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Santa Clara Valley Water District
Notification of this Addendum is transmitted via email to all current plan holders.
This Addendum is posted on the Valley Water website at
https://www.valleywater.org/construction

March 24, 2021

ADDENDUM NO. 7
TO CONTRACT DOCUMENTS FOR THE
ANDERSON DAM TUNNEL PROJECT
Project No. 91864005 Contract No. C0663

Notice is hereby given to Prospective Bidder that the Contract Documents are modified as hereinafter set forth.

BID DOCUMENTS

1. **REPLACE** (Addendum No. 5) Revised BID FORM NO. 1 with ATTACHMENT NO. 1 – (Addendum No. 7) Revised Bid Form No. 1.

   The following are **CHANGES** on Revised Bid Form 1 as indicated in **RED** fonts:

   a) Bid Item No.3a, Geotechnical Borings, under Approximate Unit/Quantity has been revised to **985**/LF

   b) Bid Item No. 8r under Description for Item has been revised to "Diversion Outlet Structure Access Road and **Permanent** Fencing"

2. **REPLACE** Note 1 in Bid Form No. 5, Bidder's Bond, with:

   "1. Original Bidder's Bond documents **with embossed seal from the Surety** are required. **Photocopies** are unacceptable **and will result in the Bid submitted being determined non-responsive**.**"**

SPECIFICATIONS AND CONTRACT DOCUMENTS

SPECIAL PROVISIONS

3. **REPLACE** Article 14.03.01 Engineer's Office in its entirety with ATTACHMENT NO. 2.

4. **REPLACE** Revised Attachment 20-1 Contractor Submittal Schedule, Item no. 13, Addendum No. 5, with ATTACHMENT NO. 3 – Revised Attachment 20-1, Contractor Submittal Schedule (including submittals for Specification Section 15070).

5. **REPLACE** Paragraph B.1.a in Article 21.01.04.B.1. Bid Item No. 1a—MOBILIZATION AND DEMOBILIZATION [Unit: LS] with:

   "a. Scope of Work: This Bid item shall include the preconstruction meeting, all preparatory Work, and appurtenant preconstruction operations, including, but not limited to, those necessary for the movement of personnel, Equipment, supplies, and incidentals to the Project site; building and removing any temporary construction areas; installation and removal of temporary facilities necessary for Work on the Project; other Work and operations that must be performed or costs incurred prior to beginning Work on the various Contract items on the Project site; and other Work as specified in these Specifications, including as defined in the Special Provisions (e.g., Project Signs, Contractor's Office, Pre-Construction Surveys, Temporary Utilities not covered in other bid items, Staging Areas, and Insurance), as well as furnishing all labor, material, tools, equipment, and incidentals necessary to install **Temporary** Fencing in accordance with Contract Drawings and Section 02830 Chain Link Fence and Gates.**"**

6. **REPLACE** Paragraph D.9.a in Article 21.01.04.D.9. Bid Item No. 3i—DIVERSION PORTAL INSTRUMENTATION [Unit: LS] with:

   "a. Scope of Work: This Bid item includes furnishing all labor, material, tools, equipment, and incidentals necessary to install survey monuments, inclinometers, vibrating wire piezometers and associated casings, grout backfill, cables, data acquisition systems, concrete and other surface completions, and other items for the Diversion Portal instrumentation as shown in the Contract Drawings and in accordance with Section 02315 Geotechnical Instrumentation for Tunnels, Shafts, and Portals. **This bid item includes the inclinometer and vibrating wire piezometer at the HLOW drop shaft."**

7. **REPLACE** Paragraph F.4.a in Article 21.01.04.F.4. Bid Item No. 5d—24-FOOT DIAMETER TUNNEL EXCAVATION – CLASS 3 [Unit: LF] with:

   "a. Scope of Work: This Bid item includes furnishing all labor, material, tools, equipment, and incidentals necessary to complete tunnel excavation of 24-foot diameter, Class 3 tunnel, including all incidentals necessary to stabilize the tunnel face and the anticipated excavation envelope **(pre-support)** prior to excavation, in accordance with the Contract Drawings and Section 02310 Tunnel Excavation and Support, Section 02312 Muck and Excavated Material Disposal and Section 02313 Control of Water in Tunnels and Shafts, including excavation; controlled blasting; control, treatment, and disposal of water; muck handling, hauling and disposal; ventilation, lighting, and electrical; and erosion control. Tunnel excavation class will be determined by the Contractor with the Engineer (Engineer of Record). Use of respirators for protection against dust containing naturally occurring asbestos shall also be considered an incidental cost of this bid item.**"**

8. **REPLACE** Paragraph F.5.a in Article 21.01.04.F.5. Bid Item No. 5e—24-FOOT DIAMETER TUNNEL EXCAVATION – CLASS 4 [Unit: LF] with:

    "a. Scope of Work: This Bid item includes furnishing all labor, material, tools, equipment, and incidentals necessary to complete tunnel excavation of 24-foot diameter, Class 4 tunnel, including all incidentals necessary to stabilize the tunnel face and the anticipated excavation envelope **(pre-support)** prior to excavation, in accordance with the Contract Drawings and Section 02310 Tunnel Excavation and Support, Section 02312 Muck and Excavated Material Disposal and Section 02313 Control of Water in Tunnels and Shafts, including excavation; controlled blasting; control, treatment, and disposal of water; muck handling, hauling and disposal; ventilation, lighting, and electrical; and erosion control. Tunnel excavation class will be determined by the Contractor with the Engineer (Engineer of Record). Use of respirators for protection against dust containing naturally occurring asbestos shall also be considered an incidental cost of this bid item.**"**

9. **REPLACE** Paragraph F.6.a in Article 21.01.04.F.6. Bid Item No. 5f—24-FOOT DIAMETER TUNNEL EXCAVATION – CLASS 5 [Unit: LF] with:

    "a. Scope of Work: This Bid item includes furnishing all labor, material, tools, equipment, and incidentals necessary to complete tunnel excavation of 24-foot diameter, Class 5 tunnel, including all incidentals necessary to stabilize the tunnel face and the anticipated excavation envelope **(pre-support)** prior to excavation, in accordance with the Contract Drawings and Section 02310 Tunnel Excavation and Support, Section 02312 Muck and Excavated Material Disposal and Section 02313 Control of Water in Tunnels and Shafts, including excavation; controlled blasting; control, treatment, and disposal of water; muck handling, hauling and disposal; ventilation, lighting, and electrical; and erosion control. Tunnel excavation class will be determined by the Contractor with the Engineer (Engineer of Record). Use of respirators for protection against dust containing naturally occurring asbestos shall also be considered an incidental cost of this bid item.**"**

10. **REPLACE** Paragraph I.18 in Article 21.01.04.I. Bid Item No. 8—DIVERSION OUTLET STRUCTURE with:

    "18. Bid Item No. 8r—DIVERSION OUTLET STRUCTURE ACCESS ROAD AND **PERMANENT** FENCING [Unit: LS]**"**

11. **REPLACE** Paragraph I.18.b in Article 21.01.04.I.8. Bid Item No. 8r—DIVERSION OUTLET STRUCTURE ACCESS ROAD AND PERMANENT FENCING [Unit: LS] with:

    "b. Measurement and Payment: Full compensation for Bid item 8r, Diversion Outlet Structure Access Road and **Permanent** Fencing, will be made on a lump sum basis for competed work approved by the Engineer (Construction Manager).**"**

TECHNICAL PROVISIONS

SECTION 02010. EXPLORATORY DRILLING

12. **REPLACE** Paragraph A in Article 2.01. GROUT with:

    "A. Grout for backfill of exploratory core holes shall be **5 to 7 gallons of water to one sack of Type I or Type II Portland cement, and up to 5 percent bentonite**. Portland cement and water shall be mixed first followed by slowly adding bentonite. The amount of bentonite or water used may be varied as directed by the Engineer (Engineer of Record) to control the consistency and flowability of the mix.**"**

13. **REPLACE** Paragraph B.1 in Article 2.01. GROUT with:

    "1. Portland Cement: Portland cement shall conform to ASTM C150 for **Type I or** Type II Portland cement. Only cement furnished in sacks shall be used.**"**

14. **REPLACE** Paragraph D in Article 3.02. LAND DRILLING with:

    "D. **Up to two (2) temporary** vibrating wire piezometers shall be installed using the grouted-in method in core boring OW-31 after completion of the boring in accordance with the Drawings and Section 13300 "Permanent Geotechnical Instrumentation – Diversion Portal and Diversion Outlet Structure.**"**

15. **REPLACE** Attachment One – Phase 8 Drilling Program Plan, dated March 5, 2021 (Addendum No. 4, Item no, 13) with Revised Attachment One – Phase 8 Drilling Program Plan, dated March 19, 2021.

    NOTE: Revised Attachment One – Phase 8 Drilling Program Plan will be included in the FTA link initially provided with the executed NDA under the Addenda Folder, Addendum No. 7.

SECTION 02830. CHAIN LINK FENCE AND GATES

16. **REPLACE** Paragraph A.1 in Article 1.01. SUMMARY with:

    "1. Requirements for temporary and permanent chain link fences and accessories, including materials and installation at entrances, staging areas, and site **permanent** fencing, as shown on the Drawings or specified herein.

    ~~a. All chain link fences as shown on the Contract Drawings shall meet the additional requirements specified for Security Fences.~~**"**

17. **REPLACE** Paragraph A in Article 2.01. MATERIALS with:

"A. Fence Types:

Fence Type	Maximum Fence Height
"Permanent ~~Security~~ Fencing"	8'
"Construction Fencing and Staging Area 2**E/2W** Fencing"	6'

"

18. **REPLACE** Paragraphs A and B in Article 2.02. POSTS with:

"A. Line and terminal posts (except as noted below) shall be zinc-coated in accordance with ASTM F1083. Strength and protective coating requirements shall be in accordance with ASTM F1043 (Group IA). Posts shall be Schedule 40.

Fence Type	Corner, End, and Pull Posts	Line Posts
"Permanent ~~Security~~ Fencing"	4.0" O.D. Pipe	2.875" O.D. Pipe
"Construction Fencing and Staging Area 2**E/2W** Fencing"	2.875" O.D. Pipe	2.375" O.D. Pipe

B. Gate posts shall be in accordance with ASTM F900. Strength and protective coating requirements shall be in accordance with ASTM F1043 (Group IA). Posts shall be Schedule 40.

Fence Type	Gate Post
"Permanent ~~Security~~ Fencing"	4.0" O.D. Steel Pipe
"Construction Fencing and Staging Area 2**E/2W** Fencing"	2.875" O.D. Steel Pipe

"

19. **REPLACE** Paragraph B in Article 2.03 BRACES AND RAILS with:

"B. Corner and pull posts for Types "Permanent ~~Security~~ Fencing and Construction Fencing and Staging Area 2**E/2W** Fencing" fence shall each be braced (compression brace and tension rod) in adjoining bays. All braces shall be fitted without end play.**"**

20. **REPLACE** Paragraph C in Article 2.04 FENCE FABRIC with:

"C. Fabric shall be fabricated of 9-gage wire for Types "Construction Fencing and Staging Area 2**E/2W** Fencing" fence and 11-gage wire for Types "Permanent ~~Security~~ Fencing" fences in 1" mesh.**"**

21. **REPLACE** Paragraph A.6 in Article 3.02 FENCE INSTALLATION with:

    "6. **Permanent** Fence Requirement Only**:** Fence post rigidity shall be tested by applying a 50 pound force on the post, perpendicular to the fabric, at 5' above ground; post movement measured at the point where the force is applied shall be less than or equal to 3/4" from the relaxed position; every tenth post shall be tested for rigidity; when a post fails this test, further tests on the next four posts on either side of the failed post shall be made; all failed posts shall be removed, replaced, and retested at the Contractor's expense.**"**

22. **REPLACE** Paragraph D.6 in Article 3.02 FENCE INSTALLATION with:

    "6. **Permanent** Fence Requirement Only**:** Fence fabric shall be tested the use of a 30 pound pull at the center of the panel shall cause fabric deflection of not more than 2-1/2 inches when pulling fabric from the post side of the fence; every second fence panel shall meet this requirement; all failed panels shall be re-secured and retested at the Contractor's expense. In areas where posts are directly driven; failure to achieve necessary tension required shall result in the posts being set in concrete.**"**

SECTION 03310. CONTROLLED LOW STRENGTH MATERIAL (CLSM)

23. **ADD** Paragraph C in Article 2.02. CLSM COMPRESSIVE STRENGTH with:

    "C. The CLSM used for the Anderson force main replacement shall have a minimum 28-day compressive strength 300 psi when tested in accordance with ASTM D4832."

SECTION 11287. FIXED CONE VALVES

24. **REPLACE** Paragraph C in Article 1.05. QUALITY ASSURANCE with:

    "C. Valve manufacturer must have a minimum of ten (5) years of experience with valves of the same design and **96-inch** and larger. Provide a minimum of three (3) references of operating installations with valves of the size specified or larger and in the same service as specified operating for not less than five (5) years.**"**

25. **REPLACE** Paragraph A in Article 2.01. GENERAL with:

    "A. Two 132-inch fixed-cone valves shall be provided for flow control at the Diversion Outlet Structure. Each fixed-cone valves shall be designed for 215 feet of reservoir head and be suitable for throttling flow from 5 to 100 percent open, with a maximum discharge of **3,250** cfs at **25** feet of head upstream of the valve.**"**

SECTION 15050. FABRICATION OF STEEL PIPE

26. **REPLACE** Paragraph C.1.h in Article 1.01.C.1. General with:

    "h. Pipe Circularity: **Pipe circularity shall not exceed tolerances per AWWA C200."**

27. **REPLACE** Paragraph C.3.e in Article 1.01.C.3. Fittings and Specials with:

    "e. Whether or not indicated on the Plans, reinforcements or additional wall thickness shall be provided as required **per AWWA M11 design requirements with a design pressure of 100 psi**."

28. **REPLACE** Paragraph C.3 in Article 1.04. QUALITY CONTROL with:

    "3. Contractor shall provide radiographic inspector certified in accordance with **ASME BPVC Section V."**

29. **REPLACE** Paragraph C in Article 2.01. MATERIALS with:

    "C. **Coils** for fabricating steel pipes, specials, and fittings shall conform to ASTM A 1018, Grade 40. Steel ~~plate and~~ coil thickness shall not have a variation in thickness of more than 0.01 inch less than the thickness specified.**"**

30. **REPLACE** Paragraph H in Article 2.01. MATERIALS with:

    "H. Flanges: Conform to the material and dimensional requirements of AWWA C207. Provide standard steel-ring flanges where flanges are shown on the Drawings or required at wrought fittings. Flange bolts, nuts, gaskets, flange insulation kits and unions, shall be in accordance with Section 15060. Provide bolts in accordance with ASTM A193 and ANSI B1.1, with hexagonal heads, threaded full-length with ends chamfered and rounded. **Exposed bolts** shall be ASTM A193 Grade B7 and **buried bolts** shall be ASTM A193 Grade 316SS, unless specified otherwise. Project bolt ends 1/4-inch beyond surface of nuts. Provide hexagonal nuts with dimensions in accordance with ANSI B18.2. Provide face and finish flanges flat to a plane surface. Provide flanges attached normal to the axis of the pipe for alignment. Provide flanges tested, after welding to the pipe, for true plane and reface, to bring them within specified tolerances.**"**

31. **REPLACE** Paragraph D.1.a in Article 2.02.D.1. Straight Pipe with:

    "a. Hydrostatic test each segment of steel pipe after the joint configuration is complete and prior to any lining. **Radiographic testing of welds may be performed in lieu of hydrostatic testing."**

32. **REPLACE** Paragraph D.3.B in Article 2.02.D.3. Production Weld Tests with:

    "b. Weld test specimens on each **300** feet of production welds.**"**

33. **REPLACE** Paragraph E.1.a in Article 2.02.E. Weld Test Methods with:

    "1. Radiographic Test:

        a. Perform radiographs in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, **Section V and Section** VIII, Pressure Vessels.**"**

34. **REPLACE** Paragraph E.2.a in Article 2.02.E. Weld Test Methods with:

"2. Ultrasonic Test:

a. Perform ultrasonic tests in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, **Section V and** Section VIII, Pressure Vessels.**"**

35. **REPLACE** Paragraph A.4, A.6, and A.7 in Article 3.06. ASSEMBLY AND PREPARATION FOR WELDING with:

"4. The offset in abutting edges ~~shall not exceed 1/16 of an inch~~ at circumferential seams and ~~shall not exceed 1/32 of an inch~~ at longitudinal seams **shall not exceed the tolerances per AWWA C200."**

"6. Finished **cement mortar** lining straightness shall not deviate more than 1/8 inch from a 10-foot long straight edge held against the lining.**"**

"7. The end of a **cement mortar** lining segment shall not vary more than 1/8 inch at any point from a true plane perpendicular to the pipe segment axis passing through the center of the lining at each end.**"**

36. **REPLACE** Paragraph G.1 in Article 3.07.G. Testing Welded Joints with:

"1. Radiographic Inspection: Contractor, at its expense, shall make radiographic inspection of butt welded seams. The method of x-ray inspection shall be as prescribed in **Section V and** Section VIII of the ASME Boiler and Pressure Vessel Code.

a. The total amount of radiographic inspection shall be 10 percent of all manually **or semi-manually** welded butt welds or **100 percent of butt welds that are not subjected to hydrostatic testing.**

b. When a radiograph shows a defective weld, additional radiographs shall be made to determine the extent of the defect or defects. **For welds not subjected to 100% radiographic inspection, two additional areas on the same weld shall be inspected using the same method.**

c. These additional radiographs will supplement those required.

d. Pipe cylinders and segments revealing defective welds by radiographic examination shall be repaired if, in the opinion of the Engineer, this is possible, otherwise the pipe segment will be rejected.

e. The Engineer will require additional radiographic examination of such welds after repairs are completed.

f. Radiographic inspection shall be performed by the Contractor as work incidental to the fabrication and installation of the pipeline, and no direct payment will be made therefore.

g. Non-destructive inspection shall be performed by the Contractor as work incidental to the fabrication and installation of the pipeline, and no direct payment will be made therefor."

37. **REPLACE** Article 3.11. NON-DESTRUCTIVE TESTING OF WELDED JOINTS with:

"3.11 **NOT USED"**

38. **REPLACE** Paragraph A.7 in Article 3.13. HYDROSTATIC TESTS with:

"7. In lieu of the specified hydrostatic test specified hereinbefore, Contractor will be permitted to substitute 100 percent radiographing of welded seams **per Article 3.07."**

SECTION 15070. REINFORCED CONCRETE CYLINDER PIPE

39. **ADD** Specification Section 15070, included as ATTACHMENT NO. 4

SECTION 15120. PIPING SPECIALTIES

40. **REPLACE** Paragraph E in Article 2.03. DIELECTRIC CONNECTORS in its entirety with:

"E. **Flange insulating kit shall consist of one type E full face, neoprene faced phenolic gasket, and one integral sleeve with attached washer, one insulating washer and two steel washers per bolt, suitable for use with brass, bronze, steel or stainless steel 150-lb flange joints.**

1. Flange insulating kits shall be manufactured by Advance Products & System In., GPT Industries, or an approved equivalent."

41. **REPLACE** Paragraph F in Article 2.03. DIELECTRIC CONNECTORS with:

"F. Where dielectric/insulating connections are buried, testing units reaching to the surface shall be installed. **The station will extend a minimum of 3 ft above surface grade."**

42. **ADD** Paragraph F in Article 3.03. INSTALLATION OF OTHER ITEMS with:

"F. Test stations shall be installed at the approximate locations shown on the Drawings. The Contractor shall field verify all final locations, subject to acceptance by the Engineer.

1. Connect wires to the terminal board. Each wire shall be identified with a permanent wire identifier within 4 inches of the termination. After installation all wire connections in the test station shall be tested by the Contractor.

2. The Contractor shall provide global position system (GPS) coordinates for each test station location with a minimum accuracy of 3 feet. The Contractor shall submit the GPS coordinates of the test stations after installation."

APPENDICES

43. **ADD** Appendix I - Contractor Obtained Permit Guidelines included in the FTA link initially provided with the executed NDA under the Addenda Folder, Addendum No. 7.

