PROJECT MANUAL

FOR THE

FALLON COLONY CONCRETE TANK REPLACEMENT PROJECT

FOR THE

FALLON PAIUTE-SHOSHONE TRIBE

CHURCHILL COUNTY, NEVADA

PUBLIC LAW 86-121
IHS PROJECT PH16-U83
RN 25-23

OWNER
FALLON PAIUTE-SHOSHONE TRIBE
CHAIRWOMAN: CATHI TUNI
565 RIO VISTA DRIVE
FALLON, NEVADA 89406

TECHNICAL CONSULTANTS
INDIAN HEALTH SERVICE
OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING
1150 FINANCIAL BLVD., SUITE 500
RENO, NEVADA 89502

ENGINEER
SOPHIA LOPEZ, P.E.
(775) 229-5781

DECEMBER 2023

PROFESSIONAL ENGINEER – STATE OF NEVADA
SOPHIA LOPEZ
Exp: 12/31/25
CIVIL
No. 29756
12/26/23

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ADVERTISEMENT FOR BIDS

Fallon Paiute-Shoshone Tribe
(Owner)
565 Rio Vista Drive
(Address)
Fallon, NV 89406

Separate sealed BIDS for the **Fallon Colony Concrete Tank Replacement Project** will be received by the Fallon Paiute-Shoshone Tribe ("Tribe"), acting through the Tribal Chairman, at the Tribal Admin, 565 Rio Vista Drive, Fallon, NV (physical address) until **10:00 AM (Local Time) Tuesday May 14th 2024**, at which time the Bids received will be publicly opened and read. The Project consists of, but is not limited to, the removal of the existing concrete water storage tank, installation of new welded steel water storage tank and tank foundation, temporary water storage system, tank plumbing and appurtenances, and repairs to chain-link fencing per Construction Drawings, Technical Provisions and Bid Schedule.

Bids will be received from a Single Prime Contractor. Bids shall be unit price basis.

A Pre-Bid Conference will be held for this work on **Thursday, April 11th, 2024 at 10:00 AM. (Local Time)**, which will not relieve the Contractor from the requirement to furnish all materials and perform all jobs necessary to complete the Work in strict compliance with the Contract. Attendance at the pre-bid conference is highly encouraged, but is not mandatory. The meeting will be held at the Tribal Administration Building followed by a site visit at the water storage tank site. Prospective contractors should RSVP for the pre-bid conference to the Public Works Director, John Schafer, at publicworks@fpst.org.

Requests for Information (RFI) must be received in writing no later than April 26th, 2024 at 5:00PM (Local Time).

Preference in the award for this Contract shall be given to Indian and Alaskan Native organizations and economic enterprises. The Owner shall give preference to a 51% Indian-owned Economic Enterprise so long as the bid by this enterprise does not exceed the lowest bid submitted by more than five (5) percent. "Indian-owned Economic Enterprise" means any Indian-owned commercial, industrial, or business activity established or organized for the purpose of profit, provided that such Indian Ownership shall constitute not less than 51 percent of the enterprise, and that ownership shall encompass active operation and control of the enterprise. All preferences shall be publicly announced at the bid opening. Any contractor claiming Indian preference shall give evidence, as required by the Owner, to support its claim prior to bid opening.

IHS is providing the technical assistance only and is not an agent of the Fallon Paiute-Shoshone Tribe.

The Tribe has prepared a Project Manual containing a description of the Project, Project Specifications, Project Agreements and related contract documents. The Project Manual will be advertised on the following websites:

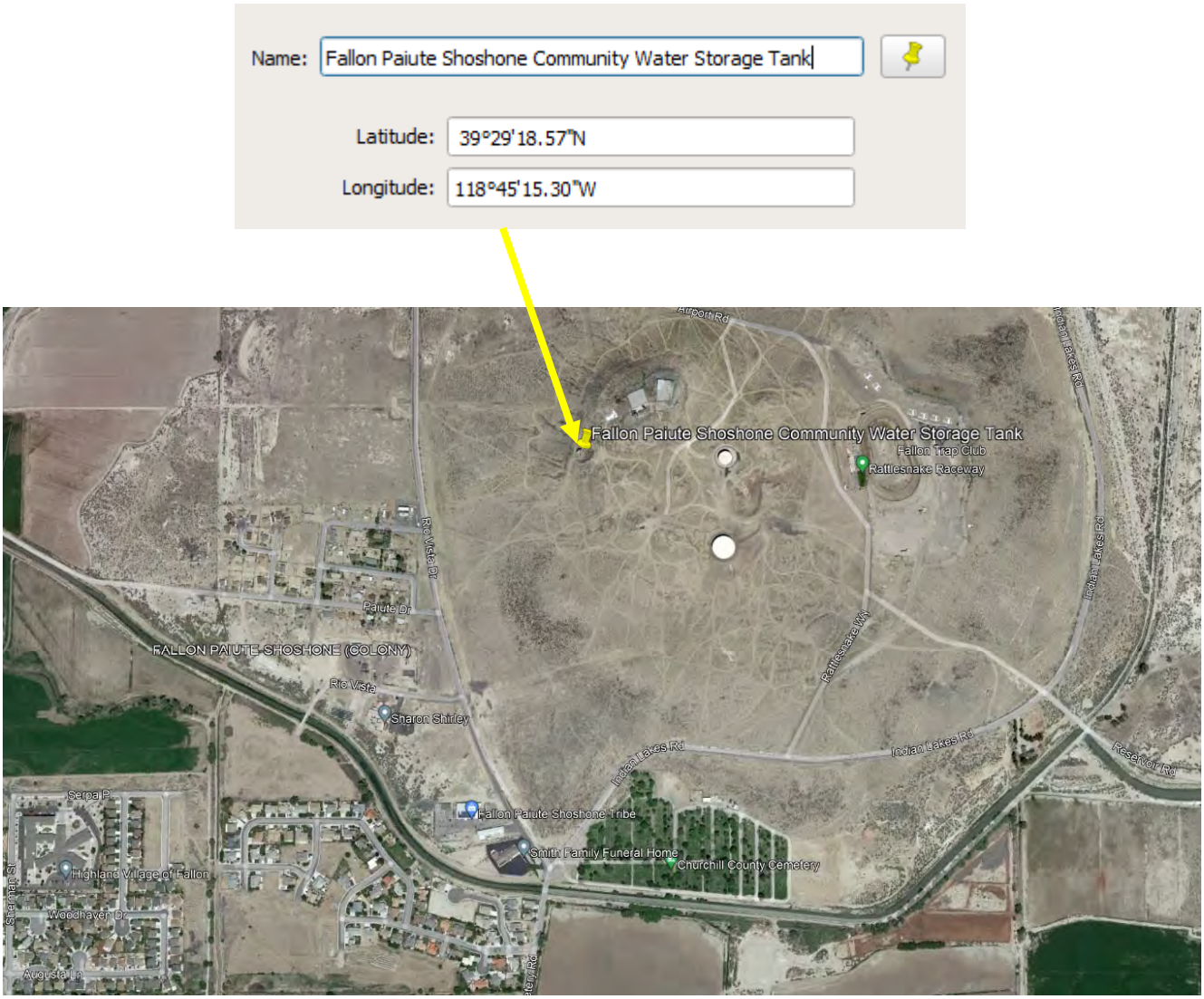
Fallon Paiute Shoshone Tribe's website: https://www.fpst.org/
Sierra Contractors Source: https://www.scsplanroom.com/

A request for the copy of the Project Manual and Plans can be obtained free of charge from the Public Works Director, John Schafer at publicworks@fpst.org and CC: project engineer, Sophia Lopez at sophia.lopez@ihs.gov.

Contractors submitting bids for this project shall be a Nevada licensed contractor. The Contractor's bid must include provisions to furnish all labor, equipment, materials, and services for the performance of all work required for the construction of the Project.

LOCATION MAP

FALLON PAIUTE-SHOSHONE RESERVATION



NOTICE OF BID ADVERTISEMENT

Fallon Paiute-Shoshone Tribe is soliciting bids for water system improvements. Information contained in the advertisement is summarized below. Additional information can be obtained by contacting the Owner.

Advertisement Number: **PH16-U83, RN 25-23**

Owner: Fallon Paiute-Shoshone Tribe

Project Location: Fallon Paiute-Shoshone Concrete Water Storage Tank, Fallon, NV 89406

Scope of Work: *Remove the existing 250,000 gallon concrete water storage tank at the Fallon colony, construct a new 375,000 gallon welded steel water storage tank, foundation and tank plumbing; New tank exterior/interior coating, provide temporary water storage system to ensure water supply and storage during construction; provide Operation and Maintenance Manual.*

Bid Opening Time: Tuesday, May 14th, 2024 at 10:00 AM (Local Time) at the Tribal Administration Building

Bid Bond: 5% of the total bid

Performance Bond: 100% of the contract amount

Payment Bond: 100% of the contract amount

Pre-Bid Conference Location: Will be held on Thursday, April 11th, 2024 at 10:00 AM Local Time at the Tribal Administration Building, 565 Rio Vista Drive, Fallon, NV with site visit to follow. Prospective contractors should RSVP for the pre-bid conference to the Public Works Director, John Schafer, at publicworks@fpst.org.

Owner Contact: Cathi Tuni, Tribal Chairman, chairman@fpst.org
John Schafer, Public Works Director, publicworks@fpst.org, (775) 427-9954

Engineer Contact: Sophia Lopez, Indian Health Service, Sophia.lopez@ihs.gov, (775) 229-5781

INFORMATION FOR BIDDERS

BIDS will be received by the Fallon Paiute-Shoshone Tribe (herein called the "OWNER") at the Tribal Admin Building, 565 Rio Vista Drive, Fallon, NV 89406 until **10:00 AM Local Time Tuesday, May 14th, 2024**, and then **publicly opened and read aloud**.

Each BID must be submitted in a sealed envelope, addressed to Fallon Paiute-Shoshone Tribe, ATTN: Cathi Tuni, Tribal Chairman. Each sealed envelope containing a BID must be plainly marked on the outside as "BID for **Fallon Concrete Storage Tank Replacement, PH16-U83, RN 25-23**" and the envelope should bear on the outside the name of the BIDDER, address and Contractor's license number if applicable. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at 565 Rio Vista Drive, Fallon, NV 89406.

All BIDS must be submitted on the required BID form as included in the Project Manual. All blank spaces for BID prices must be filled in, in ink or typed, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS; all such waivers and rejections being completely within the Owner's discretion. Any BID may be withdrawn by the BIDDER prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within this 60-day period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the drawings and specifications including any ADDENDA issued by OWNER. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

BIDDERS must submit written RFI to the OWNER no later than April 26th, 2024 at 5:00PM (Local Time).

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

The CONTRACT DOCUMENTS contain all the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the contract.

Each BID must be accompanied by a BID bond payable to the OWNER for five percent (5%) of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible BIDDERS. When the Agreement is executed the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the payment BOND and performance BOND have been executed by CONTRACTOR and approved by OWNER, after which it will be returned. A certified check may be used in lieu of a BID BOND. Each BID shall include the BIDDER'S qualifications and references for a minimum of three comparable projects.

A performance BOND and a payment BOND, each in the amount of one hundred percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign BID BONDS or payment BONDS and performance BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain and provide the performance BOND and payment BOND within ten (10) calendar days from the date when NOTICE OF AWARD is

delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may at his option consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER, within ten (10) calendar days of receipt of acceptable performance BOND, payment BOND and Agreement signed by the party (CONTRACTOR) to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. The commence work date shall be established by the OWNER in the NOTICE TO PROCEED. The CONTRACTOR must execute the NOTICE TO PROCEED within ten (10) days of receipt. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER may make such investigations as deemed necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the Agreement and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

Except as otherwise provided herein, award of the Contract will be made to the lowest responsive and responsible BIDDER, with due consideration to qualified Indian Preference bidders.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to his BID.

Further, the BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the GENERAL PROVISIONS.

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when requested to do so by the OWNER.

CONTRACTOR REFERENCE CHECKS FOR TRIBAL CONSTRUCTION

The requirement for Contractor references in this contract is to provide the highest quality facilities, constructed on time and within budget for the Owner. This requirement is mandatory for all contracts which are estimated to cost more than $50,000.

RESPONSIVE
Any contractor bidding on this project shall supply with their bid a list of ALL construction projects performed for Tribal governments in the past 10 years. The list shall include the following information:

Name of Project: _____

Tribe: _____

Total Contract Amount: _____

Date of Completion: _____

Engineer: _____

Tribal contact (Name/Phone Number): _____

The list must include ALL construction projects performed by the contractor for any Tribe. If through the process of reviewing bids it is discovered that not ALL projects are included, the bid may be considered Non-Responsive and may be rejected. Therefore it is required that all projects be listed.

If the contractor has never completed work for a Tribal government, a letter by the president/CEO of the company stating this must be provided with the bid.

Once a reference list has been investigated by the Owner to the satisfaction of the Owner's Contracting Officer as being complete, reference checks on this contractor will be completed by Owner.

RESPONSIBLE
Reference checks for the low bidding contractor will be completed prior to recommendation of award. Reference questions will include ratings on quality and performance of work, timely completion, communication, change orders, warranty performance, etc.

Upon completion of these reference checks the Contracting Officer shall make a determination to award or to not award the Contract. If the project includes public funds, the contributing funding agency shall be consulted in the determination to award or to not award a contract. The Tribe and contributing funding agency shall agree to the final decision to award or to not award a contract.

BID

Proposal of _____

(hereinafter called "BIDDER") organized and existing under the laws of the State of _____ doing business as _____

(a corporation, a partnership, an individual, etc.) to the Fallon Paiute-Shoshone Tribe (hereinafter called "Owner").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of the **Fallon Concrete Storage Tank Replacement Project** in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated in the Bid Schedule.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract as specified in the NOTICE TO PROCEED and to fully complete the PROJECT within **240 consecutive calendar** days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of **$500** for each consecutive calendar day thereafter as provided in Section 3 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

_____

_____

_____

_____

_____

BID SCHEDULE

All bidders must bid for all line items, sections and schedules. Lengths and quantities are estimates. Bidder should verify/estimate both by site visit. Contractor shall refer to the respective Method and Measurement of Payment Section of the Technical Provision for full description of all bid line items.

All Bidders shall fill out all unit and total costs. Actual quantities awarded may vary. Bid line item costs shall be honored regardless of quantity of work awarded within quantities. Mob/Demob shall not change with quantity of work awarded. Except as otherwise provided in the Contract Documents, the Award of bid shall be made to the responsive and responsible bidder with lowest costs for awarded work. Award will be made subject to available funds and submitted bid costs. The Owner reserves the right to reject all bids and make no award as determined in Owner's complete discretion.

Bidder claims Indian Preference for award of this contract: Yes _____ No _____

Note: Bidders claiming Indian Preference must attach a properly completed "Indian Owned Economic Enterprise Qualification Statement" to this bid. Failure to submit this form will void the Bidder's claim for Indian Preference.

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the unit prices or lump sum stated in the Bid Schedule

Item No.	Description	Technical Provision	Unit	Qty.	Unit Price	Bid Price
1	Mobilization/Demobilization	TP – 1	LS	1		
2	Temporary Water Storage	TP – 00	LS	1		
3	Temporary Controls	TP – 17	LS	1		
4	Remove and Dispose of 250,000 Gallon Concrete Tank	TP – 00	LS	1		
5	Tank Foundation	TP – 31	LS	1		
6	375,000 Gallon Welded Steel Water Storage Tank	TP – 31	LS	1		
7	Welding Inspector	TP – 00	LS	1		
8	Interior and Exterior Tank Coating	TP – 34	LS	1		
9	Tank Plumbing	TP – 31	LS	1		
10	Removal of Existing Fence	TP – 60	LF	270		
11	Fencing (8') including two 16' gates	TP – 60	LF	325		
12	Water Main Interconnections for Tank Inlet and Outlet	TP – 04	LS	1		
13	8" C900 PVC Water Main	TP – 04	LF	28		
14	8" Gate Valve	TP – 04	EA	1		
15	Remove Excess Rock and Re-Grade for Drainage	TP – 00	LS	1		
					Subtotal	

TRIBAL TAX 7.6% (on materials only)	
Total Base Bid:	

Submitted by Bidder:

Signature	*Title*
Firm	*Mailing Address*
License Number (if applicable)	*City, State, Zip Code*
Date	*Telephone Number*
Federal Employer ID Number	*FAX Number*

(SEAL if BID is by a corporation)

Attest _____

INDIAN OWNED ECONOMIC ENTERPRISE QUALIFICATION STATEMENT

The Undersigned certifies under oath the truth and correctness of all responses set out below as follows:

1. Name of Enterprise: _____

   Address: _____

   Telephone #: _____

2. Check one:

   _____ Corporation _____ Joint Venture
   _____ Partnership _____ Other:
   _____ Sole Proprietorship

3. Answer the following:

   A. If a Corporation:

      i. Date of incorporation: _____

      ii. State of incorporation: _____

      iii. Name & address of statutory agent: _____

      _____

      _____

      iv. Give the name and address of the officers and members of the Board of Directors of this Corporation and establish whether they are Indian (I) or Non-Indian (NI). Proof of Tribal Membership in a federally recognized Indian Tribe is required for all responses.

Name and Social Security No.	I or NI	Title	Address	% of Stock Ownership
		President		
		Vice-President		
		Sec/Clerk		
		Treasurer		

v. Complete the following information on all stockholders who are not listed above, owning 5% or more of the stock. Establish whether they are Indian (I) or Non-Indian (NI).

Name and Social Security No.	I or NI	Address	% of Stock Ownership

B. If a Sole Proprietorship or Partnership:

i. Date of Organization: _____

ii. Give the following information on the individual or partners and establish whether they are Indian (I) or Non-Indian (NI).

Name and Social Security No.	I or NI	Address	% of Stock Ownership

C. If a Joint Venture:

i. Date of Joint Venture Agreement: _____

ii. Attach the information for each member of the joint venture prepared in the appropriate format given above.

4. Give the name, address, and telephone number of the principle spokesperson of your organization:

_____

_____

5. Has this enterprise been certified as an Indian Owned Economic Enterprise by any government or Tribal agency to qualify for special consideration under Indian preference contract clauses, or been awarded contracts by any government or Tribal agency based on Indian preference consideration?

Yes _____ No _____

A. If yes, complete:

Contract Date	Contracting Agency	Contract No.	Location of Work

6. Will any officer or partner listed in #3 be engaged in outside employment?

Yes _____ No _____

A. If yes, complete:

Name	Outside Employment	Hours/Week

7. Does this enterprise have any subsidiaries or affiliates or is it a subsidiary or affiliate of another concern?

Yes _____ No _____

A. If yes, complete:

Name and address of subsidiary affiliate or other concern	Description of Relationship

8. Does this enterprise or any person listed in #3 above have or intended to enter into any type of agreement with any other concern or person which relates to or affects the on-going administration, management or operations of this enterprise? These include but are not limited to management, and joint venture agreements and any arrangement or contract involving the provision of such compensated services as administrative assistance, data processing, management consulting of all types, marketing, purchasing, production and other type of compensated assistance.

Yes _____ No _____

A. If yes, attach a copy of any written agreement or an explanation of any oral or intended agreement.

9. Attach certification by a Tribe or other evidence of enrollment in a federally recognized Tribe for each officer, partner or individual designated as an Indian in #3.

10. Attach a certified copy of the charter, articles of incorporation, by-laws, partnership agreement, joint venture agreement and/or other pertinent organizational documentation.

11. Explain in narrative form the stock ownership, structure, management, control, financing, and salary or profit sharing arrangements of the enterprise, if not covered in answers to specific questions heretofore. Attach copies of all shareholder agreements, including voting trust, employment contracts, agreements between owners and enterprise. Include information on salaries, fees, profit sharing, material purchases, and equipment lease or purchase agreements. Evidence relating to structure, management, control, and financing should be specifically included. Also, list the specific management responsibilities of each principal, sole proprietor, partner, or party to a joint venture (as appropriate) listed in response to #3.

NOTE:

- ✧ Omission of any information may be cause for rejection of claim for Indian Preference.
- ✧ The persons signing below certify that all information in this INDIAN OWNED ECONOMIC ENTERPRISE QUALIFICATION STATEMENT, including exhibits and attachments, is true and correct.
- ✧ Print and type name below all signatures.

