ADDENDUM NO. 2
FOR
SUNNYSLOPE COUNTY WATER DISTRICT
WATER MAIN RELOCATION

DATE: December 23, 2024

FROM: Wallace Group
612 Clarion Court
San Luis Obispo, CA 93401
Tel: (805) 544-4011

TO: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Procurement Documents dated November 2024, as noted herein. Each bidder shall acknowledge receipt of this Addendum by completing the acknowledgment at the end of this Addendum, and by confirming receipt of this addendum on the contract Bid Form. Failure to do so may subject Bidder to disqualification.

The following changes or clarifications have been made to the Bid Documents:

CHANGES TO PRIOR ADDENDA:

1. Not Applicable

CHANGES TO PROCUREMENT REQUIREMENTS:

2. Bid Schedule: Replace Bid Schedule with the attached revised Bid Schedule. Refer to Exhibit A.

CHANGES TO CONTRACTING REQUIREMENTS:

3. None

CHANGES TO SPECIFICATIONS:

4. **Section 01 11 00 - Summary of Work:** Add paragraph 1.1.A.3 titled "SSCWD Well #5 Improvements". The following improvements have been added to the scope of work, all occurring at Sunnyslope County Water District's Well #5 site:

    3. SSCWD Well #5 Improvements:
        a. Replace existing well discharge piping with new 6" CL 350 ductile iron pipe, fittings, and appurtenances shown on the Drawings.
        b. Connect existing Foxhill Zone and Ridgemark Zone water mains with new 12" DR 18 C900 pipe.
        c. Provide above-ground and buried electrical conduit runs for sensors, flow meters, and valve actuator.
        d. Remove and replace approximately 3,550 square feet of AC pavement.

5. **Section 01 20 00 - Price and Payment Procedures:**
    a. Add paragraph titled "Bid Item No. 15 – SSCWD Well #5 Improvements". The work identified in Item 4 above has been added to the scope of work. Refer to Exhibit C, attached.

b. Replace paragraph titled “Bid Item No. 15 – Class 2 Aggregate Base” with the attached paragraph titled “Bid Item No. 16 – Class 2 Aggregate Base”. Refer to Exhibit C, attached.
c. Replace paragraph titled “Bid Item No. 16 – Hot Mix Asphalt” with the attached paragraph titled “Bid Item No. 17 – Hot Mix Asphalt”. Refer to Exhibit C, attached.
d. Replace paragraph titled “Bid Item No. 17 – Furnish and Install Pavement Marking and Striping” with the attached paragraph titled “Bid Item No. 18 – Furnish and Install Pavement Marking and Striping”. Refer to Exhibit C, attached.

6. Add **Specification 09 90 00 - Painting and Coating**.
7. Add **Specification 26 05 29 - Hangers and Supports for Electrical Systems**.
8. Add **Specification 26 05 33.13 - Conduit for Electrical Systems**.
9. **Section 33 00 00 - Utilities:** Add the following paragraph to Paragraph 2.01.C.2:

    b. Exposed/Above-Ground Service: Unless specified otherwise, the exterior of all above-ground ductile iron pipe and fittings shall be coated per Section 09 90 00.

10. Replace **Section 40 05 51 - Common Results for Process Valve** with **Section 40 05 00 – Common Work Results for Process Interconnections**.
11. Add **Specification 40 05 64 – Butterfly Valves**.
12. Add **Specification 40 05 65.23 – Swing Check Valves**.
13. Add **Specification 40 05 67 – Specialized Pressure and Flow-Control Valves**.
14. Add **Specification 40 71 13 – Magnetic Flow Meters**.
15. Add **Specification 40 73 26 – Gauge-Pressure Transmitters**.
16. Add **Specification 40 75 00 – Process Liquid Analytical Measurement**.

CHANGES TO DRAWINGS:

17. Modified Sheet G-1.0:
    a. Revised Vicinity Map
    b. Added Project Location Map identifying SSCWD Well #5 project site.
    c. Updated Sheet List Table
18. Added Sheet C-2.6.
19. Added Sheet M-1.0.
20. Added Sheet M-1.1.
21. Added Sheet M-1.2.
22. Added Sheet M-1.3.
23. Added Sheet M-2.0.

Refer to Exhibit B for updated Plan Set.

CLARIFICATIONS:

24. Contractor is not responsible for installing cabling at Well #5. Contractor will be responsible for furnishing sensors, meters, and actuators such that the cable can be installed in the conduit without splicing.
25. Contractor shall coordinate Well #5 system testing with Owner’s SCADA consultant.

ATTACHMENTS:
1. Exhibit A - Bid Schedule (1 page)
2. Exhibit B - Revised Plans (7 pages)
3. Exhibit C - Revised Specifications (55 pages)

Please acknowledge receipt of this Addendum No. 1 by signing where indicated below. There are six pages total in this Addendum. **Please EMAIL the signed and dated addendum to Rob Hillebrecht, Sunnyslope County Water District, rob@sunnyslopewater.org.**

_____ _____

Company Name Date

END OF ADDENDUM

EXHIBIT A

ITEM	DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL COST
GENERAL CONSTRUCTION					
1	Mobilization and Demobilization	1	LS		
2	Construction Survey	1	LS		
3	Erosion, Sedimentation, and Water Pollution Control	1	LS		
4	Traffic Control	1	LS		
5	Sheeting, Shoring, and Bracing	1	LS		
UTILITIES					
6	Connect to Existing SSCWD and BRWMC Water Mains	1	LS		
7	Furnish & Install 8" PVC C-900 Water Main	4,280	LF		
8	Furnish & Install 8" Gate Valves	5	EA		
9	Furnish & Install 1" Air Valve Assembly	3	EA		
10	Furnish & Install Fire Hydrant Assembly	6	EA		
11	Furnish & Install Shallow Trench Water Main Installation	80	LF		
12	Abandon Existing BRMWC Wells	1	LS		
13	Storm Drain Undercrossing	20	LF		
14	Sanitary Sewer Force Main Undercrossing	20	LF		
15	SSCWD Well #5 Improvements	1	LS		
EARTHWORK					
16	Class 2 Aggregate Base	650	CY		
17	Hot Mix Asphalt	630	TON		
18	Furnish & Install Pavement Marking and Striping	1	LS		
				TOTAL BASE BID:	

***Bid Total* $** _____DOLLARS & _____CENTS

(*Written Amount*)

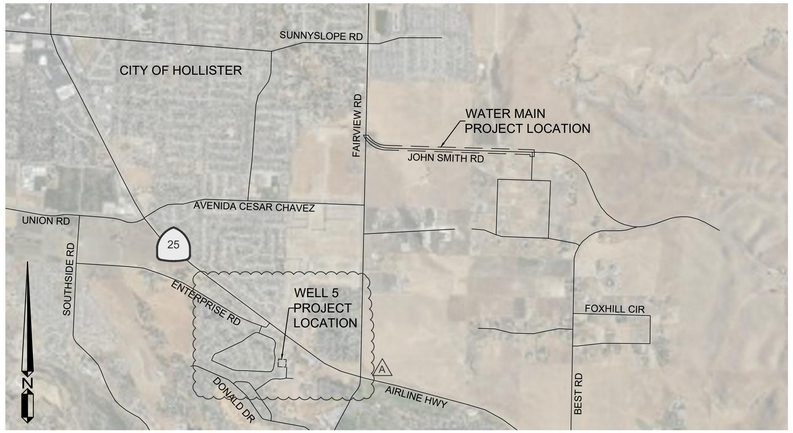
Signature of Bidder: _____ ***Date:*** _____

EXHIBIT B

APPROVED BY:

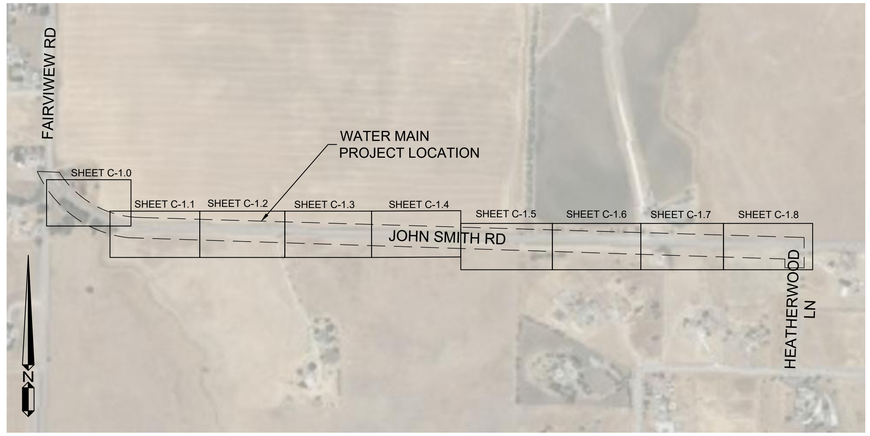
DREW A. LANDER, P.E.
GENERAL MANAGER
SUNNYSLOPE COUNTY WATER DISTRICT

BEST ROADS MUTUAL WATER COMPANY
WATER SYSTEM CONSOLIDATION PROJECT
SUNNYSLOPE COUNTY WATER DISTRICT
JOHN SMITH RD, HOLLISTER, CA



VICINITY MAP
NTS

WELL 5 SITE MAP
NTS



PROJECT SITE MAP
NTS

CALIFORNIA DEPARTMENT OF
WATER RESOURCES

FUNDING FOR THIS PROJECT HAS BEEN PROVIDED IN FULL OR IN PART FROM THE STATE DEPARTMENT OF WATER RESOURCES (DWR), FINANCED UNDER THE SMALL COMMUNITY DROUGHT RELIEF PROGRAM, AND ADMINISTERED BY THE CALIFORNIA STATE DEPARTMENT OF WATER RESOURCES.

Rev.	Date	Description of Revisions	By
A	12/23/2024	ADDENDUM 2 - WELL 5 IMPROVEMENTS	ZCM

Sheet List Table

UTILITY CONTACT INFORMATION

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www.wallacegroup.us

REGISTERED PROFESSIONAL ENGINEER
ZACHARY C. MARKOW
No. 92952
CIVIL
STATE OF CALIFORNIA

SIGNATURE

DATE SIGNED

BEST ROADS MUTUAL WATER COMPANY
WATER SYSTEM CONSOLIDATION PROJECT
COVER

JOB #: 0557-0005
DESIGNERS: ZCM
DRAWN BY: ONW
DATE: 12/26/24
DRAWING NO.
G-1.0
1 OF 25 SHEETS

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3
5

GRAPHIC SCALE
0 10' 20' 40'
(IN FEET)
1 IN = 20 FT

REFERENCE NOTES

	SYMBOL	TEMPORARY EROSION CONTROL
101		SILT FENCING PER CALTRANS BMP T-51 (SHEET C-2.7).
102		TEMPORARY DRAINAGE INLET PROTECT TYPE 3B PER CALTRANS BMP SC-10 (SHEET C-2.8) AND T62 (SHEET C-2.7).
103		TEMPORARY CONSTRUCTION ENTRANCE PER CALTRANS BMP TC-1 (SHEET C-2.8) AND T58 (SHEET C-2.7). EXACT LOCATION TBD IN THE FIELD.
104		APPROX. TEMPORARY CONSTRUCTION STAGING AREA, LARGE ENOUGH TO CONTAIN ALL EQUIPMENT, TRAILER, STORAGE, HAZARDOUS MATERIALS, WASTE, PARKING, AND STOCKPILES, PER BMPs ON SHEETS C-2.7 AND C-2.8. LOCATION TBD IN THE FIELD.
105		EXISTING TREES TO REMAIN AND BE PROTECTED IN PLACE.
106	HYDRO	HYDRO-SEED ALL DISTURBED SURFACES WITH APPROPRIATE SEED MIXTURE. SEE CONSTRUCTION NOTES, THIS SHEET, FOR MORE HYDRO-SEED INFORMATION.
107		PRESERVATION OF EXISTING VEGETATION IN ACCORDANCE WITH CALTRANS BMP SS-2 (SHEET C-2.8).
108	CONC	CONCRETE WASHOUT FACILITY IN ACCORDANCE WITH CALTRANS BMP WM-8 (SHEET C-2.8) AND T59 (SHEET C-2.7). LOCATION TBD IN THE FIELD.
109		NEW 8" PVC WATER LINE. REFER TO DETAILS 1 AND 2 (SHEET C-2.0) FOR TRENCHING INFORMATION.
110		EXISTING WELL FACILITIES TO BE DEMOLISHED AND REMOVED DURING CONSTRUCTION OF NEW WATER LINE PER SHEETS C-2.2 AND C-2.3.
111		INSTALL TEMPORARY FIBER ROLLS AROUND PERIMETER OF SOIL STOCKPILES THAT ARE NOT REMOVED BY END OF DAY IN ACCORDANCE WITH CALTRANS BMP T56 (SHEET C-2.7).
112		NEW 12" PVC WATER LINE. REFER TO DETAILS 1 AND 2 (SHEET C-2.0) FOR TRENCHING INFORMATION.
113		NEW ABOVE-GROUND AND BURIED ELECTRICAL CONDUIT. REFER TO DETAIL 1 (SHEET M-1.3) FOR JOINT UTILITY TRENCHING INFORMATION.

SWPPP PERMIT:
STATE OF CALIFORNIA PERMIT WDID#: TBD
RISK LEVEL 2

RESPONSIBLE PARTY FOR IMPLEMENTING AND MONITORING EROSION AND SEDIMENT CONTROL PLAN AND SWPPP:

LEGALLY RESPONSIBLE PERSON (LRP):
DREW LANDER, PE
SUNNYSLOPE COUNTY WATER DISTRICT
EMAIL: drew@sunnyslopewater.org
PHONE: (831) 637-4670

POC: RONALD (GLENN) RIDER, QSD/P #26736
PHONE: (805) 544-4011
EMAIL: GlennR@wallacegroup.us

NAME: TIM PETERSON, WALLACE GROUP
TRAINED QSP DELEGATE
LOCAL PHONE: (805) 544-4011

EROSION & SEDIMENTATION CONTROL NOTES

REFER TO SHEET C-2.5 FOR EROSION AND SEDIMENTATION CONTROL NOTES. REFER TO SHEETS C-2.7 AND C-2.8 FOR BMP DETAILS.

DUST CONTROL NOTES

REFER TO SHEET C-2.5 FOR DUST CONTROL NOTES. REFER TO SHEETS C-2.7 AND C-2.8 FOR BMP DETAILS.