Revised Construction Air Monitoring Plan (CAMP), Naturally Occurring Asbestos (NOA) and Metals, dated February 2021, URS Corporation (Addendum No. 3, Item no. 9)

44. **REPLACE** the second paragraph in Section 2.3, Sampling Period and Frequency, in its entirety with:

"The sampling period may be adjusted to 48 hours to achieve better sensitivity if 24-hour samples prove not to have a low enough detection limit **and/or to minimize field and analytical labor**.**"**

45. **REPLACE** the third paragraph in Section 2.3, Sampling Period and Frequency, in its entirety with:

"Samples **initially** will be collected **each day of activities likely to generate air emissions from soil or bedrock (e.g., construction, grading)** ~~on a twice per week schedule~~. The tunnel project is expected to have relatively little impact on the local air quality and the short-term temporal variability is not expected to be significant, ~~sampling every 6th day should be sufficient to meet the project objectives~~ **so the appropriate frequency of monitoring will be evaluated once sufficient data (e.g., 12 weeks) are available. If appropriate, a request to reduce the frequency of monitoring will be prepared for consideration. NOA and metals will be evaluated and considered independently of each other.** ~~To be conservative, this was increased to twice per week to account for any uncertainties. The monitoring dates will be staggered so that data are available for each day of the week and no bias is introduced related to weekday versus weekend sampling events. If possible, one sampling event per week will coincide with the USEPA schedule for every 6th day sampling. Adjustments to the schedule will be made, as needed, to address logistical considerations. For example, sampling may be shifted up or back by one day to avoid scheduled road maintenance near one of our sampling locations.~~**"**

46. **REPLACE** the third paragraph in Section 5, Data Evaluation and Reporting, in its entirety with:

"Data summaries initially will be prepared every two weeks and distributed by email. Values above the BAAQMD action level of 0.0016 s/cm3 ~~be flagged~~ **will trigger further action. BAAQMD will be notified by the end of the next business day after the laboratory data have been received**. **The available information will be reviewed to help determine which factors contributed to the relatively high value, such as proximity of the monitoring station to specific site activities, meteorological conditions, etc. Feedback will be provided to on-site decision-makers so that additional mitigation or other steps can be implemented to reduce future, similar events."**

47. **REPLACE** the fourth paragraph in Section 5, Data Evaluation and Reporting, in its entirety with:

"If the contribution from upwind sources is not significant, the measured **PM_{10} and metals** data can be compared directly to risk-based concentrations of potential concern. If the

contribution from upwind sources is significant, however, such comparisons would be biased and overstate the impact of site activities on local air quality. When appropriate, the upwind and downwind monitoring results will be used to calculate the net ground level (NGL) concentration, which is the fraction of the downwind measured concentrations that is due to the site activities. When the contribution from upwind sources is significant, **both the absolute measured concentration and** the NGL will be compared with risk-based concentrations of potential concern. Supporting information, such as laboratory reports and any field notes, will be included as appropriate.**"**

PLANS

48. **REPLACE** the following Sheet Codes will be included in the FTA link initially provided with the executed NDA under the Addenda Folder, Addendum No. 7.

a) C-005: Diversion Portal Soil Nail Wall Plan (Sheet No. 22 of 146)
b) C-015: MTBM Lake Tap Excavation Plan and Sectioning (Sheet No. 31 of 146)
c) C-016: Low Level Outlet Tunnel (Sheet 32 of 146)
d) C-300: Instrumentation Plan and Schedule (Sheet No. 61 of 146)
e) C-302: Inclinometer Details (Sheet No. 62 of 146)
f) C-610: Permanent Fencing – Details (Sheet No. 75 of 146)
g) C-611: Construction Fencing & Staging Area 2 Fencing Details (Sheet No. 76 of 146)
h) S-004: Typical Ladder and Guardrail Details (Sheet No. 81 of 146)
i) S-025: Diversion Outlet Structure Sections & Details Sheet 3 (Sheet No. 89 of 146)
j) S-101: North Weir Wall Details and Sections (Sheet No. 101 of 146)
k) M-025: Diversion Outlet Structure Details – Mechanical Appurtenances (Sheet No. 114 of 146)
l) M-040: 54" Anderson Force Main Realignment Plan (Sheet No. 116 of 146)
m) M-041: 54" Anderson Force Main Realignment Profile (Sheet No. 117 of 146)
n) M-042: 54" Anderson Force Main Realignment Connection Details (Sheet No. 118 of 146)
o) M-501: Existing Intake Hydraulic Piping Modifications (Sheet No. 122 of 146)
p) E-001: Symbol Legend, Abbreviations and General Notes (Sheet No. 123 of 146)
q) E-003: Single Line Diagram and Feeder Schedule (Sheet No. 125 of 146)
r) E-004: Main Switch board "MSA", "MCCA" Elevations and Mechanical Schedule (Sheet No. 126 of 146)
s) E-403: Enlarged Power and Grounding Plan (Sheet No. 130 of 146)
t) E-701: Title 24 (Sheet No. 134 of 146)

GENERAL QUESTIONS AND RESPONSES

Question 1. (Date Received: February 10, 2021)

Safety and Health Program states: "...Santa Clara County COVID-19 mandatory directive provided at the County website: https://www.sccgov.org/sites/covid19/Pages/mandatory directives- construction.aspx. This project is deemed a Large Construction Project. The Contractor shall comply with the Order and all the requirements of this Directive, and any changes to Directives over the course of the schedule.". If the District is expecting the Contractor to accurately estimate and include all possible changes to the COVID directives over the next 3 year, we respectively request and allowance item be added to the bid form.

Response 1.

An allowance will not be added to the bid form. VW expects that all bidders will use their expertise and good judgement and knowledge of the current COVID situation to put together their bids. Should a material change in COVID situation occur at a future time said changes will be handled in accordance with Section 3 of the Standard Provisions

Question 2. (Date Received: February 18, 2021)

Section 13.04.04 Hazardous Material Investigation Report. Paragraph a states: The following references are available online at the District's Construction Administration webpage for Contractor review:

1. Naturally Occurring Asbestos (NOA) and Metals Evaluation Report, Anderson Dam Seismic Retrofit Project, January 2021, URS Corporation.

2. Construction Air Monitoring Plan, Naturally Occurring Asbestos (NOA) and Metals, December 2020, URS Corporation.

3. Asbestos Dust Mitigation Plan Framework, December 2020, URS Corporation. We are unable to locate these on your website.

Please provide the files or a link to download the files.

Response 2.

The following are included in the FTA link that was provided after the NDA was executed:

1. Naturally Occurring Asbestos (NOA) dated January 22, 2021 is under the NOA folder with a titled name of 2021-01-22 NOA and Metals_V3_compiled.

2. This file was not initially provided but the Revised Construction Air Monitoring Plan dated February 22, 2021by URS can be found under the Addenda Folder, Addendum 3.

3. The original file of Asbestos Dust Mitigation Plan (ADMP) Framework dated November 25, 2020 by URS was included in Appendix L. There is no December 2020 ADMP. The Revised Asbestos Dust Mitigation Plan dated February 19, 2021 by URS can be found under the Addenda Folder, Addendum 3.

Question 3. (Date Received: February 28, 2021)

Can the Owner provide details on the portions of the work they may occupy prior to final acceptance?

Response 3.

Once the diversion system and the Coyote Creek modifications have been completed, including testing as specified, Valley water would occupy that portion of the work.

Question 4. (Date Received: February 28, 2021)

We note that the levying of liquidated damages is not the District's sole remedy for a failure by the Contractor to achieve contract completion Project time or to achieve the identified milestones by their applicable deadlines. We consider it customary for contracts of this type to specify that liquidated damages are the District's sole remedy for delay in order to provide certainty as to the nature and extent of the Contractor's potential liability in the event of a delay. Could the District please consider adding a standard sole remedy provision to the Contract.

Response 4.

No changes will be made to the Standard Provisions

Question 5. (Date Received: March 2, 2021)

Please add language in Article 4.22.A confirm the District will pay Contractor for Contractor's costs incurred due to the District's exercise of rights in Article 4.22.A if Contractor is not the cause of such termination of control.

Response 5.

No changes will be made to the Standard Provisions

Question 6. (Date Received: March 4, 2021)

Section 8.19 states that "The District may maintain a security checkpoint at the gate(s) and facility(ies). The security checkpoint(s) may be staffed by a District security guard during normal working hours, and at other hours, on an as-needed basis. District roving guard(s) may also patrol the property." Section 17.03 states that the "Contractor shall post a security guard 24 hours per day, 7 days a week at the project site." Is the contractor providing 24/7 security or just when the District is not providing security? Please clarify

Response 6.

Contractor shall provide security as stated in Section 17.03.

Question 7. (Date Received: March 10, 2021)

A map showing various areas of cultural concern will be available to the Contractor. This map contains confidential information and will be made available after the Contractor completes and executes the Request for Information with Non-Disclosure Agreement. We have executed both versions of the NDA, please provide the confidential map or add an allowance for Archeological Standby.

Response 7.

There are no mapped sensitive areas within the limits of work.

Question 8. (Date Received: March 11, 2021)

Spec Section 15050.1.01.C.1.h: The pipe circularity requirements are extremely stringent and appear to apply to the entire pipe length through all phases of manufacture and installation. This requirement will be impossible to achieve as written for pipe of this size. Please consider adopting AWWA C200 industry standards for manufacture and handling. Specifically Section C200 4.9 dimensional tolerances. (Stricter tolerances are achievable at the joint face at time of installation if required for fit-up.)

Spec Section 15050.1.01.C.3.e: Data for all “combined stresses,” including installation, seismic, etc. is not available to the pipe manufacturer nor is their a standardized process for evaluating all possible stresses. Please delete this paragraph and replace with, “Whether or not indicated on the plans, reinforcement or additional wall thickness shall be designed per AWWA M11.”

Spec Section 15050.1.03.C.4.e: D.1.1 applies to field welding. Section applies to shop and field welding. Recommend the following to address both shop and field welding, “Heat treatment and interpass temperature shall be in accordance with AWS D1.1 for field welds and in accordance with AWWA C200 and referenced ASME BPVC Section 9.”

Spec Section 15050.1.03.D.5: In-plant repair (as opposed to field repairs) procedures should be per AWWA C200 and all referenced standards rather than exclusively AWS D1.1.

Spec Section 15050.1.04.C.3: API 1104 is a field welding code. In-plant radiographic inspection should be per ASME BPVC Section 5. Delete and replace with, “Contractor shall provide radiographic inspector certified in accordance with ASME BPVC Section 5.”

Spec Section 15050.2.01.A: Demand within the steel market is exceptionally high and looks to remain so for the foreseeable future. Deviating from ASTM chemical content standards will result in steel availability issues. Suggest deleting, “The maximum carbon content shall not exceed 0.25 percent, and sulfur content shall not exceed 0.015 percent.”

Spec Section 15050.2.01.B: Recommend adding ASTM A516 gr70 plate. This is a more common steel plate spec with comparable characteristics to the other plate specs currently listed in this section.

Spec Section 15050.2.01.C: ASTM A1018 is a coil specification, rather than a plate specification. Delete, “Plate” & substitute, “Coil.”

Spec Section 15050.2.02.E.2.b: Ultrasonic testing should be per AWWA C200. Substitute, “The ultrasonic examination of specials shall be in accordance with

AWWA C200 and all referenced standards.”

Spec Section 15050.3.06.A.4: The offsets specified are not attainable using standard industry equipment. Please delete these offset requirements and adopt AWWA C200 offset and repair tolerances.

Spec Section 15050.3.06.A.6&7: Delete Not applicable to polyurethane or epoxy lining. 1/8” deviation along a 10-foot section will not be achievable with a paint lining across expected tolerances of the cylinder and weld heights.

Spec Section 15050.3.07.G: Delete. This weld test section duplicates and contradicts earlier weld test requirements in this section.

Spec Section 15050.3.11: Delete. This is another weld test section that duplicates and contradicts earlier weld test requirements in this section.

Spec Section 15050.3.13: Delete. This hydrotest section duplicates and contradicts earlier hydrotest requirements in this section.

Due to the size of this project’s fittings, we are finding the defined size of crotch plate reinforcement as shown on sheet M-002 make for impossible shipping hence requiring more fitting assembly at the jobsite. We request that a revised design of crotch plate reinforcement be allowed per AWWA M11 Design Guide in an effort to develop a reinforcement size more readily ship able.

Response 8.

See revisions to Specification 15050, included in Addendum 7.

AWS D1.1 is listed as a welder qualification in AWWA C200. No change made.

UT sonic testing has been revised to clarify in accordance with ASME Section 5 and 8 which are listed in AWWA C200.

Section 15050, Article 3.11 has been reconciled with Article 3.07.G and 3.11 removed. 3.07.G does not contradict previous sections and remains.

Section 15050, Article 3.13 for hydrostatic testing does not duplicate/contradict previous sections. No change made.

The chemical composition, potential savings/substitutions can be reviewed with the selected contractor.

For alternative designs of the wye reinforcement or alternative testing requirements, substitutions requests may be submitted by the selected contractor for review and approval per Article 7.07 of the Standard Provisions.

Question 9. (Date Received: March 11, 2021)

The interior finish of the single pass casing pipe installed via microtunnel is not called out explicitly in the specifications or drawing details. Will there be an internal coating requirement for the 8-9' ID microtunnel casing? If so, can you please clarify which specification section is applicable?

Response 9.

No internal coating is required.

Question 10. (Date Received: March 11, 2021)

There is a section of microtunnel casing pipe between the MTBM exit point and the trash rack that will not be grouted into the ground/rock and will be exposed to the lake water in the armor stone pile. Please confirm if this section of ~50ft of exposed casing requires any external coating? If so, which specification section is applicable?

Response 10.

No external coating is required.

Question 11. (Date Received: March 11, 2021)

Are the Lake Tap Tie-Downs depicted on page S-042 (Provided in Addendum 4) considered to be a permanent design or a temporary construction design? For example, if the Contractor elects to design its own MTBM casing anti-buoyancy system, will the system have to be designed for some permanent buoyancy, seismic, or hydraulic loading criteria or can it be temporary as long as the armor stone is thick enough above the pipe to prevent floatation should Valley Water wish to dewater the tunnel some time in the future?

Response 11.

Yes, pursuant to the requirements indicated in Note 2 on Sheet S-042.

Question 12. (Date Received: March 11, 2021)

Spec section 02320 – Microtunneling, 1.01 C.1, directs the Contractor to design the microtunnel casing to a hydrostatic design pressure of 80 psi. Spec section 02320 – Microtunneling, 1.06.A.b, directs the contractor to design the microtunnel casing for construction loads including overburden, earth, and hydrostatic loads. Please confirm that the intent of the specification is to design the microtunnel casing to 80psi hydrostatic load in addition to the Class IV ground loading of 6,535psf (specified in the GBR). Both of these loads are in addition to the construction loading [ie 80psi h20 + 45psi ground loading on crown]? Should the contractor consider an FS of 1, 1.25 or 1.5 on the 80psi hydrostatic load?

Response 12.

Specification Section 02320, Article 1.01.C.1 is applicable to the MTBM itself, not the casing. Article 1.06.A.b does not exist in Specification Section 02320. The minimum thickness as specified in the Contract Drawings as part of Addendum No. 5 is designed for all loads with exception to the Contractor's servicing/jacking loads, and therefore, the casing shall be

designed by the Contractor to meet requirements described in Specification Section 02320. The Contractor shall confirm the design of the steel casing is adequate for jacking loads with a FoS = 3.0.

Question 13. (Date Received: March 11, 2021)

Will the contractor be required to contain the grouting process from exposure to the lake water or will the in place silt curtains be acceptable?

Response 13.

Pursuant to Specification Section 02320, Article 1.06.A.4.a.8, the Contractor is required to submit a plan to minimize grout migration into the reservoir for approval by the Engineer.

Question 14. (Date Received: March 11, 2021)

Please confirm that the MTBM Launch chamber is anticipated to be in ground class V ground and that the MTBM contractor should consider this poorer ground condition in its design of the headwall, pipe restraint and jacking system.

Response 14.

Confirmed.

Question 15. (Date Received: March 11, 2021)

Drawing E-303, Addendum 4 added conduit for cameras and keycard readers. Please confirm the supply and install of the cameras, keycard readers, and associated power and signal wiring are not included in this contract

Response 15.

Confirmed, only conduit is included in ADTP contract.

Question 16. (Date Received: March 11, 2021)

Is the contractor responsible for any permanent design for the pipe support system or have all sizes, quantity, locations, etc., been fully designed and detailed within the bid documents? Will any stamped engineering calculations be required with the pipe support system submittal?

Response 16.

The selected pipe support product for the 24-inch bypass piping and BFV bypass piping shall be submitted for review and approval. M-025 has been revised to include a note, included in Addendum 7.

Question 17. (Date Received: March 11, 2021)

At the MTBM Lake tap there is excavation above the current deep pool level of Elevation 488. Does this material get disposed of in the dredging disposal area or the landside disposal area?

Response 17.

Material excavated at MTBM lake tap may be disposed of at the dredging disposal area.

Question 18. (Date Received: March 11, 2021)

Reference is made to Question 31 issued in Addendum 4. We are seeking clarification to the response with the following question. Part 3.02C of Specification Section 03300 states, “Unless otherwise specified, when placing mass concrete, lifts shall not exceed 7 feet in height. Mass concrete is any concrete section with a least dimension greater than 3 feet.” All walls at the Outlet Structure at thicker than 3 feet and therefore considered mass concrete. Based on this requirement, is a construction joint required at every 7 feet of height of wall? In other words, the walls with a bottom elevation at 405’ and a top elevation of 443’, is there to be a construction joint at elevations 412’, 419’, 426’, 433’, 440’, and top off at 443’ resulting in six pours for each 30’ length of wall?

Response 18.

The Contractor is to determine the construction joint per spec for mass concrete. Your example is a feasible option.

Question 19. (Date Received: March 11, 2021)

Are resin anchors allowed in lieu of grouted anchors in tunnel?

Response 19.

No. All permanent rock dowels shown on the Contract Drawings shall be fully-bonded, cementitious-grouted for long-term corrosion control; resin anchors are only acceptable when used at the discretion of the Contractor to supplement the prescribed initial support, or to be used as tunnel pre-support and/or face-support per the Contractor's selected means and methods.

Question 20. (Date Received: March 11, 2021)

Can synthetic fibers be used in lieu of steel fibers for tunnel shotcrete?

Response 20.

No, synthetic fibers are not permitted. Design is based on steel fibers and synthetic fibers will show inferior performance in terms of toughness and flexure. Synthetic fibers are permitted per the Contractor's selected means and methods of potential face-support measures.

Question 21. (Date Received: March 11, 2021)

Must shotcrete be full thickness in crown and walls prior to excavation of next advance? Or can full thickness placement lag by several rounds from active tunnel face?

Response 21.

The full thickness of steel fiber reinforced shotcrete shall be sprayed prior to excavating the next round.

Question 22. (Date Received: March 11, 2021)

How will determination of need for forepoling, spiling and fiberglass face bolts be determined? How will payment be made for these items? See drawing C-013.

Response 22.

Per Note 1 on C-013, Specification Section 02310 and Article 13.05.A.2 of the Special Provisions, the Contractor is responsible for the design and support of the tunnel heading. The concept shown is solely for illustrative purposes. The Contractor shall base their bid on their proprietary means and methods for tunnel pre/face support in accordance with the bid items. Payment for this item is included in Bid Items 5a, 5b, and 5c; and baselined lengths of tunnel requiring pre-support are provided in the GBR.

Question 23. (Date Received: March 11, 2021)

Which bid item is the MTBM chamber paid under. None of the items 5d, 5e, 5f cover the increased size of this excavation.

Response 23.

MTBM chamber is included under Bid Item 5f.

Question 24. (Date Received: March 11, 2021)

Is the minimum excavation support in MTBM chamber Type 5 regardless of ground conditions? See table on C-010 and Note 1 on C-014.

Response 24.

Yes.

Question 25. (Date Received: March 11, 2021)

How far beyond sta 4+00 must pre-excavation grouting extend? DWG C-001 indicates 0', but is this correct with overlap required by DWG C-011?

Response 25.

See Drawing C-001, revised in Addendum 4. Pre-excavation grouting is required from STA 3+30 to STA 7+50.

Question 26. (Date Received: March 11, 2021)

Drawing C-005 shows Soil Nail and hydrauger layout. Drawing C-008 shows the details associated with the soil nail wall. Detail 3 on C-008 shows geodrain board between vertical columns of soil nails, but the nails are not and cannot be laid out like this given the geometry of C-005 portal excavation cut and the layout shown. How shall these drain boards be placed to achieve drainage design intended?

Response 26.

See response to Question 9, Addendum 3.

Question 27. (Date Received: March 11, 2021)

Specification Section 02388 2.01 F requires that all soil nail and rock anchor bar and accessories be hot-dip galvanized. Industry standard for permanent soil nails is epoxy coating compliant with ASTM A775 (green) or A934 (purple). Is epoxy coating acceptable for these bars in lieu of galvanization which ASTM specification section if so?

Response 27.

Contractors shall use galvanized as specified.

Question 28. (Date Received: March 11, 2021)

Diversion portal soil nails are specified as Grade 150ksi bars. Is this indeed correct? It seems Grade 75ksi is more common in industry and also what is specified for all other soil nails on the project.

Response 28.

Grade 150 ksi bars is correct.

Question 29. (Date Received: March 11, 2021)

Drawing C-008 specifies hydraugers to be 2” diameter. Caltrans specifications for horizontal slotted drains requires 1.5” diameter SCH80 pipe. Can these be changed to 1.5” diameter pipe?

Response 29.

No. Contractors shall use 2" diameter as specified.

Question 30. (Date Received: March 11, 2021)

Addendum #4, item 5; has modified the Special Provisions for the project adding the following:

ADD Paragraph A.5 in Article 12.08. Construction Sequencing:

“5. Tunneling

a. Tunneling shall commence from HLOW Drop Shaft.
b. Tunneling from bottom of the HLOW Drop Shaft shall advance in the downstream direction to excavate and support the Diversion Tunnel prior to advancing upstream.”

What is the purpose of this sequence requirement? This is a cardinal change to the means and methods of the project. This complicates the tunnel excavation drastically working out of shaft vs portal access and will undoubtedly add significant budget and schedule to the

project. It also requires much larger shaft than is currently shown on drawing C-030 and C-031. Is the intent of Addendum #4 to prevent the contractor from being able to mine from the Diversion Portal upstream? What is the maximum size shaft that will be allowed by SCVW as a drop shaft structure? If this sequence change is indeed required, can the bid date be extended a minimum of 1 week to allow sufficient time to analyze this impact?

Response 30.

The purpose of this sequence is to align with the phased approvals by the two principal oversight regulators, FERC and DSOD. Yes, it may or may not affect the means and methods of the project. The drop shaft is anticipated to be part of the first phase set for approvals, so the Contractor is required to use the shaft for tunneling.

Addendum #4 is clear, and the contractor has to make his/her own assumptions and judgement using his/her expertise. The shaft's excavation dimensions shall be as large as necessary to accommodate construction and determined by the Contractor, subject to minimum requirements on the Drawings.

The Bid date has been extended from March 24 to March 30.

Refer to Addendum 6 for phasing implications on sequencing. The shaft's excavation dimensions shall be as large as necessary to accommodate construction and determined by the Contractor, subject to minimum requirements on the Drawings.

Question 31. (Date Received: March 11, 2021)

Why is waterproofing membrane being installed in a water tunnel between initial and final linings?

Response 31.

The waterproofing membrane is being installed as shown to meet design objectives of subsequent retrofit project.

Question 32. (Date Received: March 11, 2021)

The structural rebar shown in addendum #4 drawing C-031 does not seem to be possible to install whether the shaft become larger or stay small as shown, is this steel reinforcement required as shown regardless of shaft size?

Response 32.

There is no rebar shown on Drawing C-031. See Drawing S-051.

Question 33. (Date Received: March 11, 2021)

Bid item 8b calls for #10 anchors at the Diversion Structure. Drawing C-022 depicts these anchors, but indicates they are #14 bar. Which bar diameter is required?

Response 33.

Bid Form and bid item description for Bid Item 8b was clarified in Addendum 5.

Question 34. (Date Received: March 11, 2021)

Reference drawing M-501. Please confirm the quantity of Flex Coupling Replacements required. Are two replacements required at each "SEE NOTE 1" callout?

Response 34.

There are two flex coupling replacements at each location callout.

Question 35. (Date Received: March 11, 2021)

Reference drawing M-501. Please provide additional details on the Flex Coupling Replacements. The detail appears to show each pair located within a casing pipe. Is this correct? Is each repair location accessible from grade or will excavation be required? IF excavation is required, what is the approximate depth? Will the entire lines need to be removed or can each flex coupling be accessed? Will the owner drain existing fluid prior to replacement and refill after installation of the new couplings? If the contractor is to replace this fluid, please provide replacement specifications. Will the entire system need to bled and tested upon completion?

