Services	$111,292	$83,469	$0	$0	$27,823	$0	$0	$0	
Administrative & Other									
Vehicle Usage Charge	$11,606	$8,705	$0	$0	$2,902	$0	$0	$0	As Net Plant In Svc
Computer Usage Charge	58,999	44,250	0	0	14,750	0	0	0	As Net Plant In Svc
Building Maintenance Charge	46,884	35,163	0	0	11,721	0	0	0	As Net Plant In Svc
Administrative Support	146,812	110,109	0	0	36,703	0	0	0	As Net Plant In Svc
Equipment Allocation - IT Charge	3,727	2,795	0	0	932	0	0	0	As Net Plant In Svc
Equipment Allocation Charge	541	406	0	0	135	0	0	0	As Net Plant In Svc
Total Administrative & Other	$268,568	$201,426	$0	$0	$67,142	$0	$0	$0	
Total Planning and Project Management (701)	**$1,141,255**	**$855,941**	**$0**	**$0**	**$285,314**	**$0**	**$0**	**$0**	

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	Total FY 2026-27	Volume (VOL)	Strength Related: Biochemical Oxygen Demand (BOD)	Strength Related: Suspended Solids (SS)	Weighted for: Actual Customer (AC)	Weighted for: Customer Acct/Svcs (WCA)	Revenue (RR)	Direct (DA)	Basis of Allocation
Sanitary Sewer Operations (710)									
Personnel									
Regular Salaries	$875,268	$656,451	$0	$0	$218,817	$0	$0	$0	As Net Plant In Svc
Temporary Part-Time	0	0	0	0	0	0	0	0	As Net Plant In Svc
Overtime	12,600	9,450	0	0	3,150	0	0	0	As Net Plant In Svc
Standby/Unscheduled	25,881	19,411	0	0	6,470	0	0	0	As Net Plant In Svc
Acting Pay	0	0	0	0	0	0	0	0	As Net Plant In Svc
Termination Pay	0	0	0	0	0	0	0	0	As Net Plant In Svc
P.E.R.S. Retirement	231,333	173,499	0	0	57,833	0	0	0	As Net Plant In Svc
F.I.C.A. Social Security	0	0	0	0	0	0	0	0	As Net Plant In Svc
Health Insurance	0	0	0	0	0	0	0	0	As Net Plant In Svc
Medicare	14,018	10,514	0	0	3,505	0	0	0	As Net Plant In Svc
Life & Disability Insurance	3,822	2,867	0	0	956	0	0	0	As Net Plant In Svc
State Unemployment Insurance	0	0	0	0	0	0	0	0	As Net Plant In Svc
Dental Plan	8,683	6,512	0	0	2,171	0	0	0	As Net Plant In Svc
Vision Plan	2,162	1,622	0	0	541	0	0	0	As Net Plant In Svc
Uniform Allowance	0	0	0	0	0	0	0	0	As Net Plant In Svc
Allowances	505	379	0	0	126	0	0	0	As Net Plant In Svc
Deferred Compensation	28,161	21,121	0	0	7,040	0	0	0	As Net Plant In Svc
SEC 125 Benefits	241,118	180,839	0	0	60,280	0	0	0	As Net Plant In Svc
Benefit Prefunding	75,579	56,684	0	0	18,895	0	0	0	As Net Plant In Svc
Compensated Absences	0	0	0	0	0	0	0	0	As Net Plant In Svc
Workers' Compensation	113,700	85,275	0	0	28,425	0	0	0	As Net Plant In Svc
Total Personnel	$1,632,832	$1,224,624	$0	$0	$408,208	$0	$0	$0	
Supplies & Services									
After Hours Dispatch Service	$10,196	$7,647	$0	$0	$2,549	$0	$0	$0	As Net Plant In Svc
Property Tax Admin Fee	47,326	35,494	0	0	11,831	0	0	0	As Net Plant In Svc
Other Professional/Tech	117,255	0	0	0	0	117,255	0	0	100% WCA
Computer Software License	0	0	0	0	0	0	0	0	As Net Plant In Svc
Water	12,075	9,056	0	0	3,019	0	0	0	As Net Plant In Svc
Other Waste Water Treatment	262,500	117,998	67,060	77,442	0	0	0	0	45% VOL 26% BOD 30% SS
S.V.C.W. Sewer Treatment	3,561,658	1,601,021	909,885	1,050,752	0	0	0	0	45% VOL 26% BOD 30% SS
Repair & Maintenance Service	10,300	7,725	0	0	2,575	0	0	0	As Net Plant In Svc
Land/Building Rentals	57,680	43,260	0	0	14,420	0	0	0	As Net Plant In Svc
Equipment/Vehicle Rental	0	0	0	0	0	0	0	0	As Net Plant In Svc
Liability Insurance Charge	71,737	53,803	0	0	17,934	0	0	0	As Net Plant In Svc
Communications	8,240	6,180	0	0	2,060	0	0	0	As Net Plant In Svc
Telephone	0	0	0	0	0	0	0	0	100% WCA
Travel And Training	11,730	8,798	0	0	2,933	0	0	0	As Net Plant In Svc
Street Access Fee	204,204	204,204	0	0	0	0	0	0	100% VOL
Memberships & Dues	8,670	6,503	0	0	2,168	0	0	0	As Net Plant In Svc
Miscellaneous	1,030	773	0	0	258	0	0	0	As Net Plant In Svc
General Supplies	8,240	6,180	0	0	2,060	0	0	0	As Net Plant In Svc
Small Tools	15,450	11,588	0	0	3,863	0	0	0	As Net Plant In Svc
Safety Equipment	25,750	19,313	0	0	6,438	0	0	0	As Net Plant In Svc
Natural Gas & Electricity	93,555	93,555	0	0	0	0	0	0	100.0% VOL
Gasoline	26,250	19,688	0	0	6,563	0	0	0	As Net Plant In Svc
Repair & Maintenance Supplies	46,350	34,763	0	0	11,588	0	0	0	As Net Plant In Svc
Books/Manuals/Subscriptions	515	386	0	0	129	0	0	0	As Net Plant In Svc
Total Supplies & Services	$4,600,711	$2,287,932	$976,945	$1,128,195	$90,385	$117,255	$0	$0	
Administrative & Other									
Vehicle Usage Charge	$293,156	$219,867	$0	$0	$73,289	$0	$0	$0	As Net Plant In Svc
Computer Usage Charge	157,031	117,773	0	0	39,258	0	0	0	As Net Plant In Svc
Building Maintenance Charge	124,781	93,586	0	0	31,195	0	0	0	As Net Plant In Svc
Administrative Support	200,211	150,159	0	0	50,053	0	0	0	As Net Plant In Svc
Equipment Allocation - IT Charge	9,917	7,438	0	0	2,479	0	0	0	As Net Plant In Svc
Equipment Allocation Charge	1,947	1,460	0	0	487	0	0	0	As Net Plant In Svc
Total Administrative & Other	$787,043	$590,282	$0	$0	$196,761	$0	$0	$0	
Total Sanitary Sewer Operations (710)	**$7,020,585**	**$4,102,838**	**$976,945**	**$1,128,195**	**$695,353**	**$117,255**	**$0**	**$0**	

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	Total FY 2026-27	Volume (VOL)	Strength Related: Biochemical Oxygen Demand (BOD)	Strength Related: Suspended Solids (SS)	Weighted for: Actual Customer (AC)	Weighted for: Customer Acct/Svcs (WCA)	Revenue (RR)	Direct (DA)	*Basis of Allocation*
Sanitary Sewer Capital Operations (730)									
Supplies & Services									
Engineering/Architecture	$0	$0	$0	$0	$0	$0	$0	$0	As Net Plant In Svc
Other Professional/Tech	10,300	7,725	0	0	2,575	0	0	0	As Net Plant In Svc
Bond Issuance Costs	0	0	0	0	0	0	0	0	As Net Plant In Svc
Bond Amortization Expense	0	0	0	0	0	0	0	0	As Net Plant In Svc
City Project Management & Services	0	0	0	0	0	0	0	0	As Net Plant In Svc
Postage/Delivery Service	0	0	0	0	0	0	0	0	As Net Plant In Svc
Printing and Binding	0	0	0	0	0	0	0	0	As Net Plant In Svc
Miscellaneous	0	0	0	0	0	0	0	0	As Net Plant In Svc
General Supplies	0	0	0	0	0	0	0	0	As Net Plant In Svc
Total Supplies & Services	$10,300	$7,725	$0	$0	$2,575	$0	$0	$0	
Administrative & Other									
Administrative Support									
Administrative Support	$133,900	$0	$0	$0	$0	$133,900	$0	$0	100% WCA
Total Administrative & Other	$133,900	$0	$0	$0	$0	$133,900	$0	$0	
Capital Outlay									
Improvement Other Than Building	$0	$0	$0	$0	$0	$0	$0	$0	As Net Plant In Svc
Total Capital Outlay	$0	$0	$0	$0	$0	$0	$0	$0	
Total Sanitary Sewer Capital Operations (730)	**$144,200**	**$7,725**	**$0**	**$0**	**$2,575**	**$133,900**	**$0**	**$0**	
Total Operating & Maintenance Expense	**$8,306,040**	**$4,966,504**	**$976,945**	**$1,128,195**	**$983,242**	**$251,155**	**$0**	**$0**	
Net Capital Funded Through Rates	$7,025,000	$5,268,750	$0	$0	$1,756,250	$0	$0	$0	As Net Plant In Svc
Deferred Capital Funding (Debt Service)	$0	$0	$0	$0	$0	$0	$0	$0	As Net Plant In Svc
Debt Service									
2016 Sewer Revenue Refunding	$764,505	$573,379	$0	$0	$191,126	$0	$0	$0	As Net Plant In Svc
2016 Sewer Revenue	628,941	471,706	0	0	157,235	0	0	0	As Net Plant In Svc
2019 Sewer Revenue	1,107,625	830,719	0	0	276,906	0	0	0	As Net Plant In Svc
New Low Interest Loan	0	0	0	0	0	0	0	0	As Net Plant In Svc
New Revenue Bond 2024/2025	0	0	0	0	0	0	0	0	As Net Plant In Svc
Total Debt Service	$2,501,071	$1,875,803	$0	$0	$625,268	$0	$0	$0	
Change in Working Capital +/-	$551,629	$413,722	$0	$0	$137,907	$0	$0	$0	As Net Plant In Svc
TOTAL REVENUE REQUIREMENTS	**$18,383,740**	**$12,524,779**	**$976,945**	**$1,128,195**	**$3,502,667**	**$251,155**	**$0**	**$0**	
Less: Miscellaneous Revenue									
Public Works Service Charges	$0	$0	$0	$0	$0	$0	$0	$0	As Net Plant In Svc
City CIP Chargeback	176,566	132,425	0	0	44,142	0	0	0	As Net Plant In Svc
Sewer Lateral Certificate Fee	2,800	2,800	0	0	0	0	0	0	100% Vol
Interest Earnings - Investments	921,154	627,579	48,952	56,530	175,508	12,585	0	0	As Total Rev. Req.
Other Interest Earnings	0	0	0	0	0	0	0	0	As Total Rev. Req.
Interest Revenue - Change	0	0	0	0	0	0	0	0	As Total Rev. Req.
Reimbursements	0	0	0	0	0	0	0	0	As Total Rev. Req.
Standby Charges	130,062	88,611	6,912	7,982	24,781	1,777	0	0	As Total Rev. Req.
Total Miscellaneous Revenues	$1,230,582	$851,414	$55,863	$64,512	$244,430	$14,361	$0	$0	
NET REVENUE REQUIREMENTS FROM RATES	**$17,153,158**	**$11,673,365**	**$921,081**	**$1,063,682**	**$3,258,237**	**$236,793**	**$0**	**$0**	
% Net Revenue Requirement	100.0%	68.1%	5.4%	6.2%	19.0%	1.4%	0.0%	0.0%	

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City of Belmont
Sewer Cost of Service Study
Exhibit 12
Allocation of Revenue Requirement

Allocation Components	Net Revenue Requirement	Low Strength	High Strength	*Distribution Factor*
Volume Related	$11,673,365	$11,361,193	$312,172	(VOL)
Strength Related				
Bio-Oxygen Demand	$921,081	$855,280	$65,802	(BOD)
Suspended Solids	1,063,682	987,693	75,989	(SS)
Total Strength Related	**$1,984,764**	**$1,842,973**	**$141,790**	
Customer Related				
Actual Customer	$3,258,237	$3,250,157	$8,079	(AC)
Weighted Customer	236,793	236,206	587	(WCA)
Total Customer Related	**$3,495,030**	**$3,486,364**	**$8,666**	
Revenue Related	$0	$0	$0	(RR)
Direct Assignment	$0	$0	$0	(DA)
NET REVENUE REQUIREMENT	**$17,153,158**	**$16,690,530**	**$462,629**	

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City of Belmont
Sewer Cost of Service Study
Exhibit 13
Summary of the Cost of Service Analysis

	FY 2026-27 Expenses	Low Strength	High Strength
Revenues at Present Rates	$17,153,159	$16,674,345	$478,813
Distributed Revenue Requirement	$17,153,158	$16,690,530	$462,629
Balance/(Deficiency) of Funds	$0	($16,184)	$16,185
Required % Change in Rates	0.0%	0.1%	-3.4%
Proposed Rate Adjustment	**0.0%**		
Additional Revenue from Rate Adjustment	$0	$0	$0
Proposed Adjustment Based on COSA	**0.0%**	**0.0%**	**0.0%**

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City of Belmont
Sewer Utility
Proposed Rate Adjustments - 5 Year Rate Transition Plan

Demand Adjustment Factor	*10.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Revenue Adjustment July 1 each year		*0.0%*	*0.0%*	*3.0%*	*3.0%*	*3.0%*
	Present	**FY 2026-27**	**FY 2027-28**	**FY 2028-29**	**FY 2029-30**	**FY 2030-31**
Collection						
Low Strength						
Base Charge - Annual	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge (S/HCF)	6.63	7.29	7.29	7.51	7.74	7.97
High Strength						
Base Charge	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge (S/HCF)	12.88	14.17	14.17	14.60	15.04	15.49
Treatment						
Low Strength						
Base Charge - Annual	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge (S/HCF)	3.28	3.61	3.61	3.72	3.83	3.94
High Strength						
Base Charge - Annual	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge (S/HCF)	6.38	7.02	7.02	7.23	7.45	7.67

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Low Strength & High Strength Monthly Sewer Bill Comparison

Monthly Consumption (per HCF)			FY 2026-2027 Comparison Present Rates	FY 2026-2027 Comparison Proposed Rates	FY 2026-2027 Comparison $ Change	FY 2026-2027 Comparison % Percent	FY 2027-2028 Comparison Present Rates	FY 2027-2028 Comparison Proposed Rates	FY 2027-2028 Comparison $ Change	FY 2027-2028 Comparison % Percent	FY 2028 - 2029 Comparison Present Rates	FY 2028 - 2029 Comparison Proposed Rates	FY 2028 - 2029 Comparison $ Change	FY 2028 - 2029 Comparison % Percent
Adjustment Factor	***1.10***	***1.00***												
Low Strength														
0	0.00	0.00	$59.22	$59.22	$0.00	0.0%	$59.22	$59.22	$0.00	0.00%	$59.22	$60.99	$1.77	2.99%
8	8.80	8.00	146.43	146.42	(0.01)	0.0%	146.42	146.42	0.00	0.00%	146.42	150.83	4.41	3.01%
20	22.00	20.00	277.24	277.22	(0.02)	0.0%	277.22	277.22	0.00	0.00%	277.22	285.59	8.37	3.02%
40	44.00	40.00	495.26	495.22	(0.04)	0.0%	495.22	495.22	0.00	0.00%	495.22	510.19	14.97	3.02%
High Strength														
0	0.00	0.00	$59.22	$59.22	$0.00	0.0%	$59.22	$59.22	$0.00	0.00%	$59.22	$60.99	$1.77	2.99%
30	33.00	30.00	694.80	694.92	0.12	0.0%	386.22	386.22	0.00	0.00%	386.22	397.89	11.67	3.02%
60	66.00	60.00	1,330.38	1,330.62	0.24	0.0%	713.22	713.22	0.00	0.00%	713.22	734.79	21.57	3.02%
110	121.00	110.00	2,389.68	2,390.12	0.44	0.0%	1,258.22	1,258.22	0.00	0.00%	1,258.22	1,296.29	38.07	3.03%

Base Charge	**FY 2025-2026 Present**	**FY 2026-2027 Proposed**	**FY 2026-2027 Present**	**FY 2027-2028 Proposed**	**FY 2027-2028 Present**	**FY 2028-2029 Proposed**
Low Strength	$59.22	$59.22	$59.22	$59.22	$59.22	$60.99
High Strength	59.22	59.22	59.22	59.22	59.22	60.99
Flow Charge (per HCF)						
Low Strength	$9.91	$10.90	$10.90	$10.90	$10.90	$11.23
High Strength	19.26	21.19	21.19	21.19	21.19	21.83

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Proposition 218 Notice

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City of Belmont

Sewer Rate Study Summary

April 14, 2026



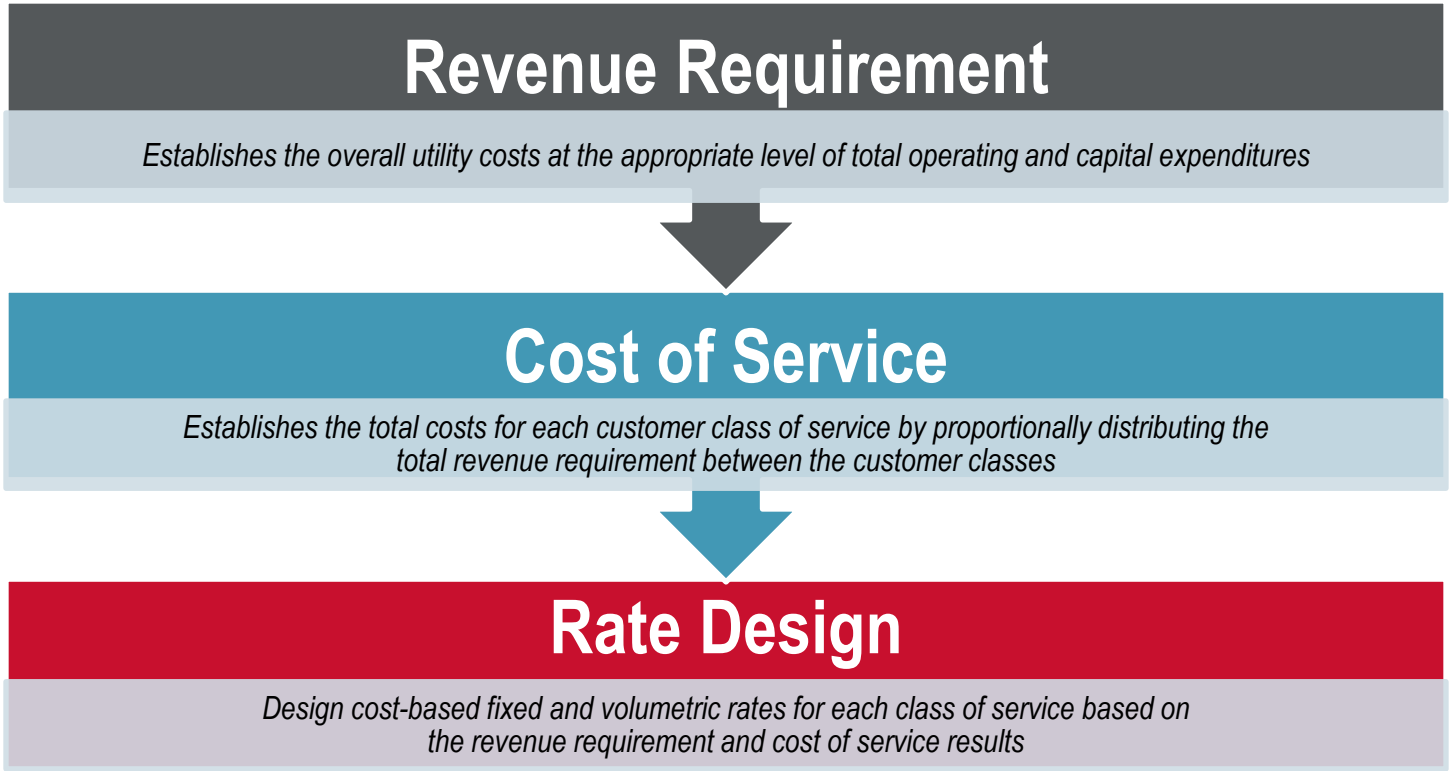
Overview of the Presentation

- Rate Study Key Issues
- Establishing Cost-Based Rates
- Revenue Requirement Analysis
- Cost of Service Analysis
- Rate Design
- Concluding Comments