Rev.	Date	Description of Revisions	By
A	12/23/2024	ADDENDUM 2 - WELL 5 IMPROVEMENTS	ZCM

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REGISTERED PROFESSIONAL ENGINEER
ZACHARY C. MARKOW
No. 92952
CIVIL
STATE OF CALIFORNIA

SIGNATURE

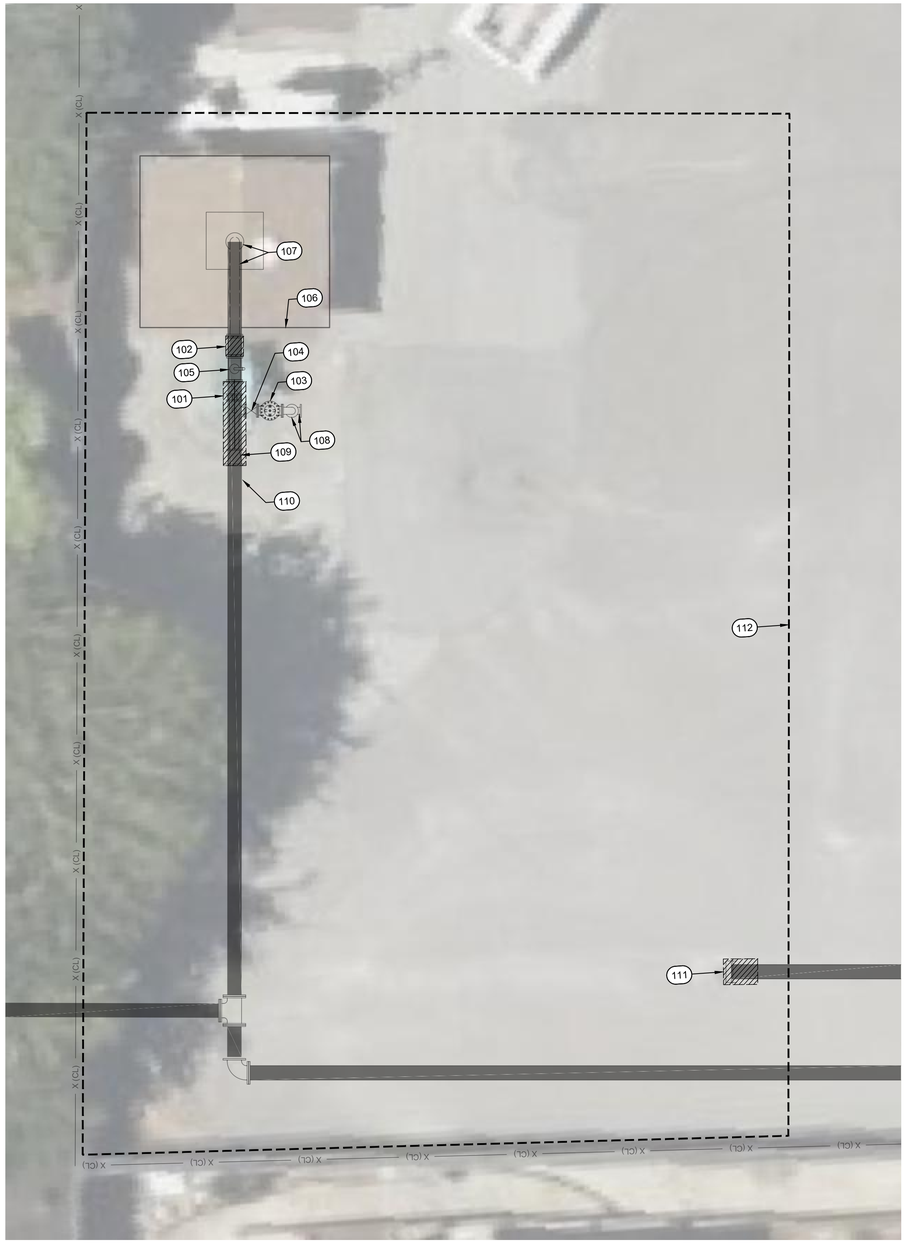
DATE SIGNED

SUNNYSLOPE COUNTY WATER DISTRICT
WATER SYSTEM CONSOLIDATION PROJECT
EROSION CONTROL PLAN

JOB #: 0557-0005
DESIGNERS: ZCM
DRAWN BY: ONW
DATE: 12/26/24

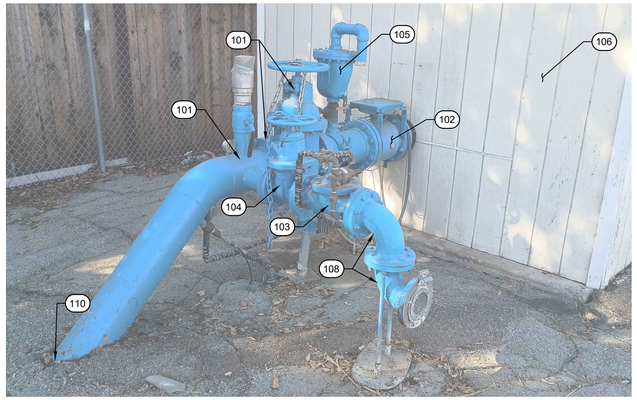
DRAWING NO.
C-2.6
18 OF 25 SHEETS

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES 0 1 2 3



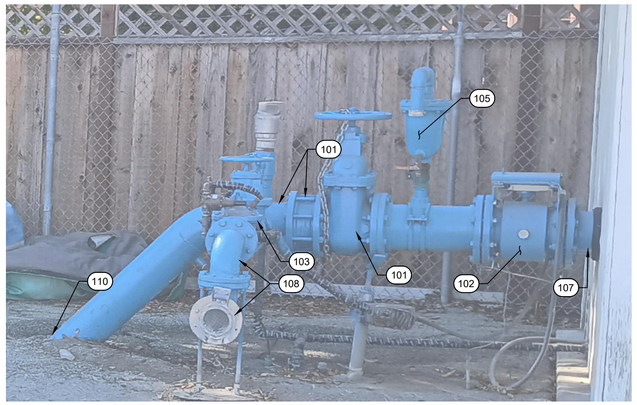
1 WELL 5 VALVING DEMOLITION DETAIL

SCALE: 1" = 5'



2 WELL 5 VALVING DEMOLITION PHOTO 1

SCALE: NTS

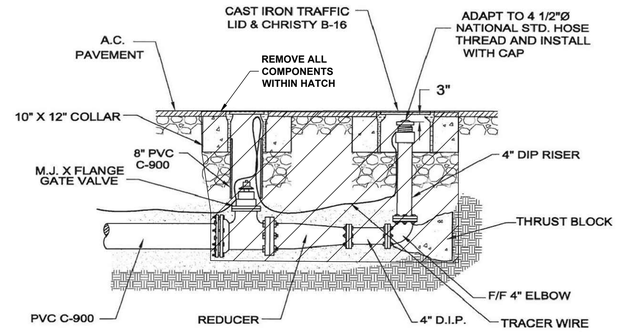


3 WELL 5 VALVING DEMOLITION PHOTO 2

SCALE: NTS

REFERENCE NOTES

NOTE	DESCRIPTION
(100)	EXISTING CONSTRUCTION
101	DISCONNECT AND REMOVE EXISTING 8" GATE VALVE, 8" MECHANICAL JOINT, AND 8" x 6" DI TEE.
102	DISCONNECT EXISTING 8" FLOW METER AND RETURN TO OWNER. CONTRACTOR TO COORDINATE RETURN OF SALVAGED EQUIPMENT WITH OWNER.
103	DISCONNECT AND SALVAGE EXISTING PRESSURE RELIEF VALVE FOR RE-INSTALLATION DURING WELL IMPROVEMENTS. SEE DETAIL 1, SHEET M-1.2.
104	DISCONNECT AND SALVAGE EXISTING 6" GATE VALVE FOR RE-INSTALLATION DURING WELL IMPROVEMENTS. SEE DETAIL 1, SHEET M-1.2.
105	DISCONNECT AND SALVAGE EXISTING COMBINATION AIR VALVE FOR RE-INSTALLATION DURING WELL IMPROVEMENTS. SEE DETAIL 1, SHEET M-1.2.
106	EXISTING WELL PUMP HOUSE; PROTECT-IN-PLACE.
107	EXISTING WELL HEAD AND 8" DISCHARGE PIPE; PROTECT-IN-PLACE.
108	DISCONNECT AND SALVAGE EXISTING 6" 90-DEG DI BEND FOR RE-INSTALLATION DURING WELL IMPROVEMENTS.
109	DISCONNECT AND REMOVE EXISTING 8" X 12" DI REDUCER.
110	EXPOSE AND REMOVE EXISTING 12" UNDERGROUND WATER MAIN AS NEEDED FOR IMPROVEMENTS. CONTRACTOR TO POTHOLE AND DETERMINE LENGTH OF PIPE TO BE REMOVED. CONTRACTOR TO RESTORE ALL REMOVED PAVEMENT PER DETAIL 1, SHEET C-2.0.
111	REMOVE EX. BLOWOFF ASSEMBLY PER DETAIL 4, THIS SHEET.
112	REMOVE 3,550 SQ. FT OF AC PAVEMENT. PAVEMENT SHALL BE SAW CUT AND EDGES SHALL BE CLEAN AND VERTICAL. PROTECT-IN-PLACE EXISTING CHAINLINK FENCE.



4 BLOWOFF ASSEMBLY REMOVAL DETAIL

SCALE: NTS

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STATE OF CALIFORNIA

SIGNATURE

DATE SIGNED

SUNNYSLOPE COUNTY WATER DISTRICT
WATER SYSTEM CONSOLIDATION PROJECT
WELL 5 DEMOLITION PLAN

JOB #: 0557-0005
DESIGNERS: ZCM
DRAWN BY: ONW
DATE: 12/26/24

DRAWING NO.
M-1.0
21 OF 25 SHEETS

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3
5

1 WELL 5 VALVING/PIPING PLAN

SCALE: 1" = 5'

GRAPHIC SCALE
0 2.5' 5' 10'
(IN FEET)
1 IN = 5 FT

REFERENCE NOTES

NOTE	DESCRIPTION
200	PROPOSED INFRASTRUCTURE
201	PROVIDE NEW 12" PVC C900 DR 18 WATER MAIN IN TYPICAL TRENCH PER DETAIL 1, SHEET C-2.0, WITH 3" THICK AC LAYER.
202	PROVIDE NEW 12" 45° DI ELBOW, MJ X MJ. ALL BURIED DI FITTINGS TO BE WRAPPED WITH POLYETHLENE WRAP PER AWWA C-105. PROVIDE MEGALUG OR APPROVED EQUAL.
203	PROVIDE NEW 12" 90° DI ELBOW, MJ X MJ. ALL BURIED DI FITTINGS TO BE WRAPPED WITH POLYETHLENE WRAP PER AWWA C-105. PROVIDE MEGALUG OR APPROVED EQUAL.
204	PROVIDE VALVING AND PIPING PER DETAIL 1, SHEET M-1.2.
205	REMOVE EXISTING 12" BLOWOFF ASSEMBLY AND GATE VALVE, IF PRESENT, INCLUDING CONCRETE COLLARS, BOXES, AND THRUST BLOCKS. SEE DETAIL 4, SHEET M-1.0. CONTRACTOR TO VERIFY LOCATION AND DEPTH. PROVIDE 12" DI ELBOW, MJ X MJ, TO CONNECT NEW 12" PIPE TO EXISTING 12" PIPE.
206	PROVIDE THRUST BLOCK PER SSCWD STANDARDS. REFER TO DETAILS 6 AND 7, SHEET C-2.4.
207	EXISTING WELL PUMP HOUSE, PROTECT-IN-PLACE.
208	CONTRACTOR TO POTHOLE TO VERIFY DEPTH AND LOCATION OF EXISTING WATER MAINS IN WATER YARD FOR CONNECTION. ASSUMED COVER TO EX. WATER MAINS IS NO GREATER THAN 4 FT.
209	10' X 10' OPEN SPACE FOR FUTURE PUMP SKID. PUMP SKID TO BE PROVIDED BY OTHERS (N.I.C.).
210	REMOVE AND REPLACE 3,550 SQ. FT OF AC PAVEMENT. EX. AC PAVEMENT SHALL BE SAW CUT. EDGES SHALL BE CLEAN AND VERTICAL. SMOOTH SUBGRADE AND PLACE AC 3" MIN. UP TO EX. SLOPE.
211	EXISTING CHAINLINK FENCE, PROTECT-IN-PLACE.

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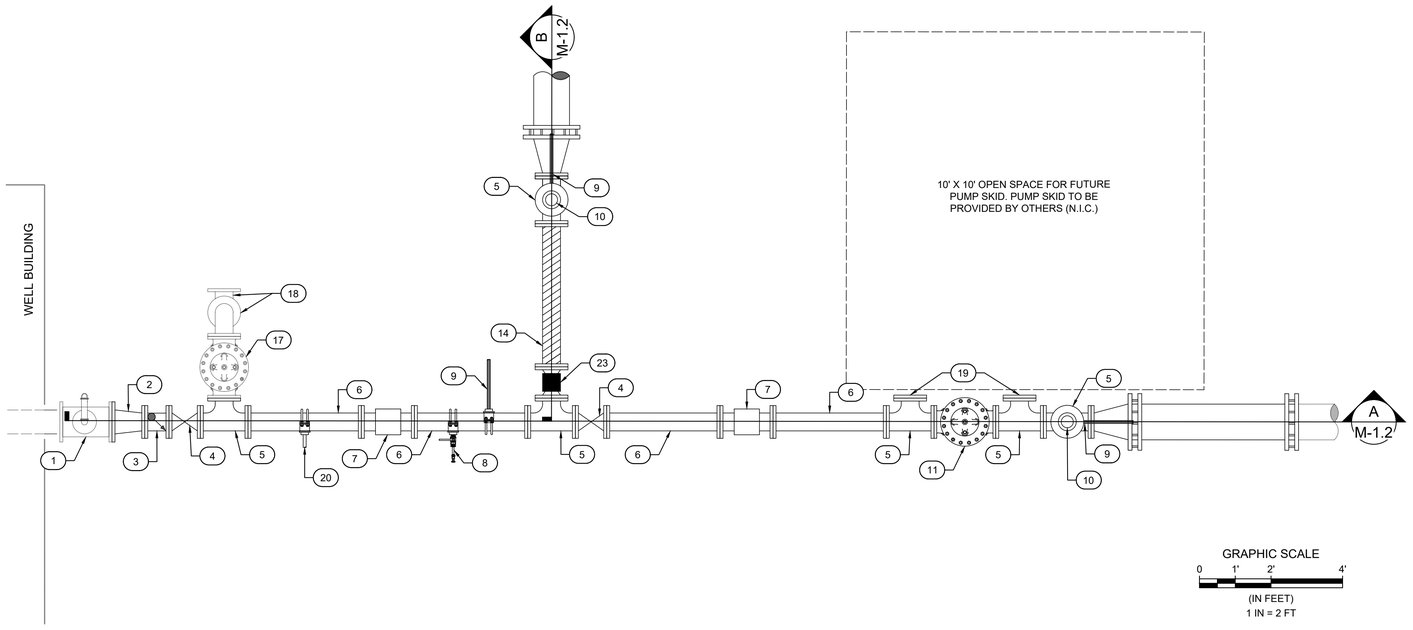
SUNNYSLOPE COUNTY WATER DISTRICT
WATER SYSTEM CONSOLIDATION PROJECT
WELL 5 IMPROVEMENT PLAN

JOB #: 0557-0005
DESIGNERS: ZCM
DRAWN BY: ONW
DATE: 12/26/24

DRAWING NO.
M-1.1
22 OF 25 SHEETS

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3
5



1 WELL 5 VALVING/PIPING DETAIL

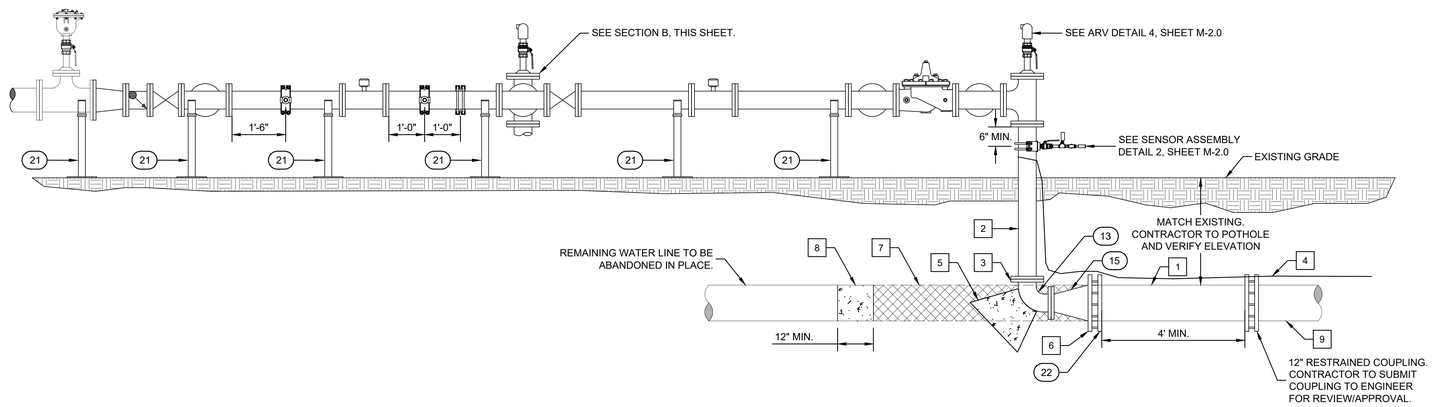
SCALE: 1" = 2'