Response 35.

The flexible couplings are located within utility trench boxes with removeable covers and are accessible from grade. Minor excavation (<1 ft) may be required to expose the line within the trench box. Each flex coupling can be accessed without removing the entire line.

Bidders shall assume the District will drain and refill hydraulic line.

Question 36. (Date Received: March 11, 2021)

Can hydrostatic testing of the newly constructed 132" pipeline be completed through and against the newly installed valves or will temporary spools and blind flanges be required?

Response 36.

Hydrostatic testing shall not be performed against newly installed valves.

Question 37. (Date Received: March 11, 2021)

Your attention is directed to the revised plans C-031 and S-51 issued with Addendum 4. Please respond to the following questions:

a) Revised plan S-51 has added reinforcement to the concrete backfill around the 13’ diameter X 1” thick steel pipe at the HLOW shaft. As the concrete material surrounding the pipe is labeled “backfill” is reinforcing really necessary?

b) Revised plan S-51 has added reinforcement to the concrete backfill around the 13’ diameter X 1” thick steel pipe at the HLOW shaft, placement of the reinforcing is not constructible as shown. There is not sufficient room between the pipe and the excavated surface to fit an ironworker in order to install reinforcing bar. There is also insufficient room to thread the vertical bars around the bends shown toward the bottom of the shaft. Can the excavation size be made larger?

c) If the excavation size is made larger, would the outer mat of reinforcing steel stay at 33” from the face of the steel shaft, or does it move to 3” from the face of excavation?

d) Plan sheet S-51 calls for 3’ of concrete backfill around the HLOW shaft, however plan sheet C-031 calls for a minimum thickness of 4.5’ of concrete backfill. Please confirm the concrete backfill thickness dimension.

Response 37.

a) Yes, it is required for shrinkage and temperature reinforcement, as well as to mitigate fault offset by making the integral system (13-foot steel liner encased in reinforced concrete) more ductile.

b) Yes, the excavation size can be larger. As stated on Note 1 of Drawing C-030 and various provisions in Specification 02311, the excavation shall be sized by the Contractor to construct the permanent lining features (13-foot diameter steel liner, and a minimum 3-foot thick reinforced concrete encasement) associated with the HLOW Drop Shaft.

c) In accordance with Section A of Drawing S-051, the extrados reinforcement moves to 4-inch from the face of excavation.

d) Section A of Drawing C-031 was revised in Addendum 4 showing a 13-foot diameter steel liner encased within a 19-foot wide concrete encasement, thereby resulting in a 3-foot thick concrete encasement of the 13-foot diameter steel liner.

Question 38. (Date Received: March 11, 2021)

Your attention is directed to Question 18 and the response in Addendum 2. The answer states that the placement of concrete in the tunnel lining shall conform to the 4 day wait period between adjoining pours per Clause 3.02A of section 03300 – Cast-in-Place Concrete. We respectfully request this response be retracted. Section 02330 – Tunnel and Shaft Linings, Clause 3.02 – Placement of Concrete, specifically describes how concrete is to be placed for the tunnel lining. This section does not contain “wait period” language. Having a directed “wait period” is not typical for tunnel work, it will be detrimental to the schedule, and will lead to an inferior product. Again, we respectfully request the response to Question 18 in Addendum 2 be retracted as written and revised to direct the bidder to Clause 3.02, of Section 02330 – Tunnel and Shaft Linings.

Response 38.

The tunnel invert slab is an exception to Specification Section 03300, Article 3.02A. This response supersedes the response to Question 18, Addendum 2.

Question 39. (Date Received: March 12, 2021)

Specification 15060, Section 3.20.C calls for a soap and compressed air test on pipe joints both before and after backfilling. The detailed procedure given in subsection 3 is written for a butt-strap joint. However, previous responses to questions confirmed that the primary welded steel pipe joint will be a butt weld. Please confirm no air test is required on the butt welds.

Response 39.

Confirmed. Specification Section 15060, Article 3.16.D.3 states air test is for butt straps joints.

Question 40. (Date Received: March 12, 2021)

Sheet Number 76, Sheet Code C-611, note 6 calls for wooden privacy slats for Staging Area 2 but wooden slats are no longer manufactured, can we use a 3-1/2" x 5-1/2" mesh with 2-3/8" plastic slats instead or will we need to provide a 2" mesh per Note 4 on same sheet and hand fed slats which be less cost effective and more labor intensive.

Please advise.

Response 40.

Fencing at Staging Area 2W intended to match existing fencing surrounding the residential property.

Question 41. (Date Received: March 12, 2021)

Would Valley Water allow for a true tee configuration of the shaft pipe from vertical to horizontal at the HLOW Drop Shaft? This will assist with completion works within tunnel, shaft pipe construction and possible future access for Valley Water.

Response 41.

Proposed configuration changes can be reviewed with the selected contractor. No changes made.

Question 42. (Date Received: March 12, 2021)

Please clarify that Geodrain with Geofabric is to only be used from 9+00 to 15+50 and the remainder of the tunnel (3+30 to 9+00) is only to use geosynthetic (geotextile) in conjunction with the PVC membrane.

Response 42.

Confirmed.

Question 43. (Date Received: March 12, 2021)

Please revise the specification to increase the longitudinal spacing of the water barrier to match the length of the arch pours. If 30' arch pours are allowed per specifications what is the need for the additional water barrier and mid length?

Response 43.

Per Specification Section 03300, Article 3.02B, the construction joint spacing is 30 feet unless otherwise specified. Drawing C-016, Section A specifies the final lining construction joint as every 50 feet.

Question 44. (Date Received: March 12, 2021)

Is it intended that all regroutable hoses be connected to and injected with grout? Typically only connected to in the presence of water.

Response 44.

Per Specification Section 02339, Article 3.04.D.2, all regroutable hose shall be grouted.

Question 45. (Date Received: March 12, 2021)

Please provide detail of 8' or 9' MTBM casing (termination point, rebar requirements) within Final Lining concrete.

Response 45.

The 8 to 9-foot steel casing's upstream terminal is located at the MTBM Operation Chamber Launch Portal Bulkhead at STA 03+30.6. Per various provisions and specifically Specification Section 02320, Article 1.01.D, the MTBM Operation Chamber Launch Portal Bulkhead shall be designed by the Contractor.

Question 46. (Date Received: March 12, 2021)

Please provide drawing S-042 which is stated to be provided as an addendum on G-002

Response 46.

Drawing S-042 was included in Addendum 4.

Question 47. (Date Received: March 12, 2021)

Please confirm the testing requirements for welded joints within the tunnel and shaft as Radiographic Testing may not be feasible due to limited access around the outside of the steel liner.

Response 47.

Radiographic testing requirements are confirmed. Review of testing requirements can be performed with the selected contractor.

Question 48. (Date Received: March 12, 2021)

Per Sheet M-040, what is the existing pipe materials for the 18" Hydro Return Line along the existing 54" Anderson Force Main? Is this a welded steel pipe or Bell and socket pre-stressed concrete cylinder pipe?

Response 48.

Existing pipe is welded steel pipe.

Question 49. (Date Received: March 12, 2021)

Sheet M-042 indicates two details, on with flanged connection (1) and one without. Are these rwo details options for connection of the 54" force main at the tie-ins? What is the tie-in detail for the 18" Hydro return line? Can the vertical mitered elbow per A B & C (on sheet M-041) be flanged sections?

Response 49.

Correct, the tie-in detail for the 18" hydro return line is shown on Drawing M-005 (Detail C). M-042 was revised in Addendum 5 to include a callout to this detail.

Question 50. (Date Received: March 12, 2021)

For the section details on M-041 A & B, a note indication the limits of "Pay Depth of Excavation" for these details. What pay item is this referenced to in the bid schedule?

Response 50.

Bid Item 9b "Realign Anderson Force Main (AFM)" is a lump sum. The callouts for "pay depth of excavation" have been removed on Sheet M-041, included in Addendum 7.

Question 51. (Date Received: March 12, 2021)

Per Sheet Note #7, the contractor is required to "Submit a work plan for the Disposal of the water drained from all pipelines". Please provide information regarding length of 54" and 18" pipes to determine quantity of water that will be generated during draining for the construction of the force main and hydro return line. Where are the shut off values for these lines and how many feet of water column will we need to consider for disposal.

Response 51.

See responses to Question 33, Addendum 4, and Question 27, Addendum 5.

Question 52. (Date Received: March 12, 2021)

Per Sheet G-002, list of drawing to be included as part of the bid documents, we note that the following sheets were called out but not included with the drawing set: S-042 "MTBM LAKE TAP" Sheet #98 & I-024 "PERMANENT SECURITY CONDUIT" Sheet #146. These items have not been provided in any of the addenda issued to date. Will this be provided?

Response 52

Drawing G-002 has been revised and was included in Addendum 5. Drawing S-042 was included in Addendum 4. Drawing I-024 has been removed.

Question 53. (Date Received: March 12, 2021)

Revised Sheet G-022 (add. #3) indicates (N) 6' Chain Link Fence (See Detail 4 on C-611) Please confirm that height of fences noted on the plans as 6' shall be installed, not the call out on sheets C-610 & C-611 indicating 8' high.

Response 53.

Fencing around Staging Area 2E and 2W is 6' high as shown on Drawing C-611.

Question 54. (Date Received: March 12, 2021)

Sheet G-022 indicates various Gates as detailed on sheet C-611. What are the widths of these gates? The detail for a sliding vehicle gate indicates a concrete base pavement for the roller system. Please provide additional details for the constriction of this gate. No information on the plan sheets G-022 and C-207 are provided regarding the magnetic gate position, electrical conduit mentioned on the typical gate details. Do these gates required Gate Position Switches? Please provide more information on this security system and tie-in/conduit runs. Fence layout on the various plans sheet do not indicate start or end of these items, is the intent that the contractor scale off of the drawing to determine a quantity of fencing required on the project? Please provide tie-in locations and layout measurements for the permanent and temporary fencing on the project.

Response 54.

Contractor to scale plans to determine quantity of fencing required. Gate details to be field confirmed for construction vehicles. Gate Position Switches as shown on details. Drawings C-610 and C-611 have been revised to clarify, included in Addendum 7. Other elements related to fencing at Staging Area 2E are Contractor means and methods.

Question 55. (Date Received: March 12, 2021)

Sheet C-600 indicates a legend for (N) 6' high Chain link fence and reference a detail on C-611 (8'), Please confirm that the length and layout for the proposed new (N) 6' high CL Fence along Cochrane road and the project site. per G-022, this fence is not completely shown. What is the alignment of this fence line, how does it terminate at the access road and the noted (N) Double Swing Gate to the site. Without more details, we are unable to determine how much clearing or tree removal that might be required for its installation. Please provide missing information as noted on sheet G-022. Where is this fence line in relationship to the edge of pavement for Cochrane Road?

Response 55.

Drawing C-611 shows 6' high fencing. Fence is intended to run along property line. Fencing connects to the gates.

Question 56. (Date Received: March 12, 2021)

Within the Upper Parking Area (Disposal Area Site) Sheet C-600 has similar legend lines to indicate a fenced in area within the area between the roadway and parking lot. Please provide additional information for this fencing requirements. What is the size and location of this fence. Also is there additional fencing requirement for the disposal site? No large scale drawing of this area was provided. Is this fence permanent or temporary and does it have wooden slats?

Response 56.

No additional fencing is required. Temporary fencing as shown is 6' per legend, see Drawing C-611. Wooden slats are not required.

Question 57. (Date Received: March 12, 2021)

Temporary Fencing & Signage Requirement per Sheet C-6001 has similar legend lines to indicate (N) 6' Chain-link Fence per C-611. Is this a temporary or permanent fence? Please confirm if wooden slats are required for this fence. Please indicate under which bid item should this cost be included under.

Response 57.

Fencing shown on Drawing C-601 are temporary. Wooden slats are not required. Drawing C-611 has been revised to clarify, included in Addendum 7. Temporary fencing to be paid under Bid Item 1a. Special Provisions, Article 21.01.04 has been revised to clarify, included in Addendum 7.

Question 58. (Date Received: March 12, 2021)

On various plan sheets sheet C-611 is referenced for Temporary Fence foe Detail (4), Please confirm if 3' deep concrete footing are required for a temporary fence, or can we drive post into the ground?

Response 58.

Contractor to install foundations for temporary fencing as shown on Drawing C-611.

Question 59. (Date Received: March 12, 2021)

If a 26" thick section is required as shown on section B will a modification be allowed so excavation and initial support is larger to accommodate the 26" dimension while keeping the finished liner the same profile as the remainder of the LLOT? As currently detailed a traveling arch form would not be able to be utilized for these sections or the areas on either side where the concrete tapers back to the LLOT profile.

Response 59.

It is not possible to determine in real time if over-excavation will be required to maintain a consistent finished liner profile. The extent of the 26" thick articulated joints will be determined after the initial excavation of the tunnel.

Question 60. (Date Received: March 12, 2021)

Reference plan sheet C-005, please provide the upper and lower limit of the shotcrete and # 6 rebar.

Response 60.

Shotcrete to be installed from bottom of excavated portal slope to Elev. 460. See Note 9.

Question 61. (Date Received: March 12, 2021)

"For the Intake Structure Flex Hose Materials, our suppliers is requesting additional information regarding the hose sizes noted and the corresponding quick connect required. Please note Parker FS Series Quick Connect does not come in 1- 1/4"" size. Please find cut sheet on these quick connects per link below, please provide model number for flex connection ends (Male or Female) for each location based on size of hose. Please confirm that existing hydraulic lines will not require any modifications to the ends to allow for the FS Series quick connects to attach. Can you please provide photos of these connection points to provide us a better understanding of the existing conditions and the scope of work required?

https://www.parker.com/literature/Quick Coupling/catalog sections/FS Series-Catalog 3800_SectionB.pdf"

Response 61.

Approved product has been revised to Parker Series Snap-Tite H series or equal. Drawing M-501 has been revised, included in Addendum 7. Photos of the existing connection are not available. For bidding purposes, assume the existing hydraulic lines are threaded and will not require any modifications for attachment.

Question 62. (Date Received: March 12, 2021)

Reference plan sheet C-022. All cross sections reference 20LF #14 anchor bars. There is no corresponding bid item, please provide method of payment.

Response 62.

Bid item 8b was revised in Addendum 5 to clarify.

Question 63. (Date Received: March 12, 2021)

There are no permanent erosion control plans provided for this project. Please confirm that Hydroseeding bid items 3k, 9m, and 10k are the full extent of permanent erosion control required for this project.

Response 63.

Confirmed.

Question 64. (Date Received: March 12, 2021)

Please confirm that there are no seasonal restrictions for the installation/removal of the Temporary Dike and dewatering of the North Channel.

Response 64.

June 15 through October 15 is the expected work window (typical for steelhead streams).

Question 65. (Date Received: March 12, 2021)

Reference plan sheet C-420, (N) Access Road to be designed by contractor. If this road is made of virgin aggregate and filter fabric can it remain in place after the completion of the work or is required to be removed?

Response 65.

Access road to be removed at end of contract.

Question 66. (Date Received: March 12, 2021)

Further to the response provided for Question 5 in Addendum 3, is it expected that the contractor install a temporary bulkhead (capable of withstanding approximately 7 bar) at Sta 13+79 to allow for the hydrostatic test from the elliptical bulkhead at the top of the shaft to the outlet structure to be conducted

Response 66.

Yes, a temporary bulkhead at 13+79 will be required for hydrostatic testing.

Question 67. (Date Received: March 12, 2021)

3.05 FIELD TESTING (132” Cone Valves) C. Upon completion of installation of the valves: 3. After successful hydrostatic field test, the Contractor shall perform the field flow rate test for the valve with maximum reservoir head. Open the valve to the 10% open position. Wait for flow to stabilize and record the pressure directly upstream of the valve. Repeat for valve positions for 20%; 30%; 40%; 50%; 60%; 70%; 80%; 90%; and 100%.

Question:

For the flow test, are we to assume that the lake level will be at the maximum reservoir depth to perform the stabilized flow test for each percent of opening of the 132” cone valve or is the contractor going to be responsible to pump the water in from the lake or hydrant source to perform the flow test?

What is the standard time for flow to stabilize? This calculation can be used to determine how many gallons of water will be needed for each graduated test.

Response 67.

Reservoir level requirements for flow test were revised in Addendum 5. Flow is considered stabilized when the pressure reading directly upstream of the FCV has stabilized. There is no standard time available.

Question 68. (Date Received: March 12, 2021)

The waterproofing spec requires the 16" water barrier (base seal waterstop) to be used at all radial, horizontal and vertical construction joints. Detail 3 illustrates the use of a waterstop but does not illustrate the use of the 16" water barrier on the waterproofing membrane. Is the waterstop and water barrier to be used in conjunction or is the water barrier to be used in lieu

of the waterstop for all radial, horizontal and vertical construction joints associated with the tunnel concrete final lining.

Response 68.

The water barrier is in conjunction with the waterstop. Location of water barriers is one of the submittals required in Specification Section 02339, Article 1.04.C.3 creating sections as defined in Specification Section 02339, Article 1.03.J, as-builts required in Specification Section 02339, Article 1.04.L.3, and requirements for their layout in Specification Section 02339, Article 3.04.B.

Question 69. (Date Received: March 12, 2021)

2.02 Butterfly Valves – Triple Offset Metal Seated: F. Electric Valve-Actuators According to the spec section an electric valve actuator is specified.

Question: If an electric actuator cannot meet the full load torque requirements can a hydraulicly actuated actuator be considered as an approved equal?

Response 69.

Substitutions requests may be submitted by the selected contractor for review and approval per Article 7.07 of the Standard Provisions.

Question 70. (Date Received: March 11, 2021)

2.02 Fixed-Cone Valves B. Fixed-Cone Valve Components 5. Valve Hoods The spec calls for them, but they’re not show on the drawings.

Question: Are discharge hoods required?

Response 70.

A hood is not required. This revision was in included in Addendum 5.

Question 71. (Date Received: March 12, 2021)

Can the valve be tested sperate of the hood to achieve the 4300 cfs requirement or do the valve and hood combination need to meet the 4300 cfs?

Response 71.

A hood is not required. This revision was in included in Addendum 5.

Question 72. (Date Received: March 12, 2021)

Given the bid items 5j and 5k changed in quantities shouldn't bid item 5i also have been adjusted.

Response 72.

Quantity for Bid Item 5i was revised in Addendum 5.

Question 73. (Date Received: March 12, 2021)

Quantities for all ground support types has slightly been modified along with the location of the MTBM chamber. Please provide a revised Geotechnical Baseline Report corresponding to the modified quantities and new bid items added.

Response 73.

Revised GBR included in Addendum 5, has the slightly modified quantities.

Question 74. (Date Received: March 12, 2021)

Notes 2 - 4 specify a specific fall arrest system for installation at all the ladders. Suppliers have indicated this specified system is no longer produced. Is the replacement system, by DBI Sala, acceptable?

Response 74.

S-004 has been revised to clarify, included in Addendum 7.

Question 75. (Date Received: March 12, 2021)

Addendum #4 changed the quantities for Bid Items 5j and 5k (Articulated Joint Segments). The new totals of the Articulated Joint Segments plus the Reinforced Concrete Liner (Bid Item 5i) exceed the total length of the tunnel to be lined. Will the bid item quantity for Reinforced Concrete Liner be adjusted so that the Articulated Joint Segments and Reinforced Concrete Liner quantities correlate with the total tunnel length to be lined?

Response 75.

Quantity for Bid Item 5i was revised in Addendum 5.

Question 76. (Date Received: March 12, 2021)

Please provide a specification for the 18” RCP shown on drawing S-021.

Response 76.

Specification Section 15070 has been added, included in Addendum 7.

Question 77. (Date Received: March 12, 2021)

Please confirm the hydraulic line modification work will not require flushing. If flushing is required, please provide an ISO particle count target as described in ASTM D4174-11.5.1.

Response 77.

Flushing is not required.

Question 78. (Date Received: March 12, 2021)

Spec section 15120 – 2.03A states that dielectric connectors shall be used at connections between new and existing work unless otherwise noted. Addendum 2 response 8 states that no isolation joints are required. Please confirm no isolation joints are required at connections between new and existing work. If isolation joints are required for new to existing connections, please confirm isolation joints are required for detail 1 on DWG M-042 and detail 1 on DWG M-051. If isolation joints are required, please confirm test stations are required per spec section 15120 – 2.04.

Response 78.

An isolation joint is needed at the connection between the new WSP AFM and the existing PCCP AFM. A callout has been added to Detail 1 on Drawing M-042, included in Addendum 7. However a test station is not required there. No isolation joint is required for Detail 1 on Drawing M-051.

Question 79. (Date Received: March 12, 2021)

Drawing ST-14 note 3 states that an insulating joint is to be used between the gate valve and CARV. Addendum 2 response 8 states that no isolation joints are required. Please confirm this insulating joint is not required.

Response 79.

An insulating joint shall be between the gate valve and CARV, as shown on ST-14. The response to Question 8, Addendum 2 did not consider the AFM.

Question 80. (Date Received: March 12, 2021)

Drawing M-040 from Addendum 4 states that the 18” hydroreturn line will be tied-into according to Detail C on Drawing M-005. This is not possible on an 18” pipe. Please confirm the tie-ins are to be performed according to Detail 1 on drawing M-042.

Response 80.

Detail C on M-005 shows a butt-strap joint. This will work for a 18" welded steel pipe. Detail 1 on M-042 is applicable for connecting the new AFM WSP with the existing AFM PCCP.

Question 81. (Date Received: March 15, 2021)

Specification 11287, Section 2.02.5 calls for a Valve Hood. Indications from valve manufacturer are that a hood for a valve this size will result in a valve assembly far more extensive that that shown in Section A of drawing M-022 and that the hood would not fit through the current opening provided in the roof. Please confirm if a hood is required.

Response 81.

A hood is not required. This revision was in included in Addendum 5.

Question 82. (Date Received: March 11, 2021)

In Addendum 4, both the response to Question 10, and note 4 on Drawing C-301, indicate the distance between the pipe in the drop shaft and the support of excavation is to 4.5 ft. However, the details on Drawing C-301 and Drawing S-051 call out the coverage around the pipe as 3 ft. Please clarify the coverage requirement around the pipe in the drop shaft

Response 82.