If applicant is Sole Proprietor, Sign Below:

_____ _____
Name Date

If applicant is in a Partnership or Joint Venture, all Partners must sign below:

_____ _____
Name Date

_____ _____
Name Date

If applicant is a Corporation, affix corporate seal:

_____ _____
Corporate Seal Date

By: _____
President's Signature

Attested by: _____
Corporate Secretary's Signature

WARNING:
U.S. Criminal Code, Section 1010, Title 18, U.S.C. provides in part: "Whoever...makes, passes, utters, or publishes any statement, knowing the same to be false...shall be fined not more than $5000 or imprisoned not more than two years, or both."

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____as Principal, and _____ as Surety, are hereby held and firmly bound unto _____ as OWNER in the penal sum of _____ for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, and our successors and assigns.

Signed, this _____ day of _____, 2024. The Condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain BID attached hereto and hereby made a part hereof to enter into a contract in writing, for the construction of the **Fallon Concrete Storage Tank Replacement Project, RN 25-23.**

NOW, THEREFORE,

1. If said BID shall be rejected, or

2. If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and a BOND for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation, shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

BIDDER

_____

Principal

BY: _____(s)

Signature and Title

SURETY

_____

Surety

BY: _____(s)

Signature and Title (attach Power of Attorney)

NOTE - Surety companies executing BONDS must be authorized to transact business in the state where the project is located.

AGREEMENT BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT is by and between the **Fallon Paiute-Shoshone Tribe** (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER AND CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

1. WORK

   A. CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

   Remove the existing 250,000 gallon concrete water storage tank and install a new foundation for a 375,000 gallon welded steel water storage tank; replace tank plumbing and controls, install temporary water storage to ensure access to water throughout construction; extend chain link fencing around new tank; provide an operation and maintenance manual.

2. THE PROJECT

   A. The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

   Fallon Concrete Storage Tank Replacement Project, RN 25-23

3. CONTRACT TIMES

   A. Time of the Essence

      i. All time limits for completion as stated in the Contract Documents are of the essence of the Contract.

   B. Days to Achieve Substantial Completion and Final Payment

      i. The Work will be completed within **240** days after the date when the Contract Times commence to run as provided in paragraph 3 of the General Conditions.

   C. Liquidated Damages

      i. CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3b above, plus any extensions thereof allowed in accordance with paragraphs 39 and 40 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER **$500** for each day that expires after the time completion specified in paragraph 3b until the Work is substantially complete.

4. CONTRACT PRICE

   A. **For all Unit Price Work**, OWNER shall pay CONTRACTOR an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item, and said amount is hereby agreed to be: $_____.

B. **For all other Work**, a cumulative amount as stated in the prices on the CONTRACTOR's Bid Schedule, shown on page 6 of this specification, and said amount is hereby agreed to be:
$_____.

C. **Total Contract Amount**. The Sum of this Section 4 A and B, $ _____, is hereby agreed to constitute the Total Contract Price payable by OWNER to Contractor for satisfactory completion of the Work under this Agreement.

5. PAYMENT PROCEDURES

A. Submittal and Processing of Payments

i. CONTRACTOR shall submit Applications for Payment in accordance with paragraph 44 of the General Conditions. Applications for Payment will be processed as provided in the General Conditions.

B. Progress Payments; Retainage

i. OWNER shall retain a portion of progress payments as provided in paragraph 44 of the General Conditions:

The OWNER shall retain five (5) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages less authorized deductions.

C. Final Payment

i. Upon final completion and actenceptance of the Work in accordance with paragraph 46 of the General Conditions, OWNER shall pay the remainder of the Contract Price as provided in said paragraph 46.

6. CONTRACTOR'S REPRESENTATIONS

A. In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

i. CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

ii. CONTRACTOR has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

iii. CONTRACTOR is familiar with and is satisfied as to all federal, tribal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

iv. CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 12 of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions.

v. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which

may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto

vi. CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

vii. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.

viii. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

ix. CONTRACTOR has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by OWNER is acceptable to CONTRACTOR.

x. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

7. CONTRACT DOCUMENTS

A. Contents

i. The Contract Documents consist of the following:

a) This Agreement;

b) General Conditions;

c) Supplementary Conditions;

d) Technical Provisions (Specifications) as listed in the table of contents of the Project Manual;

e) Drawings consisting of sheets **1-10**;

f) Addenda (numbers _____ to _____, inclusive);

g) Exhibits to this Agreement (enumerated as follows):

- ✧ Exhibit 1: Geotechnical Report by Black Eagle Consulting
- ✧ Exhibit 2: Right-Of-Way Maps
- ✧ Exhibit 3: Project Site Photos

- ✧ Notice to Proceed;

- ✧ CONTRACTOR's Bid;

- ✧ Documentation submitted by CONTRACTOR prior to Notice of Award: _____
  _____
  _____,

h) The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

- ✧ Written Amendments;
- ✧ Work Change Directives;
- ✧ Change Order(s);
- ✧ Notice of Substantial Completion.

i) The documents listed in paragraph 7.A.i. are attached to this Agreement (except as expressly noted otherwise above).

j) There are no Contract Documents other than those listed above in this paragraph 7.

k) The Contract Documents may only be amended, modified, or supplemented as provided in paragraph 4 of the General Conditions.

8. MISCELLANEOUS

A. Terms

i. Terms used in this Agreement will have the meanings indicated in the General Conditions.

B. Assignment of Contract

i. Without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

C. Successors and Assigns

i. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

D. Severability

i. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

E. Non-Waiver of Sovereign Immunity

i. Nothing in this agreement or any of the contract documents constitutes a waiver of the OWNER's absolute sovereign immunity. The CONTRACTOR acknowledges that the OWNER, including all officers, employees, subsidiaries, departments, and other instrumentalities of the OWNER are absolutely immune from suit of claim of any kind.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER and CONTRACTOR. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or on their behalf.

This Agreement will be effective on _____, _____(which is the Effective Date of this Agreement).

OWNER:	CONTRACTOR:
Fallon Paiute-Shoshone Tribe	_____
[CORPORATE SEAL]	*[CORPORATE SEAL]*
Attest	Attest
_____	_____
Address for giving notices:	Address for giving notices:
565 Rio Vista Drive, Fallon, NV 89406	_____
_____	_____
(If OWNER is a corporation, attach evidence of authority to sign. If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of OWNER-CONTRACTOR Agreement).	_____ License No. _____ *(Where applicable)*
Designated Representative	Agent for service of process: _____ *(If CONTRACTOR is a corporation or a partnership, attach evidence of authority to sign.)*
Name: John Schafer	Designated Representative Name: _____
Title: FPST Public Works Director	Title: _____
Address: 565 Rio Vista Drive Fallon, NV 89406 _____	Address: _____ _____ _____
Phone: 775-427-9954	Phone: _____
Facsimile: _____	Facsimile: _____

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called Principal,
(Corporation, Partnership, or Individual)

and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto **Fallon Paiute-Shoshone Tribe**
(Name of Owner)

_____
(Address of Owner)

hereinafter called OWNER, in the penal sum of _____ Dollars $(_____), in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____day of _____, 20___, a copy of which is hereto attached and made a part hereof for the construction of:

Fallon Colony Concrete Tank Replacement Project PH16-U83, RN 25-23

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUBCONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUBCONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration and addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall
(Number)
be deemed an original, this the _____day of _____, 20___.

ATTEST: _____
(*Principal*)

_____
(*Principal Secretary*)

(SEAL) BY _____(s)

_____

_____
(Address)

_____
(Witness as to Principal)

_____

_____
(Address)

ATTEST: _____
(*Surety*)

_____
(*Surety Secretary*)

(SEAL) BY _____(s)
(Attorney-in-Fact)

_____

_____
(Address)

_____
(Witness as to Surety)

_____

_____
(Address)

NOTES:

- ✧ Date of BOND must not be prior to date of Contract.
- ✧ If CONTRACTOR is Partnership, all partners shall execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

[END OF PAYMENT BOND SECTION]

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called Principal,
(Corporation, Partnership, or Individual)

and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto **Fallon Paiute-Shoshone Tribe**
(Name of Owner)

_____
(Address of Owner)

hereinafter called OWNER, in the penal sum of $_____ Dollars $ (_____), in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____day of _____, 20___, a copy of which is hereto attached and made a part hereof for the construction of:

Fallon Colony Concrete Tank Replacement Project PH16-U83, RN 25-23

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration and addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall
(Number)
be deemed an original, this the _____day of _____, 20___.

ATTEST:

_____
(*Principal Secretary)*

_____
(*Principal)*

(SEAL) BY _____(s)

_____

_____
(Address)

_____
(Witness as to Principal)

_____

_____
(Address)

ATTEST:

_____
(*Surety Secretary)*

_____
(*Surety)*

(SEAL) BY _____(s)
(Attorney-in-Fact)

_____

_____
(Address)

_____
(Witness as to Surety)

_____

_____
(Address)

NOTE:

- ✧ Date of BOND must not be prior to date of Contract.
- ✧ If CONTRACTOR is Partnership, all partners shall execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

[END OF PERFORMANCE BOND SECTION]

NOTICE OF AWARD

To: _____
_____
_____
_____

Project Description: **Fallon Colony Concrete Tank Replacement Project PH16-U83, RN 25-23**

1. The Owner has considered the BID submitted by you for the above described WORK. You are hereby notified that your BID has been accepted in the amount of $_____.

2. You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of receipt of this Notice.

3. If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of receipt of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.
Dated this ____ day of _____, 20___.

Fallon Paiute-Shoshone Tribe
(Owner)

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged this

_____ day of _____, 20___.

By: _____

Title: _____

[END OF NOTICE OF AWARD SECTION]

NOTICE TO PROCEED

To: _____
_____
_____
_____

Date: _____
Project: **Fallon Colony Concrete Tank Replacement Project PH16-U83, RN 25-23**

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 20___, no earlier than_____, 20___, and you are to complete the WORK within **240** consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 20___.

Fallon Paiute-Shoshone Tribe
(Owner)

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by:

_____
(Contractor)

this the _____ day of _____, 20___.

By: _____

Title: _____

[END OF NOTICE TO PROCEED SECTION]

CHANGE ORDER

Agreement Date: _____

Order No. _____ Date: _____

Name of Project: **Fallon Colony Concrete Tank Replacement Project PH16-U83, RN 25-23**
Owner: **Fallon Paiute-Shoshone Tribe**

Contractor: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Reason for Change Order:

Change to CONTRACT PRICE:

Original CONTRACT PRICE $_____

Current CONTRACT PRICE adjusted by previous CHANGE ORDER $_____

The CONTRACT PRICE due to this CHANGE ORDER will be (increased) (decreased) by: $_____

The new CONTRACT PRICE including this CHANGE ORDER will be: $_____

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by _____ calendar days.

The date for completion of all work will be _____.
(Date)

Ordered by: _____ _____
Owner *Date*

Accepted by: _____ _____
Contractor *Date*

CHANGE ORDER INSTRUCTIONS

1. GENERAL INFORMATION

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

2. COMPLETING THE CHANGE ORDER FORM

Engineer or Owner's representative normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Owner's representative has completed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Owner should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

WORK CHANGE DIRECTIVE

Date of Issuance _____ Effective Date: _____

Name of Project: **Fallon Colony Concrete Tank Replacement Project PH16-U83, RN 25-23**

Owner: **Fallon Paiute-Shoshone Tribe**

Contractor: _____

You are hereby directed to proceed promptly with the following change(s):
Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

_____

If OWNER or CONTRACTOR believe that the above change has affected Contract Price any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Contract Documents.

Method of determining change in Contract Price:

_____ Unit Prices

_____ Lump Sum

_____ Cost of the Work

Estimated increase (decrease) in Contract Price:

$_____

If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Times:

Substantial Completion: _____ days:

Ready for final payment: _____ days.

RECOMMENDED:

_____
Engineer

AUTHORIZED:

_____
Owner

ACCEPTED:

_____
Contractor

WORK CHANGE DIRECTIVE INSTRUCTIONS

1. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a change in the Contract Price or the Contract Times a Field Order should be used.

2. COMPLETING THE WORK CHANGE DIRECTIVE FORM

Engineer initiates the form, including a description of the items involved and attachments.

Based on conversations between Engineer and Contractor, Engineer completes the following:

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE: Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another Work Change Directive must be issued to change the estimated price or Contractor may stop the changed Work when the estimated time is reached. If the Work Change Directive is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked "Not Applicable".

Once Engineer has completed and signed the form, all copies should be sent to Owner for authorization because Engineer does not have authority to authorize changes in Price or Times. Once authorized by Owner, a copy should be sent to Contractor. Price and Times may only be changed by Change Order signed by Owner and Contractor .

Paragraph 40.1 of the General Conditions requires that a Change Order be initiated and processed to cover any undisputed sum or amount of time for Work actually performed pursuant to this Work Change Directive.

Once the Work covered by this directive is completed or final cost and times are determined, Contractor should submit documentation for inclusion in a Change Order.

THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR CONTRACT TIMES. A CHANGE ORDER, IF ANY, SHOULD BE CONSIDERED PROMPTLY.

GENERAL PROVISIONS

1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 ADDENDA - Written or graphic instruments issued prior to the execution of the AGREEMENT which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications or corrections.

1.3 AGREEMENT - The written instrument which is evidence of the AGREEMENT between the OWNER and CONTRACTOR covering the WORK.

1.4 ASBESTOS - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

1.5 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.6 BIDDER - Any person, firm or corporation submitting a BID for the WORK.

1.7 BONDS - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.

1.8 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.9 CLAIM - A demand or assertion by the OWNER or CONTRACTOR seeking an adjustment of CONTRACT PRICE or CONTRACT TIMES, or both, or other relief with respect to the terms of the CONTRACT. A demand for money or services by a third party is not a CLAIM.

1.10 CONTRACT - The entire and integrated written AGREEMENT between the OWNER and CONTRACTOR concerning the WORK, including all Contract Documents as defined in the Agreement, these General Provisions and the Supplementary Conditions. The CONTRACT supersedes prior negotiations, representations, or agreements, whether written or oral.

1.11 CONTRACT DOCUMENTS - The CONTRACT DOCUMENTS establish the rights and obligations of the parties and include the AGREEMENT, ADDENDA (which pertain to the Contract Documents), CONTRACTOR's BID (including documentation accompanying the BID and any post bid documentation submitted prior to the NOTICE OF AWARD) when attached as an exhibit to the AGREEMENT, the NOTICE TO PROCEED, the BONDS, these GENERAL CONDITIONS, the SUPPLEMENTARY CONDITIONS, the SPECIFICATIONS and the DRAWINGS as the same are more specifically identified in the AGREEMENT, together with all WRITTEN AMENDMENTS, CHANGE ORDERS, WORK CHANGE DIRECTIVES, FIELD ORDERS, and OWNER's written interpretations, and clarifications issued on or after the Effective Date of the Agreement. Approved submittals and the reports and drawings of subsurface and physical conditions are not Contract documents. Only printed or hard copies of the items listed in this paragraph are CONTRACT DOCUMENTS. Files in electronic media format of text, data, graphics, and the like that may be furnished by the OWNER to the CONTRACTOR are not CONTRACT DOCUMENTS.

1.12 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.13 CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.14 CONTRACTING OFFICER - The person with the OWNER organization who is authorized to administer the contract for the OWNER.

1.15 CONTRACTING OFFICER'S REPRESENTATIVE - The representative of the CONTRACTING OFFICER authorized to deal with the CONTRACTOR at the site, to administer the technical aspects of the CONTRACT, and to assure compliance with the drawings and specifications.

1.16 CONTRACTOR - The person, firm or corporation with whom the OWNER has executed the AGREEMENT.

1.17 CULTURAL RESOURCES - Buildings, archaeological sites, districts and objects of national, State or local significance on or eligible for, inclusion in the National Register of Historic Places.

1.18 DRAWINGS - The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.19 EFFECTIVE DATE OF THE AGREEMENT - The date indicated in the AGREEMENT on which it becomes effective, but if no such date is indicated, it means the date on which the AGREEMENT is signed and delivered by the last of the two parties to sign and deliver.

1.20 ENGINEER - The person or entity named as such in the CONTRACT DOCUMENTS.

1.21 FIELD ORDER - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the OWNER to the CONTRACTOR during construction.

1.22 HAZARDOUS ENVIRONMENTAL CONDITION - The presence at the SITE of ASBESTOS, PCBs, PETROLEUM, HAZARDOUS WASTE, or RADIOACTIVE MATERIAL in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the WORK.

1.23 HAZARDOUS WASTE - The term HAZARDOUS WASTE shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

1.24 NOTICE OF AWARD - The WRITTEN NOTICE by the OWNER to the apparent successful BIDDER stating that upon timely compliance by the apparent successful BIDDER with the conditions precedent listed therein, the OWNER will sign and deliver the AGREEMENT.

1.25 NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.

1.26 OWNER - A public or quasi-public body or authority, Tribe, corporation, association, partnership, or individual for whom the WORK is to be performed.

1.27 PARTIAL UTILIZATION - Use by OWNER of a substantially completed part of the WORK for the purpose for which it is intended (or a related purpose) prior to SUBSTANTIAL COMPLETION of all the WORK.

1.28 PCBs - Polychlorinated biphenyls.

1.29 PETROLEUM - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel, oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

1.30 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.31 RADIOACTIVE MATERIAL - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

1.32 SITE - Lands or areas indicated in the CONTRACT DOCUMENTS as being furnished by the OWNER upon which the WORK is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by the OWNER which are designated for the use of the CONTRACTOR.

1.33 SUBMITTALS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.34 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship; synonymous with TECHNICAL PROVISIONS.

1.35 SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.36 SUBSTANTIAL COMPLETION - The time at which the WORK (or a specified part thereof) has progressed to the point where, in the opinion of the OWNER, the WORK (or a specified part thereof) is sufficiently complete, in accordance with the CONTRACT DOCUMENTS, so that the WORK (or specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the WORK refer to SUBSTANTIAL COMPLETION thereof.

1.37 SUPPLEMENTARY CONDITIONS - That part of the CONTRACT DOCUMENTS which amends or supplements these GENERAL CONDITIONS.

1.38 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.39 TRIBE - The Indian tribe which has jurisdiction on the Indian Reservation on or near which the WORK will be performed.

1.40 UNDERGROUND FACILITIES - All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, or other liquids or chemicals, or traffic or other control systems.

1.41 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.42 WORK CHANGE DIRECTIVE - A written statement to the CONTRACTOR issued on or after the EFFECTIVE DATE of the AGREEMENT and signed by the OWNER, ordering an addition, deletion, or revision in the WORK, or responding to differing or unforeseen subsurface or physical conditions under which WORK is to be performed or to emergencies. A WORK CHANGE DIRECTIVE will not change the CONTRACT PRICE or the CONTRACT TIMES but is evidence that the parties expect that the change ordered or documented by a WORK CHANGE DIRECTIVE will be incorporated in a subsequently issued CHANGE ORDER following negotiations by the parties as to its effect, if any, on the CONTRACT PRICE or CONTRACT TIMES.

1.43 WRITTEN AMENDMENT - A written statement modifying the CONTRACT DOCUMENTS, signed by the OWNER and the CONTRACTOR on or after the EFFECTIVE DATE of the AGREEMENT and normally dealing with the non-engineering or non-technical rather than strictly construction-related aspects of the CONTRACT DOCUMENTS.

1.44 WRITTEN NOTICE - Any notice to any party of the AGREEMENT relative to any part of this AGREEMENT in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. TERMINOLOGY

2.1 Intent of Certain Terms or Adjectives

2.1.1 Whenever in the CONTRACT DOCUMENTS the terms "as allowed", "as approved," or terms of like effect or import are used, or the adjectives, "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the WORK, it is intended that such action or determination will be solely to evaluate, and make recommendations to the owner, in general, the completed WORK for compliance with the requirements of and information in the CONTRACT DOCUMENTS and conformance with the design concept of the completed PROJECT as a functioning whole as shown or indicated in the CONTRACT DOCUMENTS (unless there is a specific statement indicating otherwise).

2.2 The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

2.3 Defective

2.3.1 The word "defective", when modifying the word "WORK," refers to WORK that is unsatisfactory, faulty, or deficient in that it does not conform to the CONTRACT DOCUMENTS or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to OWNER'S final payment.

2.4 Furnish, Install, Perform, Provide

2.4.1 The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the SITE (or some other specified location) ready for use or installation and in usable or operable condition.
2.4.2 The word "install", when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
2.4.3 The words "perform" or "provide", when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
2.4.4 When "furnish", "install," "perform", or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, "provide" is implied.