BILL OF MATERIALS

ITEM	QUANTITY	DESCRIPTION
1	1	RELOCATED 8" DI AIR/VAC COMBINATION VALVE, VALVE SADDLE, AND PIPE SPOOL, SALVAGED FROM EXISTING WELL DISCHARGE CONFIGURATION.
2	1	8" X 6" DI REDUCER, FLG X FLG
3	1	6" DI SWING CHECK VALVE, FLG X FLG
4	2	6" DI GATE VALVE, FLG X FLG
5	6	6" X 6" DI TEE, FLG X FLG X FLG
6	4	6"Ø DI PIPE SPOOL, 3' MIN., FLG X FLG
7	2	6" MAGNETIC FLOW METER, FLG X FLG
8	1	1" SAMPLE TAP: 1" SADDLE TAP, 1" BALL VALVE, 1" NPT NIPPLE, AND 1" NPT HOSE BIBB OUTLET
9	3	SENSOR ASSEMBLY, SEE DETAIL 2, SHEET M-2.0.
10	2	INSTALL LARGE VOLUME AIR RELIEF VALVE ASSEMBLY PER DETAIL 4, SHEET M-2.0.
11	1	6" CLA-VAL PRESSURE SUSTAINING/PRESSURE RELIEF VALVE, FLG X FLG
13	2	6" DI 90° ELBOW, FLG X FLG
14	1	6" STATIC MIXER DI PIPE SECTION, FLG X FLG. SEE SPECIFICATION 40 05 00.
15	2	6" X 12" DI REDUCER, MJ X MJ
16	~55 LF	12" C900 PVC, DR-18, FIELD FIT. CONTRACTOR TO POTHOLE AND VERIFY TIE-IN LOCATION AND PIPE LENGTH. ROUTE PIPE PER PLAN ON SHEET M-1.1.
17	1	RELOCATED 6" DI PRESSURE SUSTAINING/ PRESSURE RELIEF VALVE, FLG X FLG, SALVAGED FROM EXISTING WELL DISCHARGE CONFIGURATION
18	2	RELOCATED 6" DI 90° ELBOW, FLG X FLG, SALVAGED FROM EXISTING WELL DISCHARGE CONFIGURATION
19	2	6" CL 150 DI BLIND FLANGE
20	1	CHLORINE INJECTION PORT WITH 1/2"PVC CHEMICAL INJECTION QUILL, SEE DETAIL 3, SHEET M-2.0.
21	6	ADJUSTABLE PIPE SUPPORT PER DETAIL 1, SHEET M-2.0.
22	2	12" MJ RESTRAINT, EBAA IRON 1100 MEGALUG OR APPROVED EQUAL.
23	1	6" MOTOR-ACTUATED BUTTERFLY VALVE, FLG X FLG

GENERAL NOTES XX:

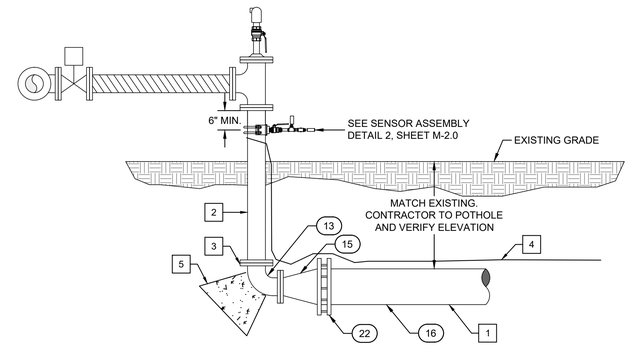
1. PROVIDE 12" PVC C900 PIPE, DR-18, FIELD FIT. BACKFILL PER DETAIL 1, SHEET C-2.0.
2. 6" DI PIPE, FLG X PE, FIELD FIT. PIPE WRAPPED WITH POLYETHYLENE WRAP PER AWWA C-105.
3. ALL BURIED DI FITTINGS TO BE WRAPPED WITH POLYETHYLENE WRAP PER AWWA C-105.
4. 10 GA. TRACER WIRE RUN CONTINUOUSLY ALONG CROWN OF WATER MAIN AS SHOWN FROM UNDERGROUND ELBOW TO TIE-IN POINT WITH EXISTING RIDGEMARK 12" WATER MAIN. INSTALL TRACER WIRE SPLICE PER DETAIL 5, SHEET C-2.4.
5. PROVIDE THRUST BLOCK PER SSCWD STANDARDS, SEE DETAIL 7, SHEET C-2.4. FOR THRUST BLOCKS PLACED AGAINST NEW FILL, INCREASE THRUST BLOCK AREA BY 25%.
6. CONNECT 6" X 12" DI REDUCER TO EX. 12" WATERLINE. CONTRACTOR TO REMOVE ENOUGH OF EX. 12" WATERLINE TO ACCOMMODATE NEW 6" RISER, 6" MJ X MJ ELBOW, THRUST BLOCK, AND NEW 12" PVC C900 PIPE SPOOL. BACKFILL PER DETAIL 1, SHEET C-2.0.
7. ENOUGH OF EX. 12" WATER MAIN SHALL BE REMOVED TO ACCOMMODATE THRUST BLOCK .SEE NOTE 5 FOR THRUST BLOCK REQUIREMENTS.
8. ABANDON REMAINING 12" WATER MAIN BY FILLING END OF EXISTING WATER MAIN WITH MIN. 12" NON-SHRINK GROUT.
9. EX. 12" C900 PVC WATER MAIN. PROTECT-IN-PLACE.



A SECTION A ELEVATION VIEW

SCALE: NTS

8. 3" WIDE ELECTRI
9. 10 GA. TI
10. RESTOR OF TREN



B SECTION B ELEVATION VIEW

SCALE: NTS

Rev.	Date	Description of Revisions	By
A	12/23/2024	ADDENDUM 2 - WELL 5 IMPROVEMENTS	ZCM

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REGISTERED PROFESSIONAL ENGINEER
ZACHARY C. MARKOW
No. 92952
CIVIL
STATE OF CALIFORNIA

SIGNATURE

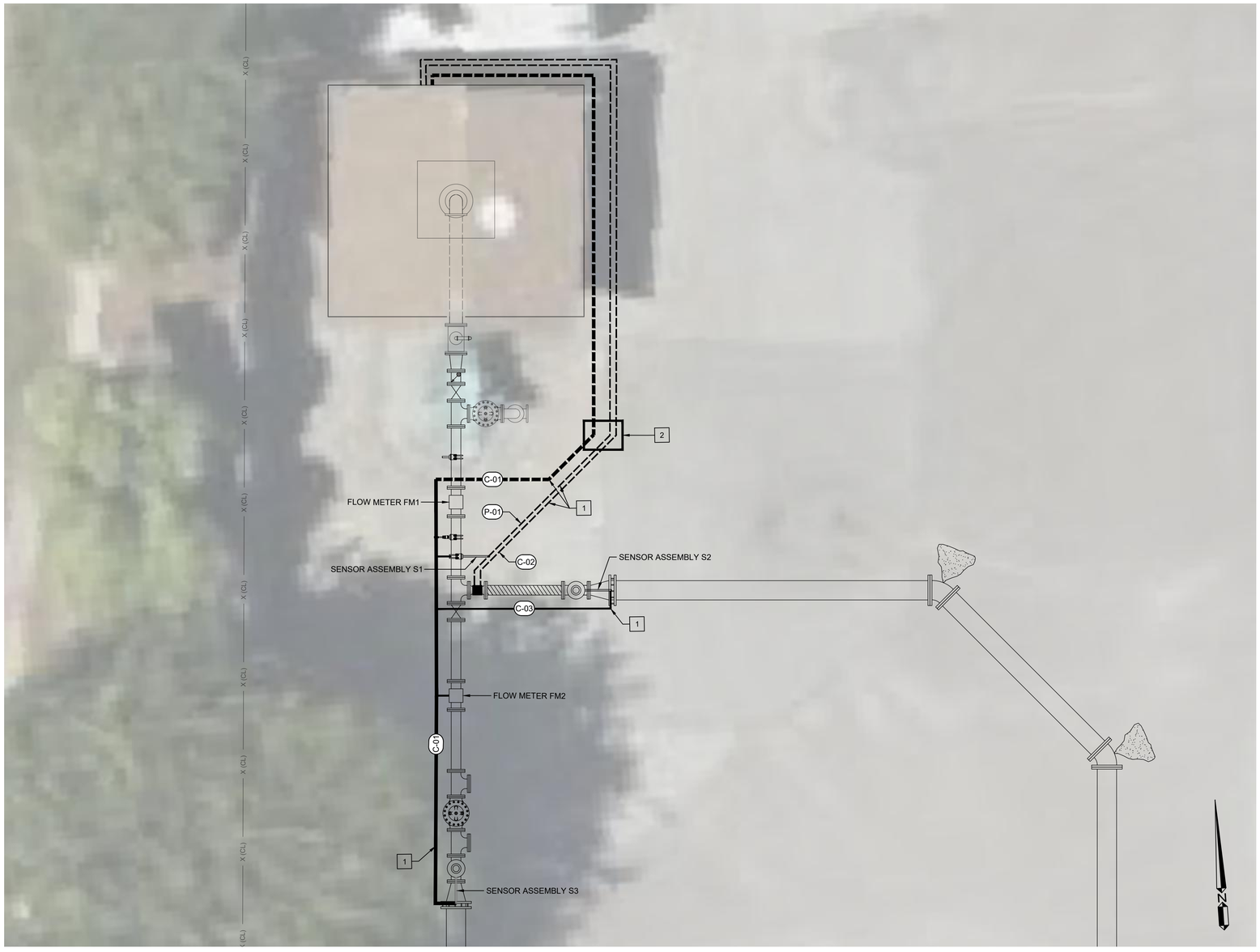
DATE SIGNED

SUNNYSLOPE COUNTY WATER DISTRICT
WATER SYSTEM CONSOLIDATION PROJECT
WELL 5 IMPROVEMENT DETAILS

JOB #: 0557-0005
DESIGNERS: ZCM
DRAWN BY: ONW
DATE: 12/26/24

DRAWING NO.
M-1.2
23 OF 25 SHEETS

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3
5



1 WELL 5 CONDUIT ROUTING PLAN

SCALE: 1" = 3'

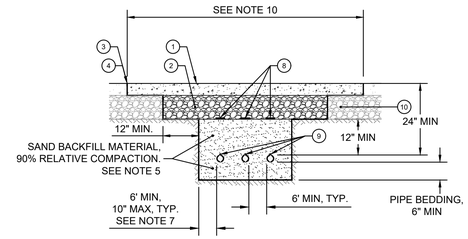
LEGEND

ABOVE-GROUND CONDUIT CABLE RUN

UNDERGROUND CONDUIT CABLE RUN

GENERAL NOTES :

1. PROVIDE CONDUIT PER SPECIFICATION 26 05 33.13. FURNISH SENSOR, FLOW METER, AND ACTUATOR CABLING IN LENGTHS SUCH THAT CABLING CAN BE INSTALLED WITHOUT SPLICING. CABLING TO BE INSTALLED BY OTHERS (N.I.C). COORDINATE ALL ELECTRICAL WORK WITH DISTRICT- APPOINTED SCADA INTEGRATOR. TRENCH/BACKFILL PER DETAIL 1, THIS SHEET.
2. PROVIDE AT GRADE CONCRETE PULL BOXES LOCATED SUCH THAT NO CONDUIT EXCEED 360 DEGREES OF BENDS OR 400FT BETWEEN PULL POINTS. TYPICAL.



NOTES:

1. ASPHALT CEMENT (AC) LAYER. AC SHALL BE HOT PLANT ASPHALT MIX. MIN. 3" THICKNESS. FINISH COURSE SHALL BE PLACED USING A PAVING MACHINE BOX WHERE POSSIBLE.
2. CLASS II AGGREGATE BASE LAYER, MIN. 8" LAYER THICKNESS OR MATCH EXISTING, WHICHEVER IS GREATER. MATERIAL COMPACTED TO 95% MIN. RELATIVE COMPACTION. CLASS 100-E-100 PCC MAY BE SUBSTITUTED FOR AGGREGATE BASE UPON APPROVAL OF ENGINEER.
3. EX. AC SHALL BE SAW CUT AND REMOVED IN SUCH A MANNER SO AS NOT TO TEAR, BULGE, OR DISPLACE ADJACENT PAVEMENT. ALL EDGES SHALL BE CLEAN AND VERTICAL.
4. APPLY TACK COAT TO EXISTING AC AT ALL CONTACT SURFACES, PRIOR TO RESURFACING, AS REQUIRED.
5. SAND BACKFILL MATERIAL MINIMUM SAND EQUIVALENT OF 30.
6. EXCAVATIONS TO COMPLY WITH CAL-OSHA REQUIREMENTS/REGULATIONS. SLOPED EXCAVATION ALLOWED WITH APPROVAL OF DISTRICT ENGINEER AND IN ACCORDANCE WITH GEOTECHNICAL RECOMMENDATIONS.
7. SIDE CLEARANCE EXCEEDING MAXIMUMS SHOWN SHALL USE 1-SACK CEMENT-SAND SLURRY OR CLASS II AGGREGATE BASE
8. 3" WIDE POLYETHYLENE NON-DETECTABLE WARMING TAPE, MARKED AND COLOR CODED FOR ALL NEW BURIED ELECTRICAL CONDUITS. INSTALL 12" ABOVE PIPE CROWN UNLESS OTHERWISE SPECIFIED OR SHOWN.
9. 10 GA. TRACER WIRE RUN CONTINUOUSLY ALONG CROWN OF BURIED CONDUIT, AS SHOWN.
10. RESTORE AC PAVEMENT WITHIN ENTIRE AREA SHOWN ON SHEET M-1.1. FOR PAVEMENT RESTORATION OUTSIDE OF TRENCH LIMITS, SMOOTH EX. AB SUBGRADE, PLACE AC 3" MIN., FINISH GRADE TO EX. SLOPE.