Sewer Rate Study Key Issues

- Maintain sufficient sewer rate revenues to:
  - Fund annual O&M expenses
  - Fund Silicon Valley Clean Water (SVCW) treatment costs (pass-through 41.0% of O&M budget)
  - Fund ongoing capital needs and existing annual debt service payments
- Capital is funded through existing rates and reserves
  - No new long-term debt for this rate setting period identified
- Propose resetting winter water flow adjustment factor to 0.0% starting in FY 2026-27
  - Currently set at 10.0%
- Maintain key financial metrics
  - Fund renewal and replacement capital greater than annual depreciation expense
  - Meet 2.0 target debt service coverage ratio
  - Maintain target minimum reserves for operations, emergency/litigation, and capital
- City has historically established rates for a two-year period
  - This study has proposed rates for the **three-year** period of FY 2026-27, FY 2027-28, and FY 2028-29

Establishing Cost-Based Rates



Revenue Requirement Analysis





Revenue Requirement Key Assumptions

Rate Revenue Assumptions

- Consumption levels based on water consumption data from Mid-Peninsula Water District
- Current 10.0% winter water flow adjustment proposed to be reset to 0.0% due to increased customer consumption to pre-drought levels
- Historical flow and current rates (FY 2025-26) to project FY 2025-26 rate revenue

O&M Expense Assumptions

- Starting point was the adopted FY 2025-26 budget
  - ✓ Projected based on historical inflationary factors (4.4% on average)
- Major O&M expense – Treatment (SVCW) - $3.6M in FY 2026-27
  - ✓ Treatment costs (rates) not controlled by the City
  - ✓ SVCW treatment rate inflation factor at average of 5.3% annually
  - ✓ Treatment costs based on projected SVCW projections

Capital Projects and Funding

- Starting point is the sewer capital improvement plan and identified projects from sewer master plan
- Maintaining past practice of rate funding at a level greater than annual depreciation
- Balance of capital funding needs provided through existing available reserves

Summary of the Sewer Capital Improvement Plan

Summary of Sewer Capital Improvement Plan ($000s)						
	FY 2025-26	**FY 2026-27**	**FY 2027-28**	**FY 2028-29**	**FY 2029-30**	**FY 2030-31**
Capital Projects	$6,500	$12,132	$18,541	$10,575	$7,154	$6,775
Total Capital Projects	**$6,500**	**$12,132**	**$18,541**	**$10,575**	**$7,154**	**$6,775**
Less: Funding Sources						
Grants	$0	$0	$0	$0	$0	$0
Capital Reserve	0	5,557	9,216	0	0	0
Connection Fee Reserve	0	0	2,700	3,900	429	0
Additional Long-Term Debt	0	0	0	0	0	0
Total Funding Sources	**$0**	**$5,557**	**$11,916**	**$3,900**	**$429**	**$0**
Total CIP Funded Through Rates	**$6,500**	**$6,575**	**$6,625**	**$6,675**	**$6,725**	**$6,775**
Annual I&I Funded Capital	**$350**	**$450**	**$450**	**$450**	**$450**	**$450**

- Funding of projects from rates and reserves
  - Minimum of CIP from rates > annual depreciation expense (increasing annually)
  - Use of capital and connection fee reserves to fund remaining capital needs
  - Additional rate funded I&I improvements

Summary of the Sewer Revenue Requirement

- Focus of projections is over the next five fiscal years (cumulative adjustment needed is 9.3%)
- Rate setting period for the next **three** years (FY 2026-27, FY 2027-28, and FY 2028-29)

Summary of Sewer Utility Revenue Requirements ($000s)						
	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31
Revenues						
Retail Rate Revenues	$16,983	$17,153	$17,325	$17,498	$17,673	$17,850
Other Revenues	309	1,231	1,130	951	958	973
Total Revenues	**$17,293**	**$18,384**	**$18,455**	**$18,449**	**$18,631**	**$18,823**
Expenses						
Collection O&M Expenses	$4,556	$4,744	$4,936	$5,123	$5,302	$5,489
Treatment O&M Expenses	3,220	3,562	3,704	3,852	4,006	4,167
Repair and Replacement Funding	6,500	6,575	6,625	6,675	6,725	6,775
I/I Capital Funding	350	450	450	450	450	450
Total Debt Service	2,498	2,501	2,501	2,497	2,496	2,499
Change in Working Capital +/-	169	552	239	377	728	1,098
Total Expenses	**$17,293**	**$18,384**	**$18,455**	**$18,974**	**$19,708**	**$20,478**
Balance/(Deficiency)	**$0**	**$0**	**$0**	**($525)**	**($1,076)**	**($1,655)**
Cumulative as % of Rates	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**6.1%**	**9.3%**
Proposed Rate Adjustment	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**3.0%**	**3.0%**

Revenue Requirement Conclusions and Recommendations

- Debt service coverage ratio calculates the ability to repay debt
  - $DSC = \frac{Total\ Revenues - Annual\ O\&M\ Expenses}{Annual\ Debt\ Service\ Payment}$
- City is legally required to meet minimum debt service coverage ratio of 1.25
- Revenue requirement recommendations addresses key financial planning metrics
  - Prudently funding system renewal and replacement
  - Debt service coverage ratio target of 2.0
  - Maintain target minimum reserve levels

Recommend adopting the proposed revenue adjustments over the three-year period as developed in the revenue requirement

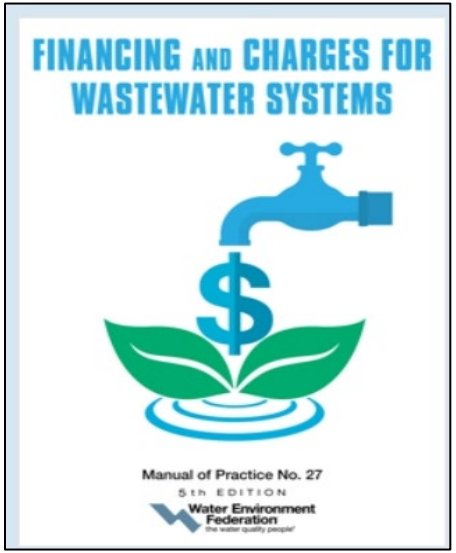
Cost of Service Analysis





Need for Cost of Service

- Reflects the proportionality requirements of Proposition 218
  - Need to develop the cost basis (justification) for the proposed rates
- Proportionally distributes the costs to the customer classes of service (e.g., low strength and high strength customers)
- Developed using generally accepted methodologies based on the City's specific system and customer characteristics
  - Water Environment Federation Manual of Practice No. 27



Summary of the FY 2026-27 Cost of Service

Summary of the FY 2026-27 Cost of Service Analysis ($000s)				
Class of Service	Present Rate Revenues	Distributed Costs	$ Difference	% Difference
Low Strength	$16,674	$16,691	($16)	0.0%
High Strength	479	463	$16	0.0%
Total	**$17,153**	**$17,153**	**$0**	**0.0%**

Cost of service results are within a reasonable range of the total system rate adjustment
No interclass adjustments ("cost of service") are recommended at this time

Rate Design Analysis





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Review of Present Sewer Rates

- Two rate schedules:
  - Low Strength
  - High Strength
- Components of the current rate structure:
  - Base charge: flat annual charge
  - Flow (volume) charge per HCF (based on winter water average)
- Winter water flow adjustment factor
  - Flow adjustment factor reset from 10.0% to 0.0% as recent billing data showing consumption has been increasing to pre-drought levels

Winter water flow adjustment factor formula:

Actual Volume Usage x (1 + (Flow Adjustment Factor)) = Adjusted Volume Usage

Example: 8 HCF x (1+.10) = 8.8 HCF adjusted volume usage

Overview of the Proposed Sewer Rates

- Maintained current customer classes of service
  - Customer classes reflect usage and system characteristics
- Maintained base charge structure
  - Base charge adjusted by the proposed rate transition plan
    - ✓ 0.0% annually in FY 2026-27 and FY 2027-28 and 3.0% in FY 2028-29
- Flow adjustment factor reset to 0.0% for future rate projections
  - Increased volume (flow) charge by present flow adjustment factor (10%) to account for change
- Sewer bills will continue to be collected through property tax bills



Proposed Annual Sewer Rates – 5 Years

Present and Proposed Sewer Rates						
	Present Rates	Proposed Rates			Forecasted Rates	
		FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31
COLLECTION						
Low Strength						
Base Charge	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge ($/HCF)	6.63	7.29	7.29	7.51	7.74	7.97
High Strength						
Base Charge	$465.80	$465.80	$465.80	$479.77	$494.16	$508.98
Flow Charge ($/HCF)	12.88	14.17	14.17	14.60	15.04	15.49
TREATMENT						
Low Strength						
Base Charge	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge ($/HCF)	3.28	3.61	3.61	3.72	3.83	3.94
High Strength						
Base Charge	$244.81	$244.81	$244.81	$252.15	$259.71	$267.50
Flow Charge ($/HCF)	6.38	7.02	7.02	7.23	7.45	7.67
COMBINED						
Low Strength						
Base Charge	$710.61	$710.61	$710.61	$731.92	$753.87	$776.48
Flow Charge ($/HCF)	9.91	10.90	10.90	11.23	11.57	11.91
High Strength						
Base Charge	$710.61	$710.61	$710.61	$731.92	$753.87	$776.48
Flow Charge ($/HCF)	19.26	21.19	21.19	21.83	22.49	23.16

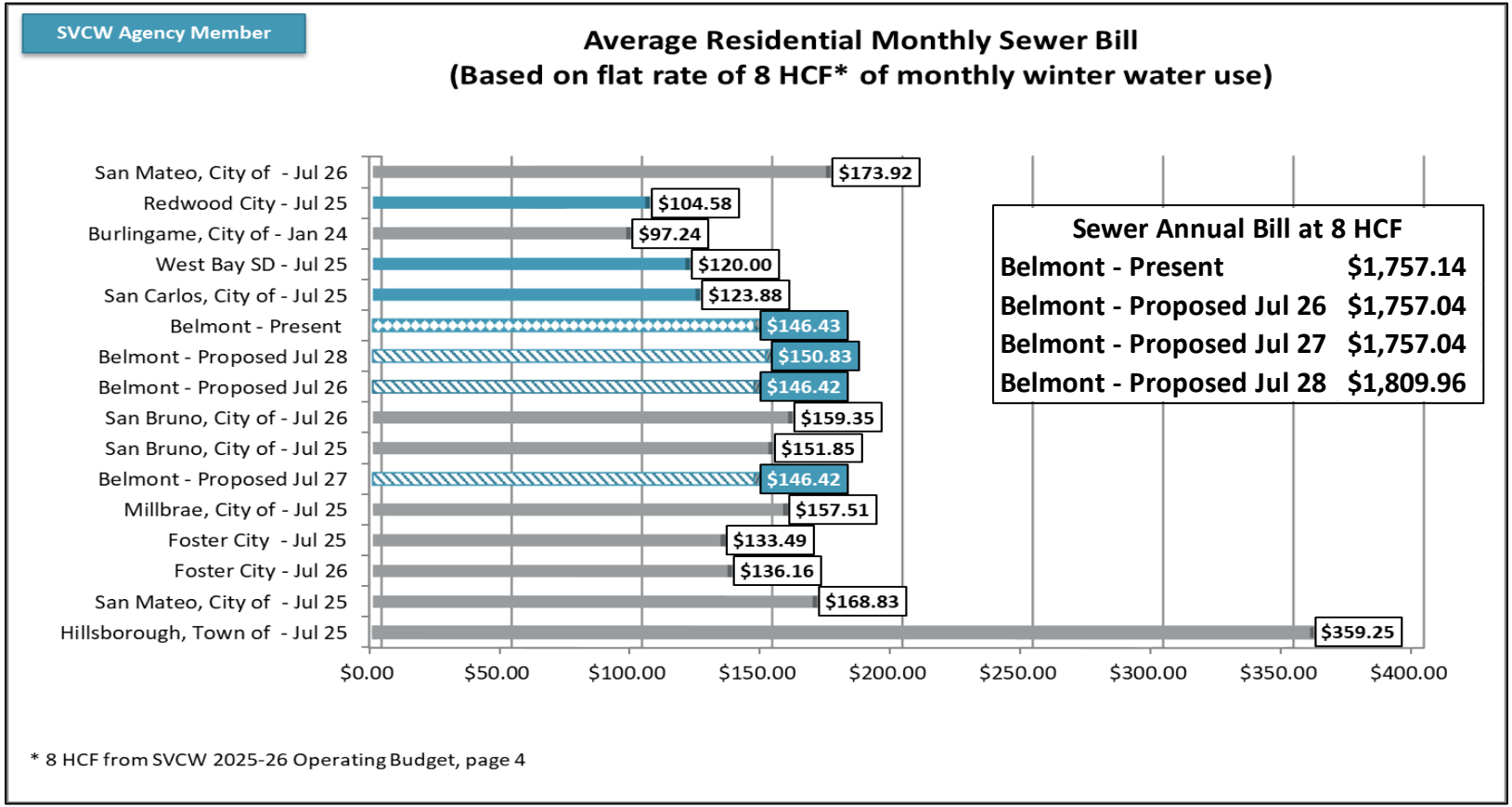
Proposed Monthly Bill Comparisons

Low Strength & High Strength Monthly Sewer Bill Comparison

Monthly Consumption (per HCF)			FY 2026-2027 Comparison Present Rates	Proposed Rates	$ Change	% Percent	FY 2027-2028 Comparison Present Rates	Proposed Rates	$ Change	% Percent	FY 2028 - 2029 Comparison Present Rates	Proposed Rates	$ Change	% Percent
Adjustment Factor	*1.10*	*1.00*												
Low Strength														
0	0.00	0.00	$59.22	$59.22	$0.00	0.0%	$59.22	$59.22	$0.00	0.00%	$59.22	$60.99	$1.77	2.99%
8	8.80	8.00	146.43	146.42	(0.01)	0.0%	146.42	146.42	0.00	0.00%	146.42	150.83	4.41	3.01%
20	22.00	20.00	277.24	277.22	(0.02)	0.0%	277.22	277.22	0.00	0.00%	277.22	285.59	8.37	3.02%
40	44.00	40.00	495.26	495.22	(0.04)	0.0%	495.22	495.22	0.00	0.00%	495.22	510.19	14.97	3.02%
High Strength														
0	0.00	0.00	$59.22	$59.22	$0.00	0.0%	$59.22	$59.22	$0.00	0.00%	$59.22	$60.99	$1.77	2.99%
30	33.00	30.00	694.80	694.92	0.12	0.0%	386.22	386.22	0.00	0.00%	386.22	397.89	11.67	3.02%
60	66.00	60.00	1,330.38	1,330.62	0.24	0.0%	713.22	713.22	0.00	0.00%	713.22	734.79	21.57	3.02%
110	121.00	110.00	2,389.68	2,390.12	0.44	0.0%	1,258.22	1,258.22	0.00	0.00%	1,258.22	1,296.29	38.07	3.03%

	FY 2025-2026 Present	FY 2026-2027 Proposed	FY 2026-2027 Present	FY 2027-2028 Proposed	FY 2027-2028 Present	FY 2028-2029 Proposed
Base Charge						
Low Strength	$59.22	$59.22	$59.22	$59.22	$59.22	$60.99
High Strength	59.22	59.22	59.22	59.22	59.22	60.99
Flow Charge (per HCF)						
Low Strength	$9.91	$10.90	$10.90	$10.90	$10.90	$11.23
High Strength	19.26	21.19	21.19	21.19	21.19	21.83

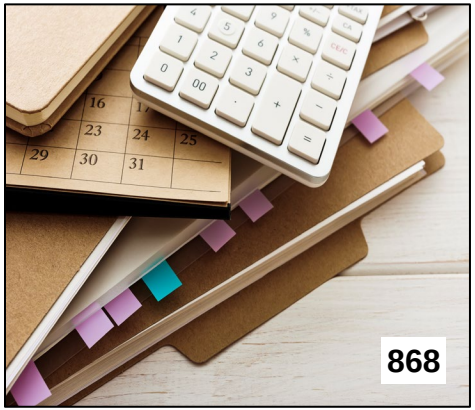
Rate Comparisons - Low Strength ($/Month)



* 8 HCF from SVCW 2025-26 Operating Budget, page 4

Concluding Comments

- Proposed rates are cost-based, proportional, and based on cost of service principles and the City's unique sewer system and customer characteristics
- Proposed rates have balanced the financial requirements of the sewer utility with the impacts to customer bills
  - Maintains financial stability
  - Continues plan to increase funding of repair and replacement through rates
  - Improved debt service coverage ratios
  - Continues to maintain target reserve balances
- Recommend approval of the proposed sewer rates
  - 0.0% in FY 2026-27 and FY 2027-28 and 3.0% in FY 2028-29
  - Winter water flow adjustment factor reset to 0.0%





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STAFF REPORT

Meeting Date:	April 14, 2026
Agency:	City of Belmont
Staff Contact:	Cody George, Recreation Manager, 650-595-7424, cgeorge@belmont.gov
Agenda Title:	Age-Friendly City Action Plan Update
Agenda Action:	For Information Only

Recommendation
Receive a presentation providing progress and updates on the City's Age-Friendly Action Plan.

Strategic Focus Area
Quality of Life

Background
The concept of the Global Network of Age-Friendly Cities was developed in 2005 by the World Health Organization (WHO) to help cities consider and implement policies and services to support older adults to live healthy and vibrant lives.

WHO has identified the following eight (8) key domains requiring a conscious effort to create an Age-Friendly Community.

1. Outdoor Spaces and Buildings
2. Transportation
3. Housing
4. Social Participation
5. Respect and Social Inclusion
6. Communication and Information
7. Civic Participation and Employment
8. Community Support and Health Services

The Network of Age-Friendly Communities offers opportunities to address the aging population in a positive and inclusive way. The program provides resources to help communities actively assist people in living easily and comfortably in their homes and communities, while encouraging older residents to take an active role and have their voices heard.

To become designated as an "Age-Friendly City" through the WHO, a City must demonstrate that it is committed to providing places for older adults to be engaged, as well as providing social opportunities and services that ensure older adults can thrive and be part of the community.

City staff worked closely with the Center for Age-Friendly Excellence (CAFE), who provided technical assistance, consultation, applied research access, community organizing synergy, coordination of the

assessment process, and helped write the official application that was submitted to WHO for Belmont to receive its Global Age-Friendly Cities Designation.

The process began with establishing an Age-Friendly Communities Task Force with various stakeholders to oversee the process. The Task Force consisted of two City Council members, one representative from the Belmont Library, and one community member at large. City staff from the Parks & Recreation Department, Police Department, and San Mateo Consolidated Fire also supported the Task Force.

The task force and CAFÉ conducted a series of focus groups to assess the baseline "age-friendliness" of the City of Belmont in the key domains. Qualitative data reports from the focus group discussions were reviewed; identifying indicators so progress can be monitored against an action plan. The Task Force and CAFÉ recommend potential projects and services to be implemented over the next one to two years to address any unmet needs and opportunities for growth or improvement.

Timeline for the City of Belmont's Age-Friendly Designation

- September 2022: The City of Belmont officially joined the AARP/WHO Age-Friendly Network and were designated as an Age-Friendly City
- December 2024: The Center for Age-Friendly Excellence and Parks and Recreation staff convened to initiate development of the Age-Friendly Action Plan
- July 2025: Parks and Recreation staff completed an internal review of the draft Action Plan.
- August 2025: The draft Action Plan was reviewed collaboratively by staff across multiple City departments and members of the community task force
- September 2025: The Action Plan was presented to the City Council
- October 2025: The Action Plan was submitted to AARP for review
- November 2025: The Action Plan received formal approval from AARP

Analysis

Belmont's Age-Friendly Action Plan is a living document, more of a roadmap, not a list of requirements, outlining initiatives and goals to help make the City of Belmont a better place to age gracefully, thrive, and be independent.

Each domain outlined in the Action Plan is listed below with a few corresponding updates for each.