2.5 Unless stated otherwise in the CONTRACT DOCUMENTS, words or phrases which have a well-known technical or construction industry or trade meaning are used in the CONTRACT DOCUMENTS in accordance with such recognized meaning.

3. CONTRACT TIME AND LIQUIDATED DAMAGES

3.1 The CONTRACT TIME for completion of the WORK is an essential condition of the CONTRACT DOCUMENTS. The CONTRACT TIME for completion appears in the SUPPLEMENTARY CONDITIONS. The WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

3.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that time for completion of the WORK under the CONTRACT is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

3.3 If the CONTRACTOR fails to substantially complete the WORK and the OWNER cannot take beneficial use of the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the CONTRACT for each calendar day that the WORK is incomplete after the date established by the CONTRACT.

3.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER.

3.4.1 To any preference, priority or allocation order duly issued by the OWNER.

3.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

3.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 3.4.1 and 3.4.2 of this article.

4. AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS

4.1 The CONTRACT DOCUMENTS may be amended to provide for additions, deletions, and revisions in the WORK or to modify the terms and conditions thereof in one or more of the following ways: (i) a WRITTEN AMENDMENT; (ii) a CHANGE ORDER; or (iii) a WORK CHANGE DIRECTIVE.

4.2 The requirements of the CONTRACT DOCUMENTS may be supplemented, and minor variations and deviations in the WORK may be authorized, by one or more of the following ways: (i) a FIELD ORDER; (ii) OWNER'S approval of a SUBMITTAL; or (iii) OWNER'S written interpretation or clarification.

5. DRAWINGS AND SPECIFICATIONS

5.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

5.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

5.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the OWNER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

6. EQUAL EMPLOYMENT OPPORTUNITY

6.1 During the performance of this contract, the CONTRACTOR agrees as follows:

6.1.1 The CONTRACTOR shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin, except as required by Indian preference provisions contained herein.

6.1.2 The CONTRACTOR shall take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin, except as required by Indian preference provisions contained herein. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

6.1.3 The CONTRACTOR agrees to post in conspicuous places available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

6.1.4 The CONTRACTOR shall, in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants shall receive consideration for employment without regard to race, color, religion, sex, or national origin.

6.1.5 The CONTRACTOR shall send, to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representative of the CONTRACTOR's commitment under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

6.1.6 The CONTRACTOR shall comply with all provisions of Executive Order No. 11246, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor.

6.1.7 The CONTRACTOR shall furnish all information required by Executive Order No. 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. Standard Form 100 (EEO - 1), or any successor form, is the prescribed form to be filed within 30 days following the award, unless filed within 12 months preceding the date of award.

6.1.8 The CONTRACTOR shall permit access to its books, records, and accounts by the OWNER or the Office of Federal Contract Programs (OFCCP) for the purposes of investigation to ascertain compliance with the applicable rules, regulations, and orders.

6.1.9 If the OFCCP determines that the CONTRACTOR is not in compliance with this clause or any rules, regulations, and orders of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the CONTRACTOR may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order No. 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the CONTRACTOR as provided in Executive Order No. 11246, as amended, the rules, regulations, or orders of the Secretary of Labor, or as otherwise provided by law.

6.1.10 The CONTRACTOR shall include the terms and conditions of this clause in every SUBCONTRACT or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order No. 11246, as amended, so that such provisions will be binding upon each SUBCONTRACTOR or vendor.

6.1.11 The CONTRACTOR shall take such action with respect to any SUBCONTRACT or purchase order as the OWNER may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the CONTRACTOR becomes involved in, or is threatened with litigation with a SUBCONTRACTOR or vendor as a result of such direction by the OWNER, the CONTRACTOR may request the OWNER and the United States to enter into such litigation to protect the interests of the United States.

6.1.12 Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60 - 1.1

7. CLEAN AIR AND WATER

7.1 The CONTRACTOR agrees:

7.1.1 To comply with all the requirements of section 114 of the Clean Air Act (42 U.S.C. 7414) and section 308 of the Clean Water Act (33 U.S.C. 1318) relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Clean Air Act and the Clean Water Act, and all regulations and guidelines issued to implement those acts before the award of this contract.

7.1.2 That no portion of the WORK required by this prime contract will be performed in a facility listed on the Environmental Protection Agency List of Violating Facilities on the date when this contract was awarded unless and until the EPA eliminates the name of the facility from the listing.

7.1.3 To use best efforts to comply with clean air standards and clean water standards at the facility in which the contract is being performed.

7.1.4 To insert the substance of this clause into any nonexempt SUBCONTRACT, including this subparagraph 7.1.4.

8. CULTURAL RESOURCES

8.1 If CULTURAL RESOURCES are encountered during excavation the CONTRACTOR shall stop construction at that location until the nature and significance of the materials can be determined by the OWNER'S archaeologist. The CONTRACTOR will be allowed to continue construction in locations not affected by the CULTURAL RESOURCES. Provision #11, DIFFERING SITE CONDITIONS shall apply, including notification requirements.

9. LAND AND RIGHTS-OF-WAY

9.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

9.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

9.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

10. SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

10.1 The CONTRACTOR will take steps necessary to ascertain the nature and location of the WORK, and investigate the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The CONTRACTOR also will observe and determine the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the OWNER, as well as from the drawings and specifications made a part of this CONTRACT. Any failure of the CONTRACTOR to take the actions described and acknowledged in this paragraph will not relieve the CONTRACTOR from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the WORK without additional expense to the OWNER.

10.2 The OWNER assumes no responsibility for any conclusions or interpretations made by the CONTRACTOR based on the information made available by the OWNER. The OWNER does not assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its representatives before the execution of this CONTRACT, unless that understanding or representation is expressly stated in this CONTRACT.

11. DIFFERING SITE CONDITIONS

11.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

11.1.1 Subsurface or latent physical conditions at the SITE differing materially from those indicated in the CONTRACT DOCUMENTS; or

11.1.2 Unknown physical conditions at the SITE, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

11.2 CONTRACTOR shall not be entitled to any adjustment in the CONTRACT PRICE or CONTRACT TIMES if:

11.2.1 CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of CONTRACT PRICE and CONTRACT TIMES by the submission of a BID or becoming bound under a negotiated CONTRACT; or

11.2.2 the existence of such a condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the SITE and contiguous areas required by the bidding requirements of CONTRACT DOCUMENTS to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or

11.2.3 CONTRACTOR failed to give the written notice as required by paragraph 11.1.

11.3 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any CLAIM of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such CLAIMS asserted before the date of final payment.

12. UNDERGROUND FACILITIES

12.1 Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing UNDERGROUND FACILITIES at or contiguous to the SITE is based on information and data furnished to OWNER or ENGINEER by the owners of such UNDERGROUND FACILITIES, including OWNER, or by others. Unless it is otherwise expressly provided in the SUPPLEMENTARY CONDITIONS:

12.1.1 OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

12.1.2 The cost of all of the following will be included in the CONTRACT PRICE, and CONTRACTOR shall have full responsibility for:

a. reviewing and checking all such information and data.

b. locating all UNDERGROUND FACILITIES shown or indicated in the CONTRACT DOCUMENTS,

c. coordination of the WORK with the OWNERS of such UNDERGROUND FACILITIES, including OWNER, during construction and

d. the safety and protection of all such UNDERGROUND FACILITIES and repairing any damage thereto resulting from the WORK.

12.2 Not Shown or Indicated

12.2.1 If an UNDERGROUND FACILITY is uncovered or revealed at or contiguous to the SITE which was not shown or indicated, or not shown or indicated with reasonable accuracy in the CONTRACT DOCUMENTS, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any WORK in connection therewith (except in an emergency) identify the owner of such UNDERGROUND FACILITY and give WRITTEN NOTICE to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the UNDERGROUND FACILITY and determine the extent, if any, to which a change is required in the CONTRACT DOCUMENTS to reflect and document the consequences of the existence or location of the UNDERGROUND FACILITY. During such time, CONTRACTOR shall be responsible for the safety and protection of such UNDERGROUND FACILITY.

12.2.2 If the OWNER concludes that a change in the CONTRACT DOCUMENTS is required, a WORK CHANGE DIRECTIVE or a CHANGE ORDER will be issued to reflect and document such consequences. An equitable adjustment shall be made in the CONTRACT PRICE or CONTRACT TIME, or both, to the extent that they are attributable to the existence or location of any UNDERGROUND FACILITY that was not shown or indicated or not shown or indicated with reasonable accuracy in the CONTRACT DOCUMENTS and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated.

13. HAZARDOUS ENVIRONMENTAL CONDITION AT SITE

13.1 If CONTRACTOR encounters a HAZARDOUS ENVIRONMENTAL CONDITION or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a HAZARDOUS ENVIRONMENTAL CONDITION. CONTRACTOR shall immediately: (i) secure or otherwise isolate such conditions, (ii) stop all WORK in connection with such condition and in any area affected thereby and (iii) notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

14. INSURANCE

14.1 Before commencing work, the CONTRACTOR and each SUBCONTRACTOR shall furnish the OWNER with certificates of insurance showing the following insurance is in force and will insure all operations under the CONTRACT:

14.1.1 Workers' Compensation, in accordance with state Workers' Compensation laws for the State(s) with in whose geographic boundaries the work shall be performed.

14.1.2 Commercial General Liability with a combined single limit for bodily injury and property damage of not less than $500,000 per occurrence, unless modified by the SUPPLEMENTARY CONDITIONS, to protect the CONTRACTOR and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists and vehicles on the site(s) not covered by Automobile Liability under 14.1.3 below. If the CONTRACTOR has a "claims-made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the CONTRACT; and the extended reporting period may not be less than five years following the completion date of the CONTRACT.

14.1.3 Automobile Liability on owned and non-owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than $500,000 per occurrence.

14.2 All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days written notice has been given to the CONTRACTOR and the OWNER. All insurance shall be carried with companies which are financially responsible and admitted to do business in the State(s) in which the project is located. If any such insurance is due to expire during the construction period, the CONTRACTOR (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish the OWNER with evidence of replacement coverage not less than 30 days prior to any expiration date.

15. CONTRACT SECURITY

15.1 The CONTRACTOR shall within ten (10) days of receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current U.S. Department of the Treasury list of approved sureties. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared as bankrupt or loses its right to do business in the state in which the WORK is to be performed, the CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER. The performance BOND shall remain in full force and effect through the guarantee period.

16. PROGRESS SCHEDULES AND REQUIREMENTS FOR COMPLIANCE

16.1 The CONTRACTOR shall within 10 days of receipt of NOTICE TO PROCEED, submit to the OWNER for approval a practicable schedule, showing the order in which the CONTRACTOR proposes to carry on the WORK, the dates on which he will start the major items of work (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule shall be prepared on the form entitled "Contract Progress Schedule", a copy of which is included in the CONTRACT. No progress payment shall be made to the CONTRACTOR until acceptable schedules are submitted to the OWNER.

16.2 If, in the opinion of the OWNER, the CONTRACTOR falls behind the progress schedule, the CONTRACTOR shall take such steps as may be necessary to assure performance within the allowable TIME FOR COMPLETION. The CONTRACTOR may propose for approval by the OWNER measures such as increasing number of workers, number of shifts, or overtime operations, days of work, or the amount of construction plant, or all of them. The OWNER may require the CONTRACTOR to submit for approval such supplementary schedule or schedules necessary to demonstrate that the WORK shall be performed within the allowable CONTRACT TIME, all without additional cost to the OWNER.

16.3 Failure of the CONTRACTOR to comply with the requirements of this provision shall be grounds for determination that the CONTRACTOR is not prosecuting the work with such diligence as will insure completion within the specified CONTRACT TIME. Upon such determination the OWNER may terminate the CONTRACTOR's right to proceed with the WORK, or any separable part thereof in accordance with Section 36 entitled "Suspension of Work, Termination and Delay".

17. REPORTS AND RECORDS

17.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

17.2 The CONTRACTOR shall keep all records related to the CONTRACT for a minimum of three years after acceptance of the completed work.

18. SUBMITTALS

18.1 The CONTRACTOR shall provide SUBMITTALS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The OWNER shall promptly review all SUBMITTALS. The OWNER'S approval of any SUBMITTALS shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SUBMITTAL which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

18.2 When submitted for the OWNER'S review, SUBMITTALS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SUBMITTALS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

18.3 Portions of the WORK requiring a SUBMITTAL or sample submission shall not begin until the SUBMITTAL or submission has been approved by the OWNER. A copy of each approved SUBMITTAL and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the OWNER.

18.4 Submittal Procedures

18.4.1 At the time of each SUBMITTAL, CONTRACTOR shall give OWNER specific written notice of such variations, if any, that the SUBMITTAL submitted may have from the requirements of the CONTRACT DOCUMENTS, such notice to be in a written communication separate from the SUBMITTAL; and in addition, shall cause a specific notation to be made on each SUBMITTAL submitted to OWNER for review and approval of each such variation.

18.4.2 OWNER's review and approval of SUBMITTALS shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the CONTRACT DOCUMENTS unless CONTRACTOR has in writing called OWNER's attention to each such variation at the time of each SUBMITTAL as required by paragraph 18.4.1 and OWNER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the SUBMITTAL approval.

19. MATERIALS, SERVICES AND FACILITIES

19.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

19.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

19.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

19.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the OWNER.

19.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

20. ~~BUY AMERICAN ACT~~

~~20.1 The CONTRACTOR agrees that only domestic construction material will be used by the CONTRACTOR, subcontractors, materialmen and suppliers in the performance of this contract, except for foreign construction materials, if any, referenced in this contract. Construction material, as used in this clause, means an article, material, or supply brought to the construction site for incorporation into the building or work. Construction material also includes an item brought to the site pre-assembled from articles, materials or supplies. Domestic construction material, as used in this clause, means (1) an unmanufactured construction material mined or produced in the United States, or (2) a construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components.~~

21. SUBSTITUTIONS

21.1 Whenever a material, article or piece of equipment is identified on the drawings or specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the OWNER, such material, article, or piece of equipment is of equal substance and function to that specified, the OWNER may approve or disapprove, at the OWNER'S sole discretion, of its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

22. PATENTS

22.1 The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the CONTRACTOR has reason to believe that the design, process, or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the OWNER.

23. SURVEYS, PERMITS, REGULATIONS

23.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

23.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

23.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise specified in the CONTRACT DOCUMENTS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the OWNER in writing, and any necessary changes shall be adjusted as provided in Section 39 - "CHANGES IN THE WORK".

24. LAWS AND REGULATIONS AFFECTING WORK

24.1 The CONTRACTOR shall at all times observe and comply with Federal, State, City, County and Tribal laws, ordinances and regulations which in any manner affect the conduct of the WORK; and all such orders and decrees as exist at the present and which may be enacted later by legislative bodies or tribunals having legal jurisdiction or authority over the WORK. No pleas of misunderstanding or ignorance thereof will be considered. The CONTRACTOR shall be wholly responsible for any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree.

24.2 Changes in Tribal Laws or Regulations effected subsequent to the time of opening of BIDS (or, on the EFFECTIVE DATE of the AGREEMENT if there were no BIDS) having an effect on the cost or time of performance of the WORK may be subject of an adjustment in CONTRACT PRICE or CONTRACT TIME.

25. TAXES

25.1 The CONTRACTOR will pay all sales, consumer, payroll, use and other similar taxes required by the law of the place where the WORK is performed. It is the Contractor's sole responsibility to determine the applicability of State, Tribal, TERO and local taxes while working on Indian lands.

26. PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS

26.1 The CONTRACTOR shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the WORK SITE, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The CONTRACTOR shall remove trees only when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the CONTRACTOR shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the OWNER.

26.2 The CONTRACTOR shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the CONTRACTOR. The existence and location of utilities are not guaranteed by the OWNER and shall be investigated and verified in the field by the CONTRACTOR before commencing construction activities in any particular area. The CONTRACTOR shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the CONTRACTOR fails or refuses to repair the damage promptly, the OWNER may have the necessary work performed and charge the cost to the CONTRACTOR.

27. OPERATIONS AND STORAGE AREAS

27.1 The CONTRACTOR shall confine all operations (including storage of materials) to areas authorized or approved by the OWNER. The CONTRACTOR shall hold and save the OWNER and its representatives, free and harmless from liability of any nature occasioned by the CONTRACTOR's performance.

27.2 Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the CONTRACTOR only with the approval of the OWNER and shall be built with labor and materials furnished by the CONTRACTOR without expense to the OWNER. The temporary buildings and utilities shall remain the property of the CONTRACTOR and shall be removed by the CONTRACTOR at its expense upon completion of the work. Only with the written consent of the OWNER may the buildings and utilities be abandoned and not removed.

27.3 The CONTRACTOR shall use only established roadways, or use temporary roadways constructed by the CONTRACTOR when and as authorized by the OWNER. In such case, the CONTRACTOR shall minimize disruption and delays to traffic in the affected areas. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the CONTRACTOR shall protect them from damage. The CONTRACTOR shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

28. ACCIDENT PREVENTION AND SAFETY PROGRAM

28.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby.

28.2 The CONTRACTOR shall be solely and completely responsible for conditions of the job site, including safety of all persons, including employees, and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable Federal, Tribal, State, County, and local laws, ordinances, codes, the requirements set forth below, and any regulations that may be detailed in other parts of these documents. Where any of these are in conflict, the more stringent requirement shall be followed. The CONTRACTOR's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth herein.

28.3 The OWNER or his Representative will notify the CONTRACTOR of any observed non-compliance with the foregoing provisions and the action to be taken. The CONTRACTOR shall, upon receipt of such notice, immediately take corrective action. If the CONTRACTOR fails or refuses to comply promptly, the OWNER may issue an order stopping all or part of the WORK until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of claims for extension of time, or for excess costs or damages by the CONTRACTOR.

28.4 The CONTRACTOR shall develop and maintain for the duration of this CONTRACT, a safety program that will effectively incorporate and implement all required safety provisions. The CONTRACTOR shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program.

28.5 The CONTRACTOR as a part of his safety program, shall maintain at his office or other well-known place at the jobsite, safety equipment applicable to the WORK as prescribed by the aforementioned authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons who may be injured on the jobsite.

28.6 If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the OWNER and the ENGINEER. In addition, the CONTRACTOR must promptly report in writing to appropriate authorities and the OWNER's representative all accidents whatsoever arising out of, or in connection with, the performance of the WORK whether on, or adjacent to, the site, giving full details and statements of witnesses. If a claim is made by anyone

against the CONTRACTOR or any subcontractor on account of any accident, the CONTRACTOR shall promptly report the facts in writing to the OWNER giving full details of the claim.

28.7 Compliance with the requirements of this provision by SUBCONTRACTORS will be the responsibility of the CONTRACTOR.

29. TEMPORARY SANITARY FACILITIES

29.1 The CONTRACTOR shall provide and maintain necessary sanitary conveniences for the use of those employed on or about the WORK, properly secluded from public observation in such a manner and at such points as shall be approved by the OWNER, and their use shall be strictly enforced.

30. SUPERVISION BY CONTRACTOR

30.1 The CONTRACTOR will supervise and direct the WORK. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of the OWNER or ENGINEER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the CONTRACT DOCUMENTS. The CONTRACTOR shall be responsible to see that the completed Work complies accurately with the CONTRACT DOCUMENTS. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

31. SUBCONTRACTING

31.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.

31.2 The CONTRACTOR must perform at least fifty (50) percent of the total amount of the WORK using the CONTRACTOR's own work force and equipment. The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s), in excess of fifty (50) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

31.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

31.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

31.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

32. CLEANUP AND FINISH GRADING

32.1 The CONTRACTOR shall restore all areas disturbed by construction to a condition at least equal to that existing prior to construction. Excess construction materials, equipment, tools, waste excavation, and rubbish shall be removed. Excavated areas shall be finish graded to provide drainage as required by the drawings and specifications, or in the absence of specific requirements, to provide drainage away from the facilities constructed and to restore original drainage patterns in existence prior to construction and to provide drainage away from excavated areas and installed facilities.

33. GUARANTY

33.1 The CONTRACTOR warrants and guarantees to the OWNER, ENGINEER and ENGINEER's Consultants that all WORK will be in accordance with the CONTRACT DOCUMENTS and will not be defective. The CONTRACTOR's warranty and guarantee hereunder excludes defects or damages caused by:

33.1.1 abuse, modification, or improper maintenance or operation by persons other than the CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity for whom the CONTRACTOR is responsible; or

33.1.2 normal wear and tear under normal usage.