1 JOINT UTILITY TRENCH DETAIL

SCALE: NTS

GRAPHIC SCALE
0 1.5' 3' 6'
(IN FEET)
1 IN = 3 FT

CONDUIT TABLE

TAG	FROM	TO	CONDUIT
POWER			
P-01	SITE CONTROL PANEL, INSIDE EX. PUMP BUILDING	6" BUTTERFLY VALVE ACTUATOR	3/4"
CONTROLS			
C-01	SENSOR ASSEMBLIES, FLOW METERS	SITE CONTROL PANEL, INSIDE EX. PUMP BUILDING	2"
C-02	SITE CONTROL PANEL, INSIDE EX. PUMP BUILDING	6" BUTTERFLY VALVE ACTUATOR	3/4"
C-03	SENSOR ASSEMBLY S2	CONDUIT C-01	3/4"

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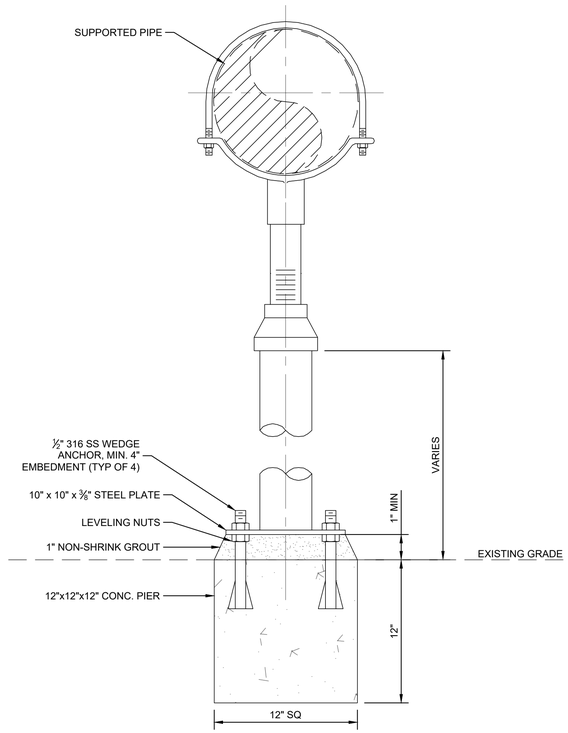
SIGNATURE

DATE SIGNED

SUNNYSLOPE COUNTY WATER DISTRICT
WATER SYSTEM CONSOLIDATION PROJECT
WELL 5 CONDUIT ROUTING PLAN

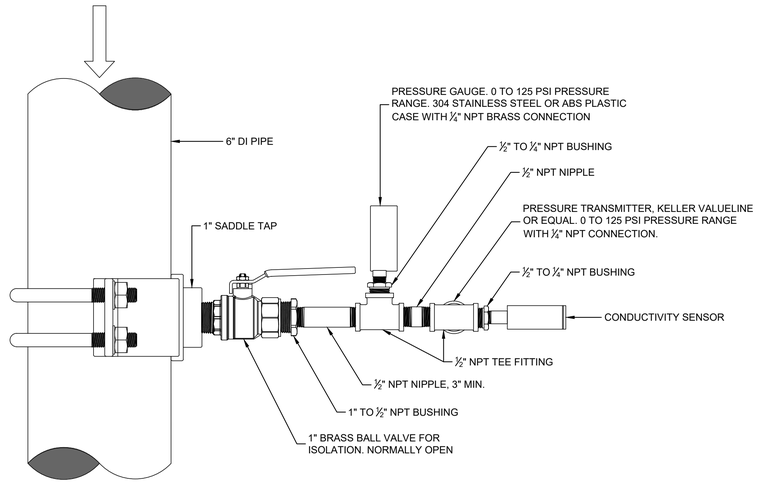
JOB #: 0557-0005
DESIGNERS: ZCM
DRAWN BY: ONW
DATE: 12/26/24

DRAWING NO.
M-1.3
24 OF 25 SHEETS



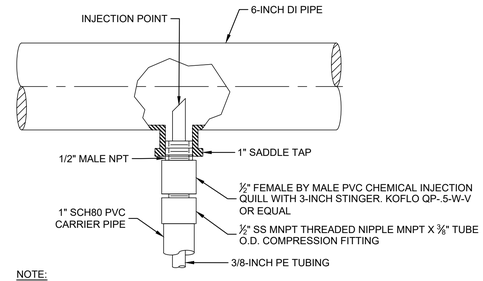
1 ADJUSTABLE PIPE SUPPORT

SCALE: NTS



2 SENSOR ASSEMBLY PROFILE DETAIL

SCALE: NTS

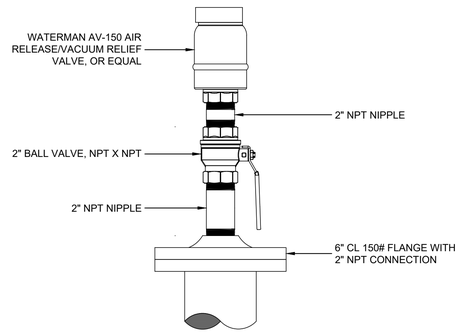


NOTE:

1. PROVIDE PTFE THREADED SEALING TAPE ON THREAD CONNECTIONS.

3 CHLORINE INJECTION PORT DETAIL

SCALE: NTS



4 AIR RELIEF VALVE ASSEMBLY DETAIL

SCALE: NTS

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SUNNYSLOPE COUNTY WATER DISTRICT
WATER SYSTEM CONSOLIDATION PROJECT
MECHANICAL DETAILS

JOB #: 0557-0005
DESIGNERS: ZCM
DRAWN BY: ONW
DATE: 12/26/24

DRAWING NO.
M-2.0
25 OF 25 SHEETS

EXHIBIT C

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 This Section describes the methods of measurement and payment for the specific bid items. All other provisions of the Contract Documents which relate to measurement and payment are applicable, except that where conflicts occur between this section and other provisions of the technical specifications or reference specifications, this measurement and payment section shall prevail.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 GENERAL

A. All work shown, described, or otherwise required by the Contract Documents, shall be included within the given bid items.

B. Payment for all bid items shall include full compensation for all equipment, materials, labor, tools, trucking, and all other incidental work necessary to construct complete and operational systems which conform to the Contract Documents.

3.02 MEASUREMENT AND PAYMENT FOR BID ITEMS

A. All lengths shall be measured in a horizontal plane (plan view dimensions), unless otherwise specified. All areas measured shall be based on the specified measurement definition included in each bid item description.

B. All work shown, described, or otherwise required by the Contract Documents, shall be included within the given bid items.

C. Basis for the submitted bid shall be on the quantities shown for the items on the Bid Sheet.

D. Unit definitions of Measurement and Payment

1. “Lump Sum”, or “LS”, shall mean a single Lump Sum Payment for the identified bid item. Partial payments may be made, based on the Engineer’s estimate of the percent completion of the specified item. Provide schedule of values for lump sum bid items with pay designation of “SV” on the bid schedule. Refer to Section 01 30 00, Administrative Requirements, Para. 1.05 for submittal requirements for Schedule of Values.

2. “Each”, or “EA”, shall mean the actual number of identified bid items provided. Payment for the identified bid item will be based on providing each item, complete and in place in accordance with the contract documents.

3. Measurable units of quantity expressed in “Linear Feet” or “LF”; “Cubic Yard or CY”; “Ton”; “SF” or “SY” shall mean the number of indicated measurable quantities of the bid item. Payment for the identified bid item will be based on actual and measured quantities of the bid item complete and in place in accordance with the contract documents.

4. For extra work, and quantity changes for unit price work, refer to the General Conditions.

E. Final Pay Quantities.

1. Bid items that are designated a Final Pay Quantity bid item by having the notation (F) or (S-F) shown on the bid sheet or by designation in this Section 01 20 00, Measurement and Payment.

2. The quantity shown on the bid sheet for a Final Pay Quantity shall be the final pay quantity used for the purpose of payments, unless the dimensions of any portion of the item are modified by the Engineer, or the item or any portion of the item is eliminated.

3. If the dimensions of any portion of a Final Pay Quantity bid item are changed, and the changes result in an increase or decrease in the quantity of the item, the final pay quantity will be revised by the change in quantity.

4. If a portion of a Final Pay Quantity item, or the item is eliminated, the final pay quantity will be adjusted by the quantity eliminated.

5. The estimated quantity shown on the bid sheet for a Final Pay Quantity bid item shall be considered as an estimate only and no guarantee is made that a quantity computed based on the details and the plans, will equal the estimated quantity shown on the bid sheet. No allowance is made in the event that a computed quantity does not equal the estimate quantity.

6. In the case of a discrepancy between a quantity shown on the plans, and an estimated quantity shown on the bid sheet for a Final Pay Quantity item, payment will be based on the quantity shown on the bid sheet.

BASE BID

Bid Item No. 1 – Mobilization/Demobilization

A. Units: Lump Sum

B. Measurement: Partial payments based on Engineer’s determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Mobilization/Demobilization.

1. Partial payment for Mobilization/Demobilization work will not be made until listed items in the schedule of values have been completed to the satisfaction of the Owner.

2. Contractor shall be compensated no more than 70% of total bid value for Mobilization/Demobilization for mobilization; and 30% for mobilization/demobilization for demobilization following completion of Work.

D. Scope of bid item: Mobilization/Demobilization includes, but is not limited to the following:

1. Mobilization/demobilization at the Project site.
2. Obtaining all required bonds, insurance, and permits.
3. Compliance with County of San Benito encroachment permit requirements, and other agency permit requirements for the Work.
4. Posting all Cal-OSHA required notices and establishment of safety programs and injury and illness prevention plan (IIPP).
5. Maintaining project schedule.
6. Moving onto the site of all Contractors' facilities and equipment required for project operations.
7. Arranging for and erection of Contractor's work areas and storage yards and coordinating such work areas and storage yards with County of San Benito, Sunnyslope County Water District staff, Best Road Mutual Water Company staff, and other agencies as necessary.
8. Procuring and installing all grant program signage per the DWR signage requirements attached to Section 01 30 00 – Administrative Requirements.
9. Coordination with utility companies during construction activities adjacent to utility agency facilities.
10. Coordinating with County of San Benito, Sunnyslope County Water District staff, Best Road Mutual Water Company staff, and other agencies during construction.
11. Providing and installing temporary communication facilities.
12. Potholing existing utilities to verify locations of subsurface utilities and tie-in points and providing pothole reports.
13. Providing and installing construction water and on-site sanitary facilities.
14. Designation of the Contractor's superintendent who will be present at the job site full time.
15. Documenting construction progress, including pre- and post-construction photographs, and progress photographs.
16. Preparing and submitting field record drawings.
17. Removing equipment, personnel, temporary facilities, and other construction resources at job completion.
18. Site cleanup.
19. All other incidental work as specified in Division 01 of these Specifications, Project Special Provisions, Project Standard Specifications, referenced Caltrans standard specifications, referenced County of San Benito special provisions, permit requirements, and as necessary to complete Mobilization/Demobilization in accordance with the Contract Documents.

Bid Item No. 2 - Construction Survey

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Construction Survey.

D. Scope of bid item: Construction Survey includes, but is not limited to the following:

1. Establishing horizontal control based on survey information provided in the Plans.
2. All survey Work related to existing and proposed water main works, as described in Section 02 21 00 – Surveys and the Drawings.
3. Re-setting monuments that may be damaged or need to be removed as part of the Work.
4. Replacement of property corner markers, including proper recordation.
5. Pothole surveys and pothole reports.
6. All other incidental work necessary to complete Construction Survey in accordance with the Contract Documents.

Bid Item No. 3 – Erosion, Sedimentation, and Water Pollution Control

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Erosion, Sedimentation, and Water Pollution Control.

D. Scope of bid item: Work for Erosion, Sedimentation, and Water Pollution Control includes, but is not limited to the following:

1. Proper management of storm water, dust, sediment, and erosion with best practices, where required. Refer to Section 01 57 13 – Temporary Erosion and Sediment Control and 01 57 23 Temporary Storm Water Pollution Control.
2. Complying with all reporting, monitoring, inspection and permitting requirements for protection of water quality.
3. All labor, equipment and materials to perform Erosion, Sedimentation, and Water Pollution Control activities.
4. All other incidental work necessary to complete Erosion, Sedimentation, and Water Pollution Control in accordance with the Contract Documents.

Bid Item No. 4 – Traffic Control

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Traffic Control.

D. Scope of bid item: Work for Traffic Control includes, but is not limited to the following:

1. Traffic control in accordance with County of San Bentio requirements, as required for execution of the Work.
2. Required plans and submittals.
3. All other incidental work necessary to complete Traffic Control in accordance with the Contract Documents.

Bid Item No. 5 - Sheeting, Shoring and Bracing

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Sheeting, Shoring and Bracing.

D. Scope of bid item: Work for Sheeting, Shoring and Bracing includes, but is not limited to the following:

1. Required fees, permits, plans, and submittals, prepared by California registered civil or structural engineer.
2. Compliance with all requirements for Cal-OSHA construction safety in the excavation of trenches and pits, and other technical requirements in Division 31 specifications, and trench details on the plans.
3. Trench excavation plans if required.
4. Providing adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, which shall conform to the applicable construction safety orders.
5. All other incidental work necessary to complete Sheeting, Shoring and Bracing in accordance with the Contract Documents

Bid Item No. 6 – Connect to Existing SSCWD and BRWMC Water Mains

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Connect to Existing SSCWD and BRMWC Water Mains.

D. Scope of bid item: Connect to Existing SSCWD and BRMWC Water Mains includes, but is not limited to the following:

1. Furnish and install new C900 pipe, ductile iron adapters and fittings, and thrust blocks at new water main connections to existing water services as shown on the Plans.
2. Removal of existing piping, fittings, blow offs, thrust blocks and blind flanges, where required.
3. Coordination and notification requirements to water service providers for temporary disruption of service.

4. Trenching, hand-digging, exposing, backfilling, compaction, including pavement restoration, where required.
5. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents, including removal and disposal of any vegetation within the project boundary as shown in the plans.
6. Control/management of groundwaters.
7. Verification of adjacent utilities.
8. Pressure testing and disinfection per SSCWD Plans and Standards and these Specifications.
9. And all other incidental work necessary to implement Connect to Existing SSCWD and BRMWC Water Mains complete, in place, and in accordance with the Contract Documents.

Bid Item No. 7 – Furnish and Install 8" C900 PVC Water Main

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of water line constructed per contract documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for Furnish and Install 8" C900 PVC Water Main shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications

D. Scope of Bid Item: Furnish and Install 8" C900 PVC Water Main shall include, but is not limited to the following:

1. Pipe, adapters, fittings, thrust blocks, and connections to existing pipes.
2. Identification/warning tape, tracer wire.
3. Trenching, hand-digging, exposing, backfilling, and sub-grade compaction.
4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
5. Removal and disposal of any vegetation within the water main alignment, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.
6. Control/management of groundwaters.
7. Verification of adjacent utilities.
8. Pressure testing and disinfection per SSCWD Plans and Standards and these Specifications.
9. And all other incidental work necessary to implement Furnish and Install 8" C900 PVC Water Main complete, in place, and in accordance with the Contract Documents.

Bid Item No. 8 – Furnish and Install 8" Gate Valves

A. Units: Each (EA)

B. Measurement: Each fully furnished and installed valve, with complete connection to water main and required valve box and riser in accordance with the Plans and Specifications.

C. Payment: The payment quantity for Furnish and Install 8" Gate Valves shall be on a unit price basis per each item, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications.

D. Scope of Bid Item: Furnish and Install 8" Gate Valves shall include, but is not limited to the following:

1. Furnish and install valves in accordance with the Plans and Specifications.
2. Tie-in to new and existing water main(s) as shown on the Plans.
3. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
4. Control/management of groundwaters.
5. Verification of adjacent utilities.
6. And all other incidental work necessary to implement Furnish and Install Valves complete, in place, and in accordance with the Contract Documents.

Bid Item No. 9 – Furnish and Install 1" Air Valve Assembly

A. Units: Each (EA)

B. Measurement: Each fully furnished and installed assembly, with complete connection to water main.

C. Payment: The payment quantity for Furnish and Install 1" Air Valve Assembly shall be on a unit price basis per each item, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications.

D. Scope of Bid Item: Furnish and Install 1" Air Valve Assembly shall include, but is not limited to the following:

1. Furnish and install 1" combination air and vacuum valve assembly in accordance with the Plans and Specifications, including traffic bollards, as shown in the drawings.
2. Connection to new water main as shown in the plans.
3. Furnish and install bollards as shown in the plans.
4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
5. Control/management of groundwaters.
6. Verification of adjacent utilities.
7. And all other incidental work necessary to implement Furnish and Install 1" Air Valve Assembly complete, in place, and in accordance with the Contract Documents.

Bid Item No. 10 – Furnish and Install Fire Hydrant Assembly

A. Units: Each (EA)

B. Measurement: Each fully furnished and installed assembly, with complete connection to water main.

C. Payment: The payment quantity for Furnish and Install Fire Hydrant Assembly shall be on a unit price basis per each item, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications.

D. Scope of Bid Item: Furnish and Install Fire Hydrant Assembly shall include, but is not limited to the following:

1. Furnish and install fire hydrant assembly in accordance with the Plans and Specifications.
2. Connection to new water main as shown on the drawings.
3. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
4. Control/management of groundwaters.
5. Verification of adjacent utilities.
6. And all other incidental work necessary to implement Furnish and Install Fire Hydrant Assembly complete, in place, and in accordance with the Contract Documents.

Bid Item No. 11 – Furnish and Install Shallow Trench Water Main Installation

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of shallow trench water main constructed per contract documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for Furnish and Install Shallow Trench Water Main Installation shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications.

D. Scope of Bid Item: Furnish and Install Shallow Trench Water Main Installation shall include, but is not limited to the following:

1. 8” CL 350 Ductile Iron pipe, adapters, fittings, and connections to new C900 PVC water main, where shown in the Plans.
2. Identification/warning tape, tracer wire.
3. Trenching, hand-digging, exposing, backfilling, and compaction, including placement of 1-sack cement slurry backfill in accordance with the Plans and these Specifications.
4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.