The coverage requirement around the pipe in the drop shaft is 3 feet minimum, as indicated in the revised sheet C-031, included in Addendum 5.

Question 83. (Date Received: March 15, 2021)

In the revised bid form issued in Addendum 4, the sum of the quantities for the tunnel concrete lining (bid items 5i, 5j, 5k) add up to 1,515 LF. This is over 200 LF more than the total length of tunnel to receive a concrete final lining. Using the full bid quantities will artificially inflate the cost of the proposals and may impact representation of the project schedule. Will the bid items be revised or are the Contractors to bid these quantities as shown in Addendum #4?

Response 83.

Quantity for Bid Item 5i was revised in Addendum 5.

Question 84. (Date Received: March 15, 2021)

Spec Section 16051 3.03.C.1 states "install direct burial ducts and conduits for low voltage and signal unless otherwise shown on the drawings". Drawing E-001 General Note 2 states " All direct burial underground conduits shall be PVC Coated Rigid Steel". Please confirm all underground conduits on sheets E-301, E-302, E-303, E-401, E-402, I-015, and I-017 are considered low voltage and require PVC Coated Rigid Steel Conduit to be direct buried per E-602 detail 8. If not, please identify which underground conduits are direct buried PVC Coated RSC verses concrete encased PVC Sch 40 conduit.

Response 84.

Drawing E-001 has been revised to clarify. See General Note 24.

Question 85. (Date Received: March 15, 2021)

Spec Section 02330 3.04 D states "maintain bracing in place a minimum of 14 days following grouting or concrete placement". If the cylinder strengths show that the backfill will reach the desired design strength before 14 days have passed, can the Contractor remove the internal pipe bracing without waiting the full 14 days?

Response 85.

Yes.

Question 86. (Date Received: March 15, 2021)

The Drawing Sheet M-042 for the 54” Anderson Force Main (FM) provides two details (1) & (2) that indicate “Cement Grout In Place” for the interior of the new WSP. Please confirm that interior grouting of the force main line is only required for connection points of the pipe welding zones. Similar to the exterior lining of the Butt Strap Joint section. What is the limits of the interior cement grouting for this section of the pipe? How thick is the interior and exterior cement grout for the connection points?

Response 86.

The new WSP cement mortar lining needs to be field applied at welds and tie-in points to the existing PCCP. The limits of the field application is 6 inches from the closest weld. Thickness of lining and coating per specifications.

Question 87. (Date Received: March 15, 2021)

Installation of Pipe Bulkhead for testing, per detail (E) & (F) on Sheet M-005 indicates the installation of a Bulkhead with required field welding on the interior and exterior, please confirm that the pipe testing for the 54” force main will require this detail and not the 18” WSP. Please confirm that the straight pipe sections can only be tested, and the elbow sections at the tie-in can not be pressure test with this fitting. Please confirm that an exterior weld only for the bulkhead will be adequate for the 54” FM without any access to the interior of the straight section of pipe.

Response 87.

The new 54" WSP will have flanged connections. A blind flange can be applied for pressure testing. Contractor's means and methods apply for hydrotesting - the bulkheads or blind flanges must be adequate to meet testing pressure. The elbows can be tested on the line.

Question 88. (Date Received: March 15, 2021)

Please confirm that Sheet M-040 connection point for the 54” FM will have an manways at elbow connections, please provide details for these fittings. Please provide to the required reference or call out for details that are applicable.

Response 88.

The elbow connections will not have a manway.

Question 89. (Date Received: March 15, 2021)

Please confirm if as-built details for the existing Anderson Force Main are applicable to the new WSP sections. Please provide Missing sheets ST-1, ST-2, SP-3 and others referenced in details that are applicable. Please confirm that there is no Cathodic Protection required for the 54” and 18” WSP Force Main pipes or as detail on sheet ST-12 for the installation of the precast concrete vault.

Response 89.

As-built details included in plan set are applicable to the pipe realignment. ST-1 and ST-2 are not relevant to the AFM. The complete set of AFM as-builts are available. Refer to Article 13.04.06.E.6 of the Special Provisions.

Question 90. (Date Received: March 15, 2021)

Revised Sheet C-600 “Temporary Fencing & Signage Sheet” Please confirm that wooden slat are only required for Staging Area 2W (to be the same type as existing). Please note that wooden slats are no longer available and have been replaced with industrial slats made of HDPE with a color pigment and UV inhibitors. Will HDPE Slats be acceptable in-lieu of wooden ones?

Response 90.

Privacy slats only required at Staging Area 2W. Drawing C-611 has been revised to clarify, included in Addendum 7. HDPE slats will be acceptable if wooden slats are no longer available (must show documentation).

Question 91. (Date Received: March 16, 2021)

Please confirm that any reference for temporary chain link fence and gates, indicates these items will need to be removed at the end of the project.

Response 91.

Temporary fencing shall remain at end of contract.

Question 92. (Date Received: March 15, 2021)

3) Sheet C-600 required (N) Double Swing Gate at the entry driveway of Staging Area #1, Please provide additional details for configuration of this gate and connection with existing fence line and the new. Please provide detail at the orange Safety fence and the new gate.

Response 92.

Contractor to determine gate configuration and connection with existing fencing. Orange safety fencing to be installed per manufacturer's requirements/recommendations.

Question 93. (Date Received: March 15, 2021)

Sheet C-610 Permanent Fencing Details do not have any requirement for Privacy Slats per the plan Notes. Please confirm none is required.

Response 93.

Privacy slats only required at Staging Area 2W.

Question 94. (Date Received: March 15, 2021)

Section 02830 Chain Link Fence and Gates of the specification under paragraph A.1.a indicate all chain link fences as shown under the contract drawings shall meet the additional requirements specified for Security Fences. Please confirm if this applies to temporary or construction fence? Please confirm that temporary/construction fence do not require PVC-coated fence fabric.

Response 94.

Specification Section 02830 has been revised to remove Article A.1.a, included in Addendum 7. Temporary/construction fencing does require PVC-coated fence fabric per Specification Section 02830, Article 2.04.C and Drawing C-611, Note 6.

Question 95. (Date Received: March 16, 2021)

After carefully considering the Contract documents, including recent changes to the Specifications the Diversion Tunnel downstream from the HLOW Drop Shaft before tunneling upstream, the Milestone 7 date becomes unachievable by several months. Additionally, the Milestone 9 date, is at far greater risk by multiple months, which in turn makes Milestone 10 unattainable. Please revise these milestone dates as shown below to be in line with achievable durations and production rates.

- Milestone 7: 950 Days from the first chargeable Day of the Contract
- Milestone 9: 1,400 Days from the first chargeable Day of the Contract
- Completion of all Work required under the contract, excluding the two-year landscape establishment period, per 12.03.A.: 1,450 Days from the first chargeable Day of the Contract

Response 95.

There will be no changes to these milestones.

Question 96. (Date Received: March 16, 2021)

Question 58 was asked and answered in Addendum 4 regarding an overall limit of liability. We believe the answer did not address the nature of the question and may have been misunderstood. The answer states that insurance is in place to satisfy overall liability. The question is not referencing liability insurance or builder's risk insurance, rather liability exposure to the Owner due to unforeseen delays to the project. Because the contract has not excluded consequential damages and does not contain an explicit statement that Liquidated Damages are the sole and exclusive remedy for delay (Addendum 4 Question #57), the Contractor is at risk for un-quantifiable, unlimited, and severe delay damages, especially considering the nature of this work and the follow-on costs associated with the dam repair. Please re-consider the answer to Question 57 and 58 given the clarifications herein.

Response 96.

The contract does not provide for a cap on Liquidated Damages, nor are Liquidated Damages the sole and exclusive remedy available to the District.

Question 97. (Date Received: March 16, 2021)

Drawing C-410 indicates that two existing inclinometers to be removed and relocated. Please confirm if this is additional instrumentation installation than what is specified on page C-300. Please also provide the details for existing inclinometers to be relocated.

Response 97

These are different inclinometers than shown on C-300. Details on inclinometers were included in the Supplemental GDR, included in Addendum 5.

Question 98. (Date Received: March 16, 2021)

Unlike the specification for the triple offset butterfly valves, there was no named, approved manufacturer for the cone valves. Specification 11287, Section 1.05.C does place some stringent qualifications on the cone valve manufacturer. Namely that the “Valve manufacturer must have a minimum of ten (5) years of experience of the same design and size specified and larger. Provide a minimum of three (3) references of operating installations with valves of the size specified or larger and in the same service as specified operating for not less than five (5) years.” We have had two very reputable cone valve manufactures note that no cone valve manufacturer in the world can meet these requirements. We request section 1.05 .C be removed.

Response 98.

Specification Section 11287 has been revised, included in Addendum 7. Valve sizes 96-inch or greater are considered acceptable experience.

Question 99. (Date Received: March 17, 2021)

See sheet E-403 and E-301: Addendum 4 added “(4) 2”C STUB UP FOR GATE, SEE E-301”. Sheet E-301 includes no information for these conduits. Please provide routing information and information on any conductors needed.

Response 99.

Drawing E-403 has been revised to clarify, included in Addendum 7.

Question 100. (Date Received: March 17, 2021)

See Sheet E-003: Conduit tag “604” is not listed in the conduit schedule. Please provide circuit and conduit requirements.

Response 100.

Drawing E-003 has been revised to clarify, included in Addendum 7. See feeder schedule.

Question 101 (Date Received: March 17, 2021)

See Sheet I-015: A temporary generator is shown on this sheet that is not shown on any electrical drawings including the one line. Please confirm that this generator is not included in the project.

Response 101.

Confirmed.

Question 102. (Date Received: March 17, 2021)

See Sheet I-015 and I-016: The conduit schedule indicates that SP-001 is UG. C-510 routed next to it is shown as above ground. All conduits on the page are shown with the same line weight. Is the conduit schedule to take precedence? Are all conduits to be routed below ground to the device and stubbed up at the location of the device?

Response 102.

The conduit routes are diagrammatic. The cable/conduit schedule should be used to determine number of circuits/cables required and to/from locations, distances expected or estimated. Routing should be coordinated with electrical. Where practical. route conduits underground. For example, the butterfly valves require power and controls. The power is routed underground; the controls conduit can be routed underground as well.

Question 103. (Date Received: March 17, 2021)

See Sheet I-015: Please provide specifications for PB-1 through PB-12 listed on the sheet.

Response 103.

Refer to Specification Section 16050 Basic Electrical Materials and Methods.

Question 104. (Date Received: March 17, 2021)

Can you confirm if there are any Valves that are being supplied by the Owner/District Furnished?

Response 104.

No valves are Owner/District furnished.

Question 105. (Date Received: March 17, 2021)

Addendum-5 came out with Fab Steel pipe spec being modified calling for Buried Bolts to be ASTM A193 Grade B7 with Exposed to be Grade 316.

Normally it would the other way around? Buried being 316 SS…… Please confirm!

Response 105.

Specification Section 15050 has been revised accordingly, included in Addendum 7.

Question 106. (Date Received: March 17, 2021)

See Sheet C-602, C-610, C-611: Sheet C-602 shows new fence and gate installation. Sheet C-610 and C-611 show new fence installation details with existing equipment (Gate Position Switch, Weather Resistant Junction boxes, Conduit, Armored Cable, Conductors Magnetic

Gate Position Switch, WP 4s J-Box). Is this equipment to be furnished and installed on new fence? The new If so please provide specifications for the equipment as well as all other associated components of the security system at both control building locations and any other locations.

Response 106.

Fencing and gates to be installed are all new components. Drawings C-610 and C-611 have been revised to clarify.

Question 107. (Date Received: March 19, 2021)

Has the PG&E Project Mapping Drawing been released by PG&E to the District for the new service MSA ? IF not where in the process is the District with this new electrical service design with PG&E? IF not whom will be responsible for these fees?

Response 107.

PG&E is finalizing the design for the new service MSA. Valley Water will be responsible for all the PG&E fees associated with the new service line, which is expected to be in service by early to mid-2023.

Question 108. (Date Received: March 19, 2021)

In order to mitigate noise and air pollution from construction generators has the District submitted temporary electrical service designs from the proposed new PG&E transformer fed via pole 1A to PG&E and if so where can the Contractor find these documents?

Response 108.

No.

Question 109. (Date Received: March 19, 2021)

Please confirm that a supplier/vendor that only suppliers materials does not need to be listed as a subcontractor.

Response 109.

Only subcontractors will be listed in Bid Form 2.

Question 110. (Date Received: March 19, 2021)

Will the district allow a printed spreadsheet (filled out with required information) similar to the table shown to be attached to bid form no. 2 or does the entire list need to be filled out in ink?

Response 110.

Printed spreadsheet (filled out with the required information) similar to the table shown to be attached to bid form no. 2 is allowed as long as each page must be originally or electronically signed (using DocuSign or similar methods) in the signature block.

Question 111. (Date Received: March 19, 2021)

Please verify that the stressing of the foundation anchors is to be done prior to the outlet structure's invert slab being placed. If the stressing is to be done after the invert slab is poured, please provide details for the blockouts and the pour backs.

Response 111.

There is no stressing of the foundation anchors on Drawing S-021. These are passive anchors.

Question 112. (Date Received: March 19, 2021)

Will rebar be required in the concrete encased duct bank? Will a ground cable be required in the conduit duct banks? What is the separation between power and communication conduits in common trenches?

Response 112.

Rebar is not required in the concrete encased duct bank. A ground cable is not required. Minimum 12" separation between power and communication conduits in common trenches.

Question 113. (Date Received: March 19, 2021)

There is a significant number of outstanding questions. Will all questions be addressed prior to bid date?

Response 113.

All outstanding questions will be addressed in the last addendum that will be issued on March 25, 2021

Question 114. (Date Received: March 19, 2021)

Due to the lack of access to the exterior of the pipe in the tunnel, the fillet weld shown in detail D is not feasible. In addition it is envisaged that the backing plate on the tunnel pipe will have a flare to allow the adjoining section to be inserted and fit which will not allow for the fillet. Please confirm this is acceptable.

Response 114.

See response to Question 32, Addendum 3.

Question 115. (Date Received: March 19, 2021)

Multiple design changes have been issued through addenda. Many of these changes, such as articulation joint segment rebar details and the length of articulation joints, have added significant costs and time to the project. Furthermore, constraints are specified with regards to stripping strengths and adjacent placements which are not typically required in tunnel construction. These requirements have significantly extended operations. No additional time has been added to milestone dates to account for this additional scope. Is there any intention to extend the milestone dates?

Response 115.

No.

Question 116. (Date Received: March 22, 2021)

Please confirm it is acceptable to dowel out of invert slab pour for both inside face and outside face vertical reinforcement – Reference C-016 – Detail A.

Response 116.

Yes, it is acceptable.

Question 117. (Date Received: March 22, 2021)

Please confirm it is acceptable to provide lap splicing at wall and crown at both inside face and outside face vertical reinforcement in lieu of “single piece” as shown on C-016 – Detail A.

Response 117.

Yes, it is acceptable.

Question 118. (Date Received: March 22, 2021)

Please confirm it is acceptable to penetrate waterproofing membrane to allow securing of reinforcement during installation of reinforcement – Reference C-016 Detail 3.

Response 118.

The waterproofing membrane shall not be penetrated under any circumstances; per the design, there is no need to penetrate the waterproofing membrane.

Question 119. (Date Received: March 22, 2021)

Please confirm it is acceptable to use a 90 degree bend on one end and a 135 degree bend other end (Vertical Hairpin) in Diversion Outlet Structure (Foundation Slab) – Reference S-023 – Detail A.

Response 119.

Yes, it is acceptable.

Question 120. (Date Received: March 22, 2021)

Please provide minimum length required of #8 horizontal trim at Rock Anchor – Reference S-025 Detail 2 (2) #8 EW.

Response 120.

Drawing S-025 has been revised to clarify, included in Addendum 7.

Question 121. (Date Received: March 22, 2021)

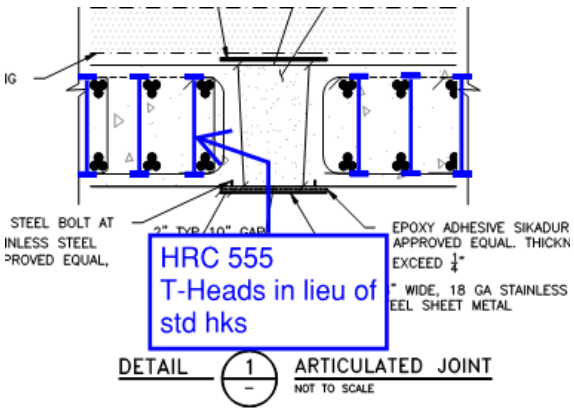
Please confirm the hoops shown around the steel pipe on sheet S-051 can be lap spliced, not resistance welded?

Response 121.

Yes, the rebar is spliced.

Question 122. (Date Received: March 22, 2021)

Please confirm it's an acceptable option to provide HRC 555 T-heads in lieu of standard hooks in an effort to eliminate congestion. See below:

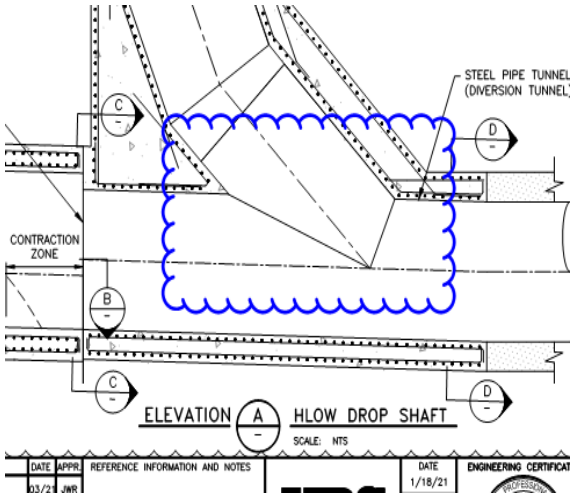


Response 122.

Substitutions requests may be submitted by the selected contractor for review and approval per Article 7.07 of the Standard Provisions.

Question 123. (Date Received: March 22, 2021)

Please provide rebar interface details at the HLOW drop shaft where it meets the concrete encased steel pipe tunnel liner. Ref. S-051.

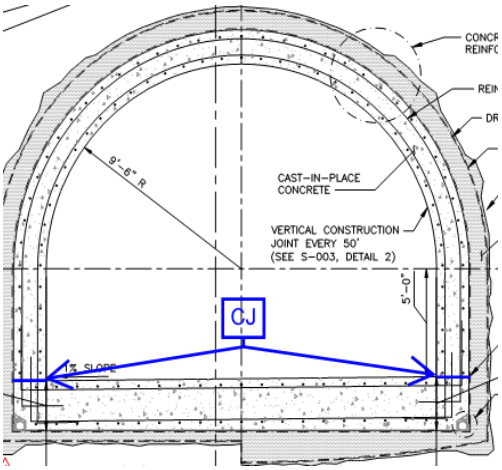


Response 123.

The details are shown on Drawing S-051, Sections A and D.

Question 124. (Date Received: March 22, 2021)

Please confirm that construction joints are allowed at the CIP linings, typ., invert to sidewalls.



Response 124.

Yes, construction joints are allowed.

Question 125. (Date Received: March 22, 2021)

Reference Spec Section 3200 Concrete Reinforcement - G. Splicing

a. G/1 – "….approved bending lists and Drawings…", confirm this to be rebar shop drawings as no bending lists are provided in contract drawings.

i. Bar splices will need to be incorporated into CIP lining sidewalls and/or crown transverse/verticals bars, conforming to G/2. Section 03200, for fabrication and trucking to jobsite.

Response 125.

Confirmed.

Question 126. (Date Received: March 22, 2021)

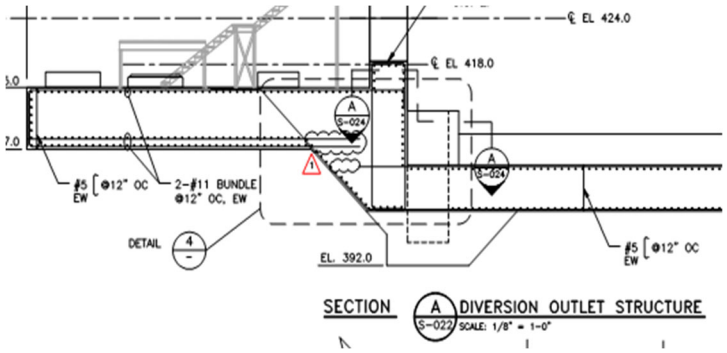
The section below (A on Sheet S-023) has a callout for the 8 ft. mat which is confusing. It call for 2 -#11 Bundle @ 12" OC E.W., and points to single bars in three layers. Please provide clarification.

Response 126.

Each single dot represents 2-#11 bundle. All three layers have 2 -#11 Bundle @ 12" OC E.W.

Question 127. (Date Received: March 22, 2021)

The vertical ties, shown in Section A, on Sheet S-023, in the six foot and 8 foot mat show a callout image with 2 x 135 degree hooks. May one hook be changed to 90 degrees?



Response 127.

Yes.

Question 128. (Date Received: March 22, 2021)

Reference Section 11287, 2.01.A Continuous operation below 10% open will have a negative impact on the lifetime of the valve and will void several of the proposed manufacturer's warranties. Please consider revising the normal operating parameters to between 10% open and 100% open.

Response 128.

Acknowledged. Actual operational procedures will include selected valve manufacturer recommendations for minimum opening percentages for continuous operations. No change made.

Question 129. (Date Received: March 22, 2021)

Reference Section 11287, 2.01.A. requires a maximum discharge of 4,300 cfs at 44 feet of head upstream of the valve. With the discharge coefficient of 0.8 the maximum discharge rate at 44 ft is approx. 4,000 cfs. The required discharge rate of 4,300 cfs cannot be achieved with a hood, only without a hood. Please confirm the hood requirement.

Response 129.

A hood is not required. This revision was in included in Addendum 5.

Question 130. (Date Received: March 22, 2021)

Reference Section 11287, 2.01.B. requires a minimum coefficient of discharge of 0.84. From preliminary calculations, the discharge coefficient for Fixed Cone Valves without hood is 0.85, only 0.80 can be achieved with a hood. Please confirm the hood requirement.

Response 130.

A hood is not required. This revision was in included in Addendum 5.

Question 131. (Date Received: March 22, 2021)

The required hood for the specified Cone Valves is approximately 27.5' in diameter and 11.5' in length. These dimensions are not inclusive of the Cone Valve itself. The inclusion of the hood also requires shipment in several sections with significant field assembly. Please confirm the hood requirement.