33.2 The CONTRACTOR's obligation to perform and complete the WORK in accordance with the CONTRACT DOCUMENTS shall be absolute. None of the following will constitute an acceptance of WORK that is not in accordance with the CONTRACT DOCUMENTS or a release of CONTRACTOR's obligation to perform the WORK in accordance with the CONTRACT DOCUMENTS:

33.2.1 observations by ENGINEER;

33.2.2 recommendations by ENGINEER or payment by OWNER of any progress or final payment;

33.2.3 the issuance of a certificate of SUBSTANTIAL COMPLETION by the ENGINEER or any payment related thereto by the OWNER;

33.2.4 use or occupancy or the WORK or any part thereof by the OWNER;

33.2.5 any acceptance by the OWNER or any failure to do so;

33.2.6 any review and approval of a SUBMITTAL or the issuance of a notice of acceptability by the OWNER;

33.2.7 any inspection, test or approval by others; or

33.2.8 any correction of defective WORK by the OWNER.

34. INDEMNIFICATION

34.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

34.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

34.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or recommended approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

35. SEPARATE CONTRACTS

35.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the OWNER any defects in such WORK that render it unsuitable for such proper execution and results.

35.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

35.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefore as provided in Sections 39 and 40.

36. SUSPENSION OF WORK, TERMINATION AND DELAY

36.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

36.2 If the CONTRACTOR is adjudged as bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the OWNER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT, and of all construction materials thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be incorporated in a CHANGE ORDER.

36.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

36.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR, the OWNER may without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the CONTRACT. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit. The reasonable profit shall be calculated in accordance with the provisions of Part 49 of the Federal Acquisition Regulation which are in effect on the date of this contract.

36.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to make recommendation on any request for payment within twenty (20) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the OWNER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to make recommendation on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days WRITTEN NOTICE to the OWNER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

36.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

37. INSPECTION AND TESTING

37.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

37.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

37.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.

37.4 If the CONTRACT DOCUMENTS, Laws or Regulations of any public body having jurisdiction require any WORK (or part thereof) specifically be inspected, tested, or approved by an employee or other representative of such public body, the CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals pay all costs in connection therewith, and furnish the OWNER with required certificates of inspection or approval.

37.5 Inspections, tests or approvals by the OWNER or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

37.6 The OWNER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

37.7 If any WORK is covered contrary to the written instructions of the OWNER it must, if requested by the OWNER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

37.8 If the OWNER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the OWNER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the OWNER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

38. CORRECTION OF DEFECTIVE WORK

38.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the OWNER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

38.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

38.3 If within one year after the date of SUBSTANTIAL COMPLETION any WORK is found to be defective, or if the repair of any damages to the land or areas made available for the CONTRACTOR's use by OWNER or permitted by Laws and Regulations is found to be defective, the CONTRACTOR shall promptly, without cost to the OWNER and in accordance OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective WORK or, if the defective WORK has been rejected by the OWNER, remove it from the PROJECT and replace it with WORK that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other WORK, to the work of others or other land or areas resulting therefrom. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the OWNER may have the defective WORK corrected or repaired or may have their rejected WORK removed and replaced, and all costs will be paid by the CONTRACTOR.

38.4 Where defective WORK (and damage to other WORK resulting therefrom) has been corrected or removed and replaced under this paragraph 38, the correction period hereunder with respect to such WORK will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

38.5 CONTRACTOR'S obligations under this paragraph 38 are in addition to any other obligation or warranty. The provisions of this paragraph 38 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

39. CHANGES IN THE WORK

39.1 Without invalidating the AGREEMENT and without notice to any surety, the OWNER may, at any time or from time to time, order additions, deletions, or revisions in the WORK by a WRITTEN AMENDMENT, a CHANGE ORDER, or a WORK CHANGE DIRECTIVE. Upon receipt of any such document, the CONTRACTOR shall promptly proceed with the WORK involved which will be performed under the applicable conditions of the CONTRACT DOCUMENTS (except as otherwise specifically provided).

39.2 The OWNER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the OWNER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the OWNER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

39.3 If the OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the CONTRACT PRICE or CONTRACT TIME, or both, that should be allowed as a result of a WORK CHANGE DIRECTIVE, a Claim may be made therefore as provided in Section 48.

40. CHANGES IN CONTRACT PRICE

40.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

40.1.1 Unit prices previously approved.

40.1.2 An agreed lump sum.

40.1.3 The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

41. USE AND POSSESSION PRIOR TO COMPLETION

41.1 The OWNER shall have the right to take possession of or use any completed or partially completed part of the WORK. Before taking possession of or using any work, the OWNER shall furnish the CONTRACTOR a list of items of WORK remaining to be performed or corrected on those portions of the work that the OWNER intends to take possession of or use. However, failure of the OWNER to list any item of work shall not relieve the CONTRACTOR of responsibility for complying with the terms of the CONTRACT. The OWNER's possession or use shall not be deemed an acceptance of any work under the CONTRACT.

41.2 While the OWNER has such possession or use, the CONTRACTOR shall be relieved of the responsibility for the loss of or damage to the WORK resulting directly from the OWNER'S possession or use. If prior possession or use by the OWNER delays the progress of the WORK or causes additional expense to the Contractor, an adjustment shall be made in the CONTRACT PRICE, the CONTRACT TIME or both, and the CONTRACT shall be modified in writing accordingly.

42. SUBSTANTIAL COMPLETION

42.1 When the CONTRACTOR considers the entire WORK ready for its intended use the CONTRACTOR shall notify the OWNER in writing that the entire WORK is SUBSTANTIALLY COMPLETE (except for items specifically listed by CONTRACTOR as

incomplete) and request that OWNER issue a certificate of SUBSTANTIAL COMPLETION. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the WORK to determine the status of completion. If the OWNER considers the WORK substantially complete, he will prepare and deliver to the CONTRACTOR a certificate of SUBSTANTIAL COMPLETION which shall fix the date of SUBSTANTIAL COMPLETION. There shall be attached to the certificate a tentative list of items to be completed or corrected before final inspection.

42.2 OWNER shall have the right to exclude CONTRACTOR from the SITE after the date of SUBSTANTIAL COMPLETION, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

43. VARIATION IN ESTIMATED QUANTITIES

43.1 If the quantity of a unit-priced item in this CONTRACT is an estimated quantity and the actual quantity of the unit-priced item varies more than 25 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon the existing unit prices as established in the bid schedule, modified by any marginal cost increase or savings due solely to the variation above 125 percent or below 75 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the CONTRACTOR may request, in writing, an extension of time, to be received by the OWNER within 10 days from the beginning of the delay, or within such further period as may be granted by the OWNER before the date of final settlement of the CONTRACT. Upon the receipt of a written request for an extension, the OWNER shall ascertain the facts and make any appropriate adjustment for extending the completion date.

44. PAYMENTS TO CONTRACTOR

44.1 Completed items of WORK shall be measured and paid for in accordance with the requirements listed in the Technical Provisions. Payment shall be based on the actual quantities completed and shall represent full compensation under the contract. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, (other than that furnished by the OWNER), tools, equipment, and performing all work required by the provisions of the contract to furnish and install the item of work, complete in place. In all cases, the finished product shall be a complete, operational system or component. The price for the completed item of work shall also include all applicable state and local sales and other taxes, as well as permit and license fees.

44.2 The CONTRACTOR will submit to the OWNER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the OWNER may reasonably require. The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect his interest therein, including applicable insurance. A copy of the partial payment estimate shall be submitted to the ENGINEER. The OWNER will, within thirty (30) days of receipt of the request for payment, either approve the estimate and pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate, or disapprove the estimate and return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate.

The OWNER shall retain five (5) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages less authorized deductions.

44.3 Upon completion and acceptance of the WORK, the OWNER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

44.4 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so, the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

44.5 If the OWNER fails to disapprove and return a partial payment estimate, or to approve and make payment to the CONTRACTOR within thirty (30) days after receipt of a recommendation by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

45. ASSIGNMENTS

45.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the CONTRACT or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

46. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

46.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the performance BOND and Payment BONDS.

47. ENGINEER'S ROLE AND AUTHORITY

47.1 The ENGINEER shall act as the OWNER'S consultant during the construction period. He shall make recommendations to the OWNER on questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall assist the OWNER to interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and notify the OWNER if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

47.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

47.3 Neither the ENGINEER nor the OWNER will be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

47.4 The ENGINEER does not have authority to obligate the OWNER to changes in the terms of the CONTRACT, or to give direction to the CONTRACTOR on behalf of the OWNER.

48. RESOLUTION OF DISPUTES

48.1 A good faith effort shall be made by all parties to the CONTRACT to resolve any claims or disputes prior to going to Arbitration.

48.2 While in no way waiving OWNER’s absolute sovereign immunity, all claims, disputes and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof which cannot be resolved by the CONTRACT parties, except for claims which have been waived by the making and acceptance of final payment as provided by Section 46, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

48.3 Notice of the demand for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and with the American Arbitration Association. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

48.4 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

49. CHOICE OF LAW; VENUE

49.1 This CONTRACT will be construed in accordance with and governed by the laws of the Fallon Paiute-Shoshone Tribe or, in the alternative at OWNER’s option, the State of Nevada. Unless OWNER and CONTRACTOR agree otherwise, any mediation or other legal proceeding will occur under the jurisdiction of the Fallon Paiute-Shoshone Tribe and Tribal Court.

50. NON-WAIVER OF SOVEREIGN IMMUNITY

50.1 Nothing in this CONTRACT constitutes a waiver of the Fallon Paiute-Shoshone Tribe’s absolute sovereign immunity. CONTRACTOR acknowledges that the OWNER, including all officers, employees, subsidiaries, departments, and other instrumentalities of the OWNER are absolutely immune from suit or claim of any kind.

SUPPLEMENTARY CONDITIONS

1. GENERAL SCOPE OF WORK

The Contractor shall furnish all materials, equipment and services required to perform the work outlined, in strict accordance with the plans and specifications.

2. ENGINEERS NOTES

i. The Contractor is responsible for all methods, sequencing, and safety concerns associated with this project during construction, unless specifically addressed otherwise in this contract.
ii. The Engineer will not be responsible for the construction means, methods, techniques, sequences or procedures or for safety precautions of programs utilized in connection with the work, and will not be responsible for the contractor's failure to carry out the work in accordance with the contract documents.
iii. The quantities and site conditions depicted in the construction plans are for informational purposes only and are subject to error and omission. Contractors shall satisfy themselves as to actual quantities and site conditions prior to bidding the work for the construction covered by this plan.
iv. A reasonable effort has been made to show the locations of existing underground facilities and utilities in the construction area. The Contractor is responsible for any damage to utilities and/or facilities caused during their construction operations.
v. The Contractor is responsible for all coordination of construction affecting the utilities and the coordination of any necessary utility relocation work.
vi. All paving, grading, excavation, trenching, pipe bedding, cut, fill and backfill shall comply with the recommendations set forth in the Technical Provisions.
vii. The Contractor is responsible for maintaining complete water system pressure at all times. Although be it low, pressure in the system must be maintained.
viii. The Contractor is to verify the elevations of all existing utilities at point of tie in prior to commencing any new construction, should any location or elevation differ from that shown on the construction plans, the contract shall contact the engineer.
ix. Coordination between all parties is an essential part of the contract.
x. The Contractor is responsible for the project and site conditions, and to work with weather conditions as the project site may be located in a flood prone area and subject to flooding and its hazards.
xi. The design engineer must approve, prior to construction, any alterations or variance form the construction plans. Any variation from the plans shall be proposed on construction field prints and transmitted to the Engineer.
xii. Nothing contained in the contract documents shall create, nor shall be constructed to create, any contractual relationship between the engineer and the contractor or any subcontractor.
xiii. It is the Contractor's responsibility to demonstrate the compliance of "equivalent" or "equal" items with the construction plans to the Engineer. Equivalent items shall be considered but their acceptance is not guaranteed.
xiv. Any work/material not in conformance with the Technical Provisions is subject to removal and replacement at the Contractor's expense.
xv. Any approved set of Construction Plans and Project Manual shall be available on the job site at all times.

3. PRE-BID CONFERENCE

A Non-Mandatory Pre-Bid Conference will be held for this work on **Thursday, April 11th, 2024** at 10:00 AM (Local Time), which will not relieve the Contractor from the requirement to furnish all materials and perform all jobs necessary to complete the Work in strict compliance with the Contract. Attendance at the pre-bid conference is highly encouraged, but is not mandatory. The meeting will be held at the Tribal Admin Building with a site visit to the water storage tank site and water treatment plant. Prospective contractors should RSVP for the pre-bid conference to the Public Works Director, John Schafer, at publicworks@fpst.org.

4. REQUEST FOR INFORMATION

Requests for Information (RFI's) shall be submitted in writing by the Bidder to the Owner requesting clarification or to obtain additional information where the intent of the Contract Documents is unclear or information is missing. RFI will be accepted until 5:00 PM Local Time on April 26th, 2024. If necessary, Addendum(s) including all RFI will be issued no later than May 3rd, 2024 to all potential Bidders.

5. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the Drawings, Specifications, or other Pre-Bid Documents will be made to any Bidder orally.

Every request for such interpretation should be in writing addressed to the Owner, and to be given consideration, must be received at least 5 days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective Bidders (at the respective addresses furnished for such purposes), not later than 3 days prior to the date fixed for the opening of bids. Failure of any Bidder to receive any such Addendum or interpretations shall not relieve such Bidder from any obligation under his bid as submitted. All Addenda so issued shall become part of the Contract Documents.

6. TRIBAL TAXES AND TERO

1. Tribal Taxes

   As part of doing a project on Tribal Trust Lands, Contractors will comply with the Tribe's Tax Laws. The Fallon Paiute Shoshone Tribe has a Tribal Tax Code which allows the Tribe to collect sales and use tax on all materials used for a given project and that are delivered by the manufacturer, wholesaler, or retailer to the job site on Tribal Land. Delivery address, location and instructions will be specified during the pre-construction meeting.

   The Tribal sales and use tax on all deliveries and materials used is similar to the County of Churchill which is currently 7.6%.

   The manufacturer, wholesaler, or retailer shall be advised that they shall not charge any tax going to sources other than the Fallon Paiute Shoshone Tribe. The Contractor doing business with the Tribe shall be responsible for paying the Tribal Sales and Use Tax and shall make this a part of the bid proposals on the project.

   A Tax Exemption letter can be prepared by the Tax Department to be sent to the appropriate manufacturer, wholesaler, or retailer for deliveries to the Fallon Paiute Shoshone Tribe Reservation.

   The Tax Administrator shall explain the requirements of a Contractor in regards to sales and use tax at the scheduled Pre-Bid Meeting and with the successful bidder at the Pre-Construction meeting.

   For further information or explanation, bidders may contact the Tax Administrator. The Fallon Paiute Shoshone Tribe's Tax Administrator is:

   Melanie McFalls, Tax Administrator
   Office location – 565 Rio Vista Drive, Fallon, NV.
   Telephone (775) 423-6075, ext. 1017
   E-mail – taxdirector@fpst.org

2. Tribal Employment Rights Ordinance (TERO):

Fallon Paiute Shoshone Tribal Employment Rights Ordinance in contracting will apply. All entities awarding contracts or subcontracts for supplies, services, labor, and materials in an amount of $5,000 or more where the majority of the work on the contract or subcontract will occur within the exterior boundaries of the Fallon Paiute Shoshone Reservation shall give:

1) First preference to qualified entities that are 51% or more owned and controlled by Tribal Members.

2) Preference in contracting and subcontracting to qualified entities that are certified by the TERO Commission as 51% or more Indian owned and controlled.

These requirements shall apply to the award of contracts awarded directly by the Fallon Paiute Shoshone Tribal Council. They shall also apply to any contracts awarded by any commercial enterprises of the Fallon Paiute Shoshone Tribe, even if said contracts must be submitted to the Fallon Paiute Shoshone Tribal Council for approval. Tribal Programs or divisions other than commercial enterprises shall be required to comply with these requirements when submitting a contract to the Fallon Paiute Shoshone Tribal Council for approval, to indicate the steps taken to award the contract to a tribal member contractor. These requirements shall apply to all subcontracts awarded by a Tribal, federal, state, direct contractor or grantee, whether or not the prime contract was subject to those requirements. All covered entities shall comply with the rules, regulations, guidelines and orders of the Commission which sets for the specific obligations of such entities in regard to Indian Preference in contracting and subcontracting. The Bidder must complete the Certification of Indian Preference Firm Application if claiming Indian Preference.

In addition to the requirements of the section entitled “Indian Preference in Contracting” the Contractor shall comply with the Tribal Ordinance concerning Tribal employment and training for work performed under this contract within the boundaries of the Fallon Paiute Shoshone Indian Reservation. Preference will be given to qualified Indian applicants in accordance with the provisions of Section 703(i) of Title VII of the Civil Rights Acts of 1964 and the TERO Ordinance. The Fallon Paiute Shoshone Tribe is an Equal Opportunity Employer.

7. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK

The Contractor shall be required to commence work under this Contract as specified in the Notice to Proceed, to prosecute the work diligently, and to complete all required work within the time period specified in the Agreement.

8. DAYS OF WORK AND HOURS OF WORK

Construction work will not be permitted on Saturdays, Sundays, nor on New Year's Days, President's Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, and Christmas Day, nor any other holidays declared by the federal government. However, the Owner, when in his opinion it is justified, may grant the Contractor permission to work on any of the above days upon written application by the Contractor in advance.

Regular work shifts shall be eight hours daily Monday through Friday, except on holidays indicated above. Time of beginning and ending the day's work shall be approved by the Owner's representative. Work on week-ends or holidays will be subject to the written approval of the Owner's representative. Approval shall be requested in writing at least 48 hours in advance. When for good reason short periods of overtime work are required, the Owner's representative may give approval without advance written notice.

9. LIQUIDATED DAMAGES

Liquidated Damages will be assessed in the amount of $**500** for each calendar day of delay beyond the Time For Completion **(240 days)** stated in the Contract, or any extension thereof that may be granted pursuant to the terms of the Contract, until the work is determined by the Owner to be substantially complete.

10. PRE-CONSTRUCTION CONFERENCE AND PROJECT MEETINGS

Prior to commencing work on this contract, the Contractor shall be required to participate in a pre-construction conference with the Owner, Engineer, and other representatives designated by the Owner. The meeting will commence at the Tribal Admin Building (565 Rio Vista Drive, Fallon NV 89406) and conclude in the field at the project site location. The purpose of this conference will be to discuss the authorities, duties, and responsibilities of parties involved and to plan operating procedures mutually satisfactory to those involved. It will also present an opportunity to resolve any questions regarding performance under the contract which have not been previously resolved.

To enable orderly review of progress during construction and to provide for systematic discussion of problems, the Owner may conduct project meetings throughout the construction period. In general project meetings may be held monthly in accordance with a mutually acceptable schedule. The purposes of the meetings are to analyze problems that might arise between the community, the Tribe, and the Contractor, relative to execution of the work.

Persons designated by the Contractor to attend and participate in project meetings shall have all required authority to commit the Contractor to solutions as agreed upon in the project meetings. The agenda shall be made available to all parties at least 24 hours in advance of the meeting. To the maximum extent practicable, project meetings shall be held at the job site.

11. UTILITIES

The Contractor shall arrange for and provide all required utilities at his or her sole cost and expense. This includes but is not limited to water, power, and personnel sanitation facilities.

12. WARRANTIES

Unless otherwise indicated, the Contractor shall warrant all materials provided and work performed under this contract for a period of no less than one year from the date of final payment. The Contractor shall replace promptly and at his or her own expense any materials and workmanship which fails during this warranty period. A follow up inspection shall be scheduled within 11 months of the final inspection to ensure there are no potential claims for warranty.

13. FINAL INSPECTION

Final inspection will be made by the Owner and Engineer when requested and when the Contractor advises that all the materials have been furnished, all the work has been performed, and all the construction provided for by the contract has been completed in accordance with its terms.

Request for final inspection shall be submitted in writing by the Contractor to the Owner at least 5 working days prior to the requested date of final inspection to allow sufficient preparation and scheduling by the Owner and Engineer.

The Contractor may be charged with additional cost of re-inspection when the work is not ready at the time specified by the Contractor and re-inspection or re-test is necessary.