5. Removal and disposal of any vegetation within the water main alignment, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.
6. Control/management of groundwaters.
7. Verification of adjacent utilities.
8. Pressure testing and disinfection per SSCWD Plans and Standards and these Specifications.
9. And all other incidental work necessary to implement Furnish and Install Shallow Trench Water Main Installation, in place, and in accordance with the Contract Documents.

Bid Item No. 12 – Abandon Existing BRMWC Wells

A. Units: Each (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for Abandon Existing BRMWC Wells.

D. Scope of Bid Item: Abandon Existing BRMWC Wells shall include, but is not limited to the following:

1. Removal of existing well pump, motor, electrical components, and above-ground piping.
2. Capping existing underground discharge pipe.
3. Backfill of well casing in accordance with the Contract Documents.
4. Trenching, hand-digging, exposing, backfilling, surface restoration, compaction, and hydroseeding.
5. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
6. Removal and disposal of any vegetation within the well area, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.
7. Control/management of groundwaters.
8. Verification of adjacent utilities.
9. And all other incidental work necessary to implement Abandon Existing BRMWC Wells, in place, and in accordance with the Contract Documents.

Bid Item No. 13 – Storm Drain Undercrossing

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of shallow trench water main constructed per contract documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for Storm Drain Undercrossing shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications.

D. Scope of Bid Item: Storm Drain Undercrossing shall include, but is not limited to the following:

1. Furnish and install 20 LF of 8" CL 350 Ductile Iron pipe, adapters, fittings, and connections to new C900 PVC water main, where shown in the Plans.
2. Identification/warning tape, tracer wire.
3. Trenching, hand-digging, exposing, backfilling, and compaction, including placement of 1-sack cement slurry backfill in accordance with the Plans and these Specifications.
4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
5. Removal and disposal of any vegetation within the water main alignment, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.
6. Control/management of groundwaters.
7. Verification of adjacent utilities.
8. Pressure testing and disinfection per SSCWD Plans and Standards and these Specifications.
9. And all other incidental work necessary to implement Storm Drain Undercrossing, in place, and in accordance with the Contract Documents.

Bid Item No. 14 – Sanitary Sewer Force Main Undercrossing

A. Units: Linear Feet (LF)

B. Measurement: Linear feet of shallow trench water main constructed per contract documents for this item, measured along horizontal projection along centerline axis of water main.

C. Payment: The payment quantity for Sanitary Sewer Force Main Undercrossing shall be on a unit price basis per lineal foot, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications.

D. Scope of Bid Item: Sanitary Sewer Force Main Undercrossing shall include, but is not limited to the following:

1. Furnish and install 20 LF of 8" CL 350 Ductile Iron pipe, adapters, fittings, and connections to new C900 PVC water main, where shown in the Plans.
2. Identification/warning tape, tracer wire.
3. Trenching, hand-digging, exposing, backfilling, and compaction, including placement of 1-sack cement slurry backfill in accordance with the Plans and these Specifications.

4. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.

5. Removal and disposal of any vegetation within the water main alignment, as shown in the plans, including all labor, equipment, materials, and miscellaneous costs to perform this work.

6. Control/management of groundwaters.

7. Verification of adjacent utilities.

8. Pressure testing and disinfection per SSCWD Plans and Standards and these Specifications.

9. And all other incidental work necessary to implement Sanitary Sewer Force Main Undercrossing in place, and in accordance with the Contract Documents.

Bid Item No. 15 – SSCWD Well #5 Improvements

A. Units: Lump Sum (LS)

B. Measurement: Partial payments based on Engineer's determination.

C. Payment: Payment includes full compensation for all work required to complete the contract requirements for SSCWD Well #5 Improvements.

D. Scope of Bid Item: SSCWD Well #5 Improvements shall include, but is not limited to the following:

1. Removal of all above-ground piping and valving, blowoff assembly, thrust blocks, and sections of underground piping, where shown on the Drawings.

2. Furnish and install 6" Cl 350 Ductile Iron pipe, adapters, valving, fittings, flanges, and connections to new C900 PVC water main, where shown on the Drawings.

3. Furnish and install 12" C900 pipe, adapters, fittings, and connections to existing water mains, where shown on the Drawings.

4. Furnish and install all sensors, control valves, magnetic flow meters, static mixers, and associated appurtenances, where shown on the Drawings.

5. Furnish and install all above-ground and underground conduit, including all fittings and conduit supports/hangers and pull rope, where shown on the Drawings.

6. Coordinate system integration and testing with Owner and SCADA consultant.

7. Painting/coating of all new above-ground piping, in accordance with these Specifications and where shown on the Drawings.

8. Identification/warning tape, tracer wire.

9. Trenching, hand-digging, exposing, backfilling, compaction, and pavement restoration in accordance with the Plans and these Specifications.

10. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.

11. Control/management of groundwaters.

12. Potholing of adjacent utilities.

13. And all other incidental work necessary to implement SSCWD Well #5 Improvements, in place, and in accordance with the Contract Documents.

Bid Item No. 16 – Class 2 Aggregate Base

A. Units: Cubic Yard (CY)

B. Measurement: Cubic yard of Class 2 aggregate base material placed and compacted inside the pipe trench in accordance with the Plans and Specifications, measured along the horizontal of the pipe trench and the depth of the base layer, measured from the top of the existing grade.

C. Payment: The payment quantity for Class 2 Aggregate Base shall be on a unit price basis per cubic yard, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications

D. Scope of Bid Item: Class 2 Aggregate Base shall include, but is not limited to the following:

1. Furnish, place, and compact Class 2 aggregate base required for street restoration, within the pipe trench and other areas of excavation for items of Work shown in the Plans.
2. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
3. And all other incidental work necessary to implement Class 2 Aggregate Base, in place, and in accordance with the Contract Documents.

Bid Item No. 17 – Hot Mix Asphalt

A. Units: Tons (TON)

B. Measurement: Ton of Hot Mix Asphalt material placed and compacted inside the pipe trench and up to the existing pavement, in accordance with the Plans and Specifications, measured along the horizontal of the pipe trench and the depth of the HMA layer, measured from the top of the existing grade.

C. Payment: The payment quantity for Hot Mix Asphalt shall be on a unit price basis per ton, and shall be full compensation for all materials, labor, tools equipment and incidentals to acceptably construct this item in accordance with the Plans and Specifications

D. Scope of Bid Item: Hot Mix Asphalt shall include, but is not limited to the following:

1. Furnish, place, and compact hot mix asphalt required for street restoration, within the pipe trench and other areas of excavation for items of Work shown in the Plans.
2. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
3. And all other incidental work necessary to implement Hot Mix Asphalt, in place, and in accordance with the Contract Documents.

Bid Item No. 18 – Furnish and Install Pavement Marking and Striping

E. Units: Lump Sum (LS)

F. Measurement: Partial payments based on Engineer's determination.

G. Payment: Payment includes full compensation for all work required to complete the contract requirements for Furnish and Install Pavement Marking and Striping.

H. Scope of Bid Item: Furnish and Install Pavement Marking and Striping shall include, but is not limited to the following:

1. Thermoplastic striping, where required and in accordance with the Plans and Specifications.
2. Hauling and disposing of all waste, unsuitable, and excess material in accordance with the Contract Documents.
3. And all other incidental work necessary to implement Furnish and Install Pavement Marking and Striping, in place, and in accordance with the Contract Documents.

END OF SECTION

SECTION 09 90 00

PAINTING AND COATING

PART 1 GENERAL

1.01 DESCRIPTION

A. This section covers all labor, material, tools and services for the performance of all painting work specified, shown, or scheduled, including the painting of all machinery, piping, miscellaneous structural metal hangers and supports, and certain ferrous surfaces exposed to liquids or the weather.

B. The terms "paint" and "coating" used herein include emulsions, enamels, paints, stains, varnishes, sealers, and other coatings, organic or inorganic, whether used as intermediate, or finish coats.

C. Complete painting in accordance with specifications, and paint manufacturer's current surface preparation and application instructions.

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. NACE International (NACE): RP0188, Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
2. NSF International (NSF): 61, Drinking Water System Components-Health Effects.
3. The Society for Protective Coatings (SSPC) Standard Protocols.

1.03 SUBMITTALS

A. All submittals shall be in accordance with the requirements of Section 01 33 00.

B. Submit manufacturer’s data sheets showing the following information:

1. Percent solids by volume.
2. Minimum and maximum recommended dry film thickness per coat for prime, imtermediate, and finish coats.
3. Recommended surface preparation.
4. Recommended thinners.
5. Statement verifying that the specified prime coat is recommended by the manufacturer for use with the specified intermediate and finish coats.
6. Application instructions including recommended equipment and temperature limitations.
7. Curing requirements and instructions.

C. Submit color swatches.

D. Submit certificate identifying the type and gradation of abrasives used for surface preparation.

E. Submit material safety data sheets for each paint system.

1.04 QUALITY ASSURANCE

A. Applicator's Experience: Minimum 5 years' practical experience in application of specified products.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Site in unopened containers that plainly show designated name, date of manufacture, color, and manufacturer.

B. Store paints in a protected area that is heated or cooled to maintain temperature range recommended by paint manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Paint manufacturer shall be nationally recognized manufacturer of paints and protective coatings and regularly engaged in production of such materials that have essentially identical service conditions as this Project.

B. Minimum of 5 years' verifiable experience in manufacture of specified products.

2.02 PAINTING AND COATING SYSTEMS

A. The following index lists the various painting and coating systems by service and generic type:

No.	Title	Generic Coating
13	Exposed Metal, Atmospheric Weathering and Corrosive Environments	Epoxy with urethane topcoat
21	Buried Metal	Epoxy

B. Exposed Metal Coating Systems:

1. System No. 13: Exposed Metal, Atmospheric Weathering and Corrosive Environments.
   a. Type: High-build epoxy prime coat with a pigmented high-build aliphatic or acrylic polyurethane finish coat.
   b. Service Conditions: For use with metal structures, pipes, fittings, appurtenances, and pipe supports subjected to water condensation and corrosive environments.
   c. Surface Preparation: SSPC SP-10.

d. Prime Coat: Two-component high-build epoxy. Apply to a thickness of 8 mils.
   1) Products:
      a) Ameron 400,
      b) ICI Devoe 235,
      c) Tnemec 104,
      d) International Interseal 670HS,
      e) Sherwin-Williams Macropoxy 646 B58-600,
      f) PPG PITT-GUARD® Direct-to-Rust Epoxy Mastic Coaring 97 145 Series, or approved equal.

e. Finish Coat: Two-component pigmented high-build polyurethane. Apply one or more coats to a total thickness of 5 mils.
   1) Products:
      a) Ameron Amershield,
      b) ICI Devoe Devthane 359,
      c) Tnemec Series 1075,
      d) International Interthane 990HS,
      e) Sherwin-Williams Hi-Solids Polyurethane B65-300,
      f) PPG PITTHANE® Ultra Gloss Urethane Enamel 95-812 Series, or approved equal.

C. Buried Metal Coating Systems:

1. System No. 21: Buried Metal.
   a. Type: High solids epoxy or phenolic epoxy having a minimum volume solids of 80% (ASTM D2697).
   b. Service Conditions: For use with buried metal, such as valves, flanges, bolts, nuts, structural steel, and fittings.
   c. Surface Preparation: SSPC SP-10.
   d. Coating System: Apply three or more coats to a total thickness of 30 mils. Maximum thickness of an individual coating shall not exceed the manufacturer's recommendation.
      1) Products:
         a) Ameron 400,
         b) Tnemec 104HS,
         c) ICI Devoe Bar-Rust 233H,
         d) Carboline 890LT,
         e) Sherwin-Williams Tank Clad HS B62-80 Series, or approved equal.

D. Abrasives for Surface Preparation:

1. Abrasives used for preparation of ferrous (excluding stainless steel) surfaces shall be one of the following:
   a. 16 to 30 or 16 to 40 mesh silica sand or mineral grit.
   b. 20 to 40 mesh garnet.
   c. Crushed iron slag, 100% retained on No. 80 mesh.
   d. SAE Grade G-40 or G-50 iron or steel grit.

2. Abrasives used for preparation of stainless steel surfaces shall be 20 to 40 mesh silicon carbide or aluminum oxide.

PART 3 EXECUTION

3.01 GENERAL

A. Perform painting in accordance with the recommendations of the following:

1. Paint manufacturer's instructions.
2. Federal, state, and local agencies having jurisdiction.

B. Environmental Requirements:

1. Do not paint in the rain, wind, snow, mist, and fog or when steel or metal surface temperatures are less than 5°F above the dew point.
2. Do not apply paint when the relative humidity is above 85%.
3. Do not paint when temperature of metal surface is above 120°F.
4. Do not apply epoxy, acrylic latex, and polyurethane paints on an exterior or interior surface if air or surface temperature is below 60°F or expected to drop below 60°F in 24 hours.

3.02 SURFACE PREPARATION

A. Surface Preparation Procedures:

1. Remove oil and grease from metal surfaces in accordance with SSPC SP-1. Use clean cloths and cleaning solvents and wipe dry with clean cloths. Do not leave a film or greasy residue on the cleaned surfaces before abrasive blasting.
2. Remove weld spatter and weld slag from metal surfaces and grind smoothly rough welds, beads, peaked corners, and sharp edges including erection lugs in accordance with SSPC SP-2 and SSPC SP-3. Grind 0.020 inch (minimum) off the weld caps on pipe weld seams. Grind outside sharp corners, such as the outside edges of flanges, to a minimum radius of 1/4-inch.
3. Do not abrasive blast or prepare more surface area in one day than can be coated in one day; prepare surfaces and apply coatings the same day. Remove sharp edges, burrs, and weld spatter.
4. Do not abrasive blast PVC piping. Do not abrasive blast epoxy- or enamel-coated pipe, fittings, or appurtenances that have already been factory coated, except to repair scratched or damaged coatings.
5. Apply coatings within two hours of blasting or before any rust bloom forms.

B. Surface preparation shall conform with the SSPC specifications as follows:

Solvent Cleaning	SP-1
Hand Tool Cleaning	SP-2
Power Tool Cleaning	SP-3
White Metal Blast Cleaning	SP-5
Commercial Blast Cleaning	SP-6
Brush-Off Blast Cleaning	SP-7
Near-White Blast Cleaning	SP-10
Power Tool Cleaning to Bare Metal	SP-11
Surface Preparation and Cleaning of Steel and Other Hard Materials by High- and Ultrahigh-Pressure Water Jetting Prior to Recoating	SP-12

C. Wherever the words “solvent cleaning,” “hand tool cleaning,” “wire brushing,” or “blast cleaning” or similar words are used in these specifications or in paint manufacturer’s specifications, they shall be understood to refer to the applicable SSPC surface preparation specifications listed above.

D. For carbon steel surfaces, after abrasive blast cleaning, the height of the surface profile shall be 2 to 3 mils. Verify the surface profile by measuring with an impresser tape acceptable to the Owner or Owner’s Representative.
   1. Perform a minimum of one test per 100 square feet of surface area.
   2. Testing shall be witnessed by the Owner or Owner’s Representative.
   3. Impresser tape used in the test shall be permanently marked with the date, time, and locations where the test was made.
   4. Test results shall be promptly presented to Owner or Owner’s Representative.

E. Surface Preparation Inspection:

   1. Inspect and provide substrate surfaces prepared in accordance with these Specifications and printed directions and recommendations of paint manufacturer whose product is to be applied. In the event of conflict, the more stringent requirements shall apply.

   2. Notify Owner a minimum of 7 calendar days prior to start of surface preparation work or coating application work.

   3. Perform work only in the presence of the Owner, unless Owner grants prior approval to perform work in Owner’s absence.

3.03 ABRASIVE BLAST CLEANING

A. Use dry abrasive blast cleaning for metal surfaces. When shop or field blast cleaning with handheld nozzles, do not recycle or reuse blast particles.