Response 131.

A hood is not required. This revision was in included in Addendum 5.

Question 132. (Date Received: March 22, 2021)

Reference Section 11287, 2.01.A requires a maximum discharge of 4,300 cfs at 44 feet of head upstream of the valve. There does not appear to be any flow measurement systems in line with the large piping. Please provide details on how this flow measurement requirement will be verified. Will the contractor be required to provide a temporary metering system?

Response 132.

Flow measurement will be based on pressure reading directly upstream of the valve and compared with manufacturer ratings curves.

Question 133. (Date Received: March 22, 2021)

Following up the response #30 in addendum 2, please confirm the quantity and type of hydraulic fluid that needs to be drained and refilled.

Response 133.

Bidders shall assume the District will drain and refill hydraulic line. This response supersedes response to Question 30, Addendum 2.

Question 134 (Date Received: March 22, 2021)

Technical Specification 02960 indicated that the contractor is to use onsite materials in the construction of the boulder grade control, but if sufficient material is not onsite, the contractor is to use off site material. There is no indication of how the contractor will get paid if there is insufficient material onsite and the contractor has to import material. Please confirm the contractor is to price these work, as if the material is onsite and the owner will issue a change order if the contractor has to import material.

Response 134.

Confirmed. A change order will be issued if import is determined to be necessary.

Question 135. (Date Received: March 22, 2021)

Please confirm if district will witness the factory testing of 132" Butterfly Valves, 132" Cone Valves, and 24" Sleeve Valve. If so, please confirm if district will pay for this travel. If travel costs are to borne by the contractor, please provide specific details as to the number of attendees, minimum duration, and required per diem expenses.

Response 135.

District will pay costs associated with own travel.

Question 136. (Date Received: March 22, 2021)

Please confirm that “or equal” manufacturers will be considered for the 132” Butterfly Valves and the 24” Sleeve Valve. Please also confirm that any non-named manufacturers within these sections will be considered under Article 7.08 - “Or Equal” Items of Section 7 – Submittal Management and NOT under Article 7.07 - Substitutions.

Response 136.

"Or equal" manufacturers will be considered. Evaluation of "Or Equal" substitutions are included under Article 7.07.G.1.

Question 137. (Date Received: March 22, 2021)

Reference drawing M-501. Please provide the quantity of Hydraulic Fluid to be replaced. Please also provide specifications on the existing fluid and confirm that it will not contain any hazardous wastes.

Response 137.

Bidders shall assume the District will drain and refill hydraulic line.

Question 138. (Date Received: March 22, 2021)

Per plan sheet ST-12 Det. 1 & 2 have notes that state: “CP Terminal Box to be located as directed by engineer…See Sheet ST-19” The sheet being referenced is not included in the plan set for this project. Can you please provide plan sheet ST-19?

Response 138.

The as-built drawings are available. Refer to Article 13.04.06.E of the Special Provisions.

Question 139. (Date Received: March 22, 2021)

Per plan sheet ST-12 Det. 1 & 2 have another note that states: “For connection of test lead see sheet ST-18” The sheet being referenced is not included in the plan set for this project. Can you please provide plan sheet ST-18?

Response 139.

The as-built drawings are available. Refer to Article 13.04.06.E of the Special Provisions.

Question 140. (Date Received: March 22, 2021)

Per note 7. Sheet ST-14 a CP Terminal Box is referenced again. What size box? What material? What terminal configuration is required inside of the box? What quantity and color of test leads #4 RR/USE in conduit? What size diameter and material conduit to run the cable to the terminal box?

Response 140.

The as-built drawings are available. Refer to Article 13.04.06.E of the Special Provisions.

Question 141. (Date Received: March 22, 2021)

Addendums 5 and 6 outlined various phased NTP's for the project. It also stated "The first chargeable Date of the Contract shall be defined in the Phase 1 NTP issued by the District." Does that mean the first chargeable day will be Phase 1 NTP or some later date or future phased NTP? In order to finalize our estimates and project schedules, we request to know what the anticipated first chargeable day of the contract will be.

Response 141.

As stated in Section 5.03 the first chargeable day will be at least ten (10) days after the date of the Phase 1 NTP.

Question 142. (Date Received: March 22, 2021)

For the tunnel at Station 14+07, please provide a section detail for the rebar around the vertical wye at the HLOW Drop Shaft.

Response 142.

The details are shown on Drawing S-051, Details A and D.

Question 143. (Date Received: March 22, 2021)

Referencing Drawing S-023 Section A, the section has a callout for the 8 ft. mat which is confusing. It calls for 2 -#11 Bundle @ 12" OC E.W., and points to single bars in three layers. Please clarify if the 3 mats are supposed to be bundled bars or single bars.

Response 143.

Each single dot represents 2-#11 bundle. All three layers have 2 -#11 Bundle @ 12" OC E.W.

Question 144. (Date Received: March 22, 2021)

Referencing Drawing S-023 Section A, the vertical ties in the 6’ and 8’ mat show a callout image with 2 x 135-degree hooks. May we change one hook to 90 degrees?

Response 144.

Yes.

Question 145. (Date Received: March 22, 2021)

For the #6 hoop rebar around the HLOW Drop Shaft please confirm that the rebar is spliced and not resistance-welded.

Response 145.

Yes, the rebar is spliced.

Question 146. (Date Received: March 22, 2021)

For the tunnel articulated joints, please confirm it's an acceptable option to provide HRC 555 T-heads in lieu of standard hooks to mitigate rebar congestion.

Response 146.

Substitutions requests may be submitted by the selected contractor for review and approval per Article 7.07 of the Standard Provisions.

Question 147. (Date Received: March 22, 2021)

Reference Spec Section 3200 Concrete Reinforcement - G. Splicing

a. G/1 – "….approved bending lists and Drawings…", confirm this to be rebar shop drawings as no bending lists are provided in contract drawings.

i. Bar splices will need to be incorporated into CIP lining sidewalls and/or crown transverse/verticals bars, conforming to G/2. Section 03200, for fabrication and trucking to jobsite.

Response 147.

Confirmed.

Question 148. (Date Received: March 22, 2021)

The TRIPLE OFFSET BUTTERFLY VALVES - SECTION 11285, BID ITEM 8i could be manufactured to include internal cladding of 316SS to eliminate the concern of the epoxy lining coming off in the VERY HIGH velocity application. Would an alternate bid of a more expensive internal lining system be considered for long term performance?

Response 148.

No, there are no alternate bid items.

THIS ADDENDUM NO. 7, WHICH CONTAINS 50 PAGES AND 4 ATTACHMENTS, IS ATTACHED TO AND IS A PART OF THE SPECIFICATIONS AND CONTRACT DOCUMENTS FOR THIS PROJECT.

DocuSigned by:
Christopher Hakes
0F4F8DE1003D4CD...

Date: 3/24/2021

Christopher Hakes, P.E.
Deputy Operating Officer
Dam Safety & Capital Delivery Division

Enclosures:

ATTACHMENT NO. 1 – REVISED BID FORM NO. 1 (ADDENDUM NO. 7)

ATTACHMENT NO. 2 – REVISED ARTICLE 14.03 – ENGINEER'S OFFICE

ATTACHMENT NO. 3 – REVISED ATTACHMENT 20-1, CONTRACTOR SUBMITTAL SCHEDULE

ATTACHMENT NO. 4 – SPECIFICATION SECTION 15070

ATTACHMENT NO. 1

Revised Bid Form No. 1
(Addendum No. 7)

*This form must be completed in **ink** and changes must be **initialed**.*

Honorable Board of Directors
Santa Clara Valley Water District (District)

Pursuant to, and in compliance with, the Notice to Bidders and the Contract Documents, relating to the

C0663 – ANDERSON DAM TUNNEL PROJECT, the undersigned Bidder having become thoroughly familiar with the terms and conditions of the Contract Documents and with local conditions affecting the performance and costs of the Work and having fully inspected the Work site in all particulars, hereby proposes and agrees to fully perform the Work, including providing any and all labor and materials and performing all Work required to construct and complete said Work within the contract time stated and in accordance with the requirements of the Contract Documents, for the following sum of money.

The undersigned Bidder agrees to complete all the Work within **1,710** calendar days from the first chargeable day of the Contract, as stated in the Notice to Begin Work. The Bidder agrees to enter into a Contract with the District and provide the required bonds and insurance in accordance with the Instructions to Bidders, Contract Bonds, paragraph #22 and Execution of Contract, paragraph #23. If the Bidder fails to meet these requirements within the time specified in the Instruction to Bidders, Failure to Execute Contract, paragraph #24, the Bidder's security accompanying this Proposal may be forfeited and become the property of the District. No Contract exists until all Contract bonds and insurance documents have been accepted by the District.

TOTAL BID: $_____

Bidder acknowledges receipt of the following Addenda to the Bid Documents:

Addenda are posted online at https://www.valleywater.org/construction.

☐ **NO** Addenda received

☐ Addenda received as follows:

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

Failure to acknowledge receipt of an Addendum on the Bid Form is not, in itself, cause for withdrawal or rejection of Bid, if it can be established that Bidder did, in fact, receive such Addendum prior to Bid opening.

BIDDER'S COMPANY INFORMATION	
NAME:	ADDRESS:
CONTRACTOR'S CALIFORNIA LICENSE NUMBER: DATE OF EXPIRATION: LICENSE CLASSIFICATION(S):	
PHONE NO.: ( )	FAX NO.: ( )
EMAIL ADDRESS:	

SIGNATURE BLOCK (Signature Block must be completed in *ink* and changes must be *initialed*.)	
Bidder's Signature:	Date:
Bidder's Name and Title (Print):	

*This form must be completed in **ink** and changes must be **initialed**.*

SECTION A — BASE BID

ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
1	**MOBILIZATION AND DEMOBILIZATION**			
1a	Mobilization and Demobilization	Lump Sum Lump Sum	$	
1b	Contractor – Obtained Permits	Lump Sum Lump Sum	$	
2	**SITE PREPARATION**			
2a	Demolition	Lump Sum Lump Sum	$	
2b	Clearing and Grubbing	16 ACRES	$	
2c	Stripping	27,000 SY	$	
2d	Install Active Treatment System (ATS)	Lump Sum Lump Sum	$	
2e	Operate Active Treatment System (ATS)	32 MO	$	
2f	Coyote Road Turnouts	Lump Sum Lump Sum	$	
2g	Giancola Driveway and Waterline	Lump Sum Lump Sum	$	
2h	Compliance with NPDES General Permit	32 MO	$	
2i	Migratory Birds	32 MO	$	
2j	Noise and Vibration Monitoring	32 MO	$	

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ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
2k	Dust Control and Air Monitoring	32 MO	$	
3	**DIVERSION PORTAL**			
3a	Geotechnical Borings	**985** LF	$	
3b	Diversion Portal Excavation	89,500 CY	$	
3c	Soil Nails #20, 120ft	43 EA	$	
3d	Soil Nails #18, 120ft	81 EA	$	
3e	Soil Nails #14, 120ft	121 EA	$	
3f	12-inch Shotcrete and #6 Rebar Mat	42,650 SF	$	
3g	Diversion Tunnel Portal Reinforced Concrete Encasement	Lump Sum Lump Sum	$	
3h	Hydraugers	42 EA	$	
3i	Diversion Portal Instrumentation	Lump Sum Lump Sum	$	
3j	Temporary Tunneling Portal Support	Lump Sum Lump Sum	$	
3k	Diversion Portal Hydroseed	2.94 ACRES	$	
4	**LAKE – TAP PORTAL**			
4a	Core Borings (Over Water)	150 LF	$	

*This form must be completed in **ink** and changes must be **initialed**.*

ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
4b	Turbidity Barrier	Lump Sum Lump Sum	$	
4c	Lake-Tap Excavation (Dredging) and MTBM Landing Pad	16,900 CY	$	
4d	Lake-Tap Rock Backfill	810 CY	$	
4e	Diversion Intake Trash Rack	Lump Sum Lump Sum	$	
5	**TUNNEL EXCAVATION AND LINING**			
5a	18.5-foot Diameter Tunnel Excavation - Class 3	70 LF	$	
5b	18.5-foot Diameter Tunnel Excavation - Class 4	215 LF	$	
5c	18.5-foot Diameter Tunnel Excavation - Class 5	70 LF	$	
5d	24-foot Diameter Tunnel Excavation - Class 3	150 LF	$	
5e	24-foot Diameter Tunnel Excavation - Class 4	550 LF	$	
5f	24-foot Diameter Tunnel Excavation - Class 5	450 LF	$	
5g	#8 Rock Dowels	210 EA	$	
5h	Shotcrete in Transition Zone	175 CY	$	
5i	Reinforced Concrete Liner in Tunnel	675 LF	$	
5j	5-foot Articulated Joint Segments	85 LF	$	

*This form must be completed in **ink** and changes must be **initialed**.*

ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
5k	10-foot Articulated Joint Segments	460 LF	$	
5l	LLOT Downstream Leg Reinforced Concrete Plug	Lump Sum Lump Sum	$	
5m	13-foot Steel Liner and Concrete Backfill within Tunnel	Lump Sum Lump Sum	$	
5n	CLSM Backfill in Transition Zone	450 CY	$	
5o	Probing Within Rock Tunnel	4,950 LF	$	
5p	Waterproofing Membrane and Drainage Collection System	1,220 LF	$	
5q	Diversion Air Vent and Observation Well	Lump Sum Lump Sum	$	
5r	Pre-excavation Drilling Within Rock Tunnel, Direct Cost	4,000 LF	$	
5s	Pre-excavation Drilling and Grouting Within Rock Tunnel, Indirect Cost	150 SHIFTS	$	
5t	Pre-excavation Grouting Within Rock Tunnel, Microfine Cement	4,000 SACKS	$	
5u	Pre-excavation Grouting Within Rock Tunnel, Chemical Grout	5,300 GALLONS	$	
5v	Tunnel Excavation in Transition Zone – Class 3	505 CY	$	
5w	Tunnel Excavation in Transition Zone – Class 4	840 CY	$	
5x	Tunnel Excavation in Transition Zone – Class 5	340 CY	$	

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ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
5y	Tunneling Standby	30 DAYS	$	
6	**SHAFT EXCAVATION AND LINING**			
6a	Shaft Excavation, Initial Support, Final Lining and Backfill	Lump Sum Lump Sum	$	
7	**MICROTUNNEL**			
7a	Microtunneling Mobilization and Demobilization	Lump Sum Lump Sum	$	
7b	Microtunneling (8 to 9-ft Inside Diameter)	372 LF	$	
8	**DIVERSION OUTLET STRUCTURE**			
8a	Diversion Outlet Structure Excavation	21,500 CY	$	
8b	Soil Nails #14, 20 ft	72 EACH	$	
8c	6-inch Shotcrete and #6 Rebar Mat	5,150 SF	$	
8d	CLSM Backfill for Diversion Outlet Structure	9,650 CY	$	
8e	Earthfill Backfill for Diversion Outlet Structure	6,200 CY	$	
8f	Diversion Outlet Structure Concrete Foundation	3,600 CY	$	
8g	Diversion Outlet Structure Foundation Anchors	114 EACH	$	
8h	Diversion Outlet Structure	Lump Sum Lump Sum	$	

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ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
8i	132-inch Butterfly Valves	Lump Sum Lump Sum	$	
8j	132-inch Fixed Cone Valves	Lump Sum Lump Sum	$	
8k	156-inch Steel Pipe	50 LF	$	
8l	132-inch Steel Pipe	180 LF	$	
8m	Special Seismic Steel Pipe	Lump Sum Lump Sum	$	
8n	24-inch Sleeve Valve	Lump Sum Lump Sum	$	
8o	Miscellaneous Mechanicals	Lump Sum Lump Sum	$	
8p	Electrical Equipment	Lump Sum Lump Sum	$	
8q	Instrumentation and Controls	Lump Sum Lump Sum	$	
8r	Diversion Outlet Structure Access Road and **Permanent** Fencing	Lump Sum Lump Sum	$	
8s	Hydrostatic Testing	Lump Sum Lump Sum	$	
9	**COYOTE CREEK MODIFICATIONS**			
9a	Temporary Dike and Dewater Northern Channel	Lump Sum Lump Sum	$	
9b	Realign Anderson Force Main (AFM)	Lump Sum Lump Sum	$	
9c	Discharge Channel and Northern Channel Excavation	41,950 CY	$	

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ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
9d	Northern Channel Substrate	3,450 CY	$	
9e	Northern Weir and Southern Weir	Lump Sum Lump Sum	$	
9f	Permanent Dikes Abutting Southern Weir	Lump Sum Lump Sum	$	
9g	Riprap Type 1	3,600 CY	$	
9h	Riprap Type 2	9,750 CY	$	
9i	Riprap Type 3	1,350 CY	$	
9j	Riprap Type 4	60 CY	$	
9k	Boulder Grade Control	200 TONS	$	
9l	Turf Reinforcement Matting	3,700 SY	$	
9m	Coyote Creek Hydroseed	0.75 ACRES	$	
		SECTION A SUBTOTAL	**$**	

*This form must be completed in **ink** and changes must be **initialed**.*

SECTION B — SUPPLEMENTAL BID ITEMS
These Bid items may or may not be required. They may be deleted entirely or in part, by deductive change order(s), at the sole discretion of the District.

ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
10	**SUPPLEMENTAL WORK**			
10a	Landslide Excavation, Hoot Owl Way	21,650 CY	$	
10b	Landslide Excavation, Boat Marina	4,330 CY	$	
10c	Landslide Remediation, Soil Nails #8, 100 feet	737 EACH	$	
10d	Landslide Remediation, Soil Nails #8, 140 feet	248 EACH	$	
10e	Landslide Remediation, Earthfill for Hoot Owl Way	21,850 CY	$	
10f	Landslide Remediation, Earthfill for Boat Marina	4,400 CY	$	
10g	Existing Intake Improvements, Soil Nails #8, 75 feet	45 EACH	$	
10h	Existing Intake Improvements, Soil Nails #8, 100 feet	46 EACH	$	
10i	Existing Intake Improvements, Soil Nails #14, 75 feet	4 EACH	$	
10j	Existing Intake Improvements, Structural/Mechanical Alterations	Lump Sum Lump Sum	$	
10k	Supplemental Work Hydroseed	6.3 ACRES	$	
			SECTION B SUBTOTAL	**$**

*This form must be completed in **ink** and changes must be **initialed**.*

SECTION C — ALLOWANCES

ITEM NO.	DESCRIPTION OF ITEM	APPROXIMATE QUANTITY UNIT	UNIT PRICE	TOTAL
11	**ALLOWANCES**			
11a	Other Wildlife and Fish Species (19.09)	1	**$250,000.00**	**$250,000.00**
11b	Sensitive Plants and Vegetation (19.10)	1	**$250,000.00**	**$250,000.00**
11c	Dispute Review Board	1	**$75,000.00**	**$75,000.00**
11d	Facilitated Partnering	1	**$25,000.00**	**$25,000.00**
			SECTION C SUBTOTAL	**$600,000.00**
TOTAL BID (SECTIONS A SUBTOTAL + B SUBTOTAL + C SUBTOTAL)				**$**

ATTACHMENT NO. 2

Revised Article 14.03 - Engineer's Office

14.03. Office Facilities

A. Office facilities, furnishings, and/or Equipment specified in Article 14.03 shall be furnished, installed, and in operating conditions prior to performing any other Contract Work under the Contract.

B. The location and condition of the office facilities shall be as approved by the Engineer (District Engineer).

C. The Contractor shall clean the office facilities on a regular basis, at least two (2) times per week, for the duration of the Work. Cleaning shall include emptying waste receptacles, vacuuming and mopping floors, dusting, cleaning the toilet room, and washing windows. Cleaning shall begin after 4 p.m. during weekdays. The Contractor shall also provide pest control as required during the Work.

14.03.01. Engineer's Office

A. The Contractor shall provide and maintain two (2) office trailers facilities in Staging Area 2 East (E) as described for the exclusive use of the Engineer and representatives of the Engineer including utilities for water, electricity, and sewer. Maintenance shall be daily, including janitorial service and repairs as necessary.

B. The District has leased a residential home adjacent to Staging Area 2 West (W) to be used as office space for the Valley Water Staff Only. The District will maintain residential home office, will provide power, water and sewer. No additional Trailers will be allowed in Staging Area 2 West (W).

C. Submit a plan for the Engineer's Office (office trailers) for acceptance prior to office trailers purchase or rental to include the following, as a minimum.

D. The office trailers shall include the installation and setup of (2) networking thirty-five (35) page per minute, multifunction color digital imaging systems, one at each office location The systems shall include network scan, copy, print, fax, stapling, sorter, and 11" x 17" capabilities. The systems shall be capable of supporting up to ten end users at each office location. The systems shall also include a maintenance contract for the duration of the contract, to include parts, labor, and toner sufficient to support a monthly usage of 1000 pages of color and 5,000 pages of black and white.

E. The office trailers shall consist of two (2) new unit trailers, 24 feet x 60 feet each and capable of accommodating below characteristics and meeting local building code requirements. Trailers number 1 will house Valley Water Consultants and shall contain 15 offices with doors and 2 bathrooms at a minimum. Trailers number 2 will house Valley Water staff and shall contain 5 offices with doors, 1 conference room capable of seating 30 people, and 2 bathrooms at a minimum. Remaining floor area to be open and accommodating of supporting furniture.

F. The office trailers shall be insulated and of weather-tight construction. The trailers shall be rigidly mounted and level. Stairs with a landing at floor level and guardrails shall be provided for two (2) entrance doors at the trailers, each complete with deadbolt locksets. All locksets shall be keyed alike and ten (10) keys shall be provided. The door closest to the conference room shall be

provided with a ramp with a slope of no greater than a 1-foot rise to a 12-foot run, landing, and conforming to the CBC and Americans with Disabilities Act (ADA) requirements for access. Ground surfaces within 20 feet of trailers shall be covered with six (6) inches of Class 2, aggregate-base rock compacted to 90 percent relative compaction overlying high-modulus, woven, and soil-separation geotextile. Surrounding surfaces shall be sloped to drain away from the trailers.

G. The office trailers shall have offices with doors plus two (2) bathrooms. There shall be at least one (1) operable screened window per office room. All windows shall be fitted with mini-blinds. Trailers shall be adequately lighted, heated, ventilated, and air conditioned. HVAC Equipment shall be capable of maintaining a 70 ºF temperature within each trailer. At least six (6) air changes per hour shall be provided in all rooms except the toilet rooms, which shall have ten (10) air changes per hour.