Domain 1: Outdoor Spaces & Buildings

- The Parks department will be working on an exciting placemaking project in Twin Pines Park adjacent to the Senior and Community Center. A space will be created that includes several benches and a game table. One feature of the placemaking project will be a chatty bench. A chatty bench is a designated bench specifically designed to encourage social interaction among passersby. These benches also help combat loneliness and isolation
- The Parks department will be conducting seasonal brush cutting along open space trails. The seasonal brush cutting helps with visibility and fire prevention along trails and paths throughout Belmont

Domain 2: Transportation

- New Senior Mobility Guides have been made available at the Senior Center (prepared by SMC Transit District)
- SMC Transit District has set up a concierge phone line to walk people through navigating from one place to another
- Information has been disseminated in the City's eNews about California's updated bike and e-bike lighting requirements

Domain 3: Housing

- There has been continued financial support for HIP Housing's home sharing program with outreach to Accessory Dwelling Units ADU owners about the program
- In 2025, the City issued building permits for (ADUs). Building permits were also issued for a 37-unit 100% affordable housing project, named the Corners at Belmont located at Hill Street and El Camino Real
- The City has approved entitlements in 2025 for a 100% affordable 63-unit development at 951 Old County Road (The Ridge at Masonic) and 140 units located at 580 Masonic Way, 25 of which are affordable

Domain 4: Social Participation

- The Belmont Library offers dozens of 55+ Friendly programs every month, some recurring and others as one-off experiences, some programs focus on making and crafting, while others invite participants to learn and consider topics they may never have explored deeply.
- The Senior Center offers over 30 free drop-in programs (most weekly) in the areas of arts and crafts, table games, movies, language conversation groups, sports, and fitness. Additionally, there are monthly social events and informational seminars.
    - The Spring schedule includes a Bird Show, Brain Games, Mix and Mingle, a Tea Party, a presentation on the San Francisco Worlds Fairs, day trips, and a Matter of Balance class

Domain 5: Communication & Information

- The City continues to offer communications in both digital and printed formats such as flyers, Recology mailers, and on channel 27
- Digital literacy classes are ongoing at the Belmont Library with new offerings and partnerships bringing unique and reoccurring experiences every month
- The City continues to provide tabling at all City events

Domain 6: Respect & Social Inclusion

- The City offers cultural events such as Lunar New Year and Diwali
    - These events span generations and bring Belmont residents together in celebration and community. These events also meet our goal of offering more intergenerational programming
- The Senior Center has started holding "Town Hall" style meetings which have been named "Senior Connections" to create a space for overall feedback from the aging community. The first Senior Connection meeting was held in March, and these meetings will continue quarterly

Domain 7: Civic Participation/Employment

- Volunteering at the Belmont Library and the Senior Center remains an opportunity for seniors to stay engaged with their communities
- Library programs like English Conversation Clubs and Citizenship Classes are create meaningful opportunities for adult and senior learners to explore civic participation, language development, and community
- The Belmont Library offers an author talk series which invites adults and older adults to engage directly with writers and experts whose work challenges assumptions and expands perspectives
- The Senior Cetner celebrates their volunteers at an annual luncheon, as well as provides smaller gestures of appreciation throughout the year

Domain 8: Community Support & Health Services

- The San Mateo Daily Journal "Senior Showcase" resource fair was held on March 20th with over 30 senior-focused organizations tabling and several types of health screenings available
- The Legal Aid Society of San Mateo County will be offering an Advanced Healthcare Directives and Power of Attorney clinic in May
- Sequoia Hospital will be providing a free educational seminar on Fall Prevention
- The Belmont Library provides tech literacy through practical, lecture style presentations, and collaborative gamification through providers like California Brain Games allowing individuals to stay engaged in lifelong learning
- The Senior Center has added a "Documentaries and Discussions" program to their schedule to encourage learning and thoughtfulness on a variety of topics

Emergency Services – *Additional Domain added by Center for Age-Friendly Excellence*

- Belmont Police Department assists residents in signing up for SMC Alert and social media.
    - Belmont Police Department provides this information at their public event booths and has held special presentations at Senior Center lunch program
- Belmont Police Department holds an annual education event at Senior Center regarding elder scams and how to avoid them
- Pizza with the Police events at the Senior Center and a Coffee with a Cop events offer opportunities for seniors to share ideas and concerns, receive information, and connect with local law enforcement in a positive environment

Staff remain committed to advancing the initiatives and goals outlined in the Age-Friendly Action Plan. This work will continue to be guided by ongoing community engagement, data-driven evaluation, and collaboration across departments and partner organizations. As community needs evolve, staff will adapt strategies to ensure programs, services, and facilities continue to support older adults in living healthy, connected, and independent lives. Regular updates will be provided to ensure transparency and to track progress toward creating a more inclusive and age-friendly Belmont.

Alternatives

1. Take no action.

Attachments

A. Approved Age-Friendly Action Plan 2026-2029
B. Staff Presentation

Fiscal Impact

☒ No Fiscal Impact
☐ Funding Source Confirmed:

Source:	**Purpose:**	**Public Outreach:**
Staff	Discretionary Action	Posting of Agenda

City of Belmont Age-Friendly Action Plan

2026–2029



"Age is an issue of mind over matter. If you don't mind, it doesn't matter."- **Mark Twain**





Executive Summary

In September 2022, the American Association of Retired Persons (AARP) and the World Health Organization (WHO) formally designated the City of Belmont as an Age-Friendly City. This designation marks a significant milestone in our journey toward fostering a community that is inclusive, accessible, and supportive of residents of all ages. Our commitment reflects the guiding principle of livability, ensuring that Belmont remains a place where all people can thrive at every stage of life.

Demographic shifts worldwide highlight the need for cities to adapt to an aging population. By 2034, the U.S. Census Bureau projects that there will be more people over 65 than under 18 for the first time in history. We have reached a crossroads where older adults outnumber children in many countries.*

Belmont is committed to being an Age-Friendly community and providing quality public services and programs. We respect community values and apply necessary resources to meet our community members' prospective challenges and expectations. We want to ensure that our City incorporates programs and policies that enhance the quality of life and promote wellness for all residents, especially those over 55. A variety of classes are offered to cater to all fitness levels, including seated boot camps, Tai Chi, Yoga Therapy for Brain Health, balance classes, and more.

A sense of community and belonging is critical to a city's offerings. The goals and strategies outlined in the action plan will represent a positive step forward in identifying how we intend to engage the community, broaden services, create opportunities for residents to thrive, and provide feedback on our progress.

**Aging in the United States: Strategic Framework for a National Plan on Aging*, May 2024.

Belmont strives to lead the global Age-Friendly movement through continued commitment, innovation, and collaboration. By sharing best practices, learning from our experiences, and adapting to emerging challenges, we will ensure that our City remains a vibrant, inclusive, and livable place for all.

As longevity increases, the need for an Age-Friendly environment becomes increasingly essential. The Belmont Parks and Recreation Department along with the City Council and staff, played a critical role in supporting this vision.

This plan is a culmination of a detailed consultation process that brought service providers, City staff, commissioners, elected officials, and community members together in Belmont to identify how the City can continue to make Belmont a phenomenal place to live, work, and play.

With this plan and vision, the City can strive to work with its residents and counterparts to establish a worldwide community. It is a testament to the community's unwavering commitment and dedication to creating an Age-Friendly environment.



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Overview:
AGE-FRIENDLY CITIES



The concept of Age-Friendly cities emerged in response to the rapid aging of populations and increasing urbanization. The World Health Organization's Global Age-Friendly Network was launched in 2008 to foster an exchange of experiences and provide a forum for mutual learning worldwide. In the United States, the Age-Friendly effort is a partnership with the World Health Organization (WHO) and the American Association of Retired Persons (AARP). There are currently 1,705 cities in 60 countries, covering a population of 330 million worldwide. In 2007, the World Health Organization published the WHO Global Age-Friendly Cities guide, which outlines the domains of life that impact adults aged 55 and above. From this guide, the WHO identified and implemented eight domains to incorporate into establishing Age-Friendly cities. In 2010, the Global Network of Age-Friendly Cities and Communities was established to facilitate the exchange of ideas and information among cities, enabling them to work more effectively in accommodating older residents. The WHO has recognized that the number of people aged 60 and over is projected to double from 11% in 2006 to 22% by 2050. According to the Master Plan on Aging's dashboard, 21% of the population in California was age 60 or older in 2022. In San Mateo County, approximately 23% of the population was 60 or older in 2020, with a projected increase to 34% by 2040.

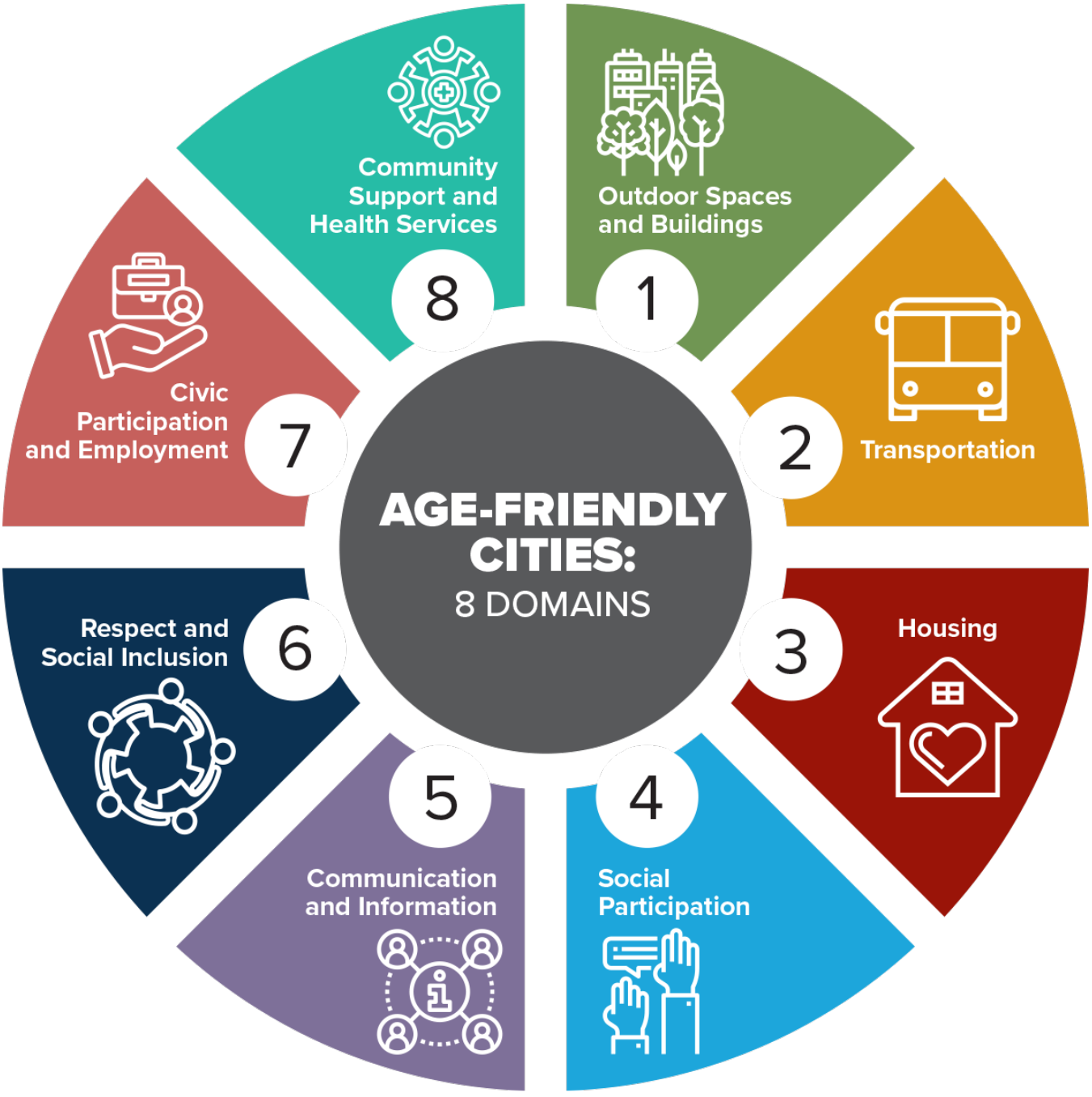
The WHO and AARP serve as platforms for cities to share information, learn from each other's experiences, and collaborate on innovative solutions to the challenges of an aging population. The WHO identified eight domains: outdoor spaces and buildings, transportation, housing, social participation, respect and social inclusion,

civic participation and employment, communication and information, and community support and health services. In this plan, an additional domain related to emergency preparedness and services is introduced, which doesn't fall within the original eight domains of the WHO. The findings from the World Health Organization were compiled into the *Global Age-Friendly Cities Guide and the Checklist of Essential Features of Age-Friendly Cities*, which was released in 2007.

In 2019, Governor Gavin Newsom signed an executive order calling for the development of the California Master Plan on Aging, which was launched in 2021. It is a comprehensive blueprint to address the needs of the aging population and people with disabilities. Stakeholders from the state provided input on issues and concerns affecting older adults. The plan outlines five goals, accompanied by 23 strategies to promote health, aging, equity, and inclusion across the lifespan, supported by multiple initiatives and a data dashboard to track progress. This plan emphasizes preparing for increased health and care demands while fostering community growth. The plan outlines five goals to build a California for All Ages by 2030: Housing for All Ages & Stages; Health Reimagined; Inclusion & Equity, Not Isolation; Caregiving that Works; and Affordable Aging.

This action plan also addresses the emerging challenge of combating ageism. The City of Belmont's work on this plan will align with the emerging focus at the County, State, Federal, and international levels to utilize resources effectively in meeting the growing needs of our increasingly older adult population. Age-Friendly communities benefit from a wide range of citizen engagement by including residents in identifying community needs and developing action plans to implement a course of action, along with evaluation metrics. The plan proves to be a testament to the commitment in establishing an environment where older adults can thrive and are encouraged to continue to contribute to the community. The Age-Friendly movement faces challenges, but continues to evolve, driven by a commitment to creating an inclusive and equitable suburban environment where older adults can work, live, and thrive. Making cities more Age-Friendly is a necessary and logical response to promote the well-being and contributions of older adults, while also ensuring cities remain thriving. The City wants to encourage enablement rather than disablement. Age-Friendly cities can only result from an integrated approach centered around how older adults live.

AGE-FRIENDLY DOMAINS



NOTE: A ninth additional domain has been added to highlight Belmont's Action Plan for **Emergency Services**.

DOMAIN 1: Outdoor Spaces and Buildings



Age-Friendly outdoor spaces and buildings are essential components that contribute to healthy and active aging in a community. These environments are designed with the needs of older adults in mind. Ensuring that public areas are safe, accessible, and inclusive for people of all ages, backgrounds, and abilities is essential to providing a good quality of life. An Age-Friendly design promotes independence and social participation by minimizing physical barriers. It is necessary to foster an environment where older adults can fully participate in community life and maintain their health and well-being. Some critical features to explore in this domain for an Age-Friendly community include, but are not limited to, the following:

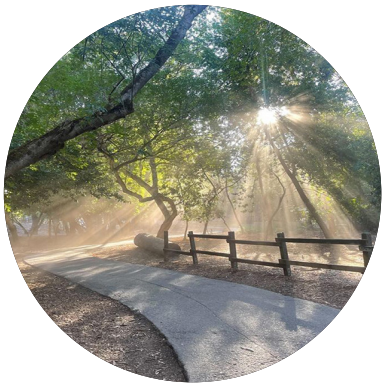
Accessibility: Age-Friendly environments prioritize ease of access for people of all mobility levels. This involves designing barrier-free pathways with smooth, non-slip surfaces and adequate width to accommodate everyone's use. Clear signage with large, readable fonts enhances navigation for individuals with visual or cognitive impairments. Accessibility also extends to parking areas, including designated spaces close to entrances, ensuring ease of access for individuals with mobility challenges. Accessible elevators, ramps, and stairs are essential for ensuring accessibility.

Safety and Security: Older adults are more vulnerable to falls and other risks, so safety is a primary consideration in developing Age-Friendly designs. Well-maintained and well-lit pathways, trails, pedestrian areas, and parking lots help reduce the risk of falls or accidents. Adequate lighting, emergency call buttons, and cameras help older adults feel more secure when using public spaces during the day and in the evening.

Public Facilities: Public facilities should be designed with accessibility as a focal point. Buildings should be easily accessible to older adults, including those with mobility issues or disabilities. Comfort in outdoor environments and buildings helps enhance usability for older adults. Seating areas with sturdy benches and chairs that offer high backrests and armrests will be placed in high-traffic pedestrian areas and rest spots. Placement of seating under a shade structure helps protect against sun exposure and provides shelter from wind and rain. Additionally, outdoor exercise equipment must be designed for both youth and mature adults to empower intergenerational socialization. Green spaces should be readily available for older adults to enjoy nature and participate in physical activities to foster a sense of well-being.

DOMAIN 1: Outdoor Spaces and Buildings

Walkability: Outdoor spaces should encourage walking by providing well-maintained sidewalks, trails, and pedestrian crossings with sufficient crossing times. Walking loops in parks or neighborhoods with clear signage and distance markers help seniors track their activity.



Inclusive Design: Building and suburban planning should consider the needs of older adults, incorporating features that enhance safety, comfort, and usability for people of all ages. Design should also address sensory, cognitive, and physical differences. Inclusive spaces foster social interaction between residents of different generations, which helps reduce isolation by making everyone feel welcome in their community.



DOMAIN 2: Transportation



An Age-Friendly community provides a variety of reliable, accessible, and affordable transportation options, along with mobility education, which allows residents the ability to be connected to all areas and services within the community. Transportation is a critical necessity influencing active aging, social participation, and access to essential community services and resources. A robust transportation system ensures residents can move safely and comfortably throughout the local and regional community.

Accessible Public Transportation: Accessible public transportation ensures that older adults and individuals with disabilities can travel independently. There should be designated priority seating, ramps, and lifts. Doors need wide openings to accommodate walkers and wheelchairs. Audible announcements and transparent visual displays inside vehicles help riders stay aware of their upcoming stops.

Affordable Transportation Options: Transportation should be affordable for older adults, which could include subsidies or discounted fares. In addition to traditional transportation options, volunteer transportation options, and shuttles should be readily available to increase access to grocery stores, community centers, libraries, and medical clinics and hospitals. By reducing financial strain, these measures encourage the use of public transportation among older adults, to maintain easy access to services and increase social interaction with others.

Safe and Comfortable Transit: Safety in transportation involves well-lit and secure bus stops and transit stations. Comfort is enhanced by providing shelters, seating, and protection from the elements at transit stops. Temperature controls inside vehicles are vital monitors to ensure a pleasant experience year-round for riders. Transit staff should be trained in disability awareness and customer service. Transportation modes must be clean, safe, and well-maintained. Buses, trains, and shuttles need to have grab bars, climate controls, and non-skid flooring. Transportation stations should have security cameras and easily accessible emergency call buttons.

Availability of Various Transportation Modes: Curating a “whole” approach to transportation will result in shorter waiting times. There should be a range of transport options available, such as buses, trains, on-demand options, taxi vouchers, and shuttles, which can accommodate different needs. On-demand transportation options that are made available, such as door-to-door pick-ups and drop-offs, also enhance the experiences of older adults and those with special needs.

DOMAIN 2: Transportation

Walkable and Safe Streets: Safety and comfort need to play an essential role throughout the City's transportation infrastructure. Ensuring streets are safe and walkable includes having well-maintained sidewalks, pedestrian crossings, and parking lots, and incorporating traffic-calming measures. Pedestrian crossings need countdown timers, audible and visual signals, and sufficient crossing times to accommodate slower walking speeds.



Information and Education: Clear, concise, and accessible information about transportation options, routes, and schedules with large fonts and high-contrast colors is essential. Workshops and outreach sessions at community centers and libraries are needed to teach older adults how to use online transportation tools and smart cards. Volunteer "travel buddies" and helplines will help ensure that residents can take full advantage of available transportation options.



DOMAIN 3: **Housing**



An Age-Friendly City offers housing that provides accessible living spaces, is affordable, and safe. Housing options include single-family homes, accessible dwelling units, multi-unit apartments, and co-housing options. Housing options must meet the ongoing changing needs of people as they age. Older adults need as many options as possible to help them stay in their homes, and not be forced to leave due to physical limitations, financial hardship, or lack of essential support systems.

Affordability: Housing should be financially accessible to older adults, ensuring they can afford to live in suitable homes without experiencing financial strain. Most older adults live on fixed incomes. Age-Friendly housing may include options like subsidized housing, rent-controlled units, or shared living models.

Accessibility and Adaptability: Homes should be designed or modified to accommodate the physical needs of older people. Design concepts such as wide doorways, step-free entrances, lever-style handles, non-slip flooring, and grab bars in bathrooms will help enhance safety as older adults age. Kitchens can include adjustable countertops and easy-grip cabinets, enabling residents to maintain independence regardless of physical limitations.

Safety and Security: Ensuring that the housing environment is safe is crucial. Innovative technologies offer numerous benefits for older adults in housing, including enhanced safety, increased independence, and improved convenience. Safety features include security cameras, smart fall detection sensors, emergency buttons, smart locks, voice assistants, and smart thermostats.

Proximity to Services: It is essential that housing is located near transportation hubs, retail stores, libraries, community centers, and healthcare facilities. Access to these services helps older adults maintain independence and reduces the risk of isolation.

Support Services: Supportive services need to be integrated into the City's housing framework to promote aging in place. On-site coordinators connect residents to health resources, meal delivery, health care, and other personal needs. Incorporating volunteer networks and intergenerational programs pairs younger residents with older adults for day-to-day tasks such as grocery shopping, driving to medical appointments, attending City events, and assisting with home maintenance. This holistic approach helps ensure that housing is not just a physical support, but also incorporates mental health components to promote connection and independence.

DOMAIN 4: Social Participation

An Age-Friendly community fosters affordable and accessible activities and opportunities for social interaction and engagement that cater to people of all ages, abilities, and cultures. Social interaction and participation foster a vibrant, inclusive environment where older adults are empowered to engage daily in their community.