B. After abrasive blast cleaning and prior to application of coating, dry clean surfaces to be coated by dusting, sweeping, and vacuuming to remove residue from blasting. Apply the specified primer or touch-up coating any blast cleaned surface not coated within time period specified in Paragraph 3.02.A.5.

C. Kep the area of work in a clean condition and do not permit blasting particles to accumulate and constitute a nuisance or hazard.

D. During abrasive blast cleaning, prevent damage to adjacent coatings.

E. Schedule blast cleaning and coating such that dust, dirt, blast particles, old coatings, rust, mill scale, etc. will not damage or fall upon wet or newly coated surfaces.

3.04 PAINTING SYSTEMS

A. All materials of a specified painting system, including primer, intermediate, and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.

B. Deliver paints to the jobsite in the original, unopened containers.

3.05 PAINT STORAGE AND MIXING

A. Store and mix materials only in areas designated for that purpose by the Owner.

B. The area shall be well-ventilated, with precautionary measures taken to prevent fire hazards. Post “No Smoking” signs. Storage and mixing areas shall be clean and free of rags, waste, and scrapings.

C. Tightly close containers after each use. Store paint at an ambient temperature from 50°F to 100°F.

D. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life.

E. Provide small quantity kits for touch-up painting and for painting other small areas.

F. Mix only the components specified and furnished by the paint manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

3.06 SURFACES TO BE COATED

A. The exact coating to be applied in any location is not designated by the descriptive phrases in the coating system titles such as “corrosive environment,” “buried metal,” or “submerged metal.” Coat surfaces with the specified coating systems as described below:
   1. Coat valves as described the same as the adjacent piping. Above-ground valves, or valves in vaults and structures, shall match the color of the connecting piping, unless otherwise specified.
   2. Coat buried flanges, valves, flexible pipe couplings, exposed rebar in thrust blocks, and valve boxes per System No. 21.

3.07 PROCEDURES FOR THE APPLICATION OF COATINGS

A. Conform to the requirements of SSPC PA-1. Follow the recommendations of the coating manufacturer including the selection of spray equipment, brushes, rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

B. Stir, strain, and keep coating materials at a uniform consistency during application. Power mix components. For multiple component materials, premix each component before combining. Appy each coating evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. Use a different shade or tint on succeeding coating applications to indicate coverage where possible. Finished surfaces shall be free from defects or blemishes.

C. Do not use thinners unless recommended by the coating manufacturer. If thinning is allowed, do not exceed the maximum allowable amount of thinner per gallon of coating material. Stir coating materials at all times when adding thinner. Do not flood the coating material surface with thinner prior to mixing. Do not reduce coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry-film thickness.

D. Allow ventilator fans to clean airborne dust to provide good visibility of working area prior to coating applications.

E. Remove dust from coated surfaces by dusting, sweeping, and vacuuming prior to applying succeeding coats.

F. Apply coating systems to the specified minimum dry-film thickness as determined per SSPC PA-2.

G. Apply primer immediately after blast cleaning and before any surface rusting occurs, or any dust, dirt, or any foreign matter has accumulated. Reclean surfaces by blast cleaning that have surface colored or become moist prior to coating application.

H. Apply a brush coat of primer on welds, sharp edges, nuts, bolts, and irregular surfaces prior to the application of the primer and finish coat. Apply the brush coat prior to and in conjunction with the spray coat application. Apply the spray coat over the brush coat.

I. Before applying subsequent coats, allow the primer and intermediate coats to dry for the minimum curing time recommended by the manufacturer. In no case shall the time between coats exceed the manufacturer's recommendation.

J. Each coat shall cover the surface of the preceding coat completely, and there shall be a visually perceptible difference in applied shade or tint of colors.

K. Applied coating systems shall be cured at 75°F or higher for 48 hours. If the temperature is lower than 75°F, curing time shall be in accordance with printed recommendations of the manufacturer, unless otherwise allowed by the Owner.

L. Assembled parts shall be disassembled sufficiently before painting or coating to ensure completed coverage by the required coating.

3.08 PROCEDURES FOR ITEMS HAVING SHOP-APPLIED PRIME COATS

A. After application of primer to surfaces, allow coating to cure for a minimum of two hours before handling to minimize damage.

B. When loading for shipment to the project site, use spacers and other protective devices to separate items to prevent damaging the shop-primed surfaces during transit and unloading. If wood spacers are used, remove wood splinters and particles from the shop-primed surfaces after separation. Used padded chains or ribbon binders to secure the loaded items and minimize damage to the shop-primed surfaces.

C. Cover shop-primed items 100% with protective coverings or tarpaulins to prevent deposition of road salts, fuel residue, and other contaminants in transit.

D. Handle shop-primed items with care during unloading, installation, and erection operations to minimize damage. Do not place or store shop-primed items on the ground or on top of other work unless ground or work is covered with a protective covering or tarpaulin. Place shop-primed items above the ground upon platforms, skids, or other supports.

3.09 FIELD TOUCH-UP OF SHOP-APPLIED PRIME COATS

A. Remove oil and grease surface contaminants on metal surfaces in accordance with SSPC SP-1. Use clean rags wetted with a degreasing solution, rinse with clean water, and wipe dry.

B. Remove dust, dirt, salts, moisture, chalking primers, or other surface contaminants that will affect the adhesion or durability of the coating system.

C. Use a high-pressure water blaster or scrub surfaces with a broom or brush wetted with a solution of trisodium phosphate, detergent, and water. Before applying intermediate or finish coats to inorganic zinc primers, remove any soluble zinc salts that have formed by means of scrubbing with a stiff bristle brush. Rinse scrubbed surfaces with clean water.

D. Remove loose or peeling primer and other surface contaminants not easily removed by the previous cleaning methods in accordance with SSPC SP-7. Take care that the remaining primers are not damaged by the blast cleaning operation. Remaining primers shall be firmly bonded to the steel surfaces with blast cleaned edges feathered.

E. Use repair procedures on damaged primer that protects adjacent primer. Blast cleaning may require the use of lower air pressure, smaller nozzles, and abrasive particle sizes, short blast nozzle distance from surface, shielding, and/or masking.

F. After abrasive blast cleaning of damaged and defective areas, remove dust, blast particles, and other debris by dusting, sweeping, and vacuuming; then apply the specified touch-up coating.

G. Surfaces that are shop-primed shall receive a field touch-up of the same primer used in the original prime coat.

3.010 DRY-FILM THICKNESS TESTING

A. Measurement: Measure coating thickness specified for carbon steel surfaces with a magnetic-type dry-film thickness gauge in accordance with SSPC PA-2.
   1. Provide certification that the gauge has been calibrated by a certified laboratory within the past six months.
   2. Gauge manufacturers:
      a. Mikrotest,
      b. Elcometer.

B. Test the finish coat of metal surfaces (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type.
   1. Provide certification that the detector has been calibrated by a certified laboratory within the past six months.
   2. Detector manufacturers:
      a. Tinker and Rasor,
      b. K-D Bird Dog.

C. Test each coat for correct dry-film thickness.

D. Do not measure within eight (8) hours after application of coating.

E. For metal surfaces:
   1. Make five separate spot measurements (average of three readings) spaced evenly over each 100 square feet of area (or fraction thereof) to be measured.
   2. Make three readings for each spot measurement of either the substrate or the paint. Take the average (mean) of the three readings as the spot measurement
      a. Move the probe or detector a distance of 1 to 3 inches for each new gauge reading.
      b. Discard any unusually high or low reading that cannot be repeated consistently.
   3. The average of five spot measurements for each such 100 square-foot area shall not be less than the specified thickness.
   4. No single spot measurement in any 100 squre-foot area shall be less than 80%, nor more than 120%, of the specified thickness.

F. Perform tests in the presence of the Owner or Owner’s representative.

3.011 SURFACES NOT TO BE PAINTED

A. The following surfaces shall not be painted or coated, unless otherwise noted in the Drawings or in other specification sections. Protect during the painting of adjacent areas:
   1. Concrete walkways, aprons, foundations, or slabs
   2. Asphalt paving
   3. Stainless steel supports, fittings, valve trim, shafts, or fasteners
   4. Metal letters
   5. Glass
   6. Fencing
   7. Copper tubing, red brass piping, and PVC piping, except where such piping occurs in rooms where the walls are painted, or required for color coding.
   8. Electrical fixtures, except where factory-coated and touch-up is required.

9. Grease fittings
10. Brass and copper fittings
11. Buried pipe, unless specifically required in the piping specifications
12. Magnetic flow meters
13. Aluminum items

3.012 PROTECTION OF SURFACES NOT TO BE PAINTED

A. Protect all surfaces adjacent to, and downwind of Work area from overspray. Contractor shall be responsible for any damages resulting from overspray.

B. Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not specified elsewhere.

C. Provide drop cloth to prevent paint materials from falling on or marring adjacent surfaces.

D. Protect working parts of mechanical and electrical equipment from damage.

E. Mask openings in motors to prevent paint and other materials from entering the motors.

3.013 REPAIR OF IMPROPERLY COATED SURFACES

A. If the item has an improper finish color or insufficient film thickness, clean and topcoat the surface with the specified paint material to obtain the specified color and coverage.

B. Sandblast or power-sand visible areas of chipped, peeled, or abraded paint, feathering the edges. Then prime and finish coat in accordance with the specifications.

C. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

3.014 CLEANING

A. During the progress of the work, remove discarded materials, rubbish, cans, and rags at the end of each day’s work.

B. Thoroughly clean brushes and other application equipment at the end of each period of use and when changing to another paint system or color.

C. Upon completion of the painting work, remove masking tape, tarps, and other protective materials, using care not to damage surfaces.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section includes materials, testing, and installation requirements of hangers and supports for conduit utilized for electrical services.

1.02 RELATED SPECIFICATIONS

A. Section 01 33 00 – Submittals

B. Section 26 05 33.13 – Conduit for Electrical Systems

C. Section 31 23 33 – Trenching and Backfilling

1.03 REFERENCES

A. NECA 1 - Standard for Good Workmanship in Electrical Construction

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
   2. Notify Owner of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00.

B. Product data:
   1. Provide manufacturer’s standard catalog pages and data sheets for hangers and supports

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store hangers and supports in accordance with manufacturer’s instructions.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   4. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
      c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Comply with MFMA-4.
   2. Channel Material:
      a. Indoor Dry Locations: Use zinc-plated steel or galvanized steel.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
   3. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch (2.66 mm).
   4. Minimum Channel Dimensions: 1-5/8 inch (41 mm) width by 13/16 inch (21 mm) height.
   5. Manufacturers:
      a. Cooper B-Line, a division of Eaton Corporation.
      b. Thomas & Betts Corporation.
      c. Unistrut, a brand of Atkore International Inc.
      d. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.

E. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete: Use preset concrete inserts or expansion anchors.
   3. Solid or Grout-Filled Masonry: Use expansion anchors.
   4. Hollow Masonry: Use toggle bolts.
   5. Hollow Stud Walls: Use toggle bolts.

6. Steel: Use machine bolts or welded threaded studs.
7. Wood: Use wood screws.
8. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
   a. Comply with MFMA-4.
   b. Channel Material: Use galvanized steel.
   c. Manufacturer: Same as manufacturer of metal channel (strut) framing system.
9. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 2.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

D. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.

E. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.

F. Do not penetrate or otherwise notch or cut structural members without approval of Owner.

G. H. Equipment Support and Attachment:
1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

H. Conduit Support and Attachment: Also comply with Section 26 05 33.13.

I. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.

J. Secure fasteners according to manufacturer's recommended torque settings.

K. Remove temporary supports.

3.03 2.03 FIELD QUALITY CONTROL

A. Inspect support and attachment components for damage and defects.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

SECTION 26 05 33.13

CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section includes materials, testing, and installation requirements of conduit for electrical services, including:
   1. Galvanized steel rigid metal conduit (RMC)
   2. Intermediate metal conduit (IMC)
   3. PVC-coated galvanized steel RMC
   4. Flexible metal conduit (FMC)
   5. Liquidtight flexible metal conduit (LFMC)
   6. Electrical metallic tubing (EMT)
   7. Rigid polyvinyl chloride (PVC) conduit
   8. Conduit fittings
   9. Accessories

1.02 RELATED REQUIREMENTS

A. Section 01 33 00 – Submittals

B. Section 26 05 29 – Hangers and Supports for Electrical Systems

C. Section 31 23 33 – Trenching and Backfilling

1.03 REFERENCES

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC)

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing-Steel (EMT-S)

C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit (EIMC)

D. NECA 1 - Standard for Good Workmanship in Electrical Construction

E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT)

F. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC)

G. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable

H. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit

I. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit

J. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing

K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

M. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

N. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.

O. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

P. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

Q. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

R. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.

S. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
3. Notify Owner of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00.

B. Product data:
1. Provide manufacturer’s standard catalog pages and data sheets for conduits and fittings.
2. Shop drawings
3. Record drawings: record actual routing for all installed conduits, boxes, and fittings.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer’s instructions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:
   1. Under Slab on Grade: Use galvanized steel rigid metal conduit, PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   2. Exterior, Direct-Buried: Use galvanized steel rigid metal conduit, PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit, PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
   5. Where rigid polyvinyl (PVC) conduit larger than 2-inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit elbows for bends.
   6. Where steel conduit is installed in direct contact with earth, use corrosion protection tape to provide supplementary corrosion protection or use PVC-coated galvanized steel rigid metal conduit.
   7. Where steel conduit emerges from concrete into soil, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches (100 mm) on either side of where conduit emerges or use PVC-coated galvanized steel rigid metal conduit.

D. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

E. Concealed Above Accessible Ceilings: Use electrical metallic tubing (EMT).

F. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.

G. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).

H. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.

I. Exposed, Exterior: Use galvanized steel rigid metal conduit or PVC-coated galvanized steel rigid metal conduit.

J. Concealed, Exterior, Not Embedded in Concrete or in Contact with Earth: Use galvanized steel rigid metal conduit.

K. Hazardous (Classified) Locations: Use galvanized steel rigid metal conduit or PVC-coated galvanized steel rigid metal conduit.

L. Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit.
   2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
   3. Maximum Length: 6 feet (1.8 m) unless otherwise indicated.
   4. Vibrating equipment includes, but is not limited to:
      a. Transformers.
      b. Motors.

2.02 CONDUIT REQUIREMENTS

A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Minimum Conduit Size, Unless Otherwise Indicated:
1. Branch Circuits: 3/4-inch (21 mm) trade size.
2. Branch Circuit Homeruns: 3/4-inch (21 mm) trade size.
3. Control Circuits: 3/4-inch (21 mm) trade size.
4. Flexible Connections to Luminaires: 3/8-inch (12 mm) trade size.
5. Underground, Interior: 3/4-inch (21 mm) trade size.
6. Underground, Exterior: 1 inch (27 mm) trade size.

D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:
1. Allied Tube & Conduit
2. Wheatland Tube Company

B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

C. Fittings:
1. Manufacturers:
a. O-Z/Gedney, a brand of Emerson Electric Co
b. Thomas & Betts Corporation
2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
4. Material: Use malleable iron or die cast zinc.
5. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 INTERMEDIATE METAL CONDUIT (IMC)

A. Manufacturers:
1. Allied Tube & Conduit
2. Wheatland Tube Company

B. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

C. Fittings:
1. Manufacturers:
a. O-Z/Gedney, a brand of Emerson Electric Co
b. Thomas & Betts Corporation

2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
4. Material: Use malleable iron or die cast zinc.
5. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:
1. Thomas & Betts Corporation

B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

C. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil (1.02 mm).

D. PVC-Coated Fittings:
1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.
3. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
4. Material: Use steel or malleable iron.
5. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil (1.02 mm).

E. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil (0.38 mm).

2.06 2.06 FLEXIBLE METAL CONDUIT (FMC)

A. Manufacturers:
1. AFC Cable Systems, Inc.

B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

C. Fittings:
1. Manufacturers:
a. O-Z/Gedney, a brand of Emerson Electric Co.
b. Thomas & Betts Corporation.
2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use malleable iron, aluminum, or die cast zinc.

2.07 2.07 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Manufacturers:
   1. AFC Cable Systems, Inc.