Acceptance will be made by the Owner on the date when all materials, work or other requirements of the drawings, specifications and contract are furnished or completed. The Contractor will be advised in writing of the date the work is determined to be completed and accepted and until such acceptance the Contractor will be responsible for all work performed and materials delivered.

14. ORDER OF PRECEDENCE

In the event of an inconsistency between provisions of this contract, the inconsistency shall be resolved by giving precedence in the following order:

A. Bid Schedule, and Terms and Conditions of Contract.

B. Written bidding instructions.

C. Supplementary Conditions.

D. General Provisions.

E. Submittals.

F. Technical Provisions.

G. Drawings.

15. INDIAN PREFERENCE

The Contractor agrees to give preference in employment opportunities under this contract to the greatest extent feasible to Indians who can perform the required work, regardless of age (subject to existing laws and regulations), sex, religion, or Tribal affiliation. To the maximum extent feasible and consistent with the efficient performance of this contract, the Contractor further agrees to give preference to the greatest extent feasible in employment and training opportunities under this contract to Indians who are not fully qualified to perform regardless of age (subject to existing laws and regulations), sex, religion, or tribal affiliation.

The Contractor also agrees to give preference to tribal organizations and Indian-owned economic enterprises in the awarding of any subcontracts to the greatest extent feasible and consistent with the efficient performance of this contract. The Contractor shall maintain statistical records as are necessary to indicate compliance with this paragraph.

In connection with the Indian employment preference requirements of this clause, the Contractor shall provide opportunities for training incident to such employment. Such training shall include on-the-job, classroom, or apprenticeship training which is designed to increase the vocational effectiveness of an Indian employee.

If the Contractor is unable to fill its employment and training opportunities after giving full consideration to Indians as required by this clause, those needs may be satisfied by selection of persons other than Indians in accordance with applicable fair employment practices.

If no tribal organizations or Indian-owned economic enterprises are available under reasonable terms and conditions, including price, for awarding of subcontracts in connection with the work performed under this contract, the Contractor agrees to comply with the provisions of this contract by applying fair, competitive contracting practices.

As used in this clause:

"Indian" means a person who is a member of an Indian Tribe. If the Contractor has reason to doubt that a person seeking employment preference is an Indian, the Contractor shall grant the preference but shall require the individual to provide evidence within thirty (30) days from the Tribe concerned that the person is a member of that Tribe.

"Indian Tribe" means an Indian Tribe, pueblo, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688; 43 U.S.C. l60l) which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.
"Tribal Organization" shall be as defined in Section 4© of the Indian Self-Determination and Education Assistance Act (P.L. 93-638); that is: "the recognized governing body of any Indian Tribe; any legally established organization of Indians which is controlled, sanctioned or chartered by such governing body or which is democratically elected by

the adult members of the Indian community to be served by such organization and which includes the maximum participation of Indians in all phases of its activities."

"Indian-owned Economic Enterprise" means any Indian-owned commercial, industrial, or business activity established or organized for the purpose of profit, provided that such Indian ownership shall constitute not less than 51 percent of the enterprise, and that ownership shall encompass active operation and control of the enterprise.

The Contractor agrees to include the provisions of this clause, including this paragraph in each subcontract awarded at any tier under this contract.

In the event of noncompliance with this clause the Owner may terminate the contract in whole, or in part, or may impose any other sanctions authorized by law or by other provisions of the contract.

16. PROTECTION OF WORK

The Contractor shall protect and maintain completed work during the progress of construction and until the final completion and acceptance of all the work included in the contract. Any work which, after being satisfactorily completed, is damaged (including, but not limited to, damage by weather, Contractor, subcontractors, vandalism, theft, animals and material failure) before final acceptance of the contract, shall be replaced by the Contractor. No additional payment will made for this remedial work, unless the damages were directly caused by actions of the Owner.

17. CONTRACT DOCUMENTS

Bidders are requested to examine the specifications to make certain that all pages and sheets indicated in the index are bound within the specifications. Any material found to be missing will be supplied upon request. The Owner assumes no responsibility for a bid submitted on the basis of an incomplete set of specifications.

Upon request a maximum of six (6) sets of contract drawings and specifications shall be furnished to the Contractor after award without charge, except applicable publications incorporated by reference to be furnished on request at the cost of reproduction.

18. RECORD DRAWINGS

General: The as-constructed drawings shall be a record of the construction as installed and completed by the Contractor.

They shall include all the information shown on the Contractor's set of drawings and a record of all deviations, modifications or changes from those drawings, however minor, which were incorporated in the work, all additional work not appearing on the contract drawings and all changes which are made after final inspection of the contract work.

Record Drawings: The Contractor shall mark up one set of paper prints to show the Record Drawing information. These Record Drawing prints shall be kept current and available on the job site at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. No construction work shall be concealed until the necessary record data has been recorded. The Record Drawing marked prints will be jointly inspected for accuracy and completeness by the Owner and a responsible representative of the Contractor prior to submission of each partial payment, as evidenced by the issuance of a receipt by the Owner indicating the adequacy of the information. Failure to keep the as-constructed marked prints on a current basis shall be sufficient justification to withhold approval of request for payment or suspend pay estimates. The drawings shall show the following information, but not limited thereto.

A. The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.

B. The location and dimensions of any changes from the contract drawings.

C. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabrication, erection, installation plans, and placing details, pipe sized, insulation materials, dimensions of equipment foundations, etc.

D. All changes or modifications which result from the final inspection.

E. All information as required in the technical provisions.

F. Drawings showing one line diagrams with all conduit and wire sizes shown of the distribution systems, motor control centers, corrected wiring diagrams, equipment and conduit plans.

G. Schematic (Elementary) Diagrams: This shall include, but not be limited to, complete schematics including items furnished by others for the following:

i. Motor Control Circuits for Starters furnished under this Contract.

Review and Approval: One set of the preliminary Record Drawings marked prints shall be delivered to the Owner before final inspection for his review and approval. The review by the Owner will be expedited; however, the Owner cannot guarantee to review more than one complex mechanical or electrical Record drawing sheet per working day. Upon disapproval of the Record Drawings one set of marked prints will be returned to the Contractor for further work and resubmitted to the Owner.

Other: All costs incurred by the Contractor in the preparation and furnishing Record drawings shall be included in the contract price and no separate payment will be made for this work.

Except where noted herein, all requirements of the General Section of the Technical Provisions shall apply.

Approval and Acceptance of Record drawings must be accomplished before final payment is made to the contractor.

19. CONTRACTOR LICENSING

The Contractor must be licensed in accordance with the contracting regulations of the State of Nevada, or be licensed in the State of his principal practice. If the contractor is a joint venture between two or more individuals or firms, the joint venture itself, not just the individual parties, must be licensed. Bidders not meeting this licensing requirement will not be eligible for award of this contract.

20. SUBMITTALS

Some sections of the construction documents have requirements for the Contractor to submit proof that the materials he plans to use will meet the specifications.

Submittals are required:

1. Where called for in the technical provisions or on the drawings.
2. For any item the Contractor proposes to substitute for a specified item as an "or equal".
3. For any proposed design change or deviation from these specifications or the drawings.
4. For anything in these plans or specifications found to conflict with applicable codes and ordinances.
5. For anything the Contractor does not understand.

Two sets of submittals shall be provided to the Owner or his representative at least two weeks before a determination is required. Substitutions or deviations not approved by the Owner will risk rejection.

Submittals may be drawings, sketches, manufacturer's literature, catalog descriptions, or other descriptions in sufficient detail to allow a decision. In addition, if the information supplied shows more than one model or style of equipment or material, the Contractor shall annotate the particular equipment or material he is submitting for approval. The information submitted for approval shall clearly show that the applicable sections of the specifications have been met. A transmittal letter shall accompany information submitted for approval. Items requiring approval must be approved by the Engineer in writing prior to installation. The Contractor shall also give the name, address, and phone number of the firm from which the Contractor purchased the subject items. The Contractor shall also give the name, address, and phone number of the firm, which provides service, spare or additional parts for the subject items. The submittal will indicate the amount to be added to or deducted from the bid price should the submittal be accepted.

Additional submittal requirements, if any, are described in the Submittal Requirements documents that follow the Specifications.

21. OPERATION AND MAINTENANCE MANUALS

The Contractor shall prepare Operation and Maintenance (O&M) Manuals for equipment furnished and incorporated in the work. All such manuals shall be prepared in durable 3-ring binders, approximately 8.5 x 11 inches in size, and at least the following:

A. Identification on the front cover stating the general nature of manual.

B. Neatly typewritten index near the front of the manual.

C. Complete instructions regarding operation, maintenance, and troubleshooting of all equipment involved. Material list of components with manufacturers' bulletins and list of replacement parts, their part numbers, current costs, and name and address of nearest vendor of the parts and equipment.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Physical wiring diagram of all control system devices, accessory equipment, and the physical location of each wire between connection terminals on these devices.

G. Electrical schematic (ladder) diagram of the control system showing all circuits and control components in symbolic form using standard symbols. The diagram shall include a legend which explains all symbols.

H. Outline dimension and general physical arrangement drawings of each enclosure and panel board.

I. Copy of all guarantees and warranties issued.

J. Copy of approved shop drawings, with all data concerning all changes made during construction.

Other requirements for Operation and Maintenance Manuals are described under the specific items listed in the Technical Provisions. Final payment to the Contractor will not be made until the provisions of this section are satisfied.

22. DISCOVERY OF ARCHEOLOGICAL OR HISTORICAL PROPERTIES

The Indian Health Service has, in accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800.4, undertaken investigations to identify historic properties with the project's area of potential effect. However, should evidence of subsurface archeological or historic properties be discovered during the course of construction, the Contractor shall halt construction, take all necessary steps to protect the property, and immediately notify the Owner or the Owner's representative. The Owner shall have the authority to take all necessary steps to determine the property's significance and make a determination of eligibility in accordance with 36 CFR 800.11. In addition, should human skeletal remains and/or associated funerary objects be discovered during construction, the Contractor shall suspend earthmoving operations, take all necessary steps to protect the remains, and immediately notify the Owner or the Owner's representative. Construction work in the vicinity of the remains shall be suspended until the Tribe decides as to disposition of the skeletal remains and objects in accordance with Section 3(d) of the Native American Graves Protection and Repatriation Act.

The duration of such investigations will vary according to the type and volume of materials discovered, their significance, and the amount of effort required to retrieve the data if so required following consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. If possible, the Owner or the Owner's representative shall direct the Contractor to work outside the area of investigations. As it is not possible to determine in advance whether such discovery situations will occur, payment for any downtime or movement to another portion of the project shall be negotiated at the time of occurrence for a modification to the contract. It shall be the responsibility of the Contractor to keep careful written records of any and all personnel and equipment costs involved commencing when any remains are encountered and concluding when work has restarted.

23. SAFETY REQUIREMENTS

The Contractor shall ensure safe working conditions for employees during excavations. The Contractor shall comply with the Occupational Safety and Health Standards – Construction Standards for Excavations (29 CFR Part 1926, Subpart P) with additions or modifications thereto issued by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) as well as applicable state and local regulations. Excavations and adjacent areas must be inspected by a competent person at the start of each work day and as needed throughout the day for evidence of hazardous conditions or developing hazardous conditions. Prior to the start of construction, the Contractor shall provide the Owner a list of inspections when required. A record of these daily inspections shall be kept by the Contractor and be made available to the Owner or the Owner's representative upon request. It is the Contractor's responsibility to become knowledgeable of the regulations and comply with all requirements contained therein.

Employees in excavations must be protected from cave-ins by sloping and benching systems, support systems, shield systems, or other protective systems as described in the OSHA regulations. Only excavations which are entirely within stable rock, or excavations which are less than 5 feet in depth and, upon examination by a competent person, show no indication of potential cave-in are exempted from the requirement for cave-in protection. No material shall be placed within 2 feet of the edge of the excavation. Where employees are required to be in excavations more than 4 feet deep, a ladder, stairway, or ramp shall be provided and located so as to require no more than 25 feet of lateral travel. The total length of open trench shall not exceed 500 feet without the Owner's approval. All trenches shall be completely backfilled at the end of each working day, unless otherwise approved by the Owner or the Owner's representative.

All work within the right-of-way of a street, road, highway, sidewalk, trail, or other public thoroughfare, or work which requires encroachment into the right-of-way of a public thoroughfare, shall incorporate adequate signs, barricades, warning lights, and flagmen to ensure the protection of the work, protection of the employees, and the safety of the public. All open construction, obstructions, or other hazards left in place at the end of a work session shall be barricaded and marked by yellow warning lights, which shall be kept burning from sunset to sunrise. All signs, barricades, warning lights, and other traffic control devices, and all traffic control activities shall be in accordance with the most recent edition of the Federal Highway Administration "Manual On Uniform Traffic Control

Devices" (ANSI D6.1), OSHA regulations, and the requirements of the transportation department which owns or maintains the thoroughfare.

The Contractor shall ensure that all employees wear proper protective clothing during construction in accordance with current OSHA standards.

The following measures or provisions are to be adhered to at all times during the construction of this project:

1. All heavy construction machinery, such as trenching machines, bulldozers, and backhoes, must be equipped with a roll bar meeting the requirements of the above regulation.
2. Safety helmets will be worn by all personnel working at the site.
3. Safety shoes or boots will be worn by all personnel working at the site.

24. STANDARD SPECIFICATIONS

When referred to in these specifications, the following means the latest edition, publication, standard, or specification of:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
FDA	Food and Drug Administration
NEMA	National Electrical Manufacturers' Association
NEC	National Electrical Code
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
SSPC	Society for Protective Coatings
UL	Underwriters Laboratories, Inc.
UPC	Uniform Plumbing Code

25. NOTIFICATION REQUIREMENTS

It shall be the Contractor's responsibility to notify all utility companies involved whenever a utility line is to be cut, tapped, moved, or in any way disturbed from its original placement. Sufficient notice shall be given to the utility company so that its users can be informed of any disruption of service. Such notice must be given no less than 12 hours in advance.

26. CONSTRUCTION EASEMENTS

The City of Fallon has issued a temporary construction easement for temporary controls, water storage and construction equipment. The easement map is located in Exhibit 2 of this construction package. Contractor must notify the Owner of the chosen temporary water storage alternative and if any additional land will be needed for equipment and facilities. City of Fallon contact information is below:

Derek Zimney, PE, Fallon City Engineer
55 West Williams Avenue,
Fallon NV 89406
Phone: 775-423-5107
Email: dzimney@fallonnevada.gov

LABOR PROVISIONS

1. DAVIS-BACON ACT

(a) All laborers and mechanics employed or working upon the site of the WORK will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the CONTRACTOR and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section l(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions or paragraph (d) of this clause also, regular contributions made or costs incurred for more than a weekly period (but not less than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the determination for classification of work actually performed without regard to skill, except as provided in the clause entitled "Apprentices" and "Trainees." Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-l32l) shall be posted at all times by the CONTRACTOR and its subcontractors at the site of the WORK in a prominent and accessible place where it can be easily seen by the workers.

(b) (1) The OWNER shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The OWNER shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met.

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The Classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the CONTRACTOR and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the OWNER agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the OWNER to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 202l0. The Administrator or an approved authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the OWNER or will notify the OWNER within a 30-day period of that additional time is necessary.

(3) In the event the CONTRACTOR, the laborers or mechanics to be employed in the classification or their representatives, and the OWNER do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the OWNER shall refer the questions, including the views of all interested parties and the recommendation of the OWNER, to the Administrator of the Wage and Hour Division for determination. The Administrator or an authorized representative, will issue a determination within 30 days of receipt and so advise the OWNER or will notify the OWNER within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (b)(2) or (b)(3) of this clause, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the CONTRACTOR shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(d) If the CONTRACTOR does not make payments to a trustee or other third person, the CONTRACTOR may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, that the Secretary of Labor has found, upon the written request of the CONTRACTOR, that applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the CONTRACTOR to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT - OVERTIME COMPENSATION

(a) Overtime requirements: No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics (See Federal Acquisition Regulation 22.300) shall require or permit any such laborer or mechanic in any workweek in which individual is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(b) Violation, liability for unpaid wages, liquidated damages: In the event of any violation of the provisions set forth in paragraph (a) of this clause, the CONTRACTOR and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to

each individual laborer or mechanic, employed in violation of the provisions set forth in paragraph (a) of this clause, in the sum of $l0 for each calendar day for which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the provisions set forth in paragraph (a) of this clause.

(c) Withholding for unpaid wages and liquidated damages: The Contracting officer shall upon his or her own action or written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the CONTRACTOR or subcontractor under any such contract or any other Contract with the same Prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in paragraph (b) of this clause.

(d) Payrolls and basic records:

(1) The CONTRACTOR or subcontractor shall maintain payrolls and basic payroll records during the course of contract work and shall preserve them for a period of 3 years from the completion of the contract for all laborers and mechanics working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Nothing in this paragraph shall require the duplication of records required to be maintained for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act.

(2) The records to be maintained under paragraph (d)(1) of this clause shall be made available by the CONTRACTOR or subcontractor for inspection, copying, or transcription by authorized representatives of the OWNER or the Department of Labor. The CONTRACTOR or subcontractor shall permit such representatives to interview employees during working hours on the job.

(e) Subcontracts: The CONTRACTOR or subcontractor shall insert in any subcontracts the provisions set forth in paragraphs (a) through (d) of this clause and also a clause requiring the subcontractors to include these provisions any lower tier subcontracts. The Prime CONTRACTOR shall be responsible for compliance by any subcontractor or lower tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.

3. APPRENTICES AND TRAINEES

(a) Apprentices: Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the Program but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeyman on the job site in any craft classification shall not be greater than the ratio permitted to the CONTRACTOR as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice’s level of progress, expressed as percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringes in accordance with the provisions of the apprenticeship program. If the apprenticeship programs does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits shall be paid in accordance with that determination.

In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the CONTRACTOR will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees: Except as provided in 29 CFR 5.l6, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employee and Training Administration withdraws approval of a training program, the CONTRACTOR will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) Equal Employment Opportunity: The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order ll246, as amended, and 29 CFR Part 30.

4. PAYROLLS AND BASIC RECORDS

(a) Payrolls and basic records relating thereto shall be maintained by the CONTRACTOR during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the WORK. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates or wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section l(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deduction made and actual wages paid. Whenever the Secretary of Labor has found under paragraph (d) of the clause entitled "Davis-Bacon Act" that the wages of any Laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section l(b)(2)(B) of the Davis-Bacon Act, the CONTRACTOR shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(b) (1) The CONTRACTOR shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the OWNER. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause. The information may be submitted in any form desired. Optional Form WH-347 Federal stock number 029-005-00014-1 is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance" signed by the CONTRACTOR or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause entitled "Payrolls and Basic Records" and that such information is correct and complete.

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deduction as set forth in Regulations, 29 CFR Part 3 and

(iii) That each laborer or mechanic has been paid not less that the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph (b)(2) of this clause.

(4) The falsification of any of the certifications may subject the CONTRACTOR or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 18 and Section 231 of Title 31 of the United States Code.

(c) The CONTRACTOR or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by authorized OWNER or representatives of the OWNER or the Department of Labor. The CONTRACTOR or subcontractor shall permit the OWNER or representatives of the OWNER or the Department of Labor to interview employees during working hours on the job. If the CONTRACTOR or subcontractor fails to submit the required records or to make them available, the OWNER may, after written notice to the CONTRACTOR, sponsor take such action as may be necessary to cause the suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

5. COMPLIANCE WITH COPELAND ACT REQUIREMENTS

The CONTRACTOR shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

6. WITHHOLDING OF FUNDS

The OWNER shall upon his or her own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the CONTRACTOR under this contract or any other Federal contract with the same Prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirement, which is held by the same Prime CONTRACTOR, so much of the accrued payment or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the CONTRACTOR or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of WORK, all or part of the wages required by the contract, the OWNER may, after written notice to the CONTRACTOR, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. SUBCONTRACTS (LABOR STANDARDS)

(a) The CONTRACTOR or subcontractor shall insert in any subcontracts the clauses entitled "Davis-Bacon Act", "Contract Work Hours and Safety Standards Act Overtime Compensation", "Apprentice and Trainees", "Payrolls and Basic Records", "Compliance With Copeland Act Requirements", "Withholding of Funds", "Subcontracts (Labor Standards)", "Contract Termination: Debarment", "Disputes Concerning Labor Standards", "Compliance with Davis-Bacon and Related Act Requirements", and "Certification of Eligibility", and such other clauses as the OWNER may by appropriate instruction require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses cited in this paragraph.