Accessible and Affordable Activities: Social participation opportunities need to be financially inclusive and physically accessible. This includes holding events and activities at venues that are easy to reach and navigate for people with mobility challenges. Costs should be kept low or subsidized to assist residents who are on limited incomes and have limited resources.

Intergenerational Opportunities: Intergenerational programs, such as storytelling, karaoke, music, playing board games, and watching movies, foster social interaction and reduce social isolation. Promoting intergenerational activities and opportunities for social engagements helps bridge the gap between generations and provides positive interactions that promote healthy aging and foster respect. This is crucial for maintaining physical health, cognitive function, and emotional well-being.

Community Support: Age-Friendly Cities encourage community organizations and local governments to support social participation for older adults through funding and the use of community rooms and other community spaces designed to promote spontaneous social interactions. Pop-up food trucks and cafes also create spaces and casual settings for residents and neighbors to gather and chat. Regular interaction with peers and other community members can improve mental and emotional well-being. Participating in meaningful events and activities contributes to a higher quality of life, which enables older adults to pursue their interests, hobbies, and passions, which fosters a sense of belonging and purpose.



DOMAIN 5: Communication and Information

As defined by the AARP, an Age-Friendly community ensures timely information from multiple sources, is multilingual, covers various topics, and is distributed widely throughout the community. The opportunity to stay connected with events and essential information is necessary to maintain a good quality of life. This domain encompasses a variety of elements, with a key focus on user-friendly communication channels. When information is easy to access and understand, seniors can fully participate in their communities without feeling isolated, disconnected, or overwhelmed. This approach fosters a sense of respect and value for the older adult population.



Accessible Information: Information must be accessible and available in multiple formats to accommodate different needs and preferences. This includes having printed materials in large fonts and focusing on the Who, What, When, and Where. It is also essential to ensure that online information is easily accessible and that residents are educated on using technology.

Transparent and Timely Updates: Communication should be simple, direct, and easy to understand. Visual aids such as graphs, pictures, and diagrams should be appealing and capture the audience's interest. There should be frequent updates, and information should be disseminated through a variety of mediums and channels.

Inclusive Communication Channels: Mixing of traditional and modern communication methods ensures information is disseminated across a broad spectrum of the community. This may include, but is not limited to, flyers, newspapers, newsletters, electronic news, television, community bulletin boards, social media, and websites.

Educational Support: Technical support helps older adults navigate the digital world. Classes and workshops focusing on using computers, tablets, smartphones, and the internet ensure that older residents can access online resources, social media, and digital communication tools. Community centers and libraries often provide free internet access, group sessions, and one-on-one tech assistance, bridging the digital divide and empowering older adults to stay connected with family and friends.

Responsive Services: Age-Friendly communication must be responsive and interactive. Communication channels may include helplines, concierges, customer service centers, and support centers. Staff need to be respectful, kind, and patient. Websites should offer chat features that are easy to use. Older adults should also have the opportunity to ask questions and receive feedback in a timely fashion. This empowers older adults to stay informed, connected, and engaged in all aspects of community life.

DOMAIN 6: **Respect and Social Inclusion**



An Age-Friendly City with robust social inclusion and respect policies creates an environment where older adults feel included and empowered. Older adults need to feel they are included and respected in their communities. These cities prioritize equity, ensuring that older adults of all income levels, cultural backgrounds, or physical abilities have equal access to resources, opportunities, and services. Intergenerational interactions can be beneficial in understanding the differences between generations. An Age-Friendly community fosters positive attitudes towards aging, promotes inclusive community activities, and engages older adults in decision-making processes.

Positive Attitudes Towards Aging: An Age-Friendly City promotes positive perceptions of aging by challenging stereotypes and reducing age-based discrimination. This can be accomplished through education campaigns and media representation to help reshape how aging is viewed. It is vital to emphasize resilience, wisdom, and continued contributions. Respect and inclusion also extend to the City's workforce and service providers. Staff should receive training emphasizing cultural competence and awareness of age-related challenges like mobility limitations, hearing loss, and memory loss. When society values older adults, they are more likely to be treated with dignity. Businesses are incentivized to adopt Age-Friendly practices through certification programs recognizing their commitment to inclusion.

Intergenerational Opportunities: Facilitating interactions between different generations can foster mutual respect and understanding, promoting a more inclusive and harmonious society. Intergenerational programs in schools, workplaces, and community centers can help bridge the gap between young and old, fostering a more cohesive community, comfortable with socializing and collaborating.

Recognition of Contributions: Acknowledging and celebrating the knowledge, wisdom, and life experiences of older generations is key to fostering respect. This can be achieved through recognizing contributions at Council meetings, City events, and local media features. With this increased recognition, people feel a stronger sense of belonging and purpose.

Involvement in Decision-Making: Including older adults in decision-making processes, especially those affecting their lives, ensures their voices are heard and respected. This will be achieved through advisory boards, commissions, and community boards and committees.

DOMAIN 7: Civic Participation and Employment

An Age-Friendly City creates environments that support community participation and employment by removing barriers and providing resources and opportunities to facilitate this concept. This includes ensuring that there is transportation to work and volunteer sites, as well as developing supportive legislative policies catering to older adults' needs. Residents' voices shape the community.



Employment Opportunities: Age-Friendly Cities promote flexible and fair employment opportunities for older adults who want to work. This can include offering part-time and full-time employment opportunities, job training opportunities, and remote work options. Employers are encouraged to adopt age-inclusive hiring practices, value experience, and avoid age-based discrimination.

Volunteerism: Older adults can partner with schools, governments, local businesses, and nonprofits to contribute meaningfully while staying socially connected. Activities such as tutoring, storytelling, community gardening, and participating in and planning events help reinforce a sense of belonging and purpose. Encouraging volunteer activities in both public and private sectors allows older adults to contribute to their communities, stay active, and maintain social connections.

Recognition: To sustain engagement, it is crucial that older adults' contributions, whether paid or unpaid, are celebrated and acknowledged. This can be accomplished through certificates, appreciation events, and public thank-you messages. These types of recognition promote positive civic engagement. When appreciation is exhibited, older adults are more likely to continue participating and feel a strong sense of belonging in their community.



DOMAIN 8: Community Support and Health Services



An Age-Friendly community provides adequate access to various healthcare services that help promote, enhance, and restore health. This ensures that older adults can access the necessary services to maintain their health and encourage independence for as long as possible. Health services are prioritized to enhance residents' physical and mental well-being. As people age, their healthcare needs become more complex, which requires increased medical care and supportive healthcare services. An Age-Friendly approach incorporates affordable, accessible, and person-centered care that supports aging in place and independence.

Accessible Health Services: Age-Friendly communities ensure that health care services are financially and physically accessible. Health services such as hospitals, clinics, and health centers are located near residential areas with ample parking, wheelchair access, and Age-Friendly signage.

Community-Based Supports: Preventive health initiatives should be part of a city's approach to promoting active and healthy aging. Community and senior centers offer affordable fitness classes, nutrition workshops, and educational sessions focusing on a wide range of health-related topics, including cardiovascular disease, diabetes, hypertension, and fall prevention. This may also include other services such as meal delivery, adult day care services, and transportation assistance.

Support for Caregivers: Family members and caregivers play a critical role in supporting older adults' healthcare needs. In addition to providing care for the patient, caregivers also need support to maintain their physical and mental well-being. This includes access to respite care, healthcare workshops, financial assistance, resource directories, and emotional support groups. Offering support services for caregivers protects their well-being and also enhances the quality, safety, and sustainability of care for older adults in the community.





Action Plan

An Age-Friendly Action Plan is a five-year framework developed by communities to create an environment that supports the quality of life of older adults as they age. A plan serves as a roadmap for developing projects and policies that make a city a better place for individuals to age gracefully, thrive, and maintain their independence. In developing Belmont's Action Plan, the City engaged with residents in various ways. Belmont officially joined the AARP/WHO network in September 2022, marking its certification as an Age-Friendly City. The process began in April 2022, when the Belmont City Council approved the formation of a task force to oversee the application, with support from the Center for Age-Friendly Excellence (CAFE) and the San Mateo County Board of Supervisors. This designation demonstrates the City's commitment to developing an action plan to implement and evaluate Age-Friendly initiatives, thereby enhancing the City's livability for all ages. It is essential to conduct a baseline community assessment of the needs of older adults, establish a three-year action plan to address these needs, and develop tools to measure the progress of this Action Plan.

ACTION PLAN INTRODUCTION (continued)

Before developing an Action Plan, the City has implemented many projects and policies to support its older adult population. Some examples include, but are not limited to:



Outdoor Spaces and Buildings

Provide informal places to gather to build community connections:

- Providing plenty of seating, such as chatty benches and picnic tables, encourages active socialization.
- Two locations have recently resurfaced tennis courts with newly added pickleball lines.
- Public playgrounds have seating nearby for grandparents and others.
- Off-leash dog areas enable individuals with limited mobility to provide their dogs with exercise and engage in social interaction with other dog owners.
- The Parks and Recreation Master Plan calls for the addition of gathering spaces.
- The City added a Public Plaza in 2018 to provide additional gathering space in the downtown area.

Transportation, Mobility, and Pedestrian Safety

- Measure I was approved to address the necessary sidewalk repairs for safety and accessibility.
- The City's Bike and Pedestrian Plan, approved in 2016, outlines phased improvements to Ralston Ave. These include crosswalks in new locations and hawk signals at select crosswalks to allow pedestrians of all abilities enough time to cross.
- The City provides transportation to and from its Senior Center, allowing seniors to attend safely.
- Sequoia Village volunteers drive Village members to medical appointments, stores, and social events.

Housing

- The City of Belmont has approved and constructed a wide variety of affordable housing projects. A few examples of developments include:
  - The Corners
  - Belmont Family Apartments
  - Firehouse Square
  - Artisan Crossing
  - Hayden

ACTION PLAN INTRODUCTION (continued)

- Staff collaborate with Rebuilding Together Peninsula (RTP) to provide minor building repairs for older adults.



Social Participation

- The Senior Center, in collaboration with other community-based organizations (CBO's), offers monthly educational seminars on a variety of health topics and organizations that provide resources for seniors.
- Library, in collaboration with Dignity Health Sequoia Hospital and Friends of the Belmont Library, offers "Maturing Gracefully", a speaker series on similar topics.
- Library outreach services include homebound book deliveries and book discussions at senior living facilities.
- Residents are informed that they can request the City's e-newsletter in print form.
- Information about the Senior Newsletter and senior resources are included in the tri-annual Recreation brochure.
- Parks & Recreation staff engage with participants regularly to gain knowledge of interests and needs.

Respect and Social Inclusion

- The Library offers events and classes with intergenerational opportunities, including technology assistance provided by teen volunteers, and English as a Second Language (ESL) studies.
- The Parks and Recreation Department offers several free programs in partnership with local agencies to support seniors' physical, mental, and financial well-being.

Civic Participation and Employment

- The Twin Pines Senior & Community Center has an average of 30 volunteers who assist with various events, including senior lunches.

Communication and Information

- The monthly Twin Pines Newsletter is specifically designed for seniors. The newsletter is available at the Twin Pines Senior and Community Center, as well as on the City website. It can be mailed upon request.
- A reference rack with take-home pamphlets and flyers with information on free resources provided by nonprofits for seniors is available at the Twin Pines Senior and Community Center, the Library and the Police Department lobby.

ACTION PLAN INTRODUCTION (continued)

- The City's Parks and Recreation Activity Guide features a full-page ad showcasing various resources available to the senior community, including transportation options and methods for securing food.



Community Support and Health Services

- Sequoia Healthcare District and Dignity Health Sequoia Hospital offer educational programs that cater to older adults at the Senior Center and the Library.
- The Belmont Police Department has implemented a program, Belmont Tracking and Recovery of Adults & Children, which provides free GPS tracking units to families with loved ones who suffer from cognitive or developmental impairments.

In developing their application for certification, the City of Belmont reached out to the community through various channels. Five focus group sessions were conducted, both virtually and in person. These also included one-on-one phone interviews with a total of 23 participants. The focus groups represented a diverse cross-section of the community. These included older residents aged 55 to 75, 76 and older, and community leaders and service providers who work with older adult residents. Reports from these focus groups provided the task force with data to inform the development of priorities. These discussions clarified that the Communication and Information and Social Participation domains required the most attention. These domains are the premise of Belmont's inaugural Age-Friendly projects.

During Belmont's Age-Friendly City focus group discussions, the community highlighted a need for improvements to their existing communication materials and distribution channels, and the need to expand. These efforts aim to reach the full spectrum of older adults in Belmont. Secondly, the City aims to promote increased respect and social inclusion by committing to developing and offering multicultural programs, thereby enhancing cultural awareness and diversity throughout the community. Additionally, there is an opportunity to expand staff and volunteer representation of diverse cultures within the Senior Center and Library. A long-term goal for Belmont is to continue developing a new conceptual design for the Barrett Community Center. The construction of a facility is dependent on securing funding. Finally, input from the focus groups highlighted the importance of partnering with local hospitals to offer

ACTION PLAN INTRODUCTION (continued)

more affordable or no-cost health and wellness programs for older adults and researching additional transportation options to support these programs.



In February 2025, the Center for Age-Friendly Excellence (CAFE) hosted a focus group session with the task force. In March 2025, a town hall meeting was held with older adult Belmont residents to reassess Belmont's priorities. Belmont developed its own Age-Friendly survey and received responses from 229 residents. Qualitative data from all focus groups, town hall discussions, and the results of the Belmont community survey helped establish potential projects and strategies outlined in the Action Plan. The primary goal is to enhance the City's livability while encouraging the community to recognize older adults' endless and valuable contributions through their wisdom and collaboration.

To address the unmet needs of older adults, a comprehensive spreadsheet was created based on staff and community feedback, to record and track potential projects and strategies. The spreadsheet in Appendix A of the Action Plan is a valuable resource, highlighting key focus areas for the Action Plan and guiding the City in prioritizing and monitoring short and long-term initiatives for 2026 through 2029. The Action Plan outlines specific goals, strategies, and implementation steps for achieving those goals, along with designated partners and responsible parties who implement policies and projects across the eight domains identified by the World Health Organization and AARP. In addition, a ninth domain was added for emergency services by the City of Belmont, in order to address the need for accessible and reliable resources in the community. Goals will be measurable and informed by assessment and community engagement findings. Short and long-term goals will be established, with accountability assigned to relevant stakeholders. Building partnerships, advocating for policy changes, and securing funding will be crucial for the plan's sustainability. This dynamic and evolving document enables residents, staff, council, and stakeholders to regularly assess and update to meet the community's continually changing needs.

DOMAIN 1:

Outdoor Spaces and Buildings



An Age-Friendly community in the domain of outdoor spaces and buildings should offer a safe, clean, and maintained environment. Outdoor spaces should foster social interaction and encourage connectivity within a community. The outdoor environment should have infrastructure that is safe, welcoming, enjoyable, and accessible to community members of all ages.

SURVEY RESULTS

96% **of respondents rated the community as fair to excellent in providing well-maintained parks.**

90% **of respondents rated the community as fair to excellent in providing safe parks.**

77% **of respondents rated the community's provision of enough benches for resting in public areas like parks, sidewalks, and around public buildings.**

72% **of respondents rated the community as fair to excellent in providing conveniently located public parking lots and areas, including handicapped parking.**

60% **of respondents rated the community as fair to excellent in providing sidewalks that are in good condition, safe for pedestrians, and accessible for wheelchairs.**

"Relaxation areas are so important for everyone to enjoy, and we must have opportunities to learn from others."



GOAL: **Provide inclusive, safe, healthy outdoor and indoor environments, empower older adults to live independently, and promote active aging.**

STRATEGIES

1 **Utilize and enhance open spaces, buildings, and parks to promote socialization, health, wellness, relaxation, comfort, and safety.**

a. **Add additional small parks to enhance and increase community collaboration with neighboring cities to leverage parks to provide more park opportunities. Refer to the Parks, Recreation and Open Space Master Plan: Belmont Parks, Recreation & Open Space Master Plan**

b. **Educate the public about continuing improvements that make the parks more accessible and safer.**

c. **Continue discussing plans for Twin Pines Park: re-evaluate a space close to downtown and integrate that space in various ways. Consider how to proceed with the Creek Restoration Project to create a walkable creek.**

d. **Launch an "Adopt a Bench" program with community involvement.**

   i. **Develop a senior ad hoc subcommittee to discuss and research more comfortable seating, "Age-Friendly Furniture," for parks and other open space areas in downtown. Consider "friendship benches."**

      1. **The Friendship Bench | Centre for Global Mental Health**
      2. **Petaluma's Listening Bench lends an ear to seniors**
      3. **Installation of benches - Age-Friendly World**
      4. **A Guide To Choosing Age-Friendly Outdoor Furniture**

e. **Work with SamTrans to address the maintenance of bus stops.**

   i. **Trash is seen at bus stops along the El Camino and Ralston Route.**

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
SamTrans Parks & Recreation Commission Community Volunteers Public Safety Committee	Parks & Recreation Public Works	6 Months/ 2 Years	YES/NO (I/P)

*** I/P: In Progress**

Please refer to Appendix A for extensive recommendations contained in the project's spreadsheet. The Goals and Strategies described below in the following domains provide a brief overview of potential projects and options.

GOAL: **Provide inclusive, safe, healthy outdoor and indoor environments, empower older adults to live independently, and promote active aging.**

STRATEGIES (continued)

2 **Promote pedestrian and driver safety among older adults in the community.**

a. **Survey and develop a walking audit where older residents assess pedestrian safety components such as uneven sidewalks, park pathways, lack of handrails, potential crosswalk improvements, and lack of lighting. Refer to the AARP Walkability Audit Toolkit: https://www.aarp.org/livable-communities/getting-around/aarp-walk-audit-tool-kit-english.html**

b. **Evaluate the possibility of installing a rail along Hallmark Park due to its steep incline and improve pavement near the tennis courts.**

c. **Continue to offer driver's education refresher courses. AARP offers classes at Twin Pines two to three times per year.**

d. **Increase education related to pedestrian, bike, and auto safety.**

   i. **Create educational videos on pedestrian, bike, and auto safety. Post them on the City website and include them in the City e-newsletter. Send videos to all the schools to disseminate to parents and students.**

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Parks & Recreation Commission Community Volunteers Police Schools Public Safety Committee AARP	Parks & Recreation Public Safety Committee Parking & Traffic Safety Commission	1-2 Years	YES/NO (I/P)



DOMAIN 2:
Transportation



An Age-Friendly City offers safe, accessible, and affordable mobility options that enable older adults to connect with essential services and social opportunities. Transportation options should be within walking distance from residential areas and crucial services. Stops and stations should offer comfortable seating and easy-to-navigate signage. Mobility education should also be incorporated so people can easily understand the transit system and its options.

"Transportation options are not convenient for our senior center's schedule of programs and events. Transportation currently doesn't provide a sense of independence and freedom."

SURVEY RESULTS

73% **of respondents rated the community as fair to excellent in having streets and intersections that are well-lit, accessible, and safe.**

65% **of respondents rated the community as fair to excellent in providing accessible and convenient public transportation.**

65% **of respondents rated the community as fair to excellent in enforcing the speed limit.**

60% **of respondents rated the community as fair to excellent in providing sidewalks that are in good condition, safe for pedestrians, and accessible for wheelchairs.**

58% **of respondents rated the community as fair to excellent in providing affordable public transportation**

36% of respondents rated the community as fair to excellent in providing safe public transportation

GOAL: To provide safe, accessible, affordable mobility options to empower older adults to navigate their community independently and access essential services.

STRATEGIES

1 Educate older adults on various transportation resources and options, and make them available on an Age-Friendly page on the City website.

a. Utilize and disseminate information on transportation resources available through Belmont and San Mateo County.

i. Belmont Twin Pines Senior & Community Center Transportation: 650-595-7441: This is shuttle van service to and from the Senior Center, operating three days a week (Tuesday through Thursday) and is available for Belmont residents 60+. Pick-ups begin at 9:00 am, and riders depart from the Senior Center between 12:00 and 12:15 pm (extended services are available during a special social event). Encourage extension of hours, if possible, for the shuttle.

ii. Same-day Paratransit pilot program through Redi Wheels: SamTrans Board of Directors approves same-day paratransit service

iii. Senior Mobility Guide: Multiple languages

1. https://www.samtrans.com/media/34996/download?inline: English
2. https://www.samtrans.com/media/35125: Spanish
3. https://www.samtrans.com/media/35124: Chinese

iv. Redi-Wheels Reservations: Call 650-560-0360: Reservations | SamTrans

v. Public Transit Travel Training: The San Mateo County Transit District offers free 1-on-1 orientation training for adults 18+. Email: ambassador@samtrans.com or call 650-508-6362 for additional information.

vi. "Got Wheels" Program: Got Wheels! is a program for residents at least 70 years of age who reside in any of the 25 cities in San Mateo County. Rides need to be within the geographical area of the 25 cities. This program is in partnership with Peninsula Family Service and Serra Yellow Cab. Six trips are allowed per month, for 5 dollars per one-way trip. https://peninsulafamilyservice.org/got-wheels/

vii. Commute.org Shuttles

viii. FISH: Friends in Service to Humanity is a group of volunteers from local churches who provide transportation to and from medical appointments. For Belmont, call 650-593-1288.