B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

C. Fittings:
   1. Manufacturers:
      a. O-Z/Gedney, a brand of Emerson Electric Co.
      b. Thomas & Betts Corporation.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use malleable iron, aluminum, or die cast zinc.

2.08 2.08 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
   1. Allied Tube & Conduit.
   2. Wheatland Tube Company.

B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

C. Fittings:
   1. Manufacturers:
      a. O-Z/Gedney, a brand of Emerson Electric Co.
      b. Thomas & Betts Corporation.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use malleable iron or die cast zinc.
   4. Connectors and Couplings: Use compression (gland) type.
      a. Do not use indenter type connectors and couplings.
      b. Do not use set-screw type connectors and couplings.

2.09 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Manufacturers:
   1. Cantex Inc.
   2. Carlon, a brand of Thomas & Betts Corporation.
   3. JM Eagle, or approved equal.

B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

C. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.010 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil (0.51 mm).

B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.

C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

D. Pull Strings: Use nylon cord with average breaking strength of not less than 500 pound-force (2225 N).

E. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.

F. Underground Warning Tape:
1. Materials: Use foil-backed detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
2. Foil-backed Detectable Type Tape: 3 inches (76 mm) wide, with minimum thickness of 5 mil (0.1 mm), unless otherwise required for proper detection.
3. Legend: Type of service, continuously repeated over full length of tape.
4. Color:
   a. Tape for Buried Power Lines: Black text on red background.
   b. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

PART 3 EXECUTION

3.01 3.01 EXAMINATION

A. A. Verify that field measurements are as indicated.

B. B. Verify that mounting surfaces are ready to receive conduits.

C. C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install intermediate metal conduit (IMC) in accordance with NECA 101.

E. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.

F. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

G. Conduit Routing:
1. Unless dimensioned, conduit routing indicated is schematic.
2. When conduit destination is indicated without specific routing, determine exact routing required.
3. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
4. Arrange conduit to provide no more than the equivalent of four 90-degree bends between pull points.
5. Arrange conduit to provide no more than 400 feet (1320 m) between pull points.
6. Route conduits above water and drain piping where possible.
7. Maintain minimum clearance of 12 inches (300 mm) between conduits and piping for other systems.

H. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.

I. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

J. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Owner.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Conceal bends for conduit risers emerging above ground.
4. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
5. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.

K. Underground Installation:
   1. Provide trenching and backfilling in accordance with Section 31 23 33.
   2. Minimum Cover, Unless Otherwise Indicated or Required:
      a. Underground, Exterior: 24 inches (610 mm).
   3. Provide underground warning tape in accordance with Paragraph 2.10 above along entire conduit length for service entrance where not concrete-encased.

L. Hazardous (Classified) Locations: Where conduits cross boundaries of hazardous (classified) locations, provide sealing fittings located as indicated or in accordance with NFPA 70.

3.03 3.03 FIELD QUALITY CONTROL

A. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

B. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.

C. Correct deficiencies and replace damaged or defective conduits.

3.04 3.04 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.05 3.05 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 40 05 00

COMMON WORK RESULTS FOR PROCESS INTERCONNECTIONS

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section includes materials, testing, and installation of manually operated and actuated process valves and miscellaneous appurtenances for process integration. This section includes:
   1. Gate Valves
   2. Air & Vacuum Valves
   3. Fire Hydrants
   4. Static Mixers

1.02 REFERENCES

A. ASTM A126 Class B "Gray Iron Castings for Valves, Flanges and Pipe Fittings"

B. ASME B16.1 "Pipe Flanges and Flanged Fittings"

C. AWWA C509 “Resilient-Seated Gate Valves for Water Supply Service”

D. AWWA C111 "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"

E. NSF/ANSI 61 “Drinking Water System Components - Health Effects”

F. NSF/ANSI 372 “Drinking Water System Components - Lead Content”

1.03 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00:
   1. Manufacturer's catalog data and detail construction sheets showing all parts and describing material of construction by material and specification (such as AISI, ASTM, SAE, or CDA), demonstrating compliance with this Section.
   2. Complete shop drawings including dimensions, laying lengths, and recommended installation orientations.
   3. Certification that all linings and coating products are suitable for contact with drinking water in accordance with NSF Standard 61.
   4. Copy of certified hydrostatic shell tests and seat tests at the factory, as applicable.

1.04 WARRANTY

A. General: All valves, fire hydrants, static mixers, and other equipment described herein shall be warranted by the manufacturer for defects in materials and workmanship for a period of at least one year (12 months) from date of substantial completion.

PART 2 PRODUCTS

2.01 VALVES - GENERAL

A. Provide valves complete with extension stems, worm gear operators, operating nuts, and wrenches required for operation, and as indicated on the drawings for buried

valves. Provide valves complete with handwheel operators for exposed (above-ground) installations. Valves shall have the name of the manufacturer, and the size of the valve cast or molded onto the valve body or bonnet or shown on a permanently attached plate.

2.02 VALVES

A. Unless otherwise shown, all valves shall be non-rising stem, epoxy-coated resilient wedge gate valves per AWWA C509, with double O-ring seals.

B. Air and Vacuum Valves:
   1. Unless otherwise shown, all Air and Vacuum Valves shall be APCO Series 143C combination air and vacuum release valves (CAV), or approved equal.
   2. CAV shall be of the size called out on the drawings, single body, double-orifice.

2.03 VALVE OPERATORS

A. Operators for Buried Valves
   1. Provide direct acting 2-inch square AWWA operating nuts for all buried and submerged valves less than 6-inches, and for buried and submerged gate valves less than 24-inches.
   2. Provide watertight shaft seals and watertight valve and actuator cover gaskets. Provide totally enclosed operators designed for buried or submerged service.
   3. Operating Torque Requirement for Buried Valves: Operators on buried valves shall be designed to produce the required torque on the operating nut with a maximum input of 150-foot-pounds.
   4. Opening Direction: Valve operators, handwheels, or levers shall open by turning counterclockwise.

2.04 VALVE BOXES FOR BURIED VALVES

A. Per SSCWD Standard Detail W-2. Valve lids shall be labeled as follows:
   1. Potable water, “WATER”

B. Manufacturers: Valve boxes shall be Christy G5 with G5C traffic lid, or approved equal.

2.05 EXTENSION STEMS FOR BURIED VALVE OPERATORS

A. Where the depth of the valve is such that its operating nut is more than 30-inches below grade, provide operating extension stems to bring the operating nut to within the specified tolerance stated above. Extension stems shall be steel and shall be complete with 2-inch-square operating nut. Provide stem with a 1/8-inch center guide to keep stem centered. Do not use pinned couplings.

B. Provide 8” diameter SDR 35 PVC riser extending from top of valve to no more than 6” below AC finish grade.

2.06 BOLTS, NUTS, AND GASKETS FOR FLANGED VALVES

A. Nuts and bolts: All fittings shall utilize 304 stainless steel bolts and nuts, unless otherwise specified, and shall have anti-seize applied to the threads during installation.

2.07 PAINTING AND COATING

A. Buried Valves: All valves shall be epoxy-coated in accordance with AWWA C509.

2.08 FIRE HYDRANTS

A. Unless otherwise shown, shall be CLOW 860 Cast Iron/Ductile Iron wet-barrel hydrant per SSCWD Standard Detail W-1-1.

2.09 STATIC MIXERS

A. General: Static mixer shall be furnished with minimum three (3) mixing elements.

B. Material: Unless otherwise shown, mixer shall be constructed from 304L stainless steel

C. Connections: Class 150 raised face stainless steel flanged ends, per ASME B16.5. Injection port shall have FNPT process connection.

D. Manufacturer/Model: Unless otherwise shown, shall be Koflo KD-985, or approved equal.

PART 3 EXECUTION

3.01 JOINTS

A. Flanged Joints: Boltholes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. Clean flanges by wire brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing: lubricate threads with oil and graphite and tighten nuts uniformly and progressively. If flanges leak under pressure testing, loosen or remove nuts and bolts, reseat or replace the gasket; reinstall or re-tighten the bolts and nuts; and re-test the joint. Joints shall be watertight.

B. Threaded Joints: Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

3.02 INSTALLATION

A. Valves - General: Install all valves and appurtenances in strict accordance with manufacturer's recommendations and in the locations shown in the Plans.

B. Valves in Horizontal Piping: Unless otherwise indicated in the drawings, install valves in horizontal runs of pipe with their operating stems vertical.

C. Static Mixers: Install per manufacturer’s recommendations and in the locations shown on the Drawings.

D. Backfill: Backfill within 24-inches of valves shall be clean washed sand in accordance with the requirements of Section 31 23 33 - Trenching and Backfilling.

3.03 VALVE BOXES

A. Firmly support valve boxes and keep them centered and plumb over the operating nut of the valve. Do not use beveled sections of pipe at the top of the valve extension pipe. The final valve box elevation shall be flush with the finished pavement surface.

3.04 VALVE LEAKAGE TESTING

A. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 33 00 00 – Utilities, Para.3.07 for pressure testing requirements.

END OF SECTION

SECTION 40 05 64

BUTTERFLY VALVES

PART 1 GENERAL

1.01 DESCRIPTION

This section specifies the requirements for all butterfly valves and operators.

1.02 SUBMITTALS

A. Submittals shall be made in accordance with the requirements of Section 01 33 00.

B. Product Data: Submit valve manufacturer's literature, including but not limited to:
   1. Valve name, size, Cv factor, pressure rating, identification number, and specification section number.
   2. Shop drawings of valves and operators:
   3. Parts list drawings
   4. Operation and maintenance manuals
   5. Test certificates
   6. Certification that the products used are suitable for contact with drinking water in accordance with NSF Standard 61.

1.03 QUALITY ASSURANCE

A. Preconstruction Testing Requirements:
   1. Valves shall be subjected to performance, leakage, and hydrostatic tests in accordance with the procedures and acceptance criteria established by AWWA C504

1.04 DELIVERY, STORAGE AND HANDLING

A. General. Valves and operators shall at all times be handled with equipment designed to prevent damage to the valve and/or operator body, associated accessories, and interior and exterior coatings, if applicable. Hammering or otherwise means of impact to the butterfly valves or operators shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the valves or operators.

C. Unloading. Unloading from the trucks shall be done with care using slings. No equipment shall be allowed to fall from trucks.

D. Storage. All packaged butterfly valves, operators, and associated accessories shall be covered and stored on site until they are installed.

E. Gaskets. Gaskets, if provided, shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

1.05 WARRANTY

A. Unless otherwise specified, all butterfly valves and operators shall be warranted for at least one year per the manufacturer's standard terms.

PART 2 PRODUCTS

2.01 BUTTERFLY VALVES

A. Manufacturers:
   1. Crane
   2. DeZurik, or approved equal

B. Design Criteria:
   1. Valve body:
      a. Short body design with Class 150 flanged ends per AWWA C504
      b. Material: Cast iron per ASTM A126 Class B.
   2. Disc:
      a. Offset disc securely attached to valve shaft utilizing a field removable/replaceable torque screw or tangential pin locked in place with a set screw.
      b. Material: ASTM A276 Type 316 stainless steel.
      c. Fasteners: all fasteners utilized to secure disc shall be ASTM A276 Type 316 stainless steel.
   3. Seats:
      a. Material: Acrylonitrile-Butadiene (NBR), EPDM, or approved equal
      b. Seat retainer ring: Type 316 stainless steel, ASTM A276.
   4. Valve shaft:
      a. Type 316 stainless steel, ASTM A276
      b. Shaft packing shall be self-compensating V-type with a minimum of four sealing rings.
   5. Shaft bearings:
      a. Bearings shall be non-metallic and permanently lubricated.

C. Lining: Valve interior shall be factory-coated with an NSF/ANSI 61 approved fusion bonded epoxy lining.

D. Exterior coating: Per Section 09 96 01 – Coatings of these Specifications.
   1. Color: Blue

E. Fasteners: All fasteners shall be Type 316 stainless steel, ASTM A276.

2.02 BUTTERFLY VALVE OPERATORS

A. Operators and component parts: AWWA C504, unless otherwise specified in these Specifications.

B. Electric Actuators:
   1. Manufacturers/Models:
      a. Rotork IQT Series,
      b. Auma SA Series,
      c. Flowserve Limitorque QX Series, or approved equal.
   2. Design Criteria:
      a. All electric actuators shall conform to the latest requirements of AWWA Standard C542.
      b. Actuators shall be capable of the following valve opening/closing times:
         1) Opening: 10 seconds, or faster
         2) Closing: 20 seconds, or faster

c. Actuators shall contain motor, gearing, manual over-ride, limit switches, torque switches, drive coupling, integral motor controls, and “graduated” mechanical dial position indicator.
d. The motor shall be specifically designed for actuator service. The motor shall be induction-type with Class F insulation and protected by means of thermal switches imbedded in the motor windings. Motor enclosure will be totally enclosed, non-ventilated.
e. Motors will be capable of operating at the following power requirements:
1) 120V, 3-phase, 60 Hz
f. Electro-mechanical starters shall be used on all single-phase and 3-phase motors for open/close service.
g. Actuator enclosure shall be NEMA 4. All external fasteners on the electric actuator shall be stainless steel. Fasteners on limit switches and terminal compartments shall be captured to prevent loss while covers are removed.

3. Gearing:
a. All gearing shall be either oil or grease lubricated and designed to withstand the full stall torque of the motor.

4. Manual Operation:
a. Actuator shall be equipped with a handwheel for manual over-ride. Manual operation shall be independent of power gearing to minimize required rim pull and facilitate easy changeover from motor to manual operation when the actuator is under load. A seized or inoperable motor shall not prevent manual operation.
b. Actuator shall be capable of handwheel operation if motor control unit is removed.

5. Limit Switches:
a. Limit switches shall be furnished at each end of travel.
b. Limit switch adjustment shall not be altered by manual operation.
c. Limit switches must be capable of quick adjustment requiring no more than five (5) turns of the limit switch adjustment spindle.

6. Torque Switches:
a. Mechanically operated torque switches shall be furnished at each end of travel.
b. Torque switch adjustment device shall be calibrated in engineering units of torque.

PART 3 EXECUTION

3.01 GENERAL

A. Care and Handling of Materials. All materials shall be carefully handled in all steps of fabrication, storing, loading, transporting, unloading, storing at the site, and installation, using the means and following the procedures submitted with the approved shop drawings. Transport, hauling, handling, and storage of pipe shall be in accordance with manufacturer’s recommendations and the stipulations in Para. 1.04 of these specifications.

B. Installation:
1. Install valves, operators, and electronic actuators as shown on the Drawings and in accordance with manufacturer’s recommendations.

C. Conduit:

1. For each electronically actuated butterfly valve shown on the Drawings, Contractor shall provide all conduits, pull boxes, uni-strut, and all associated fixtures, fittings, and fasteners, with the number, size, and material of the conduits as defined in these Specifications and as shown on the Drawings.
2. Contractor shall provide a pull rope in all conduit installations for future cabling, to be installed by the SCADA consultant(s).

3.02 STARTUP AND TESTING

A. Contractor shall provide startup and testing of the SSCWD facilities, in coordination with the Owner and in compliance with these Contract Documents, and in conjunction with the SCADA consultant(s) who will program flow meter feedback from the measuring device to the PLC.

B. Provide all equipment warrantees, operating manuals, spare parts, and special tools.

END OF SECTION

SECTION 40 05 65.23

SWING CHECK VALVES

PART 1 GENERAL

1.01 DESCRIPTION

Furnish and install swing check valves shown and specified in accordance with the requirements of the Contract documents.

1.02 SUBMITTALS

A. In accordance with Section 01 33 00 – Submittal Procedures, submit manufacturer's Literature for all swing check valves to be provided by Contractor per the Contract documents. Manufacturer's Literature shall include, but is not limited to:
   1. Dimensional drawings
   2. Parts list drawings
   3. Operation and maintenance manuals
   4. Test certificates

1.03 QUALITY ASSURANCE

A. MANUFACTURER REQUIREMENTS
   1. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.
   2. All valves shall be hydrostatically and seat tested per AWWA C508. Manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.