(b) (1) Within 14 days after of the contract, the CONTRACTOR shall deliver to the OWNER a completed Statement and Acknowledgment Form (SF-1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph 7(a) of this clause have been included in the subcontract.

(2) Within 14 days after the award of any subsequently awarded subcontract the CONTRACTOR shall deliver to the OWNER an updated completed SF 1413 for such additional subcontract.

8. CONTRACT TERMINATION: DEBARMENT

A breach of the contract clauses entitled "Davis-Bacon Act", "Contract Work Hours and Safety Standards Act-Overtime Compensation", "Apprentices and Trainees", "Payrolls and Basic Records", "Compliance with Copeland Act Requirements", Subcontracts", (Labor Standards) "Compliance with Davis-Bacon and Related Act Requirements", and "Certification of Eligibility" may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

9. DISPUTES CONCERNING LABOR STANDARDS

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with the procedures and not the Disputes clause of this Contract. Disputes within the meaning of this clause include disputes between the CONTRACTOR (or any of its subcontractors) and the OWNER, the U.S. Department of Labor, or the employees or their representatives.

10. COMPLIANCE WITH THE DAVIS-BACON AND RELATED ACT REQUIREMENTS

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

11. CERTIFICATION OF ELIGIBILITY

(a) By entering into this contract, the CONTRACTOR certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government assisted contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government assisted contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

DAVIS BACON WAGE DETERMINATION

Compliance with the Davis-Bacon Act is required for contracts exceeding $2,000.

Contractor is responsible for verifying the Davis-Bacon rates are current. The link is as follows:
https://sam.gov/content/wage-determinations

CONTRACT PROGRESS SCHEDULE

INSTRUCTIONS TO CONTRACTOR

1. Prepare three copies of this "Project Progress Schedule" form in accordance with these instructions or provide on a similar template and submit to the Owner as required.

2. Enter Contract Number, Project Number, Starting Date, and Completion Date as shown on the contract.

3. Enter Project Title as shown on the Contract

4. Enter Contractor's name and address in the block marked "Contractor"

5. In the work element column, enter major elements of work in logical sequence and sufficient detail to identify the element.

6. Enter the calendar weeks (i.e. 1/12/22) for those weeks that work is scheduled.

7. The space above the broken line shall be used to chart the proposed progress schedule for each work element. The actual work progress shall be charted in the space below the broken line. The progress schedule shall be updated weekly and submitted to the Owner.

8. In the event the contract is modified, changing the progress of the work, adding or deleting work, or changing the original completion date, a revised progress schedule will be prepared and submitted to the Owner.

9. Care should be taken to plan the work in such a manner that it can be accomplished as stated in this schedule. If for any reason it becomes known that any part of the progress will be delayed, this fact should be reported to the Owner.

CONTRACT PROGRESS SCHEDULE

Start Date	Contract No.					Contractor						Contractor Signature				Date
	Project Title											Owner Signature				Date
	Weeks															
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CERTIFICATE OF SUBSTANTIAL COMPLETION

DATE OF ISSUANCE**:** _____

OWNER: **Fallon Paiute-Shoshone**

CONTRACTOR: _____

CONTRACT NUMBER: RN 25-23

PROJECT: Fallon Colony Concrete Tank Replacement PH16-U83, RN 25-23

This Certificate of Substantial Completion to all Work under the Contract Documents or to the following specified parts thereof:

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

_____
DATE OF SUBSTANTIAL COMPLETION

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within _____ days of the above date of Substantial Completion.

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees shall be as follows:

OWNER:

CONTRACTOR:

The following documents are attached to and made a part of this Certificate:

1.

2.

3.

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents.

Recommended by ENGINEER on _____
Date

_____
(ENGINEER)

By: _____
(Signature)

CONTRACTOR accepts this Certificate of Substantial Completion on _____
Date

_____
(CONTRACTOR)

By: _____
(Signature)

OWNER accepts this Certificate of Substantial Completion on _____
Date

_____
(OWNER)

By: _____
(Signature)

TECHNICAL PROVISIONS

TP-00: MODIFIED TECHNICAL

TP-01: TRENCH EXCAVATION AND BACKFILL

TP-02: CONCRETE

TP-03: REINFORCING STEEL

TP-04: WATER TRANSMISSION AND DSITRIBUTION MAINS

TP-17: PUMP CONTROL SYSTEMS

TP-28: HDPE PIPE

TP-31: WELDED STEEL WATER STORAGE TANK AND FOUNDATION

TP-34: COATINGS FOR WELDED STEEL WATER STORAGE TANKS

TP-60: CHAIN LINK FENCING

TECHNICAL PROVISIONS

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TP-60: CHAIN LINK FENCING

TECHNICAL PROVISIONS
SECTION 00 – MODIFYING TECHNICAL PROVISIONS

SECTION 01 – TRENCH EXCAVATION & BACKFILL FOR PIPELINES AND APPUTRENANT STRUCTURES

A. Technical Provision Section 01 (TP-01.18)
Remove and replace with:
The Owner shall be responsible for staking out pipeline centerlines with lath every 200 feet or line-of-sight whichever is less. Bends, alignment, intersections and fence corners shall be staked by the Owner and provided with offsets for alignment. The Contractor shall be responsible for the preservation of the location and line and grade stakes when set, and if disturbed, shall request to have such stakes replaced.

B. Technical Provision Section 01 (TP-01.05)
Add:
The Contractor shall remove excess rock surrounding the tank site and re-grade the existing drainage swales to ensure proper drainage of the site. See project site photos attached in bid package for reference. Contractor is encouraged, but not required, to attend the pre-bid site visit to few anticipated rocks to be removed.

C. Technical Provision Section 01 (TP-01.23)
Add after I:
J. Excess Rock Removal: Excess rock removal and drainage grading shall be measured on a lump sum basis. Payment for excess rock removal and drainage re-grading shall be at the contract price shown in the bid schedule which shall be full compensation for furnishing all labor, equipment, materials, and incidentals, required to remove excess rocks and ensure proper drainage of the existing site.

SECTION 04 – WATER TRANSMISSION AND DISTRIBUTION MAINS

A. Technical Provision Section 04 (TP-04.04A)
Remove:
3. Contractor to provide staking in accordance with Section 01 of these Technical Provisions.

Replace:
3. Owner to provide staking in accordance with Section 01 of these Technical Provisions.

SECTION 31 – WELDED WATER STORAGE TANK

A. Technical Provision Section 31 (TP-31.05)

Add:

A. Temporary Water Storage: The Contractor shall be responsible for the provision of safe and adequate temporary water storage for the Fallon Paiute-Shoshone Tribe Reservation (approximately 328 connections). This may be accomplished by placing a temporary tank or bladder (minimum of 70,000 gallons in size) at a location above the existing tank on City of Fallon land (see attached approved construction easement options) and connected to the existing inlet-outlet piping for the water storage tank. The temporary piping from the current inlet-outlet piping to the temporary storage tank may be laid above ground (at-grade) but shall be secured. Temporary pipe may be High Density Polyethylene Pipe (HDPE) but shall conform to Section 28 of these Technical Provisions. All temporary water storage equipment shall be installed per manufacturer requirements. The Contractor may reset the stop and start of the existing controls or utilize the existing pressure transducer to ensure a continuous supply of water to the community. The Contractor shall coordinate with the FPST Public Works Director for any modifications to the existing controls during construction. The means and methods of implementing and installing the temporary water storage shall be at the discretion of the Contractor. Contractor shall submit temporary water storage plan and materials specifications with submittals for Owner approval. See TP-17 for description of existing controls.

The temporary water system, including the tank and connection piping shall be disinfected prior to being put into service and shall be disinfected in accordance with AWWA C-652 (AWWA Standard for Disinfection of Water Storage Facilities) and shall be NSF 61 compliant. The temporary storage system shall then be tested before connection to the community system. The Contractor shall complete the bacteriological sampling and testing. No water shall be allowed to be drawn from the temporary water storage system during filling or allowed to enter the distribution system until bacteriological sampling and testing have been completed.

B. Temporary Controls: The Contractor shall prepare a Temporary Controls Plan, see TP-17 Pump Controls System, to be submitted to the Owner for approval.

C. Existing Tank Removal: The Contractor shall remove the existing concrete tank from the site. This work shall include the tank, tank foundation, piping and over excavation as needed to ensure complete removal. The removal of the existing tank shall not be started until the temporary storage is connected to the system and functioning properly. The dimensions of the existing tank are shown on the construction drawings.

All material removed from the site shall be disposed of in compliance with all

applicable state and federal regulations. Disposal options include regulated landfills, licensed recycling facilities, or companies intending to reuse the materials. The Contractor shall obtain the Owner's approval before initiating any disposal option. Payment will not be approved until the Contractor has provided receipts from the facility receiving the disposal items.

D. Stripping and Grubbing: The Contractor shall remove all vegetation and top soil located within the perimeter of the proposed chain link fence.

B. Technical Provision Section 31 (TP-31.12)

Change text in I:

"Unless specified otherwise on the deign drawings, and depending on regional regulatory requirements, the screen shall be 24, 16 or 12 mesh stainless steel …"

To:

"The screen shall be 24 mesh stainless steel …"

Add after N:

O. Sample Tap: A sample tap assembly shall be located on the side of the tank proposed by the Contractor's tank engineer and shall be approved by the Owner. Sample tap shall be in an accessible location to allow for water quality testing of the tank.

C. Technical Provision Section 31 (TP-31.17.D)

Add:

Contractor shall be responsible for retaining a representative from an independent geotechnical firm to be onsite during earthwork operators for tank foundation to verify that soils encountered are consistent with those identified in the geotechnical report.

D. Technical Provision Section 31 (TP-31.20.A)

Change:

"Samples shall be collected for testing by the Owner or his representative."

To:

"Samples shall be collected for testing by the Contractor."

E. Technical Provision Section 31 (TP-31.22.C)

Add after C:

D. Temporary Water Storage: Temporary water storage shall be measured on a lump sum basis. Payment for any temporary water storage facilities and controls shall be at the contract price shown in the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals, required to maintain water storage and service to the community throughout construction.

E. Existing Tank Removal: Existing tank removal shall be measured on a lump sum basis. Payment for the existing tank removal shall be at the contract price shown in the Bid Schedule, which shall be full compensation for furnishing all labor, materials, equipment and incidentals required to remove and dispose of the existing tank.

F. Welding Inspector: Welding inspector services shall be measured on a lump sum basis. Payment for welding inspector services shall be at the contract price shown in the Bid Schedule, which shall be full compensation for retaining an independent welding inspector.

SECTION 34 – COATINGS FOR WELDED STEEL STORAGE TANKS

A. Technical Provision Section 34 (TP-34.05.D)
Change:
The Owner or Owner's Representative shall retain the services of an independent NACE certified inspector for this project.

To:
The Contractor shall retain the services of an independent NACE certified inspector for this project. NACE certified inspector shall be present for all critical days spanning the entire duration of tank construction.

B. Technical Provision Section 34 (TP-34.05.E-G)
Change All:
"Owner-retained independent NACE certified inspector"

To:
"Contractor-retained independent NACE certified inspector"

C. Technical Provision Section 34 (TP-34.11)
Change:
"…minimum 65% volume solids"

To:
"…minimum 90% volume solids"

D. Technical Provision Section 34 (TP-34.20)
Change:
"Samples shall be collected for testing by the Owner or his representative."

To:
"Samples shall be collected for testing by the Contractor."

SECTION 60 – CHAIN LINK FENCING

A. Technical Provision Section 60 (TP-60.03)
General Edit:
All fencing shall be eight-foot (8') as shown in the construction drawings.

TECHNICAL PROVISIONS

SECTION 01 - TRENCH EXCAVATION AND BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES

TP - 01.01 SCOPE:

The work covered by this section includes the furnishing of all labor, tools, equipment, and materials and performing all operations in connection with the excavation, trenching and backfilling of all pipe lines, structures and accessories.

Excavation, as used in these specifications refers to all construction activities necessary to install subsurface utilities in accordance with the plans and specifications. Such activities include, but are not limited to:

A. All necessary clearing, grubbing and site preparation; removal of all materials that may interfere with construction activities (except existing pipe work, conduits, utility structures or other items to be left in place) to the lines and grades indicated on the plans and otherwise described herein.

B. Removal and/or storage of subsurface materials from trench and construction excavation areas to allow installation of designated utilities or structures. All suitable material removed from excavations shall be used, insofar as practicable, in the formation of embankments, fills and backfilling.

C. Preparation of sub-grades and backfilling of trench and construction areas upon completion of utility or structure construction.

D. All necessary bracing, shoring and protection (but not including tight sheeting in trenches and structure excavation ordered left in place by the Owner or Owner's Representative).

E. Final grading, dressing and cleanup of the construction site.

TP - 01.02 SAFETY - PROTECTION OF EXCAVATION, WORK AND PERSONS:

The Contractor shall provide safe working conditions at all excavations. All trench excavation shall be coordinated in strict accordance with current Occupational Safety and Health Standards (OSHA) - Construction Standards for Excavations (29 CFR Part 1926, Subpart P) issued by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) as well as applicable state and local regulations. It is the Contractor's responsibility to become knowledgeable of the regulations and comply with all requirements contained therein.

Excavations and adjacent areas shall be inspected daily by an OSHA certified competent person provided by the Contractor for evidence of hazardous conditions. A record of these inspections shall be kept by the Contractor and be made available to the Owner upon request. Workers in excavations shall be protected from cave-ins. Protection can be by sloping and benching systems, support systems, shield systems, and/or other protective systems as described in the regulations. Only excavations which are entirely in stable rock or excavations which are less than five (5) feet in depth and, upon examination by a competent person, show no indication of potential cave-in are exempt from the requirement for cave-in protection.

A. Trenches: No material shall be placed within two (2) feet of the edge of the excavation. Where employees are required to be in excavations more than four (4) feet deep, an adequate means of exit such as a ladder or steps shall be provided and located so as to require no more than 25 feet of lateral travel. It is the Contractor's responsibility to become knowledgeable of the regulations and comply with all requirements contained therein. The total length of open trench shall not exceed 500 feet at any time. Trenches shall be completely backfilled at the end of each working day, unless otherwise approved by the Owner or Owner's Representative and appropriate protection is utilized.

B. Shoring and Sheeting Sections:

1. Protection of employees in excavations shall conform to applicable OSHA Standards. Any trench protection and modification to trenching safety plans shall be submitted to the Owner or Owner's Representative in writing to be maintained as part of the record.

2. The Contractor shall install all shoring and sheeting systems required to prevent cave-ins and protect employees, adjacent property, and adjacent structures in accordance with current OSHA standards. No extra payment will be made for these items, the cost thereof being merged with and considered a part of the cost for the related excavation.

3. Before sheeting is withdrawn, or trench boxes moved forward, they shall be raised, in place, just above the pipe crown to safely allow the Contractor to completely fill any voids left in the pipe zone.

C. Personal Protective Equipment: The Contractor shall ensure that all employees wear proper protective clothing during construction in accordance with the current OSHA standards. The following measures or provisions are to be adhered to at all times during the construction project:

1. Hard hats shall be worn by all personnel working on the site.

2. Safety shoes or boots will be worn by all personnel working on the site.

3. When appropriate, proper safety vest or fluorescent (yellow, green or orange) safety shirts shall be worn by all personnel working on the site

4. When appropriate, proper eye and hearing protection shall be worn by all personnel working on the site.

5. When appropriate, proper gloves shall be used by personnel working on the site.

6. All visitors to the project job site shall be required to wear proper hard hat and safety vest while on the job site. No unauthorized person(s) shall be allowed on the job site. Owner's Representatives on the job site for inspection or engineering consulting work shall wear all of the above listed personal protective equipment, as appropriate.

7. All heavy construction machinery, such as trenching machines, bulldozers, and backhoes, must be equipped with a roll bar and a back-up beeper meeting the requirements of the above referenced regulation.

TP - 01.03 WORK WITHIN RIGHT-OF-WAYS & TRAFFIC CONTROL:

All work within the right-of-way of a street, road, highway, or other public thoroughfare, including roads, sidewalks or trails, or work which requires encroachment into the right-of-way of a public thoroughfare, shall incorporate adequate signs, barricades, warning lights, and/or flagmen to ensure the protection of the work, protection of the workers, and the safety of the public. When performing any work within the right-of-way of roads or railroads, the Contractor shall comply with the right-of-way permit, as applicable, for the installation including all of the requirements for traffic control and compaction. All work within the right-of-way of roads shall be performed in accordance with the "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-14, Division 600" and/or local, municipal, state or other federal requirements as noted.

In addition, the Contractor shall submit a traffic control plan to the appropriate right-of-way controller and the Owner or Owner's Representative for review and approval prior to any work within the right-of-way of any roads or railroads. The plan shall be in accordance with any applicable encroachment permits prior to any work with the right-of-way of any road or land. Any deviation from the plan must be submitted for review and approval by the appropriate right-of-way controller and Owner or Owner's Representative. All open construction, obstructions, or other hazards left in place at the end of a work session shall be barricaded and marked by yellow warning lights, which shall be illuminated from sunset to sunrise. All signs, barricades, warning lights, and other

traffic control devices, and all traffic control activities shall be in accordance with the most recent edition of the Federal Highway Administration "Manual on Uniform Traffic Control Devices" (ANSI D6.1), OSHA regulations, and the requirements of the transportation department which owns or maintains the thoroughfare.

The Contractor shall at all times perform his work so as to cause the least possible inconvenience to the general public and the residents in the vicinity of the work, and to ensure the protection of persons and property in a manner satisfactory to the Owner.

No road or street shall be closed to the public except with the permission of the Owner and proper governmental authority. Private driveways shall remain open to the maximum extent possible. Fire hydrants on or adjacent to the work shall be kept accessible to firefighting equipment at all times.

Temporary provisions shall be made by the Contractor to ensure the use of sidewalks, and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches, which shall not be obstructed except as approved by the Owner.

TP - 01.04 ROAD, RAILROAD AND SPECIAL UTILITY CROSSINGS (IF REQUIRED):

The Contractor shall be responsible for compliance with all requirements of special crossing permits applicable to this project. The Contractor shall provide copies of such permits prior to the commencement of work. If no crossing permits are appended, and such crossings are indicated on the plans, crossings will comply with all applicable provisions of Technical Provisions 11, in addition to those indicated under other provisions of this Technical Provision. At least two (2) working days' notice shall be given to the Owner or Owner's Representative before work is done on any crossing.

TP - 01.05 DRAINAGE:

The Contractor shall control the grading in the vicinity of the excavation so that the ground surface is properly sloped to prevent water from running into the excavated areas. Water that has accumulated in the excavation from rainfall and/or surface runoff, or from any other cause which might have been prevented by proper care and foresight, shall be removed and the subgrade restored to its proper bearing capacity prior to commencing construction activities, all at the Contractor's expense.

TP - 01.06 PROTECTION OF EXISTING UTILITIES:

The Contractor shall call and utilize the appropriate underground service location company to mark existing utilities within the project area. It shall be the Contractor's responsibility to determine the locations of existing underground utilities including, but not limited to, gas lines, fiber optic lines, telephone lines, pipelines, and drainage lines (storm drains, channels and ditches), not shown on the plans and to confirm the exact locations of those existing utilities shown on the plans. Existing utilities shall be protected from damage during excavation and backfilling of trenches, and if damaged, shall be repaired or replaced at the Contractor's expense. Broken water lines must be cleaned, disinfected, and flushed in accordance with AWWA C651 before being returned to service.

Continuation of the excavation shall not be permitted until damaged utilities have been repaired to the satisfaction of the Owner and the respective utility company. It shall be the Contractor's sole responsibility to protect or remove and replace any or all culverts as required for the satisfactory performance of the work.

TP - 01.07 LOCATING FACILITIES FOR INSTALLED SANITATION FACILITIES:

A. Warning Tape and Tracer Wire:

1. Warning Tape: Warning tape shall be installed 18-inches directly above the crown of the water, sewer, electrical, or other pipe with the printed side up. The warning tape shall also be installed as continuous skirting at the exterior of manholes, valve boxes, or other installed apparatus. For water pipes (mains and service lines), the warning tape shall be BLUE in color with "CAUTION: BURIED WATER

LINE BELOW" continually printed on it. For sewer pipes (mains and service lines), the warning tape shall be GREEN in color with "CAUTION: BURIED SEWER LINE BELOW" continually printed on it. For electrical lines, the warning tape shall be RED in color with "CAUTION: BURIED ELECTRICAL LINE BELOW" continually printed on it. The tape shall be minimum 3-inches wide, 5 mils total thickness and composed of plastic with a metal foil core. Where tracer wire is buried with the pipe line, the locator/warning tape may be plastic without metal foil.