GOAL: **To provide safe, accessible, affordable mobility options to empower older adults to navigate their community independently and access essential services.**

STRATEGIES (continued)

ix. Ride PVI Peninsula Volunteers offers concierge on-demand transportation. Volunteers call Lyft and Uber drivers, who are dispatched to the residence within minutes of the call. Registration for the program is needed. For more information, visit 1pvi.org/ridepvi or call 650-272-5006. The transportation hotline is 650-272-5040.

x. Peninsula Jewish Community Center offers seniors and caregivers a "Get Up and Go" transportation service. Monday-Friday 9:30 am-3:30 pm. Reservations are needed. Call 650-378-2750 for information or visit https://pjcc.org/programs/senior-transportation/

xi. Serra Yellow Cab provides taxi service anywhere between Daly City and Menlo Park. The dispatcher can accommodate wheelchair users by requesting a wheelchair-accessible vehicle. To book a ride, call 650-991-2345. For wheelchair vans, call 650-340-9999.

xii. Villages of SMC: This is a group of local volunteers in various communities that have formed a membership-based village offering a range of support services, which include transportation. Volunteer drivers are trained and background checked. They use their vehicles to provide rides for members. www.villagesofsmc.org or call 650-260-4569.

xiii. SilverRide: Drivers can be scheduled for enhanced services to assist the rider door-to-door and accompany the rider to their final destination. Call 415-861-7433 or visit www.silverride.com.

xiv. Bay Area Transportation Information: call 511 or visit www.511.org.

xv. Paratransit Advisory Council (PAC): Dedicated to improving the quality and availability of transportation for people with disabilities in San Mateo County. Call 650-299-1442 or visit www.sanmateoopcc.org.

b. Teach older adults how to use apps to utilize on-demand transportation options and encourage older adults to purchase Clipper cards: www.clippercard.com/ClipperWeb/get or call 877-878-8883.

   i. SamTrans has an eligible discount fare available to seniors age 65+ and persons with disabilities with an approved ID.

c. Encourage older adults interested in teaching others to utilize public transportation to be involved in the San Mateo County Senior Mobility Ambassador Program. San Mateo County Senior Mobility Ambassador Program, or call 1-800-660-4287.

GOAL: **To provide safe, accessible, affordable mobility options to empower older adults to navigate their community independently and access essential services.**

STRATEGIES (continued)

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Parking & Traffic Safety Commission Community Volunteers Faith-Based Organizations Peninsula Family Services SamTrans Serra Yellow Cab	Public Works Parks & Recreation	1-3 Years	YES/NO (I/P)

2 **Enhance pedestrian infrastructure and safety.**

a. Increase education on pedestrian, bike, and auto safety.

i. Create educational videos about pedestrian, bike, and auto safety. Post them on the City website and send them out twice a year in the e-newsletter. Additionally, videos should be sent to all the schools to disseminate to parents and students.

ii. If new signals are installed, educate the public on the new installations.

iii. Increase traffic patrols to enforce speeding throughout the City.

iv. Research older adult safety zones with reduced speed limits near senior communities.

v. Continue to offer AARP Smart Driver Courses two to three times a year. Additionally, online courses are available at www.aarpdriversafety.org.

vi. Consider offering Age Well Drive Smart Seminars through the California Highway Patrol. The free three-hour class is designed to help older drivers refresh their driving skills. Contact the Public Information Officer for more information: https://www.chp.ca.gov/programs-services/programs/age-well-drive-smart/.

vii. County of San Mateo Age Well Drive Smart Seminars: Call 650-363-4572 to RSVP for upcoming workshops.

GOAL: **To provide safe, accessible, affordable mobility options to empower older adults to navigate their community independently and access essential services.**

STRATEGIES (continued)

b. Provide ample parking for seniors.

- **i. Designate Age-Friendly parking in downtown and, if built, at the new Barrett Community Center. Increase the amount of parking at the current Belmont Senior Center.**
  1. **Smart Parking Spaces for Disabled People And Elderly - Age-Friendly World**
  2. **https://agefriendlyireland.ie/wp-content/uploads/2021/06/AFI-Parking-Space-Guide.pdf**
- **ii. Implement residential parking permits to reduce street crowding. Encourage people to park in their driveways and garages.**

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Police Public Safety Parking & Traffic Safety Commission Community Volunteers Belmont Chamber of Commerce	Parks & Recreation Public Works	1-2 Years	YES/NO (I/P)



GOAL: **To provide safe, accessible, affordable mobility options to empower older adults to navigate their community independently and access essential services.**

STRATEGIES (continued)

3 **In addition to providing transportation options, consider partnering with other Cities to offer residents who cannot drive feasible transportation to community centers, the library, and City events.**

a. **Research Microtransit systems that have been implemented in other cities. 'Microtransit' services replace bus systems in more North Carolina cities (Go Gastonia)**

b. **Research faith-based organizations for opportunities to have parishioners volunteer to drive residents to essential appointments, grocery shopping, and social events.**

c. **Continue to provide the current shuttle van to the Senior Community Center, but look into expanding the number of shuttles and increasing usage from 3 to 5 days a week. Expand hours from 9:00 am to 12:00 pm to 9:00 am to 3:00 pm.**

d. **Research the possibility of partnering with neighboring cities and schools to develop a pilot shuttle system. Develop Age-Friendly shuttle service hours from 9:00 am to 4:00 pm. Research the best options for a potential loop within the City that would be most beneficial for residents.**

e. **Research partnering with Senior Centers to see if they and the City can share van transportation around the City.**

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Faith-Based Organizations Villages of SMC Schools Senior Centers Community Volunteers	Parks & Recreation	1-2 Years	YES/NO (I/P)



(Please refer to Appendix A for further information on potential projects.)

DOMAIN 3:
Housing



Housing is essential for the safety and well-being of City residents—the cost of housing dictates where older residents want to live and maintain their quality of life. Diverse housing options are essential, such as multi-dwelling units, ADUs, condominium units, co-housing options, and single-family homes that incorporate universal and adaptable design features. It is important to remember that housing should be conveniently located near public transportation, and day-to-day access to critical services is imperative.

"It's getting so difficult to afford living here anymore. My wages don't keep up with the cost of living."

SURVEY RESULTS

96% **of respondents rated the community as fair to excellent for people to age in place.**

91% **of respondents thought living independently in their homes was very important or extremely important as they age.**

72% **of respondents rated the community as fair to excellent for providing trustworthy, quality, and affordable home modification and repair contractors.**

42% **of respondents rated the community as fair to excellent in providing affordable housing options for adults of varying income levels.**



GOAL: **Provide resources and options for older adults to age in place and incorporate policies that encourage developers to provide affordable, adaptable, and accessible living environments that promote independence, safety, social connection, and are located near public transportation and services.**

STRATEGIES

1 **Raise awareness and understanding of housing issues and opportunities. Maintain and update the housing page on the City website.**

a. **HIP Housing: This program helps match people seeking housing with people with a room to rent. For more information, visit Home Sharing Program—HIP Housing or call 650-358-6660. HIP Housing also offers case management for older adults. https://hiphousing.org/programs/housing-readiness-program/**

b. **Doorway Housing Portal: https://www.housingbayarea.mtc.ca.gov. Apply and find subsidized, affordable housing in the Bay Area.**

c. **Housing Endowment and Regional Trust (HEART) of San Mateo County Housing Assistance programs: Provides educational workshops throughout the community and offers loans to first-time homebuyers to assist with down payments. HEART of SMC**

d. **Promote Housing Programs offered throughout San Mateo County: Apply to Housing Programs | County of San Mateo, CA. This includes applying for affordable housing, emergency housing vouchers, and stability vouchers.**

e. **Housing Page City of Belmont: Housing | City of Belmont**

f. **Legal Aide Society of San Mateo County: Legal Aid Society of San Mateo County (LASSMC) | Housing Resources, or call 650-517-8911.**

g. **Encourage the development of additional units of affordable housing targeted for older adults.**

h. **Continue to offer various housing options, such as co-housing, ADUs, and housing with community amenities and services.**

i. **Advocate for older adult housing with supportive services.**

j. **Publish affordable housing opportunities in the City's newsletter.**

k. **Encourage older adults to the Belmont Housing Element, which provides a comprehensive strategy for delivering the production of affordable housing in the community: 2023-2031 Housing Element and Environmental Impact Report (EIR) | City of Belmont. Residents can also contact the housing department with questions at: housing@belmont.gov.**

GOAL: **Provide resources and options for older adults to age in place and incorporate policies that encourage developers to provide affordable, adaptable, and accessible living environments that promote independence, safety, social connection, and are located near public transportation and services.**

STRATEGIES (continued)

l. The City of Belmont will be partnering with The Housing Endowment and Regional Trust (HEART) in 2025 for the first time, offering homebuyers workshops in Belmont. The City will also be organizing a Fair Housing Training workshop in collaboration with Project Sentinal for both landlords and tenants.

m. Provide opportunities to ensure older adults are included in discussing housing issues.

n. Samaritan House: Provides housing assistance, emergency rent, and utility assistance: 4031 Pacific Blvd., San Mateo, 650-347-3648. Open Monday, Tuesday, Wednesday, and Friday 9:00 am to 5:00 pm. Thursday: 9:00 am to 12:00 pm. https:/samaritanhousesanmateo.org/service/housing-services/

o. The County (Center on Homelessness within the County's Human Services Agency) funds a program to assist eligible seniors, defined as eligible households with at least one resident who is 60 years or older. Samaritan House, as the Core Service provider for Belmont and other jurisdictions, awards the funding to eligible applicants.

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
SMC Housing Department HIP Housing HEART Planning Commission	Housing Department Community Development	6 Months-3 Years	YES/NO (I/P)



GOAL: **Provide resources and options for older adults to age in place and incorporate policies that encourage developers to provide affordable, adaptable, and accessible living environments that promote independence, safety, social connection, and are located near public transportation and services.**

STRATEGIES (continued)

2 Provide resources related to housing rehabilitation services.

a. Increase awareness about accessory dwelling unit construction: San Mateo County ADU Resource Center: Provides information, resources and tools to assist homeowners to build ADU's in San Mateo County. https://smcadu.org

b. Partner with Rebuilding Together to utilize it as a resource to provide affordable repairs: https://www.belmont.gov/i-want-to/find/housing

c. Villages of San Mateo County offer minor home repairs. Sequoia Village serves Belmont to Redwood City. www.villagesofsmc.org

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Rebuilding Together SMC Villages SMC Housing Department Community Volunteers	Housing Department Community Development	6 Months-1 Year	YES/NO (I/P)



DOMAIN 4:
Social Participation



Social participation plays a vital role in an Age-Friendly community. It should foster inclusion, combat isolation, and enhance an individual's well-being and quality of life. Opportunities should be tailored to the interests and needs of older adults. Connections need to be promoted across all age groups. Engagement of older adults is encouraged, and it is essential to focus on training service providers to understand how they can better respond to the needs of older people. Intergenerational activities can also help guard against isolation. In his U.S. Surgeon General's Advisory, Dr. Vivek Murthy warns about the public health crisis that loneliness and isolation pose to the American public (Our Epidemic of Loneliness and Isolation, 2023). An Age-Friendly City must create a vibrant and supportive environment where older adults are valued and connected.

"I want more activities offered both during the day and evening. Most of our programs are during the daytime hours. There also needs to be a wide array of programs for everyone of mature age."

SURVEY RESULTS

72% **of respondents rated the community as fair to excellent in providing conveniently located entertainment venues.**

69% **of respondents rated the community as fair to excellent in providing access to reliable and affordable in-home high-speed internet.**

67% **of respondents rated the community as fair to excellent in providing activities explicitly geared towards older adults.**

54% of respondents rated the community as fair to excellent in providing affordable activities to all residents.

GOAL: **Create and deliver accessible, affordable, diverse and inclusive opportunities for older adults to engage in social activities open to people of all ages, cultures, and abilities.**

STRATEGIES

1 Promote and increase intergenerational activities and engagement.

a. Create a Senior Advisory Committee/Commission to work with the Youth Advisory Committee to develop social events and activities that involve multiple generations.

b. Partner with elementary and high schools to have children and teens interact with older adults at their senior luncheons.

c. Schedule family nights with open seating at large tables to play board games or have movie nights.

d. Foster connections between generations by including intergenerational programs such as karaoke, trivia nights, storytelling, and creative art projects.

e. Facilitate the opportunity for older adults to tell their stories and exhibit their generational wisdom. Collaborate with the library and high schools to produce engaging historical videos, which wil be featured in the newsletter, City website, and school e-News.

f. Research and disseminate information related to eldera.ai: It offers a platform for intergenerational connection that is accessible to all. It is a virtual platform that pairs older adults with young people to improve the quality of life through socialization. Establish weekly virtual conversations and activities.

g. Consider rebranding the Senior Center and renaming it to the Community Wellness Center to engage healthy and active older adults.





GOAL: **Create and deliver accessible, affordable, diverse and inclusive opportunities for older adults to engage in social activities open to people of all ages, cultures, and abilities.**

STRATEGIES (continued)

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Youth Advisory Committee Schools Library Senior Center Communications & Community Affairs Officer Community Volunteers Faith-Based Organizations Parks & Recreation Commission	Parks & Recreation	6 Months-2 Years	YES/NO (I/P)

2 **Develop a broad spectrum of social programs that increase social opportunities for older residents.**

a. Conduct a City-wide survey to determine what social programs are needed, what convenient times are, and whether there are gaps in services being offered and any duplications.

b. Consider adding workshops related to retirement, health, and being empty nesters. Offer various speaker series and support groups for widows/widowers and divorcees.

c. Communicate events and programs electronically and with colorful flyers in large font.

d. Offer a wide variety of activities tailored to the interests of older adults.

e. Educate the community about the benefits of Sequoia Village which serves Belmont, San Carlos, Redwood City, and Redwood Shores. Provides access to support services that help residents engage in the community. Sequoia Village

f. Communicate programs and events, concisely and frequently, and disseminate information in multiple languages, both printed and electronic. Provide printed copies of the weekly newsletter upon request.

(Please refer to Appendix A for further information on potential projects.)

GOAL: **Create and deliver accessible, affordable, diverse and inclusive opportunities for older adults to engage in social activities open to people of all ages, cultures, and abilities.**

STRATEGIES (continued)

g. Older adults in the Belmont community are invited to take part in *Maturing Gracefully*, a wellness and education program affilitated with Dignity Health. Designed for individuals aged 50 and older, this monthly seminar series explores a variety of health topics that support vibrant, informed, and empowered living in later years. Sessions are held at the Belmont Library on the second Monday of each month from 1:00 to 2:00 pm, offering a welcoming space to learn, connect, and thrive. For more information, visit www.seqhd.org/adults-50-health-services.

h. Offer expanded programs outside of the Senior Center. Offer live performances outdoors with transportation provided. Continue Community Hikes.

i. Increase the number of fieldtrips and survey older residents for suggested future outings.

j. Increase the amount of multicultural programming offered in the City.

k. Offer a welcoming packet to all new residents. Include how residents want to be contacted to receive pertinent City information about programming and events.

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Sequoia Village Senior Center Library Chamber of Commerce Community Volunteers Parks & Recreation Commission Communications & Community Affairs Officer	Library Parks & Recreation	6 Months-3 Years	YES/NO (I/P)



(Please refer to Appendix A for further information on potential projects.)

GOAL: **Create and deliver accessible, affordable, diverse and inclusive opportunities for older adults to engage in social activities open to people of all ages, cultures, and abilities.**

STRATEGIES (continued)

3 **Actively engage isolated seniors.**

a. **Research-backed methods to improve social participation include technology, outreach via visits, and phone calls.**

b. **Research and create an "Adopt a Senior" program with schools or community members to reach out to seniors in nursing homes, assisted living facilities, or those alone at home.**

   i. **Scottsdale's Adopt a Senior Program: Collaboration between Scottsdale's Community Partners and the City of Scottsdale connects low-income seniors aged 60+ with social workers. https://www.scottsdaleaz.gov/seniors/programs/adopt-a-senior**

   ii. **Senior Companion Program (Maine's Senior Companions). Seniors have weekly volunteer visits. Center on Aging Senior Companion Program**

   iii. **East Bay's Lavender Seniors Program: includes a "Friendly Visitor" initiative for LGBTQ seniors, offering regular visits and monthly lunches. https://lavenderseniors.org/programs-services/**

c. **Offer programming that is available virtually if mobility or transportation is an issue.**

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Schools Parks & Recreation Commission Community Volunteers Senior Center Senior Assisted Living Senior Homes	Library	1-3 Years	YES/NO (I/P)



(Please refer to Appendix A for further information on potential projects.)

DOMAIN 5:
Communication and Information



An Age-Friendly community can disseminate information through various channels to engage citizens as much as possible. Information should be available in multiple languages, formats, and venues, and inclusive for all ages. City applications and websites should have user-friendly interfaces, adjustable fonts, and compatibility with screen readers. Information should be disseminated both electronically and in traditional hard-copy format. An Age-Friendly community also has timely, relevant, and widely distributed information.

"Not all of us know how to use computers; we need easy and simple instructions to help us navigate the accessibility of information regarding our community."

SURVEY RESULTS

61% **of respondents rated the community as fair to excellent in providing access to community information in one central source or location.**

45% **of respondents rated the community's free access to computers and the Internet in public spaces such as libraries and senior centers as fair to excellent.**

45% **of respondents rated the community as fair to excellent in providing displayed printed community information with large lettering.**

33% **of respondents rated the community's ability to provide information in several languages as fair to excellent.**

19% **of respondents rated the community as fair to excellent in providing community information delivered in person to people who may have difficulty or may not be able to leave their homes.**



GOAL: **Ensure older adults have access to accurate, timely, local information that is concise, reliable, relevant, diverse, and accessible so they can participate in community life and access pertinent resources.**

STRATEGIES

1 Provide digital literacy training and support

- **a. Increase technology awareness to support adults' access to transportation, order goods and services, and utilize telehealth services.**
- **b. Offer more classes in technical support for residents to learn how to use their devices and access information online.**
  - **i. Have members of the Youth Advisory Committee offer technical support workshops once a quarter at the senior center or library to teach older adults how to use smartphones, tablets, or computers to access City/County services, telehealth, and social platforms.**
  - **ii. Have Youth Advisory Committee members offer technical support on voice-first devices such as Alexa.**
  - **iii. Develop a volunteer hotline to answer tech questions.**
    1. **Have the youth assist older adults in signing up for SMC Alert**
  - **iv. Encourage older adults to attend online classes through Senior Planet (Older Adult Technology Services, OATS from AARP). Call 888-713-3495, Monday through Friday, 9:00 am-8:00 pm EDT/ Saturday, 9:00 am-2:00 pm EDT. Classes are free, but registration is required.**
    1. **In-person classes are offered at Senior Coastsiders: 925 Main Street, Half Moon Bay. Call 650-726-9056.**
    2. **In-person classes are offered at Avenidas at 450 Bryant Street, Palo Alto. Call 650-289-6400; https://seniorplanet.org/locations/palo-alto/in-person-classes-at-avenidas/**
    3. **In-person classes are offered at the Channing House at 850 Webster Street, Palo Alto.**
  - **v. Consider resurrecting the partnership between the Library and high school volunteers to offer technology assistance on a bi-weekly drop-in basis.**



GOAL: **Ensure older adults have access to accurate, timely, local information that is concise, reliable, relevant, diverse, and accessible so they can participate in community life and access pertinent resources.**

STRATEGIES (continued)

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Parks & Recreation Commission Youth Advisory Committee Library Avenidas Community Volunteers Carlmont High School Notre Dame High School Youth Volunteers	Parks & Recreation	6 Months-2 Years	YES/NO (I/P)

2 **Provide a centralized location where older adults can access brochures, newsletters, activity guides, and helpful resource information; offering it in multiple languages offering across various venues and provide opportunities for older adults to contribute to shaping communication systems.**

a. **Develop an "Age-Friendly Corner" web page on the City website that lists essential local and regional information, resources, and links for older adults. Update it continuously with the most recent information.**

b. **Display services about partner agencies throughout the community. Volunteers should distribute information in high-traffic areas such as parks, coffee shops, grocery stores, and other businesses frequented by residents.**

c. **Make printed information more accessible and encourage residents to sign up for the City eNews. Include information in water bills and newsletters. To sign up for the eNews, visit the City of Belmont's official website at www.belmont.gov.**

d. **Provide free mailed copies of the bi-monthly TwinPines Newsletter to Bay Area residents over 60 years of age.**

e. **Continue to mail the Parks and Recreation Department's activity guide three times a year.**

f. **Add additional resource racks throughout the City.**

(Please refer to Appendix A for further information on potential projects.)