H. The Contractor shall provide electrical service of sufficient capacity for all loads to the office trailers, including an adequate disconnect switch and circuit breaker panel located inside the trailers. At least one (1) grounded 120-volt electrical receptacle shall be installed on each wall of each room with a maximum spacing between receptacles of six (6) feet or as required by local building code, whichever is more stringent.

I. LED-type lights suitable for office use will be provided inside. At least 70-foot candles of initial, uniform lighting at desk level shall be provided in all rooms except the toilet room, which shall have 30-foot candles. A weatherproof light fixture will be provided outside near each entrance door.

J. The Contractor shall provide trailers that are pre-wired for telephone and internet services. A minimum of eight (8) separate phone lines shall be provided at both office locations. New telephone handsets shall also be provided, all with speakerphone capabilities at both office locations. One (1) telephone handset shall be suitable to allow a receptionist to connect to and transfer between at least four (4) incoming telephone lines. An internet-service-provider account shall be provided with a Wi-Fi wireless router with upload / download capacity of at least 100Mbps down and 100Mbps at each office location.

K. Telephone and internet services will be provided by Valley Water for Trailer 2 only. Providing telephone and internet services for trailer 1 will remain the responsibility of the contractor.

L. At the office trailers the Contractor shall provide water connections, a holding tank drain, and waste system for the toilet rooms. The toilet rooms shall contain a flush-type water closet, lavatory sink with hot and cold water, mirror, an electric five (5)-gallon water heater, toilet paper and paper towel dispensers, coat hooks, a shelf, and waste receptacle. The toilet room shall be ADA accessible. The Contractor shall maintain an adequate supply of toilet paper, paper towels and other necessary consumables during the duration of the Work at both office locations. The Contractor shall pump the holding tank empty whenever it is 50 percent to 75 percent full during the Work and keep it adequately charged with chemicals.

M. The following Equipment and furnishings shall be provided by and installed by the Contractor for the exclusive use of the Engineer throughout the duration of

the Work. These items shall be provided at the same time that the Engineer's office is provided. The Contractor shall be responsible for all maintenance, repair, and technical support required for the supplied Equipment. The Contractor shall retain ownership of these Equipment and furnishings after Project Completion.

1. Minimum of twenty (20) desks, 60 inches x 30 inches, with a minimum of five (5) side drawers and one (1) center drawer; Hon model HON-32261-WK or equal. Provide desk wings suitable for desktop computer use.

2. Minimum of twenty (20) Upholstered swivel desk chairs with arm rests; Hon model HON-4002GG32W or equal.

3. Minimum of Ten (10) metal five-drawer legal-size filing cabinets with locks and keys.

4. One (1) conference table that will adequately seat 30 people and supporting chairs

5. LED table-mounted adjustable-arm (to change fixture location and angle) desk lamps per desk.

6. One (1) mobile print/clamp system rack, 12-clamp capacity, SAFCO SAF-5076 or equal; 12 each print clamps, 36 inches long; SAFCO SAF-5004-6 or equal.

7. Eighty (80) linear feet of wall-mounted shelving, 12 inches deep, sized to hold continuous books without sagging; locations as directed by the Engineer (District Engineer).

8. Twenty (20) identical padded metal folding chairs; KI model KRG-103-BE-0G3 or equal.

9. Eight (8) worktables, 29-inch desk height, 30-inch x 72-inch top; Bevis model BVS-FTE3072WA or equal.

10. One (1) waste receptacles per desk and two (2) per common areas; Rubbermaid model RUB-R2956-0 or equal.

11. Bottled drinking water cooler with hot and cold water, large refrigerator, microwave oven, coffee machine, and paper cup dispenser. Provide Twenty (20) five (5)-gallon water bottles and 600 paper cups each month, or as-needed at both office locations, for the duration of the Work.

12. Two (2) garment racks with top storage shelf, umbrella holder, and space for a minimum of six (6) clothes hangers; Vogel Peterson Model VOG-SGN-BK or equal.

13. Each office is to contain one (1) dry-erase presentation white boards, magnetic 48 inches x 72 inches, with wall mounting brackets; Quartet Model QRT-2547 or equal.

14. Six (6) dry-erase presentation white boards, magnetic 48 inches x 72 inches, with wall mounting brackets; Quartet Model QRT-2544 or equal.

15. Minimum of twenty (20) metal bookcases, with three (3) adjustable shelves each, commercial grade, nominal dimensions 34 inches wide x 12 inches deep x 47 inches high; Hon Model HON-S48ABC-K or equal.

16. Contractor shall furnish eighteen (18) UHF radios for the Engineer to use.

17. All of the above Equipment shall be new (except where specifically noted), or shall be used Equipment (no older than three [3] years) in excellent condition acceptable to the Engineer.

14.03.02. Contractor's Office

A. The Contractor shall provide and maintain at the Project site a suitable trailers office for Contractor's use, as well as sufficient conference room space for up to 25 people for weekly Construction meetings and other conferences between the Contractor and the Engineer.

B. Conference room shall meet CBC and ADA requirements for accessibility and toilet room.

C. Location of Contractor and Subcontractor office trailers shall be at the Contractor's staging area shown on the Drawings and shall be as approved by the Engineer (District Engineer). At this office shall be kept Project copies of the Contract Documents, Project progress records, all Progress Schedules, submittals, and other relevant documents, which shall be accessible to the Engineer and to other District employees during normal working hours.

14.03.03. Removal and Disposal

A. Office facilities, furnishings, and/or Equipment specified in this Special Provisions Article 14.03. Office Facilities shall be furnished, installed, and in operating condition prior to performing any other Contract Work under the Contract.

B. Prior to issuance of the Project Completion letter by the District (Capital PM), the Contractor shall remove and dispose of its temporary facilities, Material, and Equipment and restore the site to its original or better condition.

14.03.04. Payment

A. Full compensation for doing all Work necessary to provide office facilities, including operating and maintenance costs as specified herein, shall be included in the lump sum price Bid for Mobilization, Bid Item 1a, described in Section 21, Payment Procedures.

ATTACHMENT NO. 3

REVISED ATTACHMENT 20-1

CONTRACTOR SUBMITTAL SCHEDULE

REVISED ATTACHMENT 20-1
Contractor Submittal Schedule

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
Exploratory Drilling	02010	Driller's activity records	Delivered to the Engineer daily	
		Prototype core box	Prior to mass production of core boxes	
		Field Investigation Plan	Minimum ~~30~~ 60 days prior to the start of investigations	DSOD, FERC
		~~Drilling Program Plan~~	~~Minimum 30 days prior to the start of investigations~~	~~DSOD, FERC~~
Demolition and Salvage	02050	Work plan	30 days prior to demolition work	
		Demolition and reconstruction activities and procedures		
Control, Treatment, and Discharge of Water	02075	ATS Plan	30 days prior to the operation	
		ATS field data records	Every thirty (30) days.	
Foundation Dewatering and Groundwater Level Control	02080	Plans for dewatering foundations	~~30~~ 60 days prior to dewatering work	DSOD, FERC
		Drawings of the dewatering system and connections to treatment and handling systems	Drawings should be kept up to date. As-built drawings shall be submitted within ~~30~~ 60 days of initiating the dewatering operations	DSOD, FERC
		Records of each well	Delivered to the Engineer every 7 days	
Rock Excavation by Controlled Drilling and Blasting in Tunnels and Shafts	02090	Product Data	At least 45 days prior to the start of drilling for blasting	
		One printed copy and one digital copy of Pre-Blast Survey Reports	At least ~~45~~ 60 days prior to the start of drilling for blasting	DSOD, FERC
		Working Drawings and Method Statements	At least ~~45~~ 60 days prior to the start of drilling for blasting	DSOD, FERC
		Calculations	At least 45 days prior to the start of drilling for blasting	
		Individual Blast Plans	At least ~~24~~ 48 hours before each blast	DSOD, FERC
		Blast Reports	~~At least~~Within 12 hours after each blast or at least two hours before the next blast	DSOD, FERC

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Qualifications	At least 60 days before any blasting occurs	
		Permits and Licenses	At least 45 days prior to the start of drilling for blasting	
		General Blast Plans	At least 60 days before any blasting occurs	DSOD, FERC
		Quality Control Reports	Shall be accessible to the Engineer during normal working hours	DSOD, FERC
Clearing, Grubbing, and Stripping	02110	Clearing, grubbing, and stripping plan	30 days prior to clearing, grubbing, and stripping work	
Earthwork	02200	Excavation work plan	At least ~~45~~ 60 days prior to excavation work	DSOD, FERC
		Temporary excavation slope plan		DSOD, FERC
		Copies of all slope staking survey notes	Within 14 days after any Work in surveyed areas	
		Fill placement and compaction work plan	At least ~~30~~ 60 days prior to earthwork	DSOD, FERC
		Temporary dike design		
Earthwork for Land side Remedial Grading	02201	Excavation work plan	At least 30 days prior to excavation work	
		A temporary excavation slope plan	At least 30 days prior to excavation work	
		Copies of all slope staking survey notes	Within 14 days after any work in surveyed area	
		Fill placement and compaction work plan	At least 30 days prior to excavation work	
Disposal Area	02210	Work plan	At least 45 days prior to disposal site work	
		Surveyed location and volume of NOA-Containing Material placed in the Disposal Area	~~At least 45~~Within 30 days ~~prior~~ following ~~to~~ completion of work at disposal ~~site work~~area	
Lightweight Cellular Concrete Fill	02223	Product Data	At least 60 days before beginning the work	DSOD, FERC
		Procedures for installation of LCC fill	At least ~~45~~ 60 days prior to concrete work	DSOD, FERC
		Contractor Mix Design	At least ~~45~~ 60 days prior to LCC fill placement	DSOD, FERC

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Complete description of equipment proposed for use	At least ~~45~~ 60 days prior to LCC fill placement	DSOD, FERC
Trench and Structure Excavation and Backfill	02225	Work plan	At least ~~30~~ 60 days prior to work	DSOD, FERC
		Shoring system design	At least 45 days prior to excavation work	
		Temporary excavation slope design calculations	At least ~~45~~ 60 days prior to excavation work	DSOD, FERC
		Gradations and sources of materials	At least ~~45~~ 60 days prior to excavation work	DSOD, FERC
		Copy of Contractor's CAL/OSHA trenching and excavation permit and name of competent person.	At least 45 days prior to excavation work	
Piezometer and Well Decommissioning	02280	Subcontractor license number and contact names, addresses and project descriptions of three projects completed	~~30~~ 60 days prior to well decommissioning for general review and comments	DSOD, FERC
		Drilling permit applications	At least 7 days prior to well decommissioning	
Tunnel Excavation and Support	02310	Excavation and Support Work Plan	At least 60 days prior to excavation work	DSOD, FERC
		Blasting Plan	At least 60 days before any blasting occurs	DSOD, FERC
		Structural design calculations and drawings	At least 60 days prior to excavation work	DSOD, FERC
		Provide fabrication and assembly drawings	At least 45 days prior to excavation work	
		Description of Excavation Sequence and Support in Tunnels	At least 60 days prior to excavation work	DSOD, FERC
		Information on construction tolerances	At least ~~30~~ 60 days prior to excavation	DSOD, FERC
		Working drawings of tunnel excavation and muck conveyance equipment.	Drawings should be kept up to date. As-built drawings shall be submitted within 30 days of operations	
		Drilling equipment for probe and pre-excavation grout holes	At least 30 days prior to work	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Pre-excavation grouting equipment	At least ~~30~~ 60 days prior to work	DSOD, FERC
		Traffic management plan	21 days following the NTP & no less than 10 days prior to related work	
		Description of the methods and sequence proposed for the construction of any temporary access ramps	At least ~~45~~ 60 days prior to excavation work	DSOD, FERC
		Procedures for installation of temporary sumps, construction drains, and associated measures planned	At least ~~45~~ 60 days prior to excavation work	DSOD, FERC
		Excavation and support sequences at break-out/through existing temporary support of excavations (portals), permanent structures, and openings.	At least 60 days prior to excavation work	DSOD, FERC
		Drawings and calculations	At least 30 days prior to excavation	
		Detail measures for tunnel stoppages	At least 30 days prior to excavation	
		Proposed methods and equipment for handling, transporting, erecting, and maintaining initial support.	At least 60 days prior to the start of related Work	DSOD, FERC
		Methods for measurement of tunnel water inflows and pressures	At least 21 days prior to the start of related Work	
		Methods for controlling and verifying excavated dimensions, line, and grade	At least ~~21~~ 60 days prior to the start of related Work	DSOD, FERC
		Work experience resumes of proposed tunnel superintendent(s) and shift supervisors.	At least 30 days prior to work	
		Certificates of compliance for all materials permanently incorporated into the work.	At least 60 days prior to any work	
		Required permits and approval for muck disposal sites	At least 45 days prior to the start	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Profile survey of the excavated tunnel	90 days after completion of installation	
		Equipment certifications from Cal/OSHA and the Mining and Tunneling Unit of Cal/OSHA	At least 60 days before beginning the work	
		Excavation/initial support sequencing plan.	At least 60 days prior to excavation	DSOD, FERC
		Shift report of tunnel construction work for each shift worked.	Shift report on the following calendar day	DSOD, FERC
Tunnel Shafts	02311	Name, qualifications, and resume of person responsible for excavation support system design.	At least 45 days prior to the start	
		HLOW Shaft excavation: temporary support systems, work plan explaining the means and methods for the excavation of the shaft making the connection to the Diversion Tunnel, and other related information as requested by the Engineer.	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Excavation monitoring data of horizontal and vertical deflections of supports.	Day the measurements are made	DSOD, FERC
		Site Plan	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Shaft layout, design details, workplan, means/methods	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Shop Drawings	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Temporary Support Design Calculations	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Connection and/or breakout Plan	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Site Drainage and groundwater control details	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Quality control provisions.	At least ~~45~~ 60 days prior to installation	DSOD, FERC
		Qualifications of key personnel	Within 45 days after NTP	DSOD, FERC

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Details of materials handling, stockpiling, and disposal sites for excavated materials.	Within 90 days of NTP	
		Excavation monitoring data of horizontal and vertical deflections of supports	Each day that measurements are made	
		Weekly reports on geologic conditions encountered	Weekly	DSOD, FERC
		Meeting Minutes for Coordination Meetings	Within 1 week of each meeting	
		Proposed Modification to the design	60 days ~~P~~prior to implementation of modification	DSOD, FERC
		Coordination Documentation	5th day of each month	
Muck and Excavated Material Disposal	02312	Plan for the Transportation and Disposal of Muck and Excavated Material.	30 days prior to ~~demolition~~ work	
Control of Water in Tunnels and Shafts	02313	Product Data	Within 90 days of NTP	DSOD, FERC
Geotechnical Instrumentation for Tunnels, Shafts, and Portals	02315	Monitoring plan	~~35~~ 60 days prior to installation of instrumentation	DSOD, FERC
		Two sets of operating manuals, specifications, installation procedures, and calibration certificates for each type of instrument or monitoring device.		DSOD, FERC
		Manufacturer's certification of compliance		
		Plan of instrument locations.		DSOD, FERC
		Design installation details of inclinometers, monitoring wells, piezometers, surface monitoring points, or other relevant devices.		DSOD, FERC
		Qualifications of individual(s) responsible for the instrumentation program.		
		Supply installation logs and descriptions of instrument installation	Within 48 hours of installation	DSOD, FERC

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Instrumentation monitoring reports	Daily	DSOD, FERC
		Contingency Plan	At least ~~30~~ 60 days prior to the start of construction	DSOD, FERC
		Shop Drawings	Within 48 hours of installation	
Shaft Construction by Cased-Auger Blind Drilling	02316	Product Data	At least 30 days prior to excavation	
		Shop Drawings	At least 30 days prior to excavation	
		QC Submittals	At least 30 days prior to excavation	
		Certificates	At least 30 days prior to excavation	
		Workplan for shaft-to-tunnel connections	At least ~~30~~ 60 days prior to excavation	DSOD, FERC
		Temporary support calculations for shaft-to-tunnel connections	At least ~~30~~ 60 days prior to excavation	DSOD, FERC
		Ground improvement workplan for tunnel connection	At least ~~30~~ 60 days prior to excavation	DSOD, FERC
		Workplan for steel casing installation, riser pipe installation, annular grouting	At least ~~30~~ 60 days prior to excavation	DSOD, FERC
Microtunneling	02320	MTBM system specifications	At least 1 calendar year prior to excavation	DSOD, FERC
		Refurbished MTBM documentations (if used)	At least 1 calendar year prior to excavation	DSOD, FERC
		Plans and detailed descriptions of the proposed MTBM launch within the MTBM Operation Chamber including the Operation Chamber Launch Portal Bulkhead Design	At least ~~60 days~~1 calendar year prior to excavation	DSOD, FERC
		MTBM Workplan, design, configurations, calculations, and all related items, products, and components data sheets	At least ~~60 days~~1 calendar year prior to excavation	DSOD, FERC

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Lake-Tap Downstream Bulkhead design and configuration	At least ~~60 days~~1 calendar year prior to excavation	DSOD, FERC
		Lake-Tap Upstream Bulkhead	At least ~~60 days~~1 calendar year prior to excavation	DSOD, FERC
		Lake-Tap Portal	At least ~~60 days~~1 calendar year prior to excavation	DSOD, FERC
		Procedures and Contingency Plans	At least ~~45 days~~1 calendar year prior to the start of excavation	DSOD, FERC
		Lake Tap - Steel Jacking Pipe drawings, design calculations, and all related items, products, and components data sheets	At least ~~60 days~~1 calendar year prior to excavation	DSOD, FERC
		Safety Plan	At least ~~60 days~~1 calendar year prior to excavation	DSOD, FERC
		Grouting plans for contact grouting	At least ~~60 days~~1 calendar year prior to the start of micro tunneling	DSOD, FERC
		Geotechnical Investigation	Completed at least ~~60~~ 120 days prior to excavation	DSOD, FERC
		Daily Reports	Daily for activities requiring QC-related Work	DSOD, FERC
Tunnel and Shaft Linings	02330	Structural design calculations and drawings for formwork systems	At least ~~45 days~~60 days prior to commencing adit work	DSOD, FERC
		LCC annular backfill in Diversion Tunnel		DSOD, FERC
		Work Plan		DSOD, FERC
		Contractor's method statement for constructing the linings – reinforced concrete/steel lining		DSOD, FERC
		Contractor's method statement for forming the concrete linings		DSOD, FERC
Tunnel and Shaft Contact Grouting, Probe-Hole Drilling, & Pre-Excavation Grouting	02335	Resume of Contractor's proposed Grouting Manager	At least ~~45~~ 60 days prior to excavation	
		Product Data	Within ~~45~~ 60 days to excavation	DSOD, FERC

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Grout Mix Design	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Method(s) to drill and maintain probe and grout holes	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Contact grouting workplans	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Method(s) to transport and position the drills	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Procedures	At least ~~45~~ 60 days prior to excavation	DSOD, FERC
		Daily Logs and Shift Reports	Delivered to the Construction Manager daily	
Waterproofing	02339	Resume of waterproofing installation supervisor and waterproofing installers.	Prior to the start of waterproofing installation	
		Product Data/Catalogue Cuts		
		Shop Drawings	At least 30 days prior to installation	
		Waterproofing protection plan	At least 30 days prior to installation	
		Manufacturer's Recommendations and Procedures	At least 30 days prior to installation	
		Installer certification	At least 30 days prior to installation	
		Material Safety Data Sheets	At least 30 days prior to installation	
		Certification of compliance with the requirements of this Section for geotextiles, geodrain, and membrane.	At least 30 days prior to installation	
		Material Samples	At least 30 days prior to installation	
		Field Samples	At least 30 days prior to installation	
		Surface Acceptance Form and Waterproofing Installation Acceptance Form	Prior to start of installation and immediately after completion	
		Reports of tests, repairs and retests	Daily	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		As-built drawings	Monthly	
		Leak Remediation Plan	At least 30 days prior to installation	
		Furnish an Operation and Maintenance Manual	At least 30 days prior to installation	
Excavation Rock Reinforcement	02388	Shop drawings	At least ~~30~~ 60 days prior to commencement of excavation	DSOD, FERC
		Rock reinforcement installation procedures and sequencing	At least ~~30~~ 60 days prior to commencement of excavation	DSOD, FERC
		Proposed installation equipment	At least 30 days prior to commencement of excavation	
		Manufacturer's certifications for rock reinforcement	At least 30 days prior to commencement of excavation	
Hydraugers	02400	Work plan	At least ~~30~~ 60 days prior to commencement of hydrauger work	DSOD, FERC
		Manufacturer's certificate for the PVC pipe	At least 30 days prior to commencement of hydrauger work	
		Manufacturer's certificate for the geotextile fabric	At least 30 days prior to commencement of hydrauger work	
Seeding, Hydroseeding, Mulching	02445	Provide a list of seeds with quantities of each.	No later than 30 days after award of contract	
		Pesticides, herbicides and biological control agents	At least 30 days prior to erosion control work	
		Delivery certificates	At time of delivery	
		Date seed was tested, source, supplier's and manufacturer's literature	At least 30 days prior to erosion control work	
		Bulk material delivery certificates with each delivery	Prior to the start of the establishment maintenance period	
		Seed samples	At time of delivery to site	
Aggregate Base and Subbase	02505	CTM results	At least 30 days prior to start of road-related work	
		Product Data	At least 30 days prior to start of road-related work	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Samples of aggregate base	At least 30 days prior to start of road-related work	
		List of equipment	At least 30 days prior to start of road-related work	
Asphalt Concrete Pavement	02555	Certificates of compliance with specific standards for natural materials	At least 30 days prior to start of road-related work	
		Manufacturer's technical data	At least 30 days prior to start of road-related workdays	
		Asphalt concrete job mix formula	At least 30 days prior to start of road-related work	
		Samples as requested by the engineer.	Within 7 days of request	
Chain Link Fence and Gates	02830	Product data	At least 30 days prior to start of road-related work	
		One square foot sample of fencing fabric	At least 30 days prior to start of road-related work	
		Shop Drawings	At least 30 days prior to start of road-related work	
		Test results during fence installation	Within 10 days following installation	
Channel Armoring	02888	Sources for supply of off-site materials	A minimum of 30 days prior to installation in the Work	
		Certified test results	Within 7 days from completion of testing	
Marine Dredging	02900	Dredging Plant and Equipment List	At least 45 days prior to the start of dredging	
		Dredge and Disposal Sequence Plan and Schedule		
		List and description of equipment		
		Marine surveyor		
		Silt Curtain Product Information and Deployment Plan		
		Turbidity Monitoring Plan		
		Oil Containment Plan		
		Daily logs	Daily	
		Copies of all correspondence with any regulatory agencies	At least 45 days prior to the start	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
Streambed Construction	02960	Sources for supply of offsite materials	Minimum of 30 days prior to construction	
		Testing results for supply of off-site boulders	10 days prior to construction	
		Gradation test results	Within 1 week of sampling	
		Certified test results documenting conformance		
		Copies of all test results		
		Construction Sequencing Plan		
Streambank Construction	02970	Sources for supply of off-site materials	Minimum of 30 days prior to installation in the Work	
		Certificate of Compliance	Minimum of 30 days prior to installation in the Work	
		Imported Topsoil Certificate	At time of delivery	
		Certified test results	Within 7 days from completion of testing	
Concrete Formwork	03100	Formwork calculations	At least 30 days prior to concrete work	
		Shop Drawings		
		Quality Control Submittals		
Concrete Reinforcement	03200	Shop drawings	At least 30 days prior to concrete work	
Anchorage in Concrete	03250	Technical product data	At least 30 days prior to anchorage work	
		Grout	As indicated for Section 03600	
		Samples	Upon delivery to site	
		Manufacturer's Instructions	At least 30 days prior to anchorage work	
		Shop drawings		
Joints in Concrete	03251	Product Data	At least 30 days prior to concrete work	
		Shop Drawings	At least 30 days prior to concrete work	
		Samples	At least 30 days prior to concrete work	
		Quality control Submittals	At least 30 days prior to concrete work	
Cast-In-Place Concrete	03300	Product Data	At least ~~45~~ 60 days prior to concrete work	DSOD, FERC