2. Tracer Wire: For water mains and water service lines. Direct bury 10 AWG copper clad steel wire as manufactured by Copperhead Industries, LLC, or direct bury 10 AWG solid copper wire as manufactured by Agave Wire LTD, minimum 261-lb break load with 30 mil High Molecular Weight Polyethylene jacket, blue color, or approved equal. The tracer wire shall be attached to the pipe a minimum of three (3) times for each pipe length.

   a. The tracer wire shall be securely bonded together with an approved underground waterproof splice kit at all wire joints to provide electrical continuity, and it shall be accessible at all trace wire access points. The underground waterproof splice kit shall be equal to 3M Direct Bury Splice Kit DBR/Y-6. If tracer wire is installed, the Contractor shall provide (2) extra Underground Waterproof Splice Kits to the operating utility.

   b. Tracer wire access points shall be Copperhead SnakePit Roadway as manufactured by Copperhead Industries, LLC or approved equal. Materials used to construct lid and tube shall be non-corrosive or corrosion resistant. Tube material shall be of high grade ABS, or equivalent rigid plastic that meets or exceeds ASTM D-1788, Type 1 requirements. Lid material shall be of cast iron or ductile iron and color-coded according to American Public Works Association (APWA) standards. Blue designates water, and green designates sewer. Spacing between tracer wire access points shall be indicated on the plans or as specified be the Owner.

      Tracer wire shall be connected securely to the direct connection hook-up point. Soil around the access box shall be properly compacted. The top of the access box shall be installed to finished grade. Slope final grade away from box for drainage.

   c. All tracer wire shall be tested for continuity after installation in the presence of the Owner's Representative. Tracer wire shall be repaired or replaced, as necessary, until continuity is achieved, at no additional cost to the Owner.

B. Utility Line Markers, Bollards, and Metal Marker Posts: Retroreflective tape shall be installed around the utility line markers, bollards, and metal marker posts according to the manufacturer's recommendation. Tape placement shall be approximately 6-inches from the marker top as shown on details. The 6-inch tape shall be 3M High Density Yellow Pressure Sensitive or approved equal. Concrete shall meet the requirements of TP 02.

   1. Utility Line Marker: Shall be a minimum of 66 inches in length and 3-3/4 inches in width. The utility marker may be installed within the ROW if approved by the Owner or Owner's Representative. The location and frequency of the utility line markers is indicated on the plans. The utility line markers shall be installed directly over the item that it is marking with an anchor barb bury depth of 18-inches.

      a. Water markers shall be blue in color, model CRM306608 with anchor barb and "CAUTION WATER PIPELINE" text on the marker as manufactured by Carsonite Composites, or equal.

      b. Sewer markers shall be green in green, model CRM306607 with anchor barb and "CAUTION SEWER PIPELINE" text on the marker as manufactured by Carsonite Composites, or equal.

   2. Bollards: Bollards shall be 78 inches long with a four (4) inch diameter post. They shall be installed to leave 48 inches exposed above ground.

      a. The four (4) inch diameter posts shall be aluminum or steel pipe filled with concrete. Bollards shall be painted with a minimum of two (2) coats of yellow paint designed for outdoor commercial

use. Bollards shall be properly cleaned and the surface prepared in accordance with the paint manufacturer's recommendations prior to painting. Under no circumstances shall bollards be installed within the right-of-way of any roadways, unless specifically indicated on a right-of-way permit or as approved by the right-of-way controller.

b. Set bollards in 12-inch diameter holes full of concrete. Set depth of bollard in 30-inches of concrete according to the detail drawing. Posts shall be set in a vertical position, plumb, in line and centered in the footing. Six (6) inches of concrete shall be placed under the post and concrete shall extend two (2) inches above grade and be crowned to shed water. Forms are not required, but may be used.

3. Metal Marker Posts: Markers shall be 66 inches long, 2-1/2 inches diameter, concrete filled, with a two (2) inch diameter stampable aluminum or brass cap. The cap shall be Berntsen Model CD2L, or approved equal. Metal marker posts shall be installed to leave 36 inches exposed above ground.

a. The 2-1/2 inch diameter aluminum or steel utility markers with stampable aluminum or brass caps shall be installed to mark the location of all marked facilities. Marker posts shall be painted with a minimum of two (2) coats of yellow paint designed for outdoor commercial use. The marker posts shall be properly cleaned and the surface prepared in accordance with the paint manufacturer's recommendations prior to painting. Under no circumstances shall metal marker posts be installed within the right-of-way of any roadways, unless specifically indicated on a right-of-way permit or as approved by the right-of-way controller.

b. Set metal marker posts in concrete in 10-inch diameter holes and depth of metal marker post in concrete of 30 inches. Posts shall be set in a vertical position, plumb, in line and centered in the footing. Six (6) inches of concrete shall be placed under the post and concrete shall extend two (2) inches above grade and be crowned to shed water. Forms are not required, but may be used.

TP - 01.08 EXCAVATION:

All excavation, other than by drilling and blasting, undertaken with the excavation equipment commonly used in the industry for this type of excavated material shall be classified as common excavation.

All excavation shall be made by open cut method except as approved or specified. During excavation, materials suitable for backfill shall be neatly piled no closer than 24-inches from the edge of the excavation. All materials not required or not suitable for backfill shall be removed and wasted at locations designated by the Owner or Owner's Representative.

A. Width: The sides of all trenches for the installation of utility piping systems shall be as nearly vertical as soil conditions will permit from ground level to the pipe. Except for the trenching of 1-inch water service lines, the width of the trench shall not be less than 16-inches nor more than 24-inches wider than the outside diameter of the pipe barrel. Trench excavation shall be centered on pipe alignment such that a minimum clear space of eight (8) inches is provided on each side of the pipe. Trench width above the level of the top of the pipe may be as wide as necessary for shoring or sheathing and for proper installation of the work.

B. Depth: The trench shall be excavated to the depth that permits pipe to be laid at the elevations shown on the plans or with the required depth of cover specified by the Owner or Owner's Representative, such as below the frost line. Depth of cover shall be measured from the finished grade or the surface of the permanent improvement to the top of the pipe barrel.

C. Preparation: The bottom of the trenches shall be accurately shaped to line and grade and shall provide uniform bearing and support for each section of the pipe on specifically placed bedding material at every point along its entire length. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and shall be only of such length, depth and width as required for properly making the

particular type joint. Care shall be taken not to excavate below the depths indicated. Unauthorized over depths shall be backfilled with suitable bedding material at the Contractor's expense.

D. Previous Excavation: If the trench passes over a sewer or other previous excavation, the trench bottom shall (1) be compacted to provide support equal to that of the undisturbed native soil or (2) conform to the specific regulatory requirements that preclude damage to the existing installed facility.

E. Unstable Subgrade: Where soft, spongy or otherwise unsuitable material is encountered, which will not provide a firm foundation for pipe, the Owner or Owner's Representative will direct the extent to which removal and replacement shall be made with suitable material. Special pipe foundation material is NOT anticipated. However, if required, a price shall be negotiated between the Owner and Contractor for special pipe foundation material.

F. Underground Obstructions: The Contractor shall preserve intact any underground pipes, culverts or other utilities encountered during construction (except as hereinafter permitted) provided their location is such that they do not interfere with new pipelines or structures being installed. The Contractor shall notify all appropriate utility authorities of his construction schedule so they may be at the site to locate and protect their property. If any utilities or structures are accidentally broken or disturbed, they shall be replaced immediately to a condition at least equal to that in which they were found, all at the Contractor's expense.

Couplings used to repair water and sewer mains or service lines shall be approved by the operating utility and the Owner or Owner's Representative. The repair work shall be done in a manner acceptable to the Owner or Owner's Representative and the utility company. Any existing water or sewer services that will intersect or interfere with the new pipelines or structures shall be rerouted by the Contractor in the manner indicated by the Owner or Owner's Representative.

Existing water or sewer services from the mains to private property that interfere with trenching operations may be cut and replaced at the Contractor's option and expense, provided that users of such services are notified at least 2 hours in advance and that the use of such service shall in no case be interrupted for more than 4 hours, unless specifically permitted in writing by the user. Materials and construction for these items shall be as provided in other sections of these specifications. All new and existing water and sewer mains and water and sewer services shall be protected from freezing at all times during construction.

G. Rock: The inclusion of a bid item and estimated quantity for rock excavation in the Bid Schedule indicates that rock excavation is probable. However, the exclusion of this item from the Bid Schedule does not preclude the possibility that rock will be encountered; it merely indicates that it is not anticipated. If unanticipated rock excavation is needed , the Contractor and the Owner will negotiate a price for the rock excavation.

Should rock excavation be required, it shall be the responsibility of the Contractor to have an experienced powderman handle all blasting and be able to furnish proof of credentials to the Owner. The Contractor shall comply with all laws, ordinances, applicable safety code requirements and regulations relative to the handling, storage and use of explosives and the protection of life and property. The blasting Contractor shall be licensed by the state in which the blasting is conducted. Blasting shall be conducted in accordance with OSHA guidelines. All necessary permits shall be secured and submitted to the Owner or Owner's Representative. The Contractor shall protect all adjacent utilities lines, property and structures from the blasting operation. The Contractor shall be responsible for any damage and injury caused by blasting operations. The Contractor shall inform all residents in the vicinity of proposed blasting activities and shall be responsible for any damage to persons or property as covered in the General Provisions.

Vibration Control (Ground Vibration) – Whenever vibration damage is possible, monitor each blast with a seismograph located, as approved, between the blast and the closest structure subject to blast damage. Peak particle velocity shall not exceed safe blasting recommended criteria, established by the Office of Surface Mining – OSM Alternative Blasting Level Criteria (Modified from Figure B 1, R1 8507 U.S Bureau of Mines.

Where blasting is required within 2,000 feet of any building, the blasts shall be covered with suitable weighted plank coverings or mats to confine all materials lifted by blasting. There shall be no blasting within 40 feet of the finished pipeline. The open end of the finished pipe line shall be closed and covered with earth to a depth 1 foot or greater before each blast. All charges shall be fired electrically. Erect suitable barricades and/or warning signs on all public thoroughfares leading to the site of blasting operations. Give adequate audible warning before each blast.

The Contractor shall repair any damages caused by rock excavation operations. The Contractor shall remove the excavated rock from the site unless otherwise directed by the Owner or Owner's Representative.

The following paragraphs define solid rock and loose rock excavation.

1. Solid rock shall be defined as large masses of igneous, metamorphic, or sedimentary rock that, in the opinion of the Owner or Owner's Representative, cannot be excavated without drilling, blasting, or the use of rippers or other specialized equipment. Any material excavated without the use of blasting or specialized ripping equipment shall not be considered solid rock.

   Solid rock excavation shall be measured in cubic yards from the top of the rock to a point 4-inches below the invert of the installed pipe and an assumed 24-inch trench width, regardless of the actual trench width and depth excavated. For structures, the rock shall be profiled at 12-inches outside the perimeter of the structure. The profile shall extend from the top of the rock down to the bottom of the rock to a maximum of 6-inches below the structure's footing. The rock volume shall be measured and computed by the Owner or Owner's Representative. The measurements shall be within the nearest 0.1-feet from the surface and no less than every 10-feet along the rock profile by one of the following methods:

   a. Excavating, ripping and exposing the rock profile for measurement, prior to any blasting. This shall be the responsibility of the Contractor and no additional payment shall be made for this excavation.

   b. Rock profile determined by drilling without excavating and measurements taken prior to any blasting.

   c. Rock profile measured after blasting and excavation. A 20% deduction shall be made in rock determination when this method is used to allow for expansion in ledge due to blasting.

2. Loose rock shall be defined as boulders and other detached stones each having a volume of one (1) cubic yard or more, but can be removed without drilling, blasting, or the use of a ripper or other specialized equipment. Loose rock shall be removed from the excavation in such a way that a clear distance of at least 4-inches exists between the rock and the bottom of the pipe, and 6-inches exist between the rock and the bottom of the structure. Loose rock shall not be used for backfill. Loose rock excavation shall be measured in cubic yards as the total volume of only those rocks or boulders that are individually over one (1) cubic yard in volume. The rock volume shall be confirmed with the Owner or Owner's Representative.

   A trench in which rock is encountered shall be excavated at least 4-inches deeper than the pipe invert and refilled to the required elevation with sand, gravel, or crushed rock passing a ¾-inch mesh screen. Bedding material shall extend upward at least 12-inches above the top of the pipe. Payment for this fill material shall be considered incidental to the rock excavation and no additional payment shall be made.

H. Structural Excavation: Excavation for structures (e.g., vaults, tanks, manholes, lift stations), shall extend a sufficient distance from walls and footings to provide for forming, except where concrete for walls or footings is authorized to be deposited directly against excavated surfaces. Care shall be taken to avoid

excavating below the depths indicated in the plans. Over-excavation shall be restored to proper elevation by filling with suitable granular bedding material at the Contractor's expense.

I. Removal of Nuisance Water: The Contractor shall remove and dispose of water entering the trenches and shall keep the trenches water free until the facilities are in place and sealed against the entrance of water. Use of a "trash" pump for removal of nuisance water shall be at no extra cost and shall not be considered dewatering. In no case shall water, earth, or any foreign materials be allowed to enter the water or sewer lines.

1. The removal of nuisance water is determined by pumping the water out of the trench with a heavy-duty 4 inch construction trash pump with a strainer for a minimum of 1 hour. The strainer shall be placed in a bed of pea gravel or a slotted PVC pipe in order to screen the debris.
2. All water removed from trenches shall be conveyed to natural drainage channels, storm sewers, or proper reservoirs as approved by the Owner or Owner's Representative. Such removal of water shall be in a manner that prevents property damage, erosion, or sedimentation.

TP - 01.09 DEWATERING:

The inclusion of a fee schedule item and estimated quantity for dewatering in the fee schedule indicates that dewatering is probable. However, the exclusion of this item from the bid schedule does not preclude the possibility that water will not be encountered, it merely indicates that it is not anticipated.

If continuous pumping with well points is required to maintain a satisfactory trench, and the Contractor is so directed by the Owner, this work shall be considered as dewatering. Well points shall be set separately for each trench being dewatered. Dewatering shall be based on the actual number of lineal feet of trench dewatered. Should dewatering not be included within the fee schedule, dewatering shall be paid for at the negotiated price between the Contractor and Owner.

TP - 01.10 SEPARATION OF WATER AND SEWER PIPELINES:

Water lines located near sewer facilities present conditions for potential cross contaminations. Protection from cross contamination can be provided by separation of the facilities and use of extra protection measures. For measuring separation, all measurements shall be the clearance between pipes and/or structures.

The angle of a water line and sewer line crossing shall be limited to between forty-five (45) degrees and ninety (90) degrees from parallel. Intersection angles of less than forty-five (45) degrees shall not be permitted.

Water lines and sewer lines shall not be constructed within a common trench.

For the purposes of this section, the term "lines" shall include mains, laterals, and service lines for both water and sewer.

A. Separation of Water and Gravity Sewer Lines: When water and sewer lines are laid parallel to each other, the horizontal distance between the water and sewer lines shall be at least 10 feet. Each line shall be laid in a separate trench.

When physical conditions, such as an existing obstruction, do not allow the required ten (10) foot horizontal separation, the water and sewer lines may be laid as close as five (5) feet if the bottom of the water line is at least 18 inches above the top of the sewer line.

If these requirements cannot be met, extra protection shall be required per section TP-01.10.F.

When water lines cross sewer lines, the water line shall be above the sewer line with no less than 18 inches vertical clearance.

Where a water line must cross under a sewer line, a 20 foot water pipe section shall be centered under the sewer line with a minimum vertical clearance of at least 18 inches between the bottom of the sewer line

and the top of the water line. New water and sewer lines being installed that are crossing, shall be arranged so that the pipe line joints of both the water and the sewer are equidistant and as far as possible for each line's joints.

If these requirements cannot be met, extra protection shall be required per section TP-01.10.F.

B. Separation of Water and Pressurized Sewer Lines: Water lines shall not be placed within ten (10) feet horizontal and within three (3) feet vertical above or below a pressurized sewer line.

Extra protection, as described in section TP-01.10.F, shall be required where a water line is placed within ten (10) feet horizontal and within three (3) feet vertical above a pressurized sewer line.

Extra protection, as described in section TP-01.10.F, shall be required where a water line is placed within ten (10) feet horizontal and any distance below a pressured sewer line.

C. Service Line Separation: Water and sewer services shall meet the horizontal separation requirements listed above, except where water and sewer services unavoidably must enter the building with less than 10 foot separation, the services shall diverge to achieve the required separation within 10 feet of the building wall. Water and sewer services crossing other service or mains shall meet the vertical separation requirements listed above.

If these requirements cannot be met, extra protection shall be required per section TP-01.10.F.

D. Water Main Separation from Sewer Manholes: No water pipe shall pass through, under, or come into contact with any part of a sewer manhole and shall be separated ten (10) horizontal feet from the closet edge of a sewer manhole.

If these requirements cannot be met, extra protection shall be required per section TP-01.10.F.

E. Separation between Water Lines and Components of the Sewage Disposal System: Water mains and water service lines shall meet the following minimum separation distances:

1. 10 feet to Sewer Manhole
2. 10 feet to Septic Tank
3. 25 feet to Septic Drainfield
4. 50 feet to Outhouse
5. 100 feet to Fence of Individual Lagoon
6. 500 feet to Fence of Community Lagoon

F. Extra Protection: When separation between water lines and sewer facilities cannot be accommodated, extra protection shall be required. Prior to the use of these extra protection measures, approval must be obtained in writing from the Owner.

New water lines that require extra protection from new sewer lines, shall have extra protection provided by using ductile iron pipe for one of the water or sewer lines. Lines of standard pipe length shall be centered at the point of crossing so that no joints exist within six (6) feet horizontal and only restrained or mechanical joints exist within 15 feet horizontal.

New water lines that require extra protection from existing sewer lines shall be constructed using the extra protection specified for new water lines, and the existing sewer line shall be encased in 6 inches around the circumference of the pipe of concrete for the horizontal distance of the line that requires extra protection but for a distance no less than ten (10) feet horizontal to ensure a water tight seal.

New water lines that require extra protection from existing sewer lines shall be constructed using the extra protection specified for new water lines, and the existing sewer line:

1. shall be reconstructed using a standard length of ductile iron pipe centered at the point of crossing so that no joints exist within six (6) feet horizontal and only restrained or mechanical joints exist within ten (10) feet horizontal, this shall include providing the necessary sewage by-pass means during construction as needed to prevent obstructing sewage flow in the existing line or.
2. shall be encased in 6 inches of concrete for the horizontal distance of the line that requires extra protection but for a distance no less than ten (10) feet horizontal.

Existing water lines that require extra protection from new sewer lines shall provide for extra protection by:

1. constructing the new sewer line and reconstructing the existing water line using ductile iron pipe for both lines with standard pipe lengths centered at the point of crossing so that no joints exist within six (6) feet horizontal and restrained or mechanical joints exist within ten (10) feet horizontal, or
2. encasement of both the existing water line and the new sewer line in six (6) inches of concrete for the horizontal distance of the lines that require extra protection but for a distance no less than ten (10) feet horizontal.
3. Extra protection for existing ductile iron water lines shall be met by the installation of restrained or mechanical joints on the existing water line within ten (10) feet horizontal of the crossing and either
    a) construction of new sewer line using a standard pipe length of ductile iron pipe centered at the point of crossing so that no joints exist within six (6) feet horizontal and restrained or mechanical joints exist within ten (10) feet horizontal, or
    b) encasement of the new sewer line in six (6) inches of concrete for the horizontal distance of the line that requires extra protection but for a distance no less than ten (10) feet horizontal.

Encasement of either the water lines or the sewer lines may be encased in a watertight carrier pipe that extends 10 feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be made of materials approved by the Owner or Owner's representative.