GOAL: **Ensure older adults have access to accurate, timely, local information that is concise, reliable, relevant, diverse, and accessible so they can participate in community life and access pertinent resources.**

STRATEGIES (continued)

g. During City events, such as summer concerts, provide a table with literature on resources and plans the City is working on, even if projects may not happen until a future date. Utilize these opportunities to distribute surveys asking for input.

h. Disseminate information in various formats, including both print and electronic formats. Examples include kiosks, electronic boards, and distributing flyers in multiple languages.

i. Continue participating in quarterly County-wide Senior Center Supervisor meetings to learn of successful methods other cities, the county, and community organizations have used.

j. The weekly eNews is distributed to the community every Friday and is currently shared across social media platforms. Residents can visit the Belmont Library to receive assistance signing up for the newsletter and accessing it electronically. Library staff will print a copy or a section of the newsletter for residents who do not have access electronically.

k. Increase awareness of the Twin Pines Newsletter, published by the Parks and Recreation Department for the Twin Pines Senior and Community Center. In addition to providing the latest information regarding upcoming events, resources, and lunch menus, consider having older adults contribute to the newsletter with features that share their perspectives and wisdom.

l. Increase awareness of Belmont's Channel 27. This can be used as a resource for older residents.

m. Develop a personal concierge service or senior hotline that reaches out to community members needing services.

n. Raise awareness of existing programs and events through print and online dissemination.

o. To connect with the City's social media platforms, go to: https://www.belmont.gov/i-want-to/connect/connect-via-social-media

p. Raise awareness of the availability of translations on the City website.

q. Create a communications task force to work with the Communications and Community Affairs Officer to examine how to improve communication throughout the community.

(Please refer to Appendix A for further information on potential projects.)

GOAL: **Ensure older adults have access to accurate, timely, local information that is concise, reliable, relevant, diverse, and accessible so they can participate in community life and access pertinent resources.**

STRATEGIES (continued)

PARTNERS Parks & Recreation Commission Youth Advisory Committee Community Volunteers Library Local Businesses Chamber of Commerce Farmers Market	**RESPONSIBLE STAFF** Parks & Recreation Communication & Community Affairs Library	**TIME FRAME** 6 Months-3 Years	**METRIC** YES/NO (I/P)



(Please refer to Appendix A for further information on potential projects.)

DOMAIN 6:

Respect and Social Inclusion



An Age-Friendly community offers an environment that is friendly and respectful, creating a cohesive and equitable community for all to live together in harmony.

In an Age-Friendly community, policies must foster equity and active participation for older adults, ensuring they are valued members of their community. Their voices influence and shape local projects and policies to enhance their quality of life.

SURVEY RESULTS

96% **of respondents rated the community as fair to excellent as a place for people to age in place.**

57% **of respondents rated the community as fair to excellent in providing various cultural activities for diverse populations.**

27% **of respondents rated the community as fair to excellent for having local schools that involve older adults in events and activities.**

"My opinion should matter, and our ideas should be taken seriously; what's the point of voicing opinions if we are not heard?"



GOAL: **Ensure the community fosters a culture for older adults that exhibits dignity, inclusiveness, respect, and serves the City's diverse needs.**

STRATEGIES

1 **Promote anti-ageism and kindness campaigns by improving communication with older adults across diverse groups through a social media campaign and educational training.**

- **a.** **Partner with schools and community organizations to conduct intergenerational workshops that educate the younger generations about aging and the benefits that we can all provide.**
- **b.** **Partner with schools to have a "senior day" presentation on how youth and young adults can help older residents.**
- **c.** **Educate businesses on training staff in age-sensitive customer service.**
  - **i.** **Communicate clearly and consisely with individuals using hearing aids and those requiring assistance with mobility aids.**
  - **ii.** **Demonstrate empathy, patience, and compassion toward older adults.**
  - **iii.** **Offer Age-Friendly services and products, such as having a few large-print menus and offering senior discounts.**
  - **iv.** **Have businesses host senior-specific events, such as a low-impact fitness class at a park, or offer a tech workshop once a year.**
  - **v.** **Grocery stores and banks offer a separate "Priority Line for Seniors."**
    1. **Senior citizens to be given priority in food and medicine purchases | Philstar.com**
  - **vi.** **Encourage businesses to become Age-Friendly designated and offer an Age-Friendly Business Certification. Age Friendly Business Examples**
- **d.** **Develop a "Year of Kindness" Campaign for the City of Belmont.**
  - **i.** **Kindness Campaign**
  - **ii.** **https://digitalcommons.chapman.edu/cgi/viewcontent cgi?article=1217&context=localgovernmentreconsidered**
  - **iii.** **https://extranet.who.int/agefriendlyworld/campaign-opole-in-the-rhythm-of-kindness/**
- **e.** **Disseminate information related to the California Friendship Line: 888-670-1360. The Institute on Aging's staff and volunteers respond to more than 11,000 calls each month. Friendship Line**
- **f.** **Promote Peninsula Family Service Peer Counseling for community members 55+: Peer Counseling - Peninsula Family Service**

GOAL: **Ensure the community fosters a culture for older adults that exhibits dignity, inclusiveness, respect, and serves the City's diverse needs.**

STRATEGIES (continued)

PARTNERS Schools Businesses Chamber of Commerce Institute on Aging Peninsula Family Service Faith-Based Organizations Youth Advisory Committee Community Volunteers	**RESPONSIBLE STAFF** Parks & Recreation BOLD Committee (Bridging, Opportunity, Learning and Distinction)	**TIME FRAME** 6 Months-3 Years	**METRIC** YES/NO (I/P)

2 **Offer opportunities that encourage cultural arts and events that celebrate diversity.**

a. **Have the City BOLD Committee (Bridging, Opportunity, Learning and Distinction) continue to add multicultural programs and events to expand cultural awareness and diversity throughout the community.**

b. **Expand volunteer representation of diverse cultures within the Senior Center and the Library to attract more varied cultures.**

PARTNERS City BOLD Committee Library Community Volunteers Schools Faith-Based Organizations Parks & Recreation Commission	**RESPONSIBLE STAFF** Parks & Recreation	**TIME FRAME** 1-2 Years	**METRIC** YES/NO (I/P)

(Please refer to Appendix A for further information on potential projects.)

GOAL: **Ensure the community fosters a culture for older adults that exhibits dignity, inclusiveness, respect, and serves the City's diverse needs.**

STRATEGIES (continued)

3 Facilitate Inclusive Community Engagement.

a. Create a Senior Advisory Group or Commission.
   i. Encourage collaboration with the Youth Advisory Committee.

b. Provide older adults with the opportunity to give feedback, especially on policy decisions that affect them.
   i. Conduct a survey and send it to residents 60 and over every two to three years to gain feedback so the City can stay current with older adult needs.
   ii. Recognize that the needs of active older adults may differ from those typically served by the Senior Center.

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Youth Advisory Committee Parks & Recreation Commission Community Volunteers Communication & Community Affairs Officer	Parks & Recreation	1-3 Years	YES/NO (I/P)



(Please refer to Appendix A for further information on potential projects.)

DOMAIN 7:

Civic Participation and Employment



An Age-Friendly community values the experience and knowledge of older adults and their contributions to public decision-making for the betterment of the community. Employment opportunities are tailored to meet the needs and skills of older adults, offering flexible work options. Training for employers will emphasize age-inclusive practices and bring the institutional knowledge that experienced people have to the table. Older people would also like more opportunities to volunteer in areas tailored to their needs and interests.

"I want to feel important in my community, and volunteering gives me a sense of belonging and ambition."

SURVEY RESULTS

62% **of respondents rated the community as fair to excellent in providing a broad spectrum of volunteer activities.**

50% **of respondents rated the community as fair to excellent in providing opportunities for older adults to participate in decision-making bodies.**

49% **of respondents rated the community as fair to excellent in providing accessible information on available volunteer opportunities.**

37% **of respondents thought they were likely to continue working as long as possible, rather than choose to retire.**



22% of respondents rated the community as fair to excellent in providing accessible information on available volunteer opportunities.

GOAL: **Provide opportunities for older adults to actively contribute to the community decision-making process and remain engaged through meaningful work and volunteerism.**

STRATEGIES

1 Expand opportunities for older adults to volunteer and actively participate in their community.

- a. Consider setting up a centralized location on the City website and a bulletin board to post work and volunteer opportunities.
- b. Partner with schools to explore volunteer opportunities for mentoring youth.
    - i. Create a school liaison committee consisting of two Councilmembers who work with elementary and high schools to develop volunteer opportunities for older adults.
- c. Offer a yearly job and volunteer fair.
    - i. Have tables representing nonprofit organizations, City Government, businesses, Chamber of Commerce, and City Commissions.
- d. Offer a class at the Senior Center and Library that focuses on education for planning and adjusting to retirement and the life changes one can anticipate with the aging process.
- e. Offer a stipend to older people who want to teach a workshop that would benefit residents.
- f. Offer intellectualy stimulating classes, challenge the mind, and promote growth.
- g. Provide transportation to those who want to volunteer in the City, but don't drive.
- h. Organize annual volunteer recognition events.
- i. Develop a centralized volunteer database to organize, schedule, and track volunteer activities.
- j. Encourage residents to become volunteers with the Villages of San Mateo County. (Sequoia Villages sends biweekly emails about volunteer opportunities around the Bay Area.)
    - i. https://www.villagesofsmc.org/content.aspx?page_id=693&club_id=696361
- k. Encourage residents to volunteer at the Senior Center. Currently, there are 30 volunteers.

GOAL: **Provide opportunities for older adults to actively contribute to the community decision-making process and remain engaged through meaningful work and volunteerism.**

STRATEGIES (continued)

PARTNERS Parks & Recreation Commission Non-Profit Organizations Faith-Based Organizations **Library** Villages Chamber of Commerce Schools Community Volunteers Youth Advisory Committee	**RESPONSIBLE STAFF** Parks & Recreation	**TIME FRAME** 1-3 Years	**METRIC** YES/NO (I/P)



(Please refer to Appendix A for further information on potential projects.)



GOAL: **Provide opportunities for older adults to actively contribute to the community decision-making process and remain engaged through meaningful work and volunteerism.**

STRATEGIES (continued)

2 **Provide education around civic engagement.**

a. **Create a Senior Advisory Committee, Senior Commission, or Age-Friendly committee.**

b. **Create a Civics academy that offers residents an in-depth understanding of local government, or encourage participation at the Civics 101 Academy that the County of San Mateo provides.**
   i. https://www.smcgov.org/ceo/civics-101-academy
   ii. https://www.cityofsancarlos.org/community/civics_academy.php
   iii. https://www.ci.millbrae.ca.us/391/Citizens-Academy

c. **Develop and create a culture where older adults are recognized as vital contributors and train employees to promote Age-Friendly and inclusive practices, ensuring equitable treatment.**

d. **Continue offering virtual meetings, making civic participation accessible for those with mobility and disability issues. Closed captioning capability also promotes inclusivity.**

e. **Encourage older residents to write articles that can be featured on an Age-Friendly page on the City website, activity guide, or the e-newsletter.**

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
City Departments Parks & Recreation Commission Library San Mateo County Executive's Office	Parks & Recreation	6 Months-1 Year	YES/NO (I/P)

(Please refer to Appendix A for further information on potential projects.)

DOMAIN 8:

Community Support and Health Services



An Age-Friendly community offers and provides affordable and accessible healthcare for its residents. Clinics and hospitals are located near residential areas and transit hubs. Community support services include coordinating care such as transportation, meal delivery, and utilizing volunteer networks to assist with tasks. Fostering a supportive environment helps older adults thrive.

"There are great clinics and hospitals here, we need more educational programs to help our seniors."

SURVEY RESULTS

73% **of respondents rated the community as fair to excellent in providing respectful and helpful hospital and clinical staff.**

67% **of respondents rated the community as fair to excellent in providing a variety of health professionals, including specialists.**

59% **of respondents rated the community as fair to excellent in providing access to telehealth care services.**

49% **of respondents rated the community as fair to excellent in providing easily understandable and helpful local hospital or clinic answering services.**

GOAL: **Provide programs, resources, and services in the County and City that promote independence and increase the quality of life for older adults through accessible, equitable, and comprehensive healthcare systems.**

STRATEGIES

1 **Increase awareness of resources available in San Mateo County, particularly those related to Aging and Disability Services.**

- **a. Develop an Age-Friendly page on the Belmont City website listing significant resources for older adults.**
  - **i. San Mateo County Community Information Handbook: Community Information Handbook | County of San Mateo, CA**
  - **ii. Help at Home Handbook: https://www.smchealth.org/sites/main/files/file-attachments/hh2024_english.pdf?1709940717**
  - **iii. Senior Mobility Guide: https://www.samtrans.com/media/8381/**
  - **iv. Samaritan House: https://samaritanhousesanmateo.org/**
  - **v. Self Help for the Elderly: www.selfhelpelderly.org**
  - **vi. Peninsula Family Service: www.peninsulafamilyservice.org**
  - **vii. Catholic Charities Adult Day Services: https://catholiccharitiessf.org/wp-content/uploads/2024/05/ADS-SMC-Program-Flyer.pdf or call 650-592-9325.**
  - **viii. Belmont Senior Lunch and Transportation Program: Call 650-595-7444.**
  - **ix. Friends in Service to Humanity (FISH): Volunteers from local churches who provide transportation to and from medical appointments. Call 650-593-1288.**
  - **x. 2-1-1 is a free phone number that connects Bay Area residents with Health & Human Service Programs in their local community, available in multiple languages. www.211bayarea.org**
  - **xi. Promote awareness of the library partnership with the San Mateo County Health Department, with available blood pressure kits on loan for a few weeks. This enables users to check blood pressure and track their readings. https://smcl.org/blogs/post/now-available-blood-pressure-monitor-kits-at-the-library/**
  - **xii. Ombudsman Services of San Mateo County: www.Age-Up.org or call 650-780-5707. New programs include:**
    1. **Friendly Visitors and Phone Buddies**
    2. **Kindness Crew: Volunteer Activities in Long-Term Care**
    3. **Support Groups and Creative Programming**

GOAL: **Provide programs, resources, and services in the County and City that promote independence and increase the quality of life for older adults through accessible, equitable, and comprehensive healthcare systems.**

STRATEGIES (continued)

4. Community Education, Engagement, and Advocacy
5. Navigation Help for Care Transitions
6. Elder Justice Initiatives

xiii. Share information about the Family Caregiver Alliance, which serves as a resource for caregivers: Family Caregiver Alliance

xiv. Alzheimer 24/7 Helpline: Phone: 800-272-3900 - alz.org/norcal

xv: Medical Equipment Loan Program - MELP: https://www.freemedequip.org/

xvi: Health Insurance Counseling and Advocacy Program - HICAP of San Mateo County: The Medicare Counseling Program: https://www.hicapsanmateocounty.org/

xvii: Meals on Wheels: https://1pvi.org/mealsonwheels/

xviii: Mental Health Support 988: Suicide and Crisis Lifeline: https://988lifeline.org/?utm_source=google&utm_medium=web&utm_campaign=onebox. Call 988 for support.

xix: Aging & Disability Resource Connection: Provides a point of entry for older adults and individuals wih disabilities acccess to needed services. https://sanmateocountyadrc.org/

xx: AnewVista - Technology Classes and Support: anvcs.org

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Ombudsman Services San Mateo County Library Samaritan House Peninsula Family Service San Mateo County Aging and Disability Services	Parks & Recreation	6 Months	YES/NO (I/P)

GOAL: **Provide programs, resources, and services in the County and City that promote independence and increase the quality of life for older adults through accessible, equitable, and comprehensive healthcare systems.**

STRATEGIES (continued)

2 Promote additional education and workshops for older adults.

a. Hold educational series on various health-related topics, such as diabetes, cardiac disease, good nutrition, symptoms of stroke, and fall prevention.

b. Offer financial and legal education to older adults, including retirement planning, tax assistance through AARP, avoiding financial scammers, trusts and estate planning, and advance directives.

c. Have a booth at the Farmer's market offering blood pressure checks.

d. Continue offering the Belmont Senior Showcase resource fair yearly.

e. Identify health services needed by older adults and refer residents to programs that would be beneficial.

f. Partner with local hospitals to increase awareness of additional health services: https://www.seqhd.org/adults-50-health-services

i. Sequoia Hospital Fall Prevention: https://www.dignityhealth.org/bayarea/locations/sequoia/classes-and-events/katz-cancer-resource-center

g. Offer workshops related to increasing mental sharpness. Offer talks labeled "Keep Sharp" and "Healthy Brain".

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Sequoia Hospital AARP Chamber of Commerce San Mateo County Aging and Disability Services Library Community Volunteers	Parks & Recreation	1-3 Years	YES/NO (I/P)

(Please refer to Appendix A for further information on potential projects.)

ADDITIONAL DOMAIN:

Emergency Services



In an Age-Friendly City, emergency services are critical and can be integrated into Age-Friendly domains. Older adults must be protected, empowered, and supported during challenging times. Residents need to be prepared and know what to do, where to go, and what to have on hand during an emergency. Given the community's concern about floods, earthquakes, and fires, this domain is added to incorporate into Age-Friendly Cities.

"Many of us don't know where to go in an emergency. If anything happens, I'm scared someone won't help me or my friends."

SURVEY RESULTS

72% **of respondents rated the community as fair to excellent in providing neighborhood watch programs.**





GOAL: **Educate and ensure older adults are aware and included in emergency preparedness operations and enhance their safety and well-being during emergencies.**

STRATEGIES

1 **Educate and ensure older adults are informed and included in emergency preparedness workshops, resources, and fairs.**

a. **Have the Youth Advisory Committee and volunteers assist residents sign up for SMC Alert, Genasys, and distribute emergency preparedness information in hard copy and electronic formats at the Health fair and National Night Out. Encourage picnic days and cookouts with entertainment at Belameda Park, where emergency service education is disseminated.**
   i. smcalert.org
   ii. Genasys / Zonehaven | County of San Mateo, CA

b. **Emergency Response Updates:** Emergency Response Updates | City of Belmont

c. **Wildfire Prevention:** https://www.smcfire.org/be-prepared-for-wildfires

d. **Belmont Watch: Crime prevention and community awareness program:** https://www.belmont.gov/departments/police/belmontwatch

e. **Belmont Police Department Senior Assistance and Well-Being:** https://www.belmont.gov/home/showpublisheddocument/2546/635254667217700000

f. **Residents who rely on electric medical equipment should sign up for the PG&E Medical Baseline Program.** Medical Baseline Program Application—Part A (To be completed by customer.)

g. **Belmont Emergency Resources:** Emergency Resources

h. **Fire Department:** fire@smcfire.org **| 650-522-7900**

i. **Police Department:** police@belmont.gov **| 650-595-7400**

j. **Public Works:** pworks@belmont.gov **| 650-595-7425**

k. **PG&E emergency information: 877-660-6789:** Report an Emergency

l. **City News updates:** Register Now for City Updates | City of Belmont

m. **Earthquake Early Warning: Receive alerts before shaking starts:** Earthquake Warning California

n. **Belmont Police Department: Hi-Lo Evacuation: For more information, call 650-595-7400.** Belmont Police Department - Hi-Lo Evacuation Siren

GOAL: **Educate and ensure older adults are aware and included in emergency preparedness operations in their community.**

STRATEGIES

o. **San Mateo County CERT Training: https://www.smcgov.org/ceo/emergency-training-options**

p. **Encourage residents to attend the annual disaster preparedness day hosted by the San Mateo County Department of Emergency Preparedness each year.**

q. **Disseminate information regarding City evacuation sites.**

r. **Provide scam prevention presentations quarterly.**

s. **Encourage residents to participate in the Belmont Community Police Academy.**

2 **Research and create a centralized database of people of all ages with disabilities and homebound older adults who can be contacted in an emergency.**

a. **Have Staff, Police, and Fire departments identify residents who may have challenges getting out in an emergency. Create an ongoing list.**

PARTNERS	RESPONSIBLE STAFF	TIME FRAME	METRIC
Police Fire Community Volunteers Parks and Recreation Commission Youth Advisory Committee San Mateo County Office of Emergency Service PG&E	Police Fire	1-3 Years	YES/NO (I/P)



Appendix A:
AGE-FRIENDLY PROJECTS TO CONSIDER



"Aging gracefully means being flexible, being open, allowing change, enjoying change, and loving yourself." *- Wendy Whelan*

Belmont Age-Friendly Projects Spreadsheet

Appendix B:
CURRENT AGE-FRIENDLY PRACTICES



Age-Friendly Parks and Recreation

The Parks and Recreation Department strives to create welcoming and engaging spaces for the aging population in the Belmont area. The central hub for senior activities is the Twin Pines Senior and Community Center nestled in Twin Pines Park. The center is open Monday through Friday, offering various activities daily. Free drop-in programs include language groups, exercise, arts and crafts, and table games. The Senior Program Staff makes efforts to provide both educational and social experiences. Monthly seminars cover a wide range of topics, from health to transportation. The center also offers monthly socials typically centered around upcoming holidays, birthday parties, and entertainment.