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Off-site concrete source		DSOD, FERC
		Information for the On-site concrete batch plant		DSOD, FERC
		Certificates of compliance for each load of cement	At time of delivery	DSOD, FERC
		Delivery ticket	At time of delivery	DSOD, FERC
		A print-out of the actual scale weights for all loads batched	Prior to unloading	DSOD, FERC
		Placement drawings	At least ~~15~~ 60 days prior to concrete placement prior to unloading	DSOD, FERC
		Cold weather procedures	At least ~~45~~ 60 days prior to concrete placement in cold weather	DSOD, FERC
		Mass concrete procedures	At least ~~45~~ 60 days prior to mass concrete placement	DSOD, FERC
Controlled Low Strength Material (CLSM)	03310	CLSM mix designs	At least ~~45~~ 60 days prior to backfilling	DSOD, FERC
		CLSM material specifications	At least ~~30~~ 60 days prior to backfilling	DSOD, FERC
Shotcrete	03360	Proposed shotcrete mix designs	~~Within 24 hours after each shift~~At least 60 days prior to shotcrete operations	DSOD, FERC
		Complete description of placement methods, equipment proposed for use, and methods for repair of defects.		
		Qualifications of personnel		
		Shift reports and records of all shotcrete applications	Within 24 hours after each shift	
Grout	03600	ASTM C1107 laboratory test reports	At least ~~21~~ 60 days prior to grouting	DSOD, FERC
		ASTM C807 setting time		
		ASTM C827 Laboratory Test Reports		DSOD, FERC
		ASTM C1090 Laboratory Test Reports.		DSOD, FERC
		Three standard bags of proposed grout for testing	When requested by the Engineer.	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Laboratory test reports	At least ~~21~~ 60 days prior to grouting	
		Certification based on test results		
		Normal Grout mix designs		DSOD, FERC
Welding	05050	Welder's Qualification	At least 30 days prior to start of welding work	
Metal Fabrications	05500	Product Data	At least 21 days prior to fabrication	
		Shop Drawings		
		Welder certifications of qualification		
		Quality control plan		
		Material Test Data		
		Design Calculations		
Join Sealants	07920	Product Data	At least 21 days prior to installation of sealant	
Coating and Lining of Steel Pipe and Appurtenances	09872	The coating and lining material data sheet, and the available colors for selection	Within ~~30~~ 90 days after NTP	DSOD, FERC
		Certification letter from coating manufacturer		
		SSPC-QP1 and SSPC-QP2 certifications		
		Resume of the QC Coating Inspector	At least 60 days prior to installation	
Triple Offset Butterfly Valves, Fixed-Cone Valves, Sleeve Valves	11285, 11287, 11288	Product Data	Within ~~60~~ 90 days after NTP	DSOD, FERC
		Hydrostatic Test Reports	~~7~~ 21 days prior to shipping	DSOD, FERC
		O&M Manuals	30 days after installation	
Special Seismic Steel Pipe/Flexible Coupling	11289	Product Data	Within 90 days after NTP	DSOD, FERC
		Shop Drawings	Within 90 days after NTP	DSOD, FERC
		Pipe Fabrication Plan	Within 90 days after NTP	
		System for documenting the pertinent information for each pipe segment and fitting	Within 90 days after NTP	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Written notice to the Engineer	30 days prior to start of work on seismic steel pipe	
		Hydrostatic Pressure and Leakage Test Plan and Reports	Refer to Section 15060	DSOD, FERC
		As Built Data	30 days after installation	
Permanent Geotechnical Instrumentation – Diversion Portal and Diversion Outlet Structure	13300	Working drawings	At least 60 days prior to installation of first instrument	DSOD, FERC
		Final drawings	90 days after completion of installation	DSOD, FERC
		As-built surveys		DSOD, FERC
		Proposed drilling equipment and technique	At least 60 days prior to drilling	DSOD, FERC
		Operations and Maintenance Manual	30 days after installation	DSOD, FERC
		Resumes	At least 60 days prior to installation	
		Training plan	30 days after completion of installation	
General Communications System Requirements	13310	Factory test reports	At least 60 days prior to installation	
		Training program of District Personnel	Within 90 days of Notice to Proceed.	
		Operations and Maintenance Manuals	30 days after completion of installation	
		Equipment Identification	Refer to Section 16075	
		Functional Test requirements	At least 60 days prior to installation	
		Performance Testing requirements	At least 60 days prior to installation	
Instrument and Control System	13400	Resumes of SI (System Integrator) personnel	At least 30 days prior to work	
		Shop Drawings	At least 60 days before beginning the work	
		Control strategy.		
		Project Overview.		
		System Hardware		
		Operational Readiness Test Procedure.		
		Factory Demonstration Test Procedure.		

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Functional Acceptance Test Procedure.		
		Control Systems Block Diagram.		
		Cyber Security Plan.		
		OIT Screen Layout and Database.		
		Panel Layouts – Internal and External.		
		Panel wiring (AC distribution and DC distribution).		
		Grounding Plan.		
		Data Sheets.		
		Network / Control Systems Architecture.		
		District Training Plan.		
		I&C Schedule.		
		Loop Drawings / Schematics.		
		Data Logging List	4 weeks before FAT is scheduled	
		Ten (10) complete sets of standard user's manuals for software used to program the PLC and the control system, including soft copy	At least 60 days before beginning the work	
Control Panels and Instrumentation Hardware	13410	See Section 13400 for requirements.	See Section 13400 for requirements.	
Programmable Logic Controller (Plc) And Network Equipment	13420	See Section 13400 for requirements.	See Section 13400 for requirements.	
Control Description	13430	See Section 13400 for requirements.	See Section 13400 for requirements.	
Prefabricated Building Requirements	13900	Fabrication drawings and Structural Calculations	At least 30 days prior to fabrication	
		HVAC Calculations		
		Weld Procedure Specifications		
		Building Fabrication Plan		
		Erection Plan		

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Warranty Documents		
		Structural Analysis Data		
		Manufacturer Data sheets		
Fabrication of Steel Pipe	15050	Product Data	Within 60 days of NTP	
		Shop Drawings		
		Pipe Fabrication Plan		
		Documentation of pertinent information		
		Notifications	30-day written notice to the Engineer prior to start of pipe fabrication	
		As-Built Data: Test Reports.	90 days after completion of installation	
Installation of Steel Pipe	15060	As-Built Data	90 days after completion of installation	DSOD, FERC
		Shop Drawings	Refer to Section 15050	
		Work Drawings and Method Statements	Refer to Section 15050	
Reinforced Concrete Cylinder Pipe	15070	Product Data	At least 60 days prior to beginning the work	
		Shop Drawings		
Miscellaneous Valves	15100	Shop drawings	At least 60 days before beginning the work	
		Operation and maintenance manuals	Not later than thirty (30) days prior to any scheduled training	
Piping Specialties	15120	Shop Drawings and Product Data	Within 90 days of NTP	
		Welder certificates	At least 60 days before beginning the work	
		Recommended method of installation.	At least 30 days prior to work	
		Operation and Maintenance Manual	Not later than thirty (30) days prior to any scheduled training	
Mechanical Identification	15190	Details of proposed nameplates and pipe markers	At least 60 days before beginning the work	
Field Instrumentation	15200	Product Data	2 weeks after receipt of order	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Shop Drawings	2 weeks after receipt of order	
		Test Reports	At least 2 weeks prior to shipment	
		Operating Manuals	At time of shipment	
Water Quality Equipment	15210	Product Data	2 weeks after receipt of order	
		Shop Drawings	2 weeks after receipt of order	
		Test Reports	2 weeks prior to shipment	
		Operating Manuals	At time of shipment	
Electrical General Provisions	16010	List of Materials	At least 60 days before beginning the work	
		Compliance with Applicable Standards		
		Factory, Functional Test Reports / Requirements		
		Short Circuit and Coordination Study, Arc Flash and Arc Fault Study		
		Equipment Mounting		
		Field Test Reports		
		Wiring Diagrams		
		Spare Parts		
		Manuals		
		Shop Drawings		
		Utility Company Approval		
		Apprenticeship Completion Certificate		
Short Circuit/Coordination Study/Arc Flash Hazard Analysis	16015	Study Engineer's credentials	Refer to Section 16015	
		Short-circuit study	Refer to Section 16015	
		Preliminary Study		
		Final Study		
		Two flash drives work including all libraries used.	At completion of construction	
Basic Electrical Materials and Methods	16050	Complete conduit layout plan	At least 60 days before beginning the work	
		Shop Drawings		
		Equipment Identification	Refer to Section 16075	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
Underground Electrical Construction	16051	Basic Electrical Materials and Methods	Refer to Section 16050	
		Shop Drawings		
PVC Coated Galvanized Rigid Steel (PGRS) Conduit and System Components	16052	Basic Electrical Materials and Methods	At least 60 days before beginning the work	
		Training program of District Personnel	Refer to Section 13400	
		Manufacturer's Certificate of Installation	At least 30 days prior to pipe installation	
		Equipment Identification	Refer to Section 16075	
Grounding and Bonding	16060	Product Data	At least 60 days before beginning the work.	
		Shop Drawings	At least 60 days before beginning the work.	
		Test Reports	No more than 30 days after the completion of tests.	
		Manufacturer's Instructions	At least 60 days before beginning the work.	
Electrical Identification	16075	Product Data	At least 60 days before beginning the work	
		Schedule of identification nomenclature		
		Samples		
		Manufacturer's instructions		
Wires and Cables (600 Volt Maximum)	16120	Manufacturer's Catalog Cuts	At least 60 days before beginning the work	
		Test Reports of Acceptance Testing	Refer to Section 16955	
		Composite cable and conduit schedule	At least 60 days before beginning the work	
		Cable pulling plan	Prior to any cable installation	
		Factory, Functional, Performance Test Reports / Requirements	Refer to Section 16955	
		Equipment Identification	Refer to Section 16075	
Distribution Transformers	16460	Product Data	At least 60 days before beginning the work	
		Field, Factory, Functional, Sound-Level Test Reports / Requirements	Refer to Section 16075	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Operations and Maintenance Manuals	At least thirty (30) days prior to any scheduled training	
		Equipment Identification	Refer to Section 16075	
Electrical Distribution	16471	Product Data	At least 60 days before beginning the work	
		Shop Drawings		
		Test Reports	Refer to Section 16955	
		SPD	At least 60 days before beginning the work	
		Operations and Maintenance Manuals	Not later than thirty (30) days prior to any scheduled training	
		Equipment Identification	Refer to Section 16075	
		Functional Test requirements	One hundred and twenty (120) days prior to the first functional test	
Low Voltage Control	16480	Product Data	At least 60 days before beginning the work	
		Factory, Functional Test Reports / Requirements	Refer to Section 16955	
		Shop Drawings	Not later than thirty (30) days prior to any scheduled training	
		Approved Motor Data		
Lighting	16500	Product Data,	At least 60 days before beginning the work	
		Operation and maintenance data	Not later than thirty (30) days prior to any scheduled training	
		Factory, Functional Test Reports / Requirements	Refer to Section 16955	
		Maintenance data for fixtures		
		Equipment Identification	Refer to Section 16075	
		Product certificates signed by manufacturers	No more than 30 days after the completion of work and tests.	
Uninterruptible Power Supply	16610	Product Data	At least 60 days before beginning the work	
		Shop Drawings		
		Manufacturer's Certificate and Installation Instructions	Refer to Section 16955	

Specification	Spec. No.	Required Submittals	Due Date or Delivery Time	Regulatory Review
		Training Program	Refer to Section 13400	
		Warranties, including Maintenance Service Contract	No more than 30 days after the completion of work and tests.	
		Operations and Maintenance Manuals	At least thirty (30) days prior to any scheduled training	
		Equipment Identification	Refer to Section 16075	
		Factory, Functional Test Reports/Requirements	Refer to Section 16955	
Package Generator Assembly	16620	Shop drawings and Product Data	At least 60 days before beginning the work	
		Manufacturer Seismic Qualification Certification	At least 30 days before beginning the work.	
		Manufacturer's installation instructions		
Electrical Equipment Acceptance Testing and Start-up	16955	Proof of testing firm qualification	At least 60 days before the electrical equipment is required to be energized.	
		Functional Acceptance Testing Plan		
		Functional Test /Reports, including Thermoscan Report	Refer to Section 16955	
		Training Program	Refer to Section 13400	

ATTACHMENT NO. 4

Section 15070 - Reinforced Concrete Cylinder Pipe

PART 1 GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall provide reinforced concrete cylinder pipe, complete and in place, in accordance with the Contract Documents.

1.02 REFERENCE STANDARDS

A. Commercial Standards

1.	AWWA C303	Concrete Pressure Pipe, Bar-Wrapped, Steel-Cylinder Type
2.	AWWA M9	Concrete Pressure Pipe, Manual of Water Supply Practices
3.	ASTM A36	Standard Specification for Carbon Structural Steel
4.	ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
5.	ASTM A285	Standard Specification for Pressure Vessel Plates, Carbon Steel, Low and Intermediate-Tensile Strengths
6.	ASTM A 370	Test Methods and Definitions for Mechanical Testing of Steel Products
7.	ASTM A575	Specification for Steel Bars, Carbon, Merchant Quality, M-Grades
8.	ASTM A576	Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality
9.	ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
10.	ASTM A659	Standard Specification for Steel, Carbon (0.16 Maximum to 0.25 Maximum Percent), Hot-Rolled Sheet and Strip, Commercial Quality
11.	ASTM A663	Standard Specification for Steel Bars, Carbon, Merchant Quality, Mechanical Properties
12.	ASTM A675	Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties

13. ASTM A 1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

14. ASTM A 1018 Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Carbon, Commercial, Drawing, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

15. ASTM C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field

16. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

17. ASTM C150 Standard Specification for Portland Cement

18. ASTM C172 Standard Practice for Sampling Freshly Mixed Concrete

19. ASTM C494 Standard Specification for Chemical Admixtures for Concrete

20. ASTM C497 Standard Specifications for Test Methods for Concrete Pipe, Manhole Sections, or Tile

21. ASTM C511 Standard Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes

22. ASTM E340 Standard test method for Macroetching Metals and Alloys

23. American Association of State Highway & Transportation Officials (AASHTO)

    a. A Policy on Geometric Design of Highways and Streets

24. American Railway Engineering and Maintenance-of-Way Association (AREMA)

    a. Manual for Railway Engineering

25. ANSI/AWS D1.1 Structural Welding Code – Steel

26. ANSI/AWS A3.0 Standard Welding terms and Definitions

27. ANSI/ AWS QC1 Standard for AWS Certification of Welding Inspectors

28. NSF 61 Drinking Water System Components – Health Effects

1.03 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with Section 7, “Submittal Management,” of Standard Provisions and Section 20, “Submittal and Quality Requirements,” of the Special Provisions. Submittals shall adhere to the schedule requirements defined in Article 20.01.04.

B. Submittals shall meet the requirements of AWWA C300 - Reinforced Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids, and the following supplemental requirements as applicable:

1. Certified dimensional drawings of pipe, fittings, and appurtenances.

2. Joint and pipe/fitting wall construction details which indicate the type and thickness of cylinder; the position, type, size, and area of wire or reinforcement; manufacturing tolerances; and other pertinent information required for the manufacture of the product. Joint details shall be submitted where deep bell or butt strap joints are required for control of temperature stresses.

3. Fittings and specials details such as elbows, wyes, tees, outlets, connections, test bulkheads, and nozzles or other specials which indicate amount and position of reinforcement. Fittings and specials shall be properly reinforced to withstand the internal pressure, both circumferential and longitudinal, and the external loading conditions as indicated.

4. Design calculations including a complete stress analysis of each critical section of pipe wall, girth joints, and specials, sufficient to ascertain conformance of pipe and fittings with the Specifications.

5. Material lists and steel reinforcement schedules which include and describe materials to be utilized.

6. Line layout and marking diagrams which indicate the specific number of each pipe and fitting and the location of each pipe and the direction of each fitting in the completed line. In addition, the line layouts shall include: the pipe station and invert elevation at changes in grade or horizontal alignment; the station and invert elevation to which the bell end of each pipe will be laid; elements of curves and bends, both in horizontal and vertical alignment; and the limits of each reach of restrained and/or welded joints or of concrete encasement.

7. Full and complete information regarding location, type, size, and extent of welds. The Shop Drawings shall distinguish between shop and field welds. Shop Drawings shall indicate by welding symbols or sketches the details of the welded joints and the preparation of parent metal required to make them. Joints or groups of joints in which welding sequence or

technique are especially important shall be carefully controlled to minimize shrinkage stresses and distortion.

8. Welded joint design and details.

9. Drawings showing the location, design, and details of bulkheads for hydrostatic testing of the pipeline and details for removal of test bulkheads and repair of the lining.

10. Details and locations of closures for length adjustment and for construction convenience.

11. Detail drawings indicating the type, number, and other pertinent details of the slings, strutting, and other methods proposed for pipe handling during manufacturing, transport, and installation.

12. Manufacturer's written Quality Assurance/Control Program.

1.04 QUALITY ASSURANCE

A. **Inspection**: Pipe shall be subject to inspection at the place of manufacture in accordance with the provisions of AWWA C300 as supplemented by the requirements herein. The Contractor shall notify the Engineer in writing of the date for the start of each phase of pipe production and the dates for the proof of design tests. The notification shall be given at least 14 Days prior to the start of the pipe manufacture.

B. **Materials Tests**: Copies of test reports for materials shall be transmitted to the Engineer.

1. Tensile tests of production welds for circumferential reinforcing steel shall be made at the start of production and at intervals not to exceed each 5,000 feet of production welds thereafter. Each test shall consist of at least 2 samples, tested in accordance with the requirements of AWS D1.4 for the full section tension test. The tensile strength shall not be less than 125 percent of the minimum indicated yield strength for the reinforcing steel.

2. Production weld tests for steel cylinders shall be made in accordance with AWWA C200. In addition, production weld tests shall be conducted for each 5,000 feet of production welds and whenever there is a change in the grade of steel, welding procedure, or welding equipment.

3. Physical and chemical test data on steel. Certified mill test reports will be acceptable for steel materials.

4. Physical and chemical test data for cement and aggregate proposed to be used for the pipe shall be furnished at least 4 weeks before pipe production begins. Certified test reports for cement, aggregate, and concrete strength shall be furnished during production of pipe.

5. If pipe is steam-cured, copies of recorder charts showing temperature and duration shall be furnished.

C. The CONTRACTOR shall be responsible for performing and paying for said material tests. The ENGINEER shall have the right to witness testing conducted by the CONTRACTOR; provided, that the CONTRACTOR's schedule is not delayed for the convenience of the ENGINEER.

D. In addition to those tests specifically required, the ENGINEER may request additional samples of any material including mixed concrete and lining and coating samples for testing by the OWNER. The additional samples shall be furnished as part of the WORK.

E. **Field Testing**: Field testing shall conform to the requirements of Section 01656 - Pressure Pipe Testing and Disinfection.

F. **Welding Requirements**: Welding procedures used to fabricate pipe shall be prequalified under the provisions of AWS D1.1 - Structural Welding Code - Steel or the ASME Boiler and Pressure Vessel Code, Section 9. Welding procedures shall be required for longitudinal and girth or spiral welds for pipe cylinders, spigot and bell ring attachments, reinforcing plates and ring flange welds, and plates for lug connections.

G. **Welder Qualifications**: Welding shall be done by skilled welders, welding operators, and tackers who have had adequate experience in the methods and materials to be used. Welders shall be qualified under the provisions of AWS D1.1 or the ASME Boiler and Pressure Vessel Code, Section 9 by an independent local, approved testing agency not more than 6 months prior to commencing WORK on the pipeline. Machines and electrodes similar to those used in the WORK shall be used in qualification tests.

PART 2 PRODUCTS

2.01 GENERAL

A. Reinforced concrete cylinder pipe shall conform to AWWA C300 subject to the following supplemental requirements. The pipe shall be of the diameter and class indicated, shall be provided complete with restrained, welded joints. For pipe 24-inches in diameter and larger, the nominal inside diameter after lining shall not be less than the diameter indicated, allowing for tolerances according to AWWA C300.

B. **Markings**: The manufacturer shall legibly mark pipes and specials in accordance with the laying schedule and marking diagram. Each pipe shall be numbered in sequence and said number shall appear on the laying schedule and marking diagram in its proper location for installation. Pipe sections and fittings shall be marked at each end with top field centerline and date of manufacture.

C. **Handling and Storage**: The pipe shall be handled as a minimum at the 1/3 points by use of wide slings or other devices designed and constructed to prevent damage to the pipe coating/exterior. The use of chains, hooks, or other

equipment that might injure the pipe coating/exterior will not be permitted. Stockpiled pipe shall be supported on sand or earth berms free of rock exceeding 3-inches in diameter. The pipe shall not be rolled and shall be secured to prevent accidental rolling. Pipe handling equipment and methods shall be acceptable to the ENGINEER.