1.04 DELIVERY, STORAGE AND HANDLING

A. General. Swing check valves shall at all times be handled with equipment designed to prevent damage to the valve body, associated accessories, and interior and exterior coating of the swing check valves, if applicable. Hammering or otherwise means of impact to the swing check valves and associated accessories shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the swing check valves.

C. Unloading. Unloading from the trucks shall be done with care using slings. No valves shall be allowed to fall from trucks.

D. Storage. All packaged swing check valves and associated accessories shall be covered and stored on site until they are installed.

E. Gaskets. Gaskets, if provided, shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

1.05 WARRANTY

A. Unless otherwise specified, all swing check valves shall be warrantied for one year per the manufacturer's standard terms.

PART 2 PRODUCTS

2.01 SWING CHECK VALVES

A. Unless approved otherwise by the Engineer, swing check valves shall be full waterway body type, with a domed access cover and vent port, and manufactured in conformance with ANSI/AWWA C508.

B. Swing check valves used in potable water service shall be certified to NSF/ANSI 61, Drinking Water System Components – Health Effects, and certified to be Lead-Free in accordance with NSF/ANSI 372.

C. Materials:
   1. Valve body, cover, and disc shall be constructed of ASTM A536 ductile iron.
   2. The removable body seat shall be constructed of ASTM A276, Type 304 stainless steel.
   3. The removable resilient seat shall be precision molded Buna-N (NBR), ASTM D2000-BG, or EPDM.
   4. The disc arm and external levers shall be ductile iron in accordance with ASTM A536.

D. Connections: All valves shall be provided with flanges drilled in accordance with ASME B16.42 Class 150.

E. Lining: Valve interior and all wetted parts shall be coated with an NSF/ANSI 61 approved fusion bonded epoxy lining.

F. Coating: Per Section 09 96 01 – Coatings of these Specifications.
   1. Color: Blue

G. Fasteners: All fasteners shall be either galvanized or stainless steel.

PART 3 EXECUTION

3.01 GENERAL

A. Care and Handling of Materials. All materials shall be carefully handled in all steps of fabrication, storing, loading, transporting, unloading, storing at the site, and installation, using the means and following the procedures submitted with the approved shop drawings. Transport, hauling, handling, and storage of pipe shall be in accordance with manufacturer's recommendations and the stipulations in Para. 1.04 of these specifications.

B. Installation:
   1. The interior of the swing check valve shall be clean and free from contamination when installed and effective means shall be taken to prevent the entrance of foreign matter during progress of the work. The types and sizes of swing check valves to be used shall be as specified herein and as shown on the Drawings.
   2. Install and mount valves in accordance with manufacturer's recommendations, and as shown on the drawings.

END OF SECTION

SECTION 40 05 67

SPECIALIZED PRESSURE AND FLOW-CONTROL VALVES

PART 1 GENERAL

1.01 DESCRIPTION

Furnish and install all specialized pressure sustaining, pressure relief, and altitude valves shown in the drawings and specified in accordance with the requirements of the Contract documents.

1.02 SUBMITTALS

In accordance with Section 01 33 00, submit manufacturer's Literature for all valves to be provided by Contractor per the Contract documents.

1.03 QUALITY ASSURANCE

A. MANUFACTURER REQUIREMENTS
   1. Each valve shall be factory tested by valve manufacturer prior to shipping.

1.04 DELIVERY, STORAGE AND HANDLING

A. General. Control valves shall at all times be handled with equipment designed to prevent damage to the valve body, valve pilot assemblies, all other associated accessories, and interior and exterior coating of the control valves, if applicable. Hammering or otherwise means of impact to control valves and associated appurtenances shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the control valves.

C. Unloading. Unloading from the trucks shall be done with care using slings. No control valves shall be allowed to fall from trucks. Control valves shall only be unloaded using a crane or forklift.

D. Storage. All packaged control valves and associated accessories shall be covered and stored on site until they are installed.

E. Gaskets. Gaskets shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

1.05 WARRANTY

A. Unless otherwise specified, all valves shall be warrantied for one year per the manufacturer's standard terms.

PART 2 PRODUCTS

2.01 PRESSURE SUSTAINING/RELIEF VALVES

Pressure Sustaining/Relief Control Valves shall maintain a constant upstream pressure by bypassing or relieving excess pressure and shall maintain close pressure limits without causing surges. Valve shall be fast opening and modulate to limit the upstream pressure to a pre-determined set point. Valve shall be slow closing to prevent surges. Unless otherwise

specified, pressure sustaining/relief control valves shall be Cla-Val Model 50-01, or approved equal.

A. Unless approved otherwise by the Engineer, valve bodies and covers for all control valves shall be constructed from ductile iron conforming to the material requirements of ASTM A536 and ANSI/AWWA C153/A21.53.

B. Connections: All valves shall be provided with flanges drilled in accordance with ANSI B16.42, Class 150 ductile iron flanges.

C. Joints to adjoin to mating pipe shall either be flanged or restrained mechanical joint-type per Section 33 00 00 of these Specifications.

D. Interior Lining: All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion-bonded epoxy conforming to the applicable requirements of ANSI/AWWA C23 and ANSI/NSF-61, and shall be holiday tested with a 1,500 volt spark test in conformance with ANSI/AWWA C213.

E. Coatings: Exterior surfaces shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.

F. Valve coating color: Blue.

PART 3 EXECUTION

3.01 GENERAL

A. Care and Handling of Materials. All materials shall be carefully handled in all steps of fabrication, storing, loading, transporting, unloading, storing at the site, and installation, using the means and following the procedures submitted with the approved shop drawings. Transport, hauling, handling, and storage of pipe shall be in accordance with manufacturer's recommendations and the stipulations in Para. 1.04 of these specifications.

B. Installation:
1. All control valves shall be installed in strict accordance with the manufacturer's recommendations and at the location shown in the Drawings. Minor adjustments to the location of the control valves to avoid architectural and structural features shall be approved by the Owner prior to installation.
2. The interior of the control valve body and fittings shall be clean and free from contamination when installed and effective means shall be taken to prevent the entrance of foreign matter during progress of the work. The types and sizes of control valves and fittings to be used shall be as specified herein and as shown on the Drawings.

END OF SECTION

SECTION 40 71 13

MAGNETIC FLOW METERS

PART 1 GENERAL

1.01 DESCRIPTION

A. This section describes the requirements for electromagnetic flow meters suitable for domestic water flow metering.

1.02 SUBMITTALS

A. In accordance with Section 01 33 00, submit manufacturer's Literature for all meters to be provided by Contractor per the Contract documents, including but not limited to:
   1. Connection Diagrams for equipment wiring
   2. List of spare parts and optional equipment
   3. Equipment warranty

1.03 QUALITY ASSURANCE

A. Manufacturer Requirements:
   1. Each meter shall be factory tested by manufacturer prior to shipping.

1.04 DELIVERY, STORAGE AND HANDLING

A. General. Electromagnetic flow meters shall at all times be handled with equipment designed to prevent damage to the meter, all other associated accessories, and interior and exterior coating of the meter, if applicable. Hammering or otherwise means of impact to meters and associated accessories shall not be allowed.

B. Shipping. When making shipments, all chains, cables and hold-down equipment shall be carefully padded where in contact with the meters.

C. Unloading. Unloading from the trucks shall be done with care using slings. No meters shall be allowed to fall from trucks.

D. Storage. All packaged meters and associated accessories shall be covered and stored on site until they are installed.

E. Gaskets. Gaskets, if provided, shall be stored in containers or wrappers which will protect the gaskets from ozone and other atmospheric deterioration.

1.05 WARRANTY

A. Unless otherwise specified, all electromagnetic flow meters shall be warrantied for at least one year, per manufacturer's standard terms.

B. In the event a component fails to perform as specified or is proven defective in service during the warranty period, the manufacturer shall promptly repair or replace the defective part at not cost to the Owner.

PART 2 PRODUCTS

2.01 MAGNETIC FLOW METERS

A. Flow Meter: shall be a velocity-sensing electromagnetic type tube meter.
   1. Manufacturer: McCrometer Ultramag or approved equal.
   2. Accuracy: ±0.5% of actual flow
   3. Calibration: Pre-programmed and pre-calibrated to user's specific applications
   4. Diagnostics: Test mode and self-diagnostics
   5. Line size: As shown on the drawings
   6. Range: From 0.2 FPS - 32 FPS
   7. Repeatability: ±0.05% to ±.0008 ft/s (±0.25 mm/s), whichever is greater

B. Flow Meter Sensor:
   1. Operating principle: Utilizing Faraday's Law of Electromagnetic Induction, the flow of liquid through the sensor induces an electrical voltage that is proportional to the velocity of the flow.
   2. The sensor flow tube shall be NEMA 6P or IP68 rated.
   3. Flow tube shall be constructed of 304 Stainless Steel.
   4. All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion-bonded epoxy conforming to the applicable requirements of ANSI/AWWA C23 and ANSI/NSF-61Measurement and grounding electrodes shall be 316 Stainless Steel.
   5. Connecting flanges shall be AWWA 150# Flat Face Carbon Steel.
   6. Two Stainless Steel grounding rings shall be supplied with each flow meter.
   7. Flow tube Operating Temp: +14 to +140° F.
   8. Submergence: The sensor shall be capable of continual submergence at up to 30 ft. with standard strain relief cable or up to 6 ft.

C. Converter:
   1. Electronic Enclosure: Shall be a NEMA 4X, IP67 rated enclosure.
   2. Converter/display: Background illumination with alphanumeric 8-line graphical backlit LCD display with 6-key touch programming to indicate flow rate, totalized values, settings, and faults.
   3. Power supply: 120 VAC
   4. Operating temperature: -4 to +140 degrees F.
   5. Outputs:
      a. Two 4-20 mA (0-21mA).
      b. Two separate digital programmable outputs:
      c. Open collector transistor usable for pulse
      d. Frequency and alarm settings
   6. Converter shall be meter-mounted.

D. Additional Requirements:
   1. Power & Signal Cabling: The power and signal between the converter and sensor are isolated and placed in separate cables.
   2. Flow Direction Measurement: Forward and reverse flow indication and forward, reverse, net totalization is standard on all meters.

E. Coatings: Exterior surfaces shall be factory-coated with fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.

F. All coils, electrode connections, and wire harness shall be rated for NEMA 6P/IP68 operation.

PART 3 EXECUTION

3.01 GENERAL

A. Care and Handling of Materials:
   1. All materials shall be carefully handled in all steps of fabrication, storing, loading, transporting, unloading, storing at the site, and installation, using the means and following the procedures submitted with the approved shop drawings. Transport, hauling, handling, and storage of pipe shall be in accordance with manufacturer's recommendations and the stipulations in Para. 1.04 of these specifications.

B. Installation:
   1. Install and mount devices in accordance with manufacturer's recommendations, and as shown on the drawings.
   2. Comply with manufacturer's recommended "straight pip run" upstream and downstream of flow meter.
   3. Wiring between flow sensors and signal converters shall use cable type and procedures as per the manufacturer's recommendations.

C. Calibration:
   1. Meters shall be calibrated prior to delivery by the manufacturer.
   2. Manufacturer shall provide a calibrated meter set, which includes the sensor tub, cabling, and the converter.
   3. Flow meter shall be pre-configured with calibration information/data so that it commences with measurement without any programming during commissioning.
   4. An NIST certificate of calibration shall accompany each flow meter.

D. Conduit:
   1. For each flow meter, Contractor shall provide all conduits, condulets, pull boxes, uni-strut, and all associated fixtures, fittings, and fasteners, with the number, size, and material of the conduits as defined in the Plans.
   2. Contractor shall provide a pull rope in all conduit installations for future cabling, to be installed by the SCADA consultant.

3.02 STARTUP AND TESTING

A. Contractor shall provide startup and testing of the SSCWD facilities, in coordination with the Owner and in compliance with these Contract Documents, and in conjunction with the SCADA consultant(s) who will program flow meter feedback from the measuring device to the PLC.

B. Provide all equipment warrantees, operating manuals, spare parts, and special tools.

END OF SECTION

SECTION 40 73 26

GAUGE-PRESSURE TRANSMITTERS

PART 1 GENERAL

1.01 DESCRIPTION

Furnish and install relative (gauge) pressure transmitters as shown in the drawings and specified in accordance with the requirements of the Contract documents.

1.02 SUBMITTALS

In accordance with Section 01 33 00, submit manufacturer's Literature for all relative pressure transmitters to be provided by Contractor per the Contract documents. Literature shall include Manufacturer's catalog cuts indicating material compliance and specified options.

1.03 QUALITY ASSURANCE

A. MANUFACTURER REQUIREMENTS
   1. Manufacturer shall be a company having manufacturing facilities in the United States with a minimum 5 years' experience specializing in manufacturing of such pressure measurement equipment in municipal water applications.
   2. Each transmitter shall be factory tested by manufacturer prior to shipping.

1.04 WARRANTY

A. Unless otherwise specified, all pressure measurement devices shall be warrantied for one year per the manufacturer's standard terms.

PART 2 PRODUCTS

2.01 PRESSURE SENSING AND CONTROL DEVICES

A. Pressure Transmitter
   1. General: Pressure transmitter shall be provided for monitoring the pressures within the Sunnyslope water distribution system at the locations specified in the Plans.
   2. Range: 0 to 150 psi
   3. Manufacturer/Model: Siemens SITRANS P200 Model 4CA00-GD1 or approved equal.
   4. Output: 4-20mA signal.
   5. Provide sufficient cable length such that there will be no splicing between mounting location and electrical/control panel.

PART 3 EXECUTION

3.01 GENERAL

A. Install and mount pressure sensing and control devices in accordance with manufacturer's recommendations, and as shown in the Plans.

3.02 STARTUP AND TESTING

A. Contractor shall provide startup and testing of the SSCWD water distribution facilities in coordination with the Owner per the Contract Documents, and in conjunction with SCADA consultant(s) who will program control feedback from the sensing/control device to the PLC.

B. Provide all equipment warrantees, operating manuals, spare parts and special tools.

END OF SECTION

SECTION 40 75 00

PROCESS LIQUID ANALYTICAL MEASUREMENT

PART 1 GENERAL

1.01 DESCRIPTION

Furnish and install water conductivity sensors as shown in the drawings and specified in accordance with the requirements of the Contract documents.

1.02 SUBMITTALS

In accordance with Section 01 33 00, submit manufacturer's Literature for all relative pressure transmitters to be provided by Contractor per the Contract documents. Literature shall include Manufacturer's catalog cuts indicating material compliance and specified options.

1.03 QUALITY ASSURANCE

A. MANUFACTURER REQUIREMENTS
   1. Manufacturer shall be a company having manufacturing facilities in the United States with a minimum 5 years' experience specializing in manufacturing of such process liquid analytical measurement equipment in municipal water applications.
   2. Each sensor shall be factory tested by manufacturer prior to shipping.

1.04 WARRANTY

A. Unless otherwise specified, all pressure measurement devices shall be warrantied for one year per the manufacturer's standard terms.

PART 2 PRODUCTS

2.01 CONDUCTIVITY SENSING DEVICES

A. CONTACTING CONDUCTIVITY SENSORS
   1. General: Conductivity sensors shall be provided for monitoring the well water conductivity in the Sunnyslope water distribution system at the locations specified in the Plans.
   2. Range: 0 to 1,000 µS/cm
   3. Manufacturer/Model: Hach 3433B8A30N,or approved equal.
   4. Output: 4-20mA signal.
   5. Provide sufficient cable length such that there will be no splicing between mounting location and electrical/control panel.

PART 3 EXECUTION

3.01 GENERAL

A. Install and mount conductivity sensing devices in accordance with manufacturer's recommendations, and as shown in the Plans.

3.02 STARTUP AND TESTING

A. Contractor shall provide startup and testing of the SSCWD water distribution facilities in coordination with the Owner per the Contract Documents, and in conjunction with SCADA consultant(s) who will program control feedback from the sensing/control device to the PLC.

B. Provide all equipment warrantees, operating manuals, spare parts and special tools.

END OF SECTION