The Congregate Nutrition program is the cornerstone of the Twin Pines Senior and Community Center offerings. The Parks and Recreation Department has a grant through the Older Americans Act, which the County of San Mateo administers. A hot, nutritious meal is served three days a week, and participants can socialize while enjoying their meal. The Parks and Recreation Department can provide transportation to the Twin Pines Senior and Community Center in their 8-passenger van Tuesday through Thursday. The van driver picks up participants at their residences, brings them to the senior center to participate in activities and the lunch program, and then returns them to their home. In addition to our transportation program, the center makes a concerted effort to provide resources for alternative transportation options. Resources are listed in the monthly Twin Pines Newsletter, and the San Mateo County Mobility Guides are available. Additionally, presentations from various programs are scheduled.

Age-Friendly Parks and Recreation (continued)



The Twin Pines Senior and Community Center has a vibrant volunteer program. Volunteers assist with the Congregate Nutrition Program, staff the front desk, and lead many of the center's drop-in programs. More active seniors might enjoy participating in monthly day trips throughout the Bay Area. Playing tennis or pickleball in parks throughout the City and signing up for a class with daytime and evening options are popular ways to stay active. In Summers 2024 and 2025, free staff-led community hikes were introduced to explore the open space areas.

Intergenerational activities have provided opportunities to share experiences and stories. The City's Youth Advisory Committee and Summer Camp Staff have engaged with older generations during tech help seminars, playing lawn games, and joining for lunch. The City hosts a wide array of community events open to all ages, including Summer Movies, Belmont Blooms (a gardening event), a Spring Egg Hunt, a Halloween gathering, a Craft Fair, as well as cultural events such as Lunar New Year and Diwali celebrations. The Department aims to expand intergenerational activities and is considering hosting a board game event and seniors reading to students at the Belmont Community Learning Center (preschool).

While the Parks and Recreation Department offers many programs and services, it also partners with other community organizations to provide events such as Summer concerts, Belmont Water Dog Run, and Imagine Together. The partnership with the Belmont Library continues to grow. The library has brought a book club, trivia, crafting, and collaborating on community-wide cultural events to the senior center. Some partnerships offer services, including blood pressure screenings with Sequoia Hospital, informational seminars provided by the County, legal assistance through the Legal Aid Society, balance classes led by Stanford University, and medical equipment loans through the Medical Equipment Loan Program (**FreeMedEquip.org**). Since the City recently received a grant, it will collaborate with the Sequoia Healthcare District and Catholic Charities to offer a Memory Cafe for those in the early stages of living with Alzheimer's and other dementias.

The City is working on several projects that will benefit our senior citizens/active adult community in the Parks system:

- The Parks, Recreation, and Open Space (PROS) plan recommends repaving the pathway at Hallmark Park. This pathway leads through the park to the playground, tennis and pickleball courts, and the Crystal Springs Cross Country course outside the City boundary.

Age-Friendly Parks and Recreation (continued)

The tree roots have severely damaged the pathway. The FY 26 budget includes a CIP request to repave the path.

- The PROS plan includes recommendations for improvements to Twin Pines Park which offers several benefits, particularly beneficial to seniors.
    a. Improvement of the Meadow picnic area. The City has prepared plans to implement these improvements, which include access and seating upgrades, upon completion of the adjacent detention basin project in the City Hall parking lot.
    b. Improvement of the Redwood picnic area. The PROS plan includes recommendations for improvements in this area. Further development of these recommendations will occur upon completing the Belmont Creek Restoration Project in the summer of 2025.
- Activation of the 'Town Square' area between the Senior Center and the Twin Pines parking lot. While the Twin Pines Master Plan (incorporated by reference into the PROS plan) includes recommendations to ultimately create a drop-off area to facilitate access to the Senior Center, an interim improvement is to create informal seating options along the pathway between the parking lot and the Senior Center. In response to the County's declaration of a Loneliness epidemic, the Parks and Recreation Commission is committed to creating gathering spaces encouraging interaction with others.
- The Department has completed a grant-funded chipping program, which assisted all residents west of Alameda de las Pulgas with removing brush around their homes to increase defensible space for fire safety.

The Department continues to engage the community in discussing the need for a Community Center that serves as a multigenerational space and a centrally located emergency resource center. The PROS plan incorporates the 2019 Conceptual Design Plan for a Belmont Community Center by reference.



For more information about these programs, please visit:

www.belmont.gov/adults

www.belmont.gov/departments/fire/wildfire-preparedness

https://www.belmont.gov/departments/parks-and-recreation/projects/community-center-needs-assessment-and-design

https://www.belmont.gov/departments/parks-and-recreation/projects/the-community-center-conversation



Age-Friendly Police

The Belmont Police Department offers a range of services to all members of the Belmont Community. We often collaborate with our partners at the San Mateo Consolidated Fire Department (SMCFD) and the Parks and Recreation Department to provide public safety services and outreach, which also benefit our aging community. These include the TRAC Program (Tracking and Recovery of Adults and Children), the Belmont Community Police Academy, Belmont Watch, and Coffee/Pizza with a Cop.

The TRAC Program is a service that helps families locate and track loved ones experiencing memory loss or other cognitive impairments. The program provides families in need with a tracking unit and assist them in setting up the program.

Some of the other services that Belmont PD offers to the aging community include Vacation House Watch Requests, Emergency Notifications (such as evacuations and wildfire preparedness), Belmont Watch (neighborhood watch programs), the Parking and Traffic Safety Committee, and a free Medication Disposal site located at the Belmont Police Department.

Additionally, Belmont PD conducts annual outreach to the seniors in our community regarding elder financial scams and other forms of elder abuse. This usually occurs in the Belmont Senior Center and is coordinated through our Parks and Recreation Department. In addition to the outreach programs and robust website, flyers are distributed with information on these services in the lobby of the police department and the senior center. The police recognize that online access and social media may not be the most effective means of sharing information with everyone.

Belmont PD and SMCFD frequently participate in community events, and share information about our services with attendees. We genuinely value our citizens and are honored to be a part of the community.



Age-Friendly Communications

Communications & Public Information

The City of Belmont communicates with residents through various networks. This includes digital outreach via social media, email marketing (such as weekly eNews, press releases, and newsletters), Highway 101 billboards, lobby slideshows, TV Channel 27, and website content. Belmont utilizes traditional printed outreach methods, including banners displayed across Ralston, flyers distributed throughout the City and at the facilities, tabling at community events (such as National Night Out and the Public Works Open House), and mailers (including Recology inserts, postcards, and election materials).

All the branded materials, including templates for social media posts and the Council PowerPoint presentations, have been redesigned to align with Belmont's branding and enhance ADA accessibility across all communication touchpoints.

Each department actively engages with the public and has several initiatives aimed at reaching the senior population. For example, there is the Twin Pines Newsletter and safety educational events are hosted specifically for seniors. The City is exploring new opportunities to enhance public communications, such as launching the new police Instagram page, introducing the latest 311 app, and providing new translation services that offer easy access to live translators or translated materials.

Age-Friendly Communications (continued)

Strategic Communications Plan



The City of Belmont adopted an updated Strategic Communications Plan in 2025 and can be **viewed here**. This plan includes key messages aligned with our strategic focus areas, recommendations for improving the City's outreach efforts, and an action plan for executing the outlined strategies. This plan will showcase the progress and goals for the next five years. This will also include methods to enhance accessible communications for all residents, particularly seniors.

Weekly News

The weekly newsletter is distributed to the community every Friday and shared across our social media platforms. Last year, we redesigned the newsletter to enhance visibility and make it more accessible to the public. It includes highlights of events for all residents and features specifically for seniors and Belmont's community partners. Residents can visit the City's partners at the Belmont Public Library for assistance with signing up to receive the newsletter via email or accessing it electronically. Library staff can also assist with printing a copy or a specific newsletter section. Additionally, staff conducted training sessions at the Senior and Community Center, offered by the Parks and Recreation Department, to show residents how to sign up for and access the weekly eNews.

Website Redesign

The City recently initiated a year-long website redesign project. The new site will offer enhanced accessibility, streamlined navigation, and improved access to City services, enabling residents and businesses to stay informed more easily. To ensure the new site meets the needs of all users, staff conducted a website redesign survey to gather community feedback. This survey was promoted through our website, social media, and weekly newsletter, and a flyer was posted in the Senior and Community Center.



Age-Friendly Housing and Economic Development

Belmont offers or promotes many housing services and programs that benefit older adults. The City of Belmont's website provides information on various housing resources and services available to Belmont residents, located at **https://www.belmont.gov/i-want-to/find/housing**. When the City receives inquiries about affordable housing through the Housing Department's general email or from visitors to the permit center, Housing staff respond individually, trying to match individuals with the appropriate resources, such as the ABAG/MTC Affordable Housing Portal or a suitable service provider. Belmont is collaborating with Rebuilding Together Peninsula (RTP) to provide minor home repair services to homes owned and occupied by Belmont residents with households at or below the Area Median Income (AMI). Historically, many of the homeowners served by Rebuilding Together are seniors. This program helps low-income homeowners remain in their homes and ensures their living conditions remain safe and sanitary.

The City of Belmont provides annual funding to HIP Housing for its home-sharing program, which matches individuals seeking housing with households looking to share their homes. Many seniors take advantage of this program to safely vet potential tenants for spare rooms in their homes, providing an additional source of income and helping combat loneliness and isolation.

Belmont also invests in new affordable housing developments to increase housing opportunities for low-income households of all ages throughout the community. Recent affordable housing developments funded in part by City funds include the Belmont Family Apartments, a 125-unit, affordable development currently under construction and The

Age-Friendly Housing and Economic Development (continued)



Corners housing project, a 37-unit affordable housing project offering a mix of one, two, and three-bedroom homes, ensuring stable housing for individuals and families who have experienced homelessness. This project also offers intergenerational units within close proximity to transit. Intergenerational living helps breakdown age barriers. This type of housing helps reduce age segregation and ageism, decreasing social isolation, depression and lonliness. This type of living helps build a sense of community and improves health, mental health, and self-esteem.

In addition, the City's Inclusionary Housing Ordinance requires that 15% of new rental units be set aside at affordable rents for households with incomes at or below 80% AMI. Affordable units created with assistance from the City is monitored annually for compliance with affordability restrictions. Seniors are eligible and welcome to apply to affordable housing developments funded or required by the City.

The City of Belmont also has several senior housing developments, including Bonnie Brae Terrace, Silverado Belmont Hill Assisted Living, and a recently approved new memory care development at the Nazareth Vista Assisted Living facility. Belmont also included affordable units in 2 market rate developments, the Hayden and Artisan Crossing that are available for seniors and located advacent to a transit corridor. The Hayden project located at 815 Old County Road is a market rate apartment complex with a total of 177 units and has 27 affordable units. The Artisan Crossing project located at 1325 Old County Road contains 250 units total with 38 affordable units.

Belmont also completed the Firehouse Square that consists of 66 units with 100% affordable units. This project includes an after school program and playground with youth and adult services programming. It is also located close to shopping, restaurants, public transportation and Twin Pines Park.

The City of Belmont has a certified housing element, including various programs promoting affordable and market-rate housing creation and preservation. Some examples of recent housing element implementation efforts include: the rezoning of key districts to allow greater densities and heights, supporting programs that promote the construction of accessory dwelling units, the establishment of by-right housing designation for prior housing element sites, supporting the development of pipeline housing projects, and the ongoing management of the City's portfolio of deed-restricted affordable units.



Age-Friendly Library

The Belmont Library is a welcoming and inclusive hub, offering something for everyone and serving as a vital resource for older adults in particular. Recognizing the needs of its aging community, the library has thoughtfully tailored its programs and resources to foster accessibility, connection, and enrichment. Whether it's borrowing books from its robust fiction and nonfiction collection, getting help with technology, or accessing community services, the library is a trusted destination. Older residents, in particular, appreciate the library's cozy, well-lit reading areas, where they can unwind with magazines, newspapers, or a good book, making the library a haven for comfort and connection.

For those unable to visit in person, the library ensures no one is left behind through its Homebound Delivery Service. Materials are mailed in reusable pouches upon request, keeping the joy of reading accessible. The library also shines as a multilingual space, with staff proficient in Spanish, Mandarin, Cantonese, and Hindi, ready to assist. Additionally, its collection features materials in Spanish, Tagalog, Chinese, Russian, Hindi, and Japanese materials. Older patrons, in particular, appreciate the availability of large-print books and audiobooks, while eBooks and audiobooks with flexible text sizes provide an easy-to-use, lightweight alternative.

Technology is another cornerstone of the Belmont Library's commitment to its community. With public computers, scanners, laptops, Chromebooks, and Wi-Fi hotspots available for checkout, patrons can access essential tools and resources. Friendly staff are available to assist with completing online forms, printing, scanning, and navigating library resources, including e-books.

Age-Friendly Library (continued)



The Belmont Library also invites deeper community engagement through its vibrant volunteer opportunities. Residents can contribute their time and talents as program, collection, or makerspace volunteers, supporting the library's dynamic offerings and enriching the experience for all patrons. Additionally, the Friends of the Belmont Library, a group of passionate and dedicated volunteers, operate in an on-site store, raising funds that directly enhance library programming and improvements. These volunteer roles not ony strengthen the library's services, but also foster a sense of ownership, pride, and connection among community members.

Community outreach is at the heart of the Belmont Library's mission. Library staff actively engage by attending City events and visiting the Twin Pines Senior and Community Center, where they introduce residents to the library's incredible services and programs. The library also collaborates with Dignity Health–Sequoia Hospital to offer "Maturing Gracefully," a monthly program for seniors featuring expert-led presentations on health, diet, transportation, mindfulness, and loneliness. These sessions empower older adults to lead fulfilled lives and foster connections.

The Belmont Library celebrates creativity and fosters intergenerational community building through diverse activities and events. Older adults can enjoy a weekly crochet group, sewing sessions, and monthly arts and crafts sessions tailored to their needs.

A participant-led book club meets monthly at the Twin Pines Senior and Community Center for lively discussions on selected fiction and nonfiction titles. Our multigenerational family programs are equally meaningful; grandparents regularly join their grandchildren for weekly Family Storytimes, connecting through shared activities and socializing with other caregivers. Building on this spirit, the library proudly partners with the Belmont Poet Laureate to host the annual Belmont Poetry Contest. This inspiring event gathers participants of all ages to share their creativity, foster connections, and celebrate the transformative power of poetry and community.



Age-Friendly Public Works

Public Works is committed to enhancing the quality of life for all Belmont residents through thoughtful maintenance efforts and the development of new, accessible infrastructure. Recent and Ongoing Projects:

Annual Sidewalk and Curb Ramp Improvements: Each year, the City constructs over a dozen ADA-compliant curb ramps and sidewalk improvements as a part of the yearly Pavement Rehabilitation Projects. These improvements promote greater walkability and accessibility.

Davey Glen Accessibility Improvements: This project enhanced access near key areas, including high-density housing and Davey Glen Park, making it easier and safer for residents of all ages to navigate the area.

Trip Hazard Mitigation: Public Works responds to identified tripping hazards by working with the adjacent property owners to mitigate the risk. In 2024 alone, Public Works addressed tripping dangers in front of over 120 properties, increasing safety and mobility throughout the City.

Sidewalk Installation Policy Implementation: Through Belmont's Sidewalk Installation Policy, the City continues to expand its pedestrian network by constructing new sidewalks to enhance connectivity and support active lifestyles.

Parking and Traffic Safety Committee: The department regularly evaluates traffic safety and accessibility requests through the Parking and Traffic Safety Committee, working with Belmont residents to address public needs.

Age-Friendly Public Works (continued)



In addition to these completed and ongoing projects, Belmont Public Works is continuing to improve Belmont through upcoming projects:

Ralston Avenue Segment 4 Improvements: The project will improve the streetscape, sidewalks, and accessibility of the Ralston Avenue corridor west of Alameda de las Pulgas.

Alameda de las Pulgas Corridor Project: This transformative project will enhance pedestrian and bicycle safety, walkability, and visual appeal in the Alameda de las Pulgas Corridor near high-priority destinations, including Carlmont High School and the Belmont Public Library. It is supported by a $3.5 million grant from the State of California.

Twin Pines Park Belmont Creek Restoration Project: This project will restore and stabilize eroded creek banks, enhancing both safety and environmental quality within the park. It also improves access to the creek from surrounding pathways. The project is supported by a one million dollar grant from the California Department of Water Resources.

Hallmark Park Access Improvements: Parks and Recreation Department is upgrading the primary footpath into Hallmark Park.



Appendix C:
THE CITY OF BELMONT



Origins of Our Community

When the first Spanish explorers arrived on the San Francisco Peninsula in late 1769, the Ohlone people inhabited the area that is now Belmont. The Spanish recorded that Lamchin referred to what is now Ralston Avenue in Belmont as “la Cañada del Diable”, or Devil’s Canyon. The name remained for many years. The Old County Road and Devil’s Canyon became a vital road intersection for early travelers. Not long after their arrival, the Spanish seized the Ohlone’s land. In 1795, the Spanish Governor of California, Diego de Borica, provisionally granted Jose Dario Arguello some 35,000 acres on the mid-peninsula in the area that is now Belmont, San Mateo, San Carlos, and Redwood City. Arguello was the first officer in charge of the Presidio of San Francisco, which was established to protect the Spanish settlements from the Russians and the English. Arguello was offered any part of California he wished. He chose the land that would come to be known as Rancho de las Pulgas (“Ranch of the fleas”), which was used as a military stock ranch.

Following Jose Dario Arguello’s death in 1828 and the death of his son, Luis Antonio Arguello, in 1830, Rancho de las Pulgas passed to Luis’ widow, Maria Soledad Ortega de Arguello. In 1850, when California became a state, Mrs. Arguello hired Sidney Monserrate Mezes, an attorney from Mexico City, to clear her land titles after California came under the control of the United States. Mrs. Arguello paid Mezes in land amounting to 15% of the ranch. Mezes chose Belmont for his portion and made it his home.

The City of Belmont (continued)

Count Leonetto Cipriani bought a portion of the Rancho de las Pulgas grant was awarded in 1853 and lived here until 1863. In 1864, he decided to sell his estate, which William C. Ralston acquired. The Ralston home, an 80-room Redwood Mansion became a landmark and is now located on the Notre Dame de Namur University campus, which was formerly named the College of Notre Dame.

Belmont was incorporated as a City on October 29, 1926, and was the first county seat of San Mateo County. “Belmont” means “beautiful mountain” in Spanish -- an appropriate name for the tree-covered rolling hills. The hills reach an altitude of about 750 feet, from which one can see Mt. Diablo and the San Francisco Bay on a clear day.





Appendix D:
CITY GOVERNMENT

The City of Belmont is a general law City governed by a five-member City Council including a Mayor and a Council Manager form of government. In 2022, the City transitioned from having all five Councilmembers elected at-large and the Council annually appointing one of its members as the Mayor, to four Councilmembers elected by-district and a mayor elected at-large by the voters.

The voters of each council district elect a district resident to serve as a Councilmember for a four-year term. The elections take place at a general municipal election in November of even-numbered years and are staggered such that two district seats are up at each municipal election year. The Mayor is elected Citywide by the City voters and serves a two-year term. The four council districts created to facilitate the by-district elections will be adjusted by the Council every ten years after completion of the federal census in a redistricting process governed by state and federal law.

Belmont's City Council meets regularly the second and fourth Tuesday of every month.

The City recognizes that each resident is entitled to fair, ethical, and accountable treatment by their Government; therefore, the rules of engagement are designed to achieve this goal. In line with their role as stewards of the public interest, Belmont strives to create a positive and inclusive workplace and public environment that acknowledges and values all members of the Belmont constituency. In all cases, a common goal is recognized to ensure the needs of the community at large are being met, or are progressing toward mutually beneficial goals.

City Government (continued)

Writing Belmont's Next Chapters, Together

The City of Belmont strives to measurably improve the lives of those who have traditionally been overlooked or diminished, while inviting residents and businesses to do the same.