D. The CONTRACTOR shall replace or repair damaged pipe.

E. **Strutting**: Adequate strutting shall be provided on specials, fittings, and straight pipe where required to avoid damage to the pipe and fittings during handling, storage, hauling, and installation.

F. **Laying Lengths**: Maximum pipe laying lengths shall be in accordance with AWWA C300.

G. **Finish**: The pipe shall have smooth, dense interior and exterior surfaces, and shall be free from fractures and cracks. Pits or air holes greater than 3/8-inch in any dimension on the inside or outside surfaces of the pipe shall be repaired.

H. **Closures and Correction Pieces**: Closures and correction pieces shall be provided as required so that closures may be made due to different headings in the pipe laying operation and so that correction may be made to adjust the pipe laying to conform to pipe stationing indicated.

2.02 MATERIALS

A. Unless otherwise indicated, materials shall conform to AWWA C300.

Cement	Type II or Type V, from kilns which do not burn metal-rich hazardous waste fuel
Aggregate	Per section 03300 - Cast-In-Place Concrete
Concrete Admixtures	Per section 03300 - Cast-In-Place Concrete
Water/Cement Ratio	0.45 maximum
Joint Grout (outside)	1 part of cement to 2 parts clean masonry sand, mixed to a thick creamy consistency. Sand shall pass a No. 16 sieve.
Joint Grout (inside)	1 part cement Type II per ASTM C150 to 2 parts sand and sufficient water for dry-pack consistency.
Epoxy Joint Coating	High build, polyamide epoxy, **Tnemec 20,** or equal
Pozzolan	Shall not be used as a cement substitute
Acid-soluble Chloride	The acid-soluble chloride content of the concrete mix shall not exceed 0.06 percent of the weight of cementitious material when tested per ASTM C 114 - Test Methods for Chemical Analysis of Hydraulic Cement.
Mortar Coating	No less than one part of Type II or Type V cement to 3 parts clean masonry sand
Gaskets	In accordance with AWWA C300

2.03 FITTINGS AND SPECIALS

A. Except as otherwise indicated, fittings shall be designed by the CONTRACTOR for the same external and internal loads as the adjacent pipe.

B. For fittings and specials with an earth cover of less than 10-feet, the reinforced concrete coating shall be a minimum of 4-inches thick. Steel diameter shall match the adjacent pipe. Supplemental reinforcement shall be provided, consisting of cages of reinforcing steel designed for external loads and with a minimum reinforcement steel area ratio of 0.002 in both the circumferential and longitudinal directions.

C. For fittings and specials with an earth cover of 10-feet or greater, the selected reinforced concrete coating shall result in a special wall thickness equal or greater than the adjacent pipe. The coating shall be reinforced as described above, and shall be either shop cast or field cast as an encasement.

D. The supplemental external reinforcement, with the concrete coating or encasement as described above, shall be used for buried fittings and specials regardless of the ability of the steel cylinder to carry earth loads.

E. Moderate deflections and long radius curves may be made by means of beveled joint rings, by pulling standard joints, by using short lengths of pipe, or combination of these methods, except that pulled joints shall not be used in combination with beveled joint rings. The maximum total allowable angles for beveled shall be 5 degrees per pipe joint. The maximum allowable angles for pulled joint shall be in accordance with the manufacturer's recommendations or the angle which results from a 3/4-inch pull out from normal joint closure, whichever is less. Horizontal deflections or fabricated angles shall be centered on the center of the alignment.

2.04 DESIGN OF PIPE

A. **Design Criteria**: The pipe shall be designed in accordance with AWWA C300 as modified and supplemented by this Section.

1. The design internal pressures, surge pressures, and earth burial depths shall be as indicated.

2. The design trench conditions and bedding angle shall be as indicated. The pipe design shall provide for the positive projecting embankment condition.

a. Earth loads on the pipe shall be calculated using the Concrete Pipe Design Manual as published by the American Concrete Pipe Association.

b. The unit weight of soil shall be a minimum of 120 pounds per cubic foot.

c. A settlement ratio of +0.6 shall be used.

d. The USBR Engineering Monograph No. 6, Stress Analysis of Concrete Pipe, shall be used to compute pipe stresses, except that the earth loads shall be calculated as described above.

3. Minimum concrete cover over reinforcement shall be 1-1/4 inches.

4. Circumferential reinforcing steel shall have a maximum spacing of 4-inches or 0.75 times the wall thickness, whichever is greater.

5. The circumferential reinforcing steel shall consist of concentric, circular inner and outer cages. Elliptical reinforcement or partial segments of reinforcement shall not be used.

6. Concrete structural design for combined loads shall be in accordance with AWWA C300. To provide the required reinforcing steel cross-sectional areas, bars of the smallest practical size shall be utilized, consistent with the minimum clear distance between bars.

7. For design purposes, the 28-day concrete compressive strength shall not exceed 6,000 psi.

8. For pipe with restrained joints, the minimum cylinder thickness shall be 3/16-inch or the thickness required to resist thrust loads, as calculated in accordance with the paragraph for restrained joints below, whichever is greater.

B. Lap joints prepared for field welding shall be in accordance with AWWA C200. The method used to form, shape, and size bell ends shall be such that the physical properties of the steel are not substantially altered. Unless otherwise approved by the ENGINEER, bell ends shall be formed by an expanding press or by being moved axially over a die in such a manner as to stretch the steel plate beyond its elastic limit to form a truly round bell of suitable diameter and shape. Faying surfaces of the bell and spigot shall be essentially parallel, but in no case shall the bell slope vary more than 2 degrees from the longitudinal axis of the pipe.

C. Restrained Joints

1. Joints shall be restrained joints and be field-welded joints, either single, or inside and outside lap-weld, or butt-weld, or butt-straps as indicated. Designs shall include stresses created by the greater of:

a. Temperature differential of 40 degrees F plus Poisson’s effect in combination with hoop stress, or;

b. Thrust due to bulkheads, bends, reducers, and line valves resulting from working pressure in combination with hoop stress.

2. Where indicated or where required for thrust, restrained joints shall be field-welded lap joints, with a minimum cylinder thickness of 3/16-inch. For field welded joints, steel design stresses under test pressure shall not

exceed 50 percent of the indicated minimum yield strength of the grade of steel utilized for the cylinder, or 16,500 psi, whichever is less. Design stresses for fillet welds shall not exceed 15,000 psi under test pressure and the minimum fillet weld size shall be 3/16-inch for 3/16-inch cylinders and 1/4-inch for cylinder thickness through 3/4-inch.

D. **Bonding of Reinforcement**: Reinforcing steel and joint ring steel shall be electrically bonded by the welding of bonding bars to the reinforcement steel, as necessary, to completely bond the steel in each pipe and special section.

E. **Field Closures and Correction Pieces**: Correction pieces shall be pipe sections manufactured in special lengths. Field closures and correction pieces shall be provided as required to compensate for different headings in the pipe laying operations, to adjust the pipe laying to conform to pipe stationing, and to install field closures. The number and locations of closures and correction pieces shall be acceptable to the ENGINEER. Field closures shall be made using the details indicated, in combination with correction pieces.

2.05 PIPE MANUFACTURE

A. The pipe shall be manufactured by the vertical wet cast process.

B. Reinforcing form spacers shall be plastic coated.

C. Form release agents shall be non-toxic, non-irritating, and free of solvents and petroleum oils.

D. Shop Welding

1. Welding shall be done in accordance with AWWA C200 - Steel Water Pipe 6-inch and Larger by unvarying arc-welding processes which excludes the atmosphere during the process of deposition and while the metal is in a molten state. The welding process, size and type of electrode used, and the current and voltage required, shall be subject to the approval of the ENGINEER.

2. Welded joints shall have complete penetration and fusion and shall be free from unsound metal, pinholes, undercut, cracks, and other weld defects.

3. Longitudinal and spiral joints in steel cylinders 10 gauge or thinner shall be lap-welded. Longitudinal and spiral joints in the steel cylinders thicker than 10 gauge shall be double butt-welded.

2.06 PIPE APPURTENANCES

A. Pipe appurtenances shall be in accordance with the requirements of Division 15 of the Specifications. Access manholes with covers shall be as indicated, installed during fabrication, not in the field. Threaded outlets shall be forged steel suitable for 3000 psi service, and shall be as manufactured by **Vogt**, or equal.

PART 3 EXECUTION

3.01 INSTALLATION OF PIPE

A. Handling and Storage: Pipes, fittings, specials, and appurtenances, shall be carefully handled and protected against damage, impact shocks, and free fall. Pipe shall not be placed directly on rough ground but shall be supported in a manner that will protect the pipe against injury whenever stored at the trench side or elsewhere. No pipe shall be installed which has interior or exterior cracks that may be harmful as determined by the ENGINEER. Such damaged interior and exterior surfaces shall be repaired, or a new undamaged pipe shall be provided.

B. Pipe damaged prior to Substantial Completion shall be repaired or replaced by the CONTRACTOR.

C. The CONTRACTOR shall inspect each pipe and fitting to ensure that there are no damaged portions of the pipe. The CONTRACTOR shall remove or smooth out any burrs, gouges, weld splatter or other defects prior to laying the pipe.

D. Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance which may have collected thereon and shall be kept clean at all times thereafter. For this purpose, the openings of pipes and fittings in the trench shall be closed during any interruption to the WORK.

E. Pipe shall be laid directly on the bedding material. No blocking shall be used, and the bedding shall be such that it forms a continuous, uniform bearing for the full length of the pipe. Excavations shall be made as needed to facilitate removal of slings after the pipe is laid. Bell holes shall be formed at the ends of the pipe to prevent point loading at the bells or couplings and to facilitate positioning of the grout bands. Excavations shall be made as needed outside the normal trench section at field joints to permit adequate access to the joints for field connection operations and for application of coating on field joints.

F. Installation Tolerances: Each section of pipe shall be laid in the order and position shown on the laying diagram and in accordance with the following:

1. Each section of pipe having a nominal diameter less than 48-inches shall be laid to line and grade, within plus or minus 2-inches horizontal deviation and plus or minus 1-inch vertical deviation.

2. Each section of pipe having nominal diameter 48-inches and larger shall be laid to line and grade, within plus or minus 5 percent of diameter horizontal deviation and plus or minus 2.5 percent of diameter vertical deviation.

3. In addition to the horizontal and vertical tolerances above, lay the pipe so that no high or low points other than those on the laying diagram are introduced.

G. **Test Section**: At the beginning of pipe laying operations, the CONTRACTOR shall perform a test section to demonstrate that the methods and materials to be

utilized will satisfy the pipe zone backfill compaction and pipe deflection criteria. The maximum length of the test section shall be 500-feet: the CONTRACTOR shall not proceed with production pipe laying beyond the test section without the ENGINEER's approval. The entire test section length that does not comply with the Contract Documents shall be reworked as necessary to comply. The ENGINEER will observe construction of the test section. The OWNER will take measurements and keep records for quality assurance purposes. Any change in means, methods, and trench conditions, including excavation, bedding, and pipe zone materials, insitu soils, water conditions, and backfill and compaction methods will require another successful test section before additional production pipe installation.

H. Where necessary to raise or lower the pipe due to unforeseen obstructions or other causes, the ENGINEER may change the alignment and the grades. Such change shall be made by the deflection of joints, by the use of bevel adapters, or by the use of additional fittings. However, in no case shall the deflection in the joint exceed 75 percent of the maximum deflection recommended by the manufacturer. No joint shall be misfit any amount, which will be detrimental to the strength and water tightness of the finished joint. In all cases the joint opening, before finishing with the protective grout inside the pipe, shall be the controlling factor.

I. Except for short runs that may be permitted by the ENGINEER, pipes shall be laid uphill on grades exceeding 10 percent. Pipe that is laid on a downhill grade shall be blocked and held in place until sufficient support is furnished by the following pipe to prevent movement.

J. Pipe struts shall be left in place until backfilling operations have been completed for specials and fittings 42-inches in diameter and larger. Struts in fabricated steel plate specials smaller than 42-inches may be removed immediately after laying; provided, that the deflection of the special during and after backfilling does not exceed that indicated. After the backfill has been placed, the struts shall be removed and shall remain the property of the CONTRACTOR.

K. **Cold Weather Protection**: No pipe shall be installed upon a foundation into which frost has penetrated or at any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.

L. **Pipe and Specials Protection**: The openings of pipe and specials where the pipe and specials have been cement mortar-lined in the shop shall be protected with reinforced plastic bulkheads to maintain a moist atmosphere and to prevent unauthorized access by persons, animals, water, or any undesirable substance. The bulkheads shall be so designed to prevent drying out of the interior of the pipe. The CONTRACTOR shall introduce water into the pipe to keep the mortar moist where moisture has been lost due to damaged bulkheads. At all times, means shall be provided to prevent the pipe from floating due to water in the trench from any source. Pipe that has floated shall be repaired, including restoration to original condition and grade.

M. **Pipe Cleanup**: As pipe laying progresses, the CONTRACTOR shall keep the pipe interior free of debris. The CONTRACTOR shall completely clean the interior of the pipe of sand, dirt, mortar splatter, and any other debris following completion of pipe laying, pointing of joints, and any necessary interior repairs prior to testing.

3.02 WELDED JOINTS

A. **General**: Field welded joints shall be in accordance with AWWA C206 - Field Welding of Steel Water Pipe, as modified and supplemented herein.

B. Where exterior welds are performed, adequate space shall be provided for welding and inspection of the joints.

C. Butt straps, where used or required, shall be a minimum of 6-inches wide, the same thickness as the steel cylinder wall or greater, and shall provide a minimum lap of 1-inch at each joint. The butt strap shall be designed as part of the pipe system.

D. After the pipe and pipe joint are properly positioned in the trench, the length of pipe between joints shall be backfilled to at least one foot above the top of the pipe. Care shall be exercised during the initial backfilling to prevent movement of the pipe and to prevent any backfill material from being deposited on the joint.

E. The unbackfilled joint areas of the pipe shall be shaded from the direct rays of the sun by the use of properly supported awnings, umbrellas, tarpaulins, or other suitable materials for a minimum period of 2 hours prior to the beginning of the welding operation and until the weld has been completed. Shading materials at the joint area shall not rest directly on the pipe but shall be supported to allow air circulation around the pipe. Shading of the pipe joints need not be performed when the ambient air temperature is below 45 degrees F.

F. **Shrinkage Control Joints**: At intervals not exceeding 250-feet along welded reaches of the pipeline and at the first regular lap-welded field joints outside concrete encasements and structures, the pipe shall be laid with an initial lap of not less than one-inch greater than the minimum lap dimension. The welding of each such shrinkage control joint shall be performed when the temperature is approximately the lowest during the 24 hour day, after at least 250-feet of pipe have been laid and the joints have been welded ahead of and in back of the shrinkage control joint, and after backfill has been completed to at least one-foot above the top of the pipe ahead of and in back of the shrinkage control joint. Where shrinkage control joints occur in a traveled roadway or other inconvenient location, the location of the shrinkage control joint may be adjusted, as acceptable to the ENGINEER.

G. Prior to the beginning of the welding procedure, any tack welds used to position the pipe during laying shall be removed. Any annular space between the faying surfaces of the bell and spigot shall be equally distributed around the circumference of the joint by shimming, jacking, other suitable means. The weld shall then be made in accordance with AWWA C206. Where more than one

pass is required, dirt, slag, and flux shall be removed before the succeeding bead is applied.

H. Prior to butt welding, the pipe and joint shall be properly positioned in the trench using line up clamps so that, in the finished joint, the abutting pipe sections shall not be misaligned more than 1/16-inch.

I. **Joints**: The pipe ends shall be cut straight on joints where butt straps are used for realignment, adjustment, or deflection, and fillet welds shall be made as indicated.

J. Unless double fillet welds are indicated, field welded lap joints may, at the CONTRACTOR's option, be made on either the inside or the outside of the pipe.

K. **Inspection of Field Welded Joints**: An independent testing laboratory acceptable to the ENGINEER but paid by the CONTRACTOR shall inspect the joints. Inspection shall be as soon as practicable after the welds are completed.

1. Fillet welds shall be tested by the Magnetic Particle Inspection Method in accordance with ASME Section VIII, Division 1, Appendix VI.

2. In addition, double fillet welds on butt strap joints shall be tested by the soap solution method using approximately 40 psi air pressure introduced between the plates through a threaded hole as indicated. Test holes shall be plugged by a threaded plug or welding following successful testing.

3. Butt welds shall be inspected by radiographic methods in accordance with API Standard 1104.

L. Following tests of the joint, the exterior joint spaces shall be coated in accordance with these specifications after which backfilling may be completed.

M. **Repair of Welds**: Welds that are defective shall be repaired by the CONTRACTOR to meet the requirements of the applicable sections of these Specifications. Defects in welds or defective welds shall be removed, and that section of the joint shall then be rewelded. Only sufficient removal of defective material that is necessary to correct the defect is required. After the repair is made, the joint shall be checked by repeating the original test procedure. Welds deficient in size shall be repaired by adding weld metal.

N. For lap welded joints, the minimum fillet weld size shall be as determined for restrained joints above.

3.03 JOINT COATING AND LINING

A. **General**: The interior and exterior joint recesses shall be thoroughly wiped clean and water, loose scale, dirt, and other foreign material shall be removed from the inside surface of the pipe. The grout for joint coating and lining shall be one part cement to 2 parts sand and sufficient water for dry-pack consistency for joint linings and thick cream consistency for joint coatings.

B. **Joint Coating**: After the pipe has been laid and after sufficient backfill has been placed between the joints to hold the pipe securely in place, the outside annular space between pipe sections shall be completely filled with grout formed by the use of polyethylene foam-lined fabric bands. The grout space shall be flushed with water prior to filling so that the surface of the joint to be in contact with the grout will be thoroughly moistened when the grout is poured. The joint shall be filled with grout by pouring from one side only, and shall be rodded with a wire or other flexible rod or vibrated so that the grout completely fills the joint recess by moving down one side of the pipe, around the bottom of the pipe and up the opposite side. Pouring and rodding the grout shall be continued to allow completion of the filling of the entire joint recess in one operation. Care shall be taken to leave no unfilled space. Grouting of the outside joint spaces shall be kept as close behind the laying of the pipe as possible except that in no case shall grouting be closer than 3 joints of the pipe being laid.

C. **Grout Bands (Diapers)**: The grout bands or heavy-duty diapers shall be polyethylene foam-lined fabric with steel strapping of sufficient strength to hold the fresh mortar, resist rodding of the mortar, and allow excess water to escape. The foam plastic shall be 100 percent closed cell, chemically inert, insoluble in water and resistant to acids, alkali, and solvents, and shall be **Dow Chemical Company, Ethafoam 222,** or equal.

D. The fabric backing shall be cut and sewn into 9-inch wide strips with slots for the steel strapping on the outer edges. The polyethylene foam shall be cut into strips 6-inches wide and slit to a thickness of 1/4-inch which will expose a hollow or open cell surface on one side. The foam liner shall be attached to the fabric backing with the open or hollow cells facing towards the pipe. The foam strip shall cover the full interior circumference of the grout band with sufficient length to permit an 8-inch overlap of the foam at or near the top of the pipe joint. Splices to provide continuity of the material will be permitted. The polyethylene foam material shall be protected from direct sunlight.

E. The polyethylene foam-lined grout band shall be centered over the joint space with approximately equal widths extending over each pipe end and securely attached to the pipe with the steel straps. After filling the exterior joint space with grout, the flaps shall be closed and overlapped in a manner that fully encloses the grout with polyethylene foam. The grout band shall remain in position on the pipe joint.

F. **Joint Lining**: After the backfill has been completed to final grade, the interior joint recess shall be filled with grout. The grout shall be tightly packed into the joint recess and troweled flush with the interior surface. Excess shall be removed. At no point shall there be an indentation or projection of the mortar exceeding 1/16-inch. With pipe smaller than 24-inches in diameter, before the spigot is inserted into the bell, the bell shall be daubed with grout; the joint shall be completed, and excess mortar on the inside of the joint shall be swabbed out.

3.04 INSTALLATION OF PIPE APPURTENANCES

A. **Protection of Appurtenances**: Where the joining pipe is concrete or coated with cement mortar, buried appurtenances shall be coated with a minimum

thickness of one-inch of cement mortar having one part cement to not more than 2 parts plaster sand.

B. **Installation of Valves**: Valves shall be handled in a manner to prevent any injury or damage to any part of the valve. Joints shall be thoroughly cleaned and prepared prior to installation. The CONTRACTOR shall adjust stem packing and operate each valve prior to installation to insure proper operation.

C. Valves shall be installed so that the valve stems are plumb and in the location indicated.

D. Buried valves and flanges shall be coated and protected in accordance with Section 09900.

E. **Installation of Flanged Joints**: Before the joint is assembled, the flange faces shall be thoroughly cleaned of foreign material with a power wire brush. The gasket shall be centered and the connecting flanges drawn up watertight without unnecessarily stressing the flanges. Bolts shall be tightened in a progressive diametrically opposite sequence and torqued with a suitable, approved and calibrated torque wrench. Clamping torque shall be applied to the nuts only. Full face reinforced rubber gaskets shall be applied to the inside face of blind flanges with adhesive.

F. **Insulated Joints**: Insulated joints and appurtenant features shall be provided as indicated. The CONTRACTOR shall exercise special care when installing these joints to prevent electrical conductivity across the joint. After the insulated joint is completed, an electrical resistance test shall be performed by the CONTRACTOR. Should the resistance test indicate a short circuit, the CONTRACTOR shall remove the insulating units to inspect for damages, replace damaged portions, and reassemble the insulating joint. The insulated joint shall then be re-tested to assure proper insulation.

G. **Flexible Coupled Joints**: When installing flexible couplings, care shall be taken that the connecting pipe ends, couplings and gaskets are clean and free of dirt and foreign matter with special attention being given to the contact surfaces of the pipe, gaskets, and couplings. The couplings shall be assembled and installed in conformity with the recommendations and instruction of the coupling manufacturer.

H. Wrenches used in bolting couplings shall be of a type and size recommended by the coupling manufacturer. Coupling bolts shall be tightened so as to secure a uniform annular space between the follower rings and the body of the pipe with bolts tightened approximately the same amount. Diametrically opposite bolts shall be tightened progressively and evenly. Final tightening shall be done with a suitable, approved and calibrated torque wrench set for the torque recommended by the coupling manufacturer. Clamping torque shall be applied to the nut only.

END OF SECTION