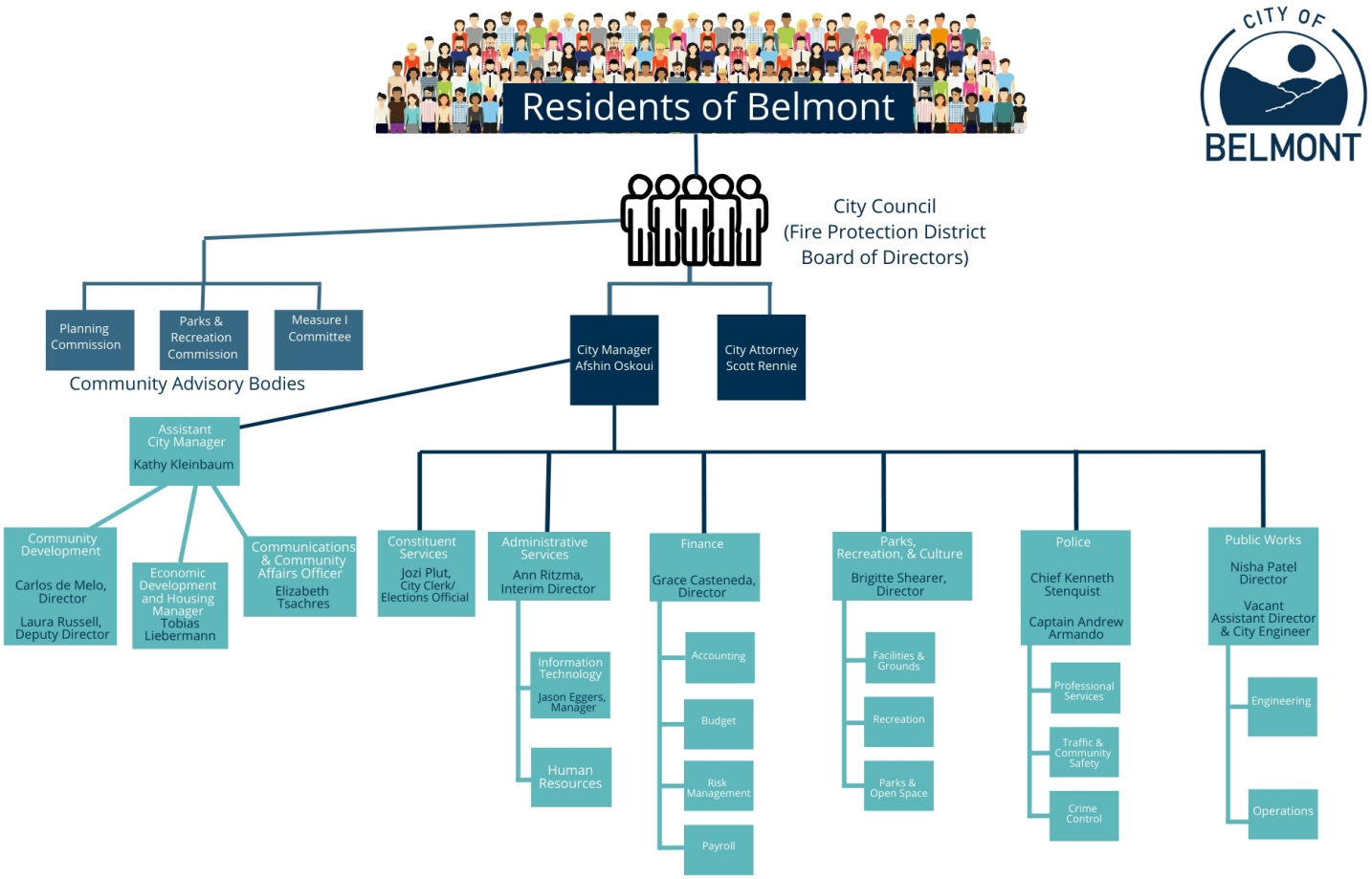
The City remains steadfast in its vision to value and celebrate all individuals in Belmont. They now have a BOLD initiative, Bridging, Opportunity, Leadership, and Distinction, to lead staff and the community forward in a positive and productive direction. Residents and City Staff continue to seek opportunities to support those who face impediments to thrive in the community. To that end, the City has learned about and celebrated the arts and traditions of the colorful tapestry of Belmont. They have created quiet spaces and support for individuals who benefit from such connections.



City Government (continued)

City of Belmont Organizational Chart

https://www.belmont.gov/departments/administrative-services/city-manager

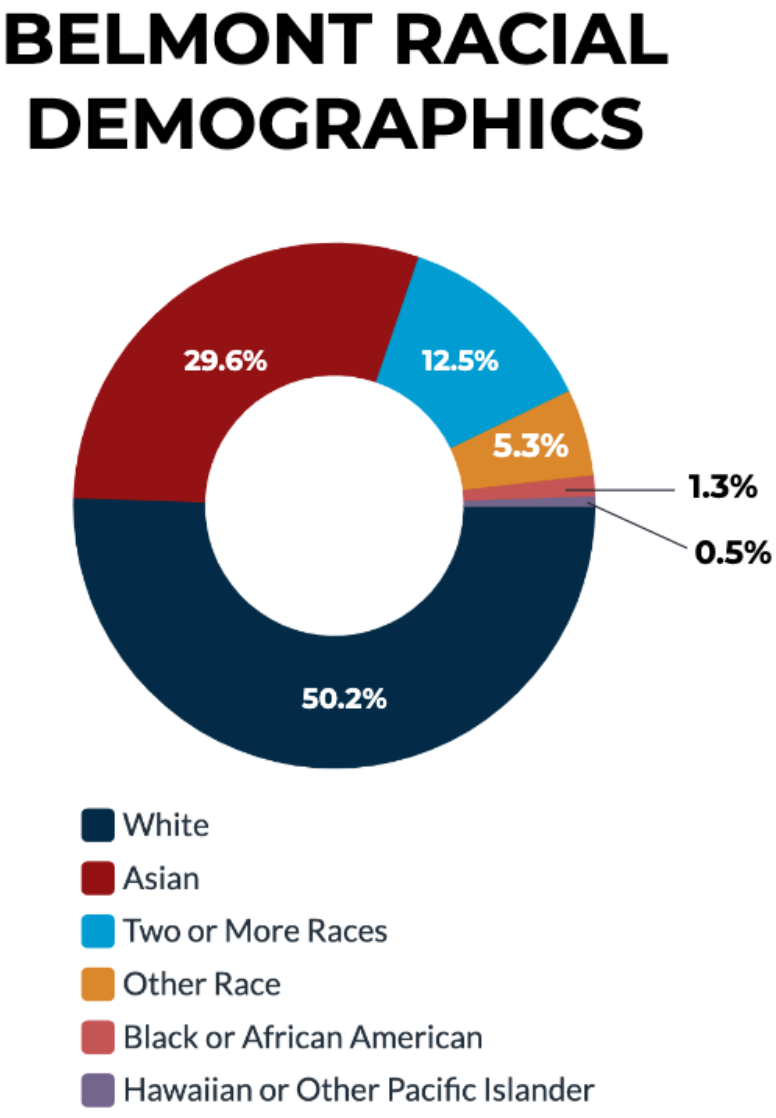


Appendix E:
DEMOGRAPHIC PROFILE

The City of Belmont is situated in San Mateo County, California, and has a population of 28,335 according the United states Census Bureau. The median age is 40.4 for males, 40.6 for females, and 40.2 for both.

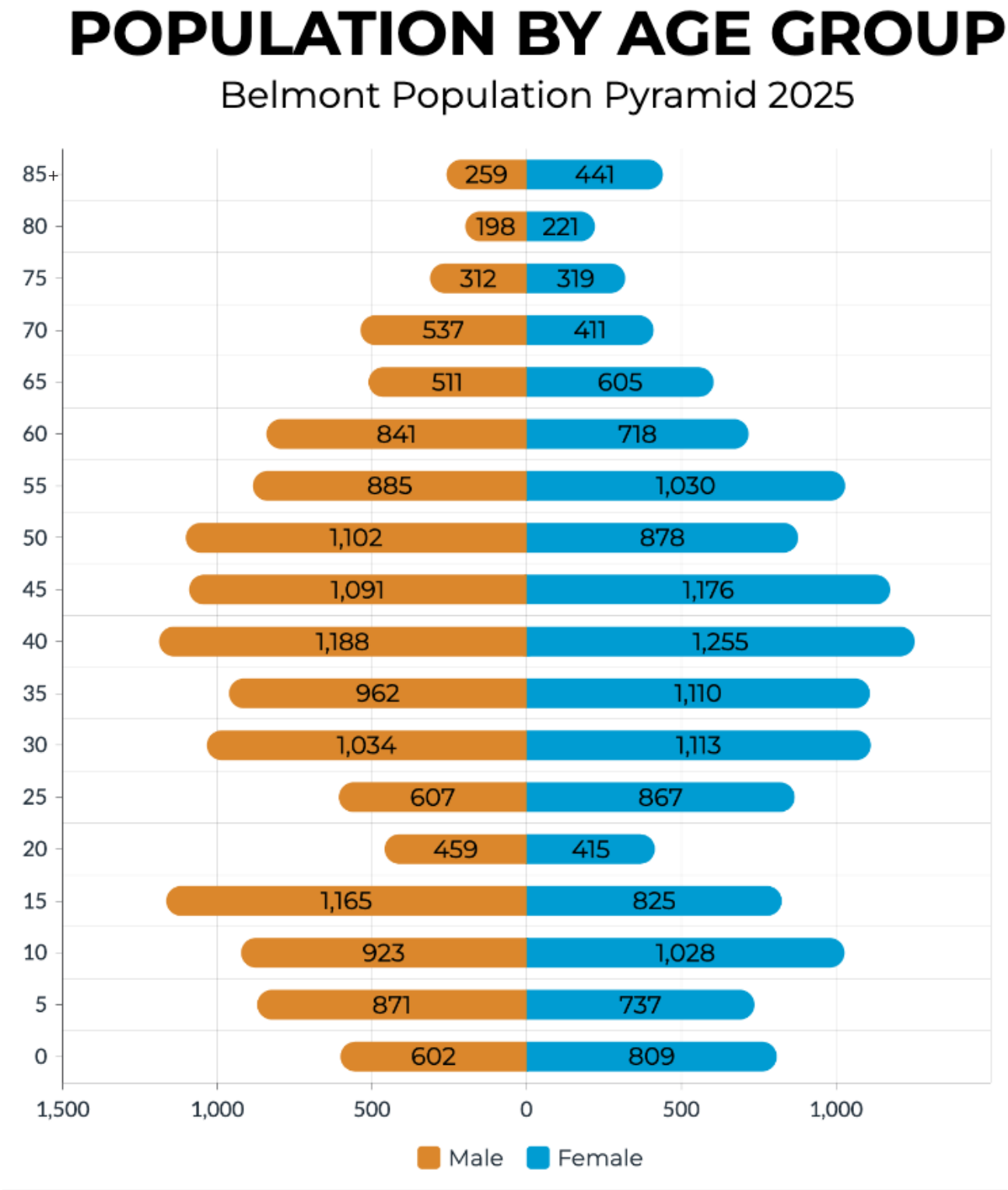
Race: City of Belmont's population is 50.2% White, 29.6% Asian, 12.5% Two or more races, 5.3% Other, 1.3% Black or African American, 0.5% Hawaiian & Other Pacific Islander.

Language: 62.6 of Belmont residents speak only English, 9.1% speak Spanish, 10.6% speak other Indo-European languages, 16.6% speak Asian and Pacific Islander languages, and 1.1% speak another language.



https://data.census.gov/profile/Belmont_city,_California?g=160XX00US0605108#race-and-ethnicity

Demographic Profile (continued)



https://data.census.gov/profile/Belmont_city,_California?g=160XX00US0605108#populations-and-people

Appendix F:
LIVABILITY INDEX

AARP's Public Policy Institute (PPI) has developed criteria to assess the characteristics that would provide a high quality of life for a diverse population within a community encompassing all generations. Their scoring includes complex livability factors that consider both metric values and policies. The AARP Livability Index is compiled from over 50 distinct data sources across the seven livability categories. By utilizing these metrics and policies, the AARP Livability Index evaluates communities based on the livability of each neighborhood. Each City is assigned an overall score. The seven categories accumulate the total score.



The overall Livability Index™ score for **Belmont, California** is **59**.

This is in the **top half** of **communities** in the U.S.

Scores are applied to the following 7 categories of livability. Examples of indicators follow:

HOUSING: Housing costs, availability of multi-family housing, state accessory dwelling unit support

NEIGHBORHOOD: Access to parks and libraries, crime rate, state and local transit-oriented development

TRANSPORTATION: Frequency of local transit service, walkability, state and local complete street policies

ENVIRONMENT: Quality of drinking water/air, state utility disconnection policies, pollution level

HEALTH: Preventable hospitalization rate, access to exercise opportunities, state/local smoke-free laws

ENGAGEMENT: Social involvement index, voting rate, state barriers to community broadband

OPPORTUNITY: Income inequality, jobs per worker, age diversity, local government credit-worthiness

***The livability score does not follow all eight domains and incorporates a few different categories per AARP.*

(AARP Livability Index, 2024) Source: https://livabilityindex.aarp.org/

Livability Index (continued)

		Belmont, California	2024 Median US City
Overall Score		59	50
Housing	Affordability & Access	41	56
Neighborhood	Proximity & Security	63	36
Transportation	Safety & Convenience	50	44
Environment	Clean Air & Water	60	59
Health	Prevention, Access, & Quality	91	43
Engagement	Civic & Social Involvement	57	47
Opportunity	Inclusion & Possibilities	54	52

For interpretation of scores, please refer to the following link:
https://livabilityindex.aarp.org/search/Belmont,%20San%20Mateo%20County,%20California,%20United%20States#scores

ACKNOWLEDGMENT

The Center for Age Friendly Excellence wishes to acknowledge and thank the community who participated in the survey and focus groups. We also would like to thank all the Belmont task force members and City of Belmont staff who provided input and guidance in developing this Age-Friendly Action Plan.

Julia Mates
Mayor

Tom McCune
Councilmember

Afshin Oskoui
City Manager

Kathy Kleinbaum
Assistant City Manager

Brigitte Shearer
Parks and Recreation Director

Cody George
Recreation Manager

Corrie Fuhrman
Recreation Supervisor

Nisha Patel
Public Works Director

Pete Lotti
Police Lieutenant

Chris Lu
Belmont Library Manager

David Vargas
Senior Librarian, Belmont Library

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Recreation Program Coordinator

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Marie Violet
Director, Sequoia Hospital Health and Wellness
Redwood City

Rosemary Field
Community Member

Rosemary Welde
Community Member

We acknowledge and appreciate the funding from the County of San Mateo for developing this Age-Friendly Action Plan. Funding from the County has made it possible for the Center for Age-Friendly Excellence to provide leadership toward completing this Age-Friendly Action Plan using a collaborative approach.

CAFE is an incubated nonprofit project of Los Altos Mountain View Community Foundation.

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Age-Friendly City Update

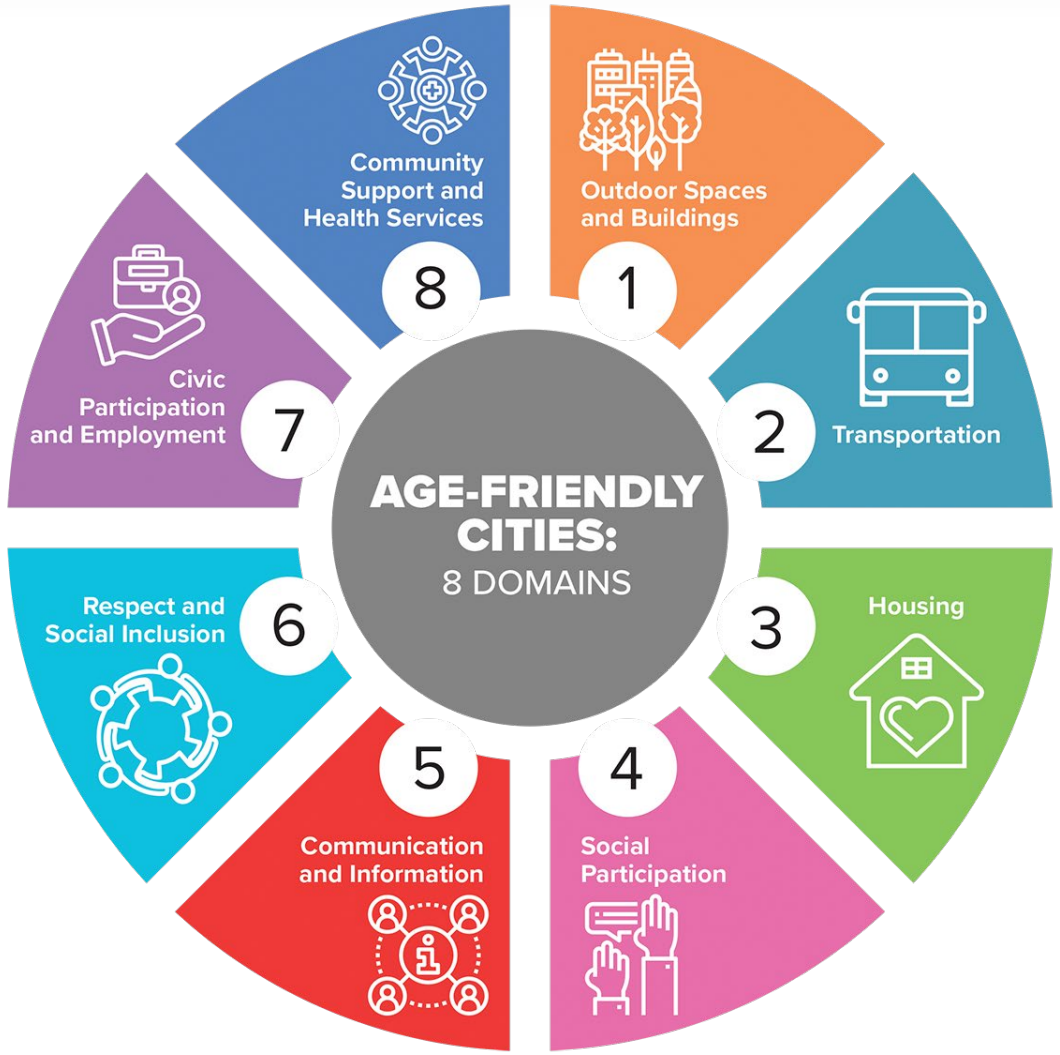
April 14, 2026

Presented By: Corrie Fuhrman, Recreation Supervisor

Background

- Age-Friendly Cities enable older people to:
  - Age safely in a place, if that is right for them
  - Continue to develop personally
  - Contribute to their communities while retaining autonomy, health, and dignity
- September 2022: Belmont designated as an Age-Friendly City
- September 2025: Action Plan presented to City Council & approved by AARP in November 2025
- The Action Plan is a living document, continually evolving in order to ensure relevance and effectiveness in supporting older adults

8 Domains of Livability



Domain 1: Outdoor Spaces & Buildings

- “Chatty Bench” project underway at Twin Pines Park
  - Encourages social interactions and combats loneliness
- Seasonal brush cutting along open space trails
  - Helps with visibility & fire prevention



Domain 2: Transportation

- New Senior Mobility Guides, prepared by SMC Transit District, made available at the Senior Center
  - Promotes independence
- SMC Transit District concierge phone line
  - Walks people through navigating from one place to another
- Information disseminated about California's updated bike and e-bike lighting requirements



Domain 3: Housing

- Continued financial support for HIP Housing's home sharing program with outreach to ADU owners
- In 2025, the City issued building permits for 29 Accessory Dwelling Units (ADUs)
- Building permits issued for a 37-unit 100% affordable housing project (The Corners)
- Approved entitlements for a 100% affordable 63-unit development (The Ridge at Masonic) and 140 units located at 580 Masonic Way, 25 of which are affordable
- Completion of the Below Market Rate Housing Guidelines

Domain 4: Social Participation

- Belmont Library & Twin Pines Senior Center offer dozens of older adult friendly programs each month
  - Arts and crafts, table games, movies, language groups, sports, and fitness, special events
  - Promotes socialization and combats loneliness



Domain 4: Social Participation

- The spring includes a Bird Show, Brain Games, Mix and Mingle, a Tea Party, a presentation on the San Francisco Worlds Fairs, day trips, and a Matter of Balance class
- Intergenerational Programming
  - YAC and Senior Center educational and social gatherings
  - Makerspace activities at the Library



Domain 5: Communication & Information

- Continuing to offer communications in both digital and printed formats such as flyers, Recology mailers, and channel 27
- Upcoming tabling at City Events
- Digital literacy classes available at the Library



Domain 6: Respect & Social Inclusion

- Cultural Arts & Events
  - Lunar New Year and Diwali celebrations celebrate diversity and inclusiveness
  - New adult programming at the Twin Pines Art Center
- New town hall style program at Senior Center called “Senior Connections” added



Domain 7: Civic Participation/Employment

- Library and Twin Pines Senior Center volunteering opportunities available
- Annual Volunteer Appreciation Luncheon at the Senior Center celebrates volunteers' dedication to their community



Domain 7: Civic Participation/Employment

- English Conversation Clubs and Citizenship classes at the Library
  - Meaningful opportunities for adult and senior learners to explore civic participation, language development, and community
- Library Author Talks
  - Opportunity to engage directly with writers and experts whose work challenges assumptions and expands perspectives



Domain 8: Community Support & Health Services

- Senior Showcase Resource Fair – 30 organizations and health screenings
  - Promotes healthy aging
- Upcoming Senior Center Seminars/Clinics:
  - Advanced Healthcare Directives & Power of Attorney Clinic
  - Fall Prevention Seminar



Domain 8: Community Support & Health Services

- Library offers educational presentations for lifelong learning
- Library offers California Brain Games to promote mental sharpness
- New Senior Center “Documentaries & Discussions” program encourages analytical thinking



Emergency Services

- Police Department assists residents in signing up for SMC Alerts and Social Media
- Information distributed at event booths
- Senior Center presentations, including Scam Prevention
- Pizza with the Police and Coffee with a Cop events create connections




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