Installation of additional pipe or fittings or concrete for extra protection as required by the pipe alignment shown on the plans shall be incidental to the respective water or sewer line construction. Payment for unexpected utility crossings that require extra protection shall be negotiated between the Contractor and the Owner.

G. Polystyrene Insulation: Rigid extruded polystyrene insulation board shall have a minimum compressive strength of 25 psi. Width shall be 4-feet for mains 6-inch (nominal diameter) and larger and 2-feet for mains and service lines less than 6-inches (nominal diameter). Unless otherwise shown on the plans, the insulation board shall be installed 6-inches above the pipe and shall be a minimum of 2-inches thick.

TP - 01.11 BACKFILLING:

This section describes requirements for backfilling any excavation made to install buried pipeline, structure, or other item where structural fill is placed. It describes the material, placement, and compaction requirements.

A. Trenches and Pipes: Bedding and backfill materials to a depth of 12 inches above the pipe shall be carefully deposited in layers not more than six (6) inches thick (loose measurements), wetted to optimum moisture content, and hand or mechanically compacted. Fill used for this bedding and initial backfill shall meet the requirements set forth herein. The excavation material shall be placed in layers not to exceed 12 inches and compacted to the density specified in section TP-01.12 from 12 inches above the pipe to ground surface. Final backfill shall be left in a uniform, neat condition matching the surrounding grade.

B. Structures: Backfill materials shall be placed gradual and even to prevent tipping. Backfill shall be placed around structures with lifts not exceeding 12 inches and compacted to the density specified in TP-01.12. Backfill material shall meet the specifications identified herein. Generally, compact the fill in the same

manner as the standard trench procedure. Backfill compaction equipment should be suited for site conditions to avoid damage to installed structures.

Wherever trenches or surrounding structures have not been properly filled, or if settlement occurs, they shall be reopened to the depth required for proper compaction and refilled and re-compacted as specified and approved by the Owner or Owner's Representative at the Contractor's expense.

Compaction methods and equipment may utilize hand and mechanical tampers and rollers. The equipment and procedures proposed by the Contractor shall be appropriate for the respective soils and shall be subject to the approval of the Owner or Owner's Representative.

C. Materials: All backfill material shall be approved in advance of installation by the Owner or Owner's Representative. Materials shall be obtained from areas approved by the Owner or Owner's Representative.

Backfill material will not be paid for separately, but shall be considered as subsidiary to and a part of the cost for the applicable contract bid item.

1. Embedment: Embedment is that material from the bottom of the trench to 12 inches above the pipe, and includes the pipe bedding material (upon which pipe is placed), haunching material (extending from pipe bottom to pipe's vertical centerline), and initial backfill material (extending from pipe's vertical centerline to 12 inches above pipe). Native soil used for embedment must be free from clods of earth or stones larger than 3/4 inch in any dimension, organic refuse, debris, frozen soil, and other objectionable material. If native soil does not meet this criteria and cannot be screened to this criteria, the Contractor shall use imported material.

2. Imported Bedding Material: If required, special bedding material shall consist of sand, sandy gravel, or other suitable granular material having a maximum plasticity index of 6, with 100% of the bedding material smaller than 3/4 inches, and no more than 5% passing a No. 200 sieve. Contractor shall be responsible for the costs of any imported material.

3. Stabilization: Granular stabilization material shall be used to replace soft, spongy, or other unsuitable material, including rock encountered in excavation, to the depths necessary to support the pipe or structure. Stabilization materials shall be underlay bedding material (as applicable) and shall consist of suitable hard, durable granular material having a maximum size of 6-inches, graded so that a maximum of 20% passes a No. 4 sieve. Granular stabilization is not anticipated. If required, a price for granular stabilization shall be negotiated between the Contractor and the Owner.

4. Final Backfill: In general, final backfill will be that material originally excavated from the trench and will extend from 12 inches above the pipe to surface grade. Final backfill material shall be the same as that around the pipe except that the inclusion of a limited amount of stones up to 6 inches in diameter will be permitted.

D. Placement:

1. Embedment: Embedment shall be placed in 6-inch loose lifts and compacted as described herein. Care shall be taken to ensure that the pipe is not supported by the bells of the pipes.

   a) Bedding: Bedding is the fill material below the pipe. To remove stony soils, the Contractor shall excavate approximately 4 inches deeper than the required grade and bed the pipe with imported material. Bedding material is to be compacted to 90% of the maximum dry density as determined by the Standard Proctor density test (ASTM D-698).

      If over-excavation is required for removal of unsuitable native soils (weak structural soils), and bedding material is to be compacted to 95% of the maximum dry density as determined by the Standard Proctor density test (ASTM D-698).

b) Haunching: Haunching is the material from the bottom of the pipe to the vertical centerline of the pipe. The same material used for bedding the pipe shall be used for haunching. After the jointing is completed and the pipe has been approved by the Owner, the haunching material shall be placed by hand and worked under the pipe haunch to provide adequate side support for the pipe. The haunching shall be compacted to 85% of the maximum dry density as defined in TP Section 01.12. Placement and compaction of the haunching shall be achieved so as to avoid damage to or displacement of the pipe.

c) Initial Backfill: Initial backfill is the material from the vertical centerline line of the pipe to 12 inches above the top of the pipe. The same material used for bedding the pipe shall be used for the initial backfill. The initial backfill shall be compacted to the density as defined in section TP Section 01.12. The Contractor shall carefully place and compact the initial backfill in such a manner that damage to or displacement of the pipe does not occur.

2. Final Backfill: Final backfill shall not be placed until the embedment material is placed and compacted to the maximum dry density as defined in section TP-1.12, and the Owner or Owner's Representative have inspected and approved the installation. Final backfill shall be placed in lifts not to exceed 12-inches unless otherwise approved by the Owner or Owner's Representative. Compaction shall be as defined in Section 01.12.

3. Backfill for Road Subgrade: Under existing and proposed roadways, to a distance of 10-feet on either side of the road, bedding and backfill materials shall be carefully deposited in layers not more than 6-inches thick, loose measurements, wetted to optimum moisture content and mechanically compacted as described in the Compaction Requirements, Methods, and Testing section. If applicable, the Contractor shall comply with local, municipal, county, state, and federal highway authority's roadway subgrade standards.

   a) In areas where pavement is to be replaced, or in roads that are to be paved, remove cobbles that may interfere with subgrade preparation. This shall include the backfill within 12 inches of the finished subgrade elevation. The upper 12 inch layer, forming the subgrade for pavements, shall be compacted to a density of at least 95% (ASTM D-698 - Standard Proctor Test). See Section 11 of the Technical Provisions where this is required.

   b) Cement slurry can be substituted for compacted native backfill and subgrade if approved by Owner or Owner's Representative. The cement slurry shall meet the requirements for slurry as provided in TP 02 and shall be placed from the concrete truck at a slump of 6 to 8 inches. Steel plates 5/8 inch thick are to be placed over the trench with at least 6 inches overlap on each side and edged with asphalt to prevent traffic movement. The concrete slurry shall be allowed to set for a minimum of 12 hours before completing the asphalt patch. Slurry can typically be installed from the trench bottom to ground surface and no intermediary subgrade material is required for placement of asphalt patch.

4. Where trenches cross roads, streets, or driveways, backfilling shall be completed immediately following excavation and inspection. No trenches across roads shall remain open overnight. All crossings shall be backfilled, compacted and open to traffic at the end of each day's work. Major road crossings shall be excavated and backfilled in half widths of the traveled way so that at least one-half of the roadway is open to controlled traffic at all times during the work.

5. Backfill Around Structures: Backfill around structures shall conform to the same requirements as those for backfill around piping in unpaved areas, unless more stringent requirements are indicated in other sections of these specifications.

TP - 01.12 COMPACTION REQUIREMENTS, METHODS AND TESTING:

A. Minimum Density: Unless otherwise specified by applicable permits initial and final backfill and gravel resurfacing shall be compacted to the following minimum requirements. The minimum acceptable percent of compaction is the in place dry density divided by the reference density times 100. Compacted soil shall also be at plus or minus 2% of optimum moisture content. Contractor shall contact the operating utility prior to obtaining water from the public water system.

TYPE	LOCATION	REQUIRED COMPACTION
I	Under any existing or proposed pavement, curb, gutter, sidewalk, roadway, shoulder, alley, slab, footing, canal embankment, or when within 2 feet of the above.	95%
II	Within any gas, electric, or telephone utility easement, or within any street or road right-of way outside the limits defined above as Type I.	90%
III	All other locations not defined above as Type I or Type II.	85% (or 100% of adjacent natural ground)

B. Reference Densities/Baseline Testing: The Contractor, at his expense, shall provide the reference densities for the various bedding and backfill materials used. All tests shall be performed by a certified soils testing laboratory approved by the Owner or Owner's representative. If reference to natural ground is used, a nuclear gauge may be used to measure the density of the natural ground.

The reference densities for compaction tests shall be established in accordance with ASTM D-698, Standard Proctor Test. The Contractor shall submit for approval a testing plan identifying proposed testing locations prior to the start of any excavation work. Contractor shall provide copies of the Standard Proctor Tests with 3 point minimum moisture versus density curves.

The Contractor shall coordinate the collection of soil samples for proctor testing with the Owner or Owner's Representative such that both parties are on-site during the collection of soil samples. This will ensure that enough samples are collected to provide for accurate density testing during construction by providing reference density for differing soil conditions within the project area. Should a change in soil be encountered at any point of the installation, a new sample shall be taken and additional test shall be conducted.

C. Methods: Mechanical compaction is permitted. Water jetting methods are not permitted. The backfill shall be uniformly moistened to optimum moisture content, placed in sufficiently thin layers to obtain the specified results, and compacted with hand and/or pneumatic tamping rammers, vibrating plate compactors, sheepsfoot rollers, compaction wheels, hydrohammer, or other device(s) which will obtain the specified density for the particular soil type, without injury to the pipe or related structures.

D. Density Tests: Backfill density tests shall be performed in accordance with the latest versions of ASTM D-1556 (Sand Cone Method), ASTM D-2167 (Rubber Balloon Method), ASTM D-2216 (Moisture Content), ASTM D-2922 (Nuclear Density), and ASTM D-3017 (Nuclear Moisture Content). The Contractor will perform initial field density tests for each location listed in the next paragraph at the expense of the Contractor. Results of the test shall be provided to the Owner and approved prior to continuing. Any additional tests due to failure of initial tests shall be at the expense of the Contractor.

E. The Contractor will perform at least one (1) compaction test at each Type I or II location as defined in TP-1.12. Compaction tests shall be performed at a minimum of five hundred (500) linear feet of trench at Type II or III locations as defined in TP-1.12 and in accordance with the approved Contractor's testing plan as specified above in 01.12.B or as determined by the Owner. The exact test locations shall be

specified by the Owner's Representative. The Owner may request performance of additional tests at the Owner's expense.

If the results of any of the compaction tests indicate insufficient compaction, the area in question shall be reopened to a depth required for proper compacting, then refilled, compacted and retested, at the expense of the Contractor, until the compaction tests indicate that the necessary compaction requirements have been met. Two copies of the test results of any retesting performed by the Contractor shall be provided to the Owner, for his approval, prior to any permanent surfacing. Any improperly placed backfill, or locations where settlement occurs, shall be reopened to the depth required for proper compaction, then refilled and compacted at the expense of the Contractor. The surface shall be restored and resurfaced, if necessary to the required grade.

TP - 01.13 ROADWAY RESTORATION AND PATCHING:

Whenever existing roadways or driveways are disturbed during the normal course of construction, the Contractor shall restore the roads and driveways to their original condition. Surfacing shall be replaced where the roadway has gravel, concrete or asphaltic surfacing. The Contractor shall comply with the standards and construction requirements of the applicable local, municipal, county, state and federal highway authorities, as noted on the plans, special provision or exhibits/crossing permits in this contract. The Contractor shall observe all prescribed traffic safety regulations.

A. Repair of the road shall be complete with adequate subgrade compaction and acceptable restoration of the roadway surface, as specified herein. No scarring of pavement will be allowed from excavation equipment tracks, outrigger shoes or other stabilizers.

Gravel used in regraveling and road base shall be well graded and conform to the following:

SIEVE SIZE	% PASSING
1-1/4	100
#4	38-65
#8	25-60
#30	10-40
#200	3-12

B. All cuts in the pavement between pavement that is to remain and pavement that is to be removed shall be cut straight leaving a clean regular and vertical edge. This edge shall be protected throughout the work, or shall be re-cut before placing the final surfacing material. After the pipe is installed, compacted backfill shall be placed to within 9 to 12 inches of the level of the roadway surface, as applicable.

1. Reinforced Concrete Patch: Compacted aggregate base course, six inches in depth, shall be placed in the roadway immediately beneath the concrete patching. The cut shall be filled with a six inch thick reinforced concrete patch. Concrete shall meet the requirements of Section 02-Concrete. The reinforcement shall be #6 welded wire reinforcement mesh (6-inch by 6-inch). The concrete patch shall be a minimum of four feet wider than the top of the trench and centered over the trench. The Contractor shall notify the Owner at least 48 hours before concrete is poured to allow the Owner or Owner's Representative to inspect patch preparation.

2. Asphalt Patch: Compacted aggregate base course, six inches in depth, shall be placed in the roadway immediately below a bituminous wear course. Asphalt mix surfacing conforming to ASTM D-3515 (Hot-Mixed, Hot Laid Bituminous Paving Mixtures) shall be placed and compacted in accordance with the detail to make the crossing level with the existing roadway. Cold mix is not permitted as a permanent asphalt patch.
3. Regraveling: Where regraveling is required after crossing of the existing roads or driveways, the Contractor shall remove existing gravel surfacing, stockpile the material, and restore the road surface after installation of the pipe. The stockpiled material shall be used for backfilling to within two inches of finished level. The final two (2) inches of gravel surfacing shall conform to the requirements of gravel for re-graveling as listed above in TP 01.13.A. This material shall be placed only in the amount and at the locations designated by the Owner or Owner's Representative. All quantities shall be verified by the Owner or Owner's Representative during placement of the gravel.

TP - 01.14 DISPOSAL OF EXCESS MATERIAL:

Excess material, including rock, broken concrete, bituminous materials, debris, or other materials not suitable for backfill, shall be removed from the site and wasted in the disposal areas selected by the Contractor and approved by the Owner or Owner's Representative.

The disposal of such excess materials will not be paid for separately, but shall be considered as incidental to and a part of the cost for the applicable contract bid item.

TP - 01.15 CLEAN-UP:

Upon completion of the work, the entire site shall be cleared of all debris, and ground surfaces shall be finished to smooth, uniform slopes, and shall present neat and workmanlike appearance. All slopes shall be trimmed and dressed, and all surfaces graded such that effective drainage is assured. Unpaved streets shall be graded smooth to the satisfaction of the Owner or Owner's Representative.

TP - 01.16 TRENCH MAINTENANCE:

The Contractor shall, for a period of one year after completion and final acceptance of the work, maintain, and repair any trench settlement that may occur and shall make suitable repairs to any pipe, pavement, or other structures that may become damaged as a result of backfill settlement.

TP - 01.17 STORM WATER POLLUTION PREVENTION PLAN (SWPPP):

For surface disturbances greater than one (1) acre in size, the Contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the latest requirements of the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Large and Small Construction Activities. The SWPPP must be prepared in accordance with good engineering practices and must 1) Identify all potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site; 2) Describe practices to be used to reduce pollutants in storm water discharges from construction site; 3) Assure compliance with the terms and conditions of the NPDES General Permit.

If the Contractor is not experienced in the preparation of SWPPP, the Contractor shall retain the services of a sub-consultant regularly engaged in the preparation of SWPPP to perform said service. The completed SWPPP must be approved by the Owner or Owner's Representative at least 10 business days before the start of construction so that a Notice of Intent can be sent to EPA.

The Contractor shall fully implement the SWPPP from the commencement of construction until final stabilization, as defined in the NPDES General Permit is achieved.

The Contractor shall maintain and update the SWPPP, as required in the NPDES General Permit, during construction. Updates shall include amendments required as a result of the ineffective controls discovered through the course of inspections or investigations conducted by the Owner or Owner's Representative, site staff, or by local, state, tribal or federal officials. The Contractor shall submit a Notice of Intent to EPA to obtain permit coverage, modify the coverage as necessary, and terminate permit coverage once final stabilization is achieved.

TP - 01.18 LINES AND GRADES:

The Owner or Owner's Representative will give all lines, grades and building locations on the plans and will supply the Contractor with the AutoCAD drawing to stake out the facilities to be installed. The Contractor shall be responsible for staking out pipeline centerlines with a lath every 200 feet or line-of-sight whichever is less. Bends, alignment, intersections, manholes, lift station centers and fence corners shall be staked by the Contractor and provided with two offsets for alignment. Elevation references will be provided as shown on the plans, for sewer lines, lift stations, vaults, tanks, sewer manholes, and other facilities where elevations are critical to the performance of the system. The Contractor shall be responsible for the preservation of the location and line and grade stakes when set, and if disturbed, shall have such stakes replaced.

TP - 01.19 CLEARING AND GRUBBING:

It is the Contractor's responsibility to clear and grub the site prior to or during construction. The Contractor shall remove all trees along the water and sewer main alignments in accordance with Tribal and local regulations. Proper approvals must be obtained as necessary prior to removing and disposal of trees and vegetation. Trees may either be chipped with a wood-chipper and placed over the trench for erosion control or disposed of at the Contractor's expense. Clearing and grubbing shall be done at the Contractor's expense.

TP - 01.20 FINISH GRADING:

After the structures have been constructed and installed, all piping installed, all required compaction and density testing has been performed and all backfilling and embankments have been completed, areas on the site of the work shall be brought to the true grades. All slopes shall be trimmed and dressed, and all surfaces graded such that effective drainage is assured. Final grading shall prevent water runoff from pooling around installed facilities. The Contractor shall leave each project site in a neat and orderly condition, restoring it as near as possible to its original condition and to the approval of the Owner or Owner's Representative.

TP - 01.21 SEEDING:

All disturbed areas shall be returned to their pre-construction vegetative state. The Contractor shall submit a seed mix that is equivalent to state highway or local road authority's approved seed mix. The Contractor shall protect the seed after it is placed with a tackifier, hay mulch, straw mulch, wood cellulose mulch, or as approved by the Owner. A minimum of 20 pounds of seed per acre shall be placed. Seed shall be placed by either drill seeding at a depth of approximately one (1) inch or broadcast seeding. If broadcast seeding is utilized, the Contractor shall apply twice the minimum seeding rate (i.e. 40 pounds of seed per acre). The Contractor shall perform maintenance as needed to ensure that adequate vegetative growth and stabilization has taken place to minimize erosion after construction is completed.

TP - 01.22 RECORD DRAWINGS:

The Contractor shall be responsible for keeping accurate records of all installed items under sections of the Technical Provisions package. These records shall indicate revised changes ("red-lines") of the construction drawings in sufficient detail to be accepted by the Owner or Owner's Representative for record drawings. Sufficient detail under this contract means that the Contractor shall take accurate measurements and record them on the drawings to provide the minimum information of at least two swing ties and distances to permanent objects. These permanent objects shall include but not be limited to all: valves, pressure reducing valves, air and vacuum valves, meters, curb stops, hydrants, connections to other lines, bends, marker posts, manholes, fence corners,

inspection ports, water and sewer tapping points, cleanouts, septic tank access covers, drainfield extents, intersection with other utilities, connection to existing utilities or home, roadway crossing locations, abandoned facilities, and depths of noted facilities; the beginning and end of any stabilization material placed; the beginning, end, and depth of rock encountered; the beginning, end, and depth of any encasement installed; and the location and depth of any each utility encountered. Further information on record drawings may be contained in the Supplementary Conditions.

The recording of the as-built information is considered an integral part of the progress of this construction and shall be reviewed with the Owner and Owner's Representative in determining progress under this contract. Record drawings shall be submitted by the Final Inspection and before final payment can be made.

TP - 01.23 MEASUREMENT AND PAYMENT:

Except for the following items, the cost of all work done by the Contractor as required under Section 01 of the Technical Provisions shall be merged with the pay items defined within the Measurement and Payment portions of other Technical Provisions of this contract.

A. Solid Rock Excavation: Payment for rock excavation shall be at the unit price listed in the Bid Schedule based on the computed number of cubic yards removed. Separate payments will be made between solid and loose rock excavations.

B. Loose Rock Excavation: Payment for loose rock excavation shall be at the unit price listed in the Bid Schedule based on the computed number of cubic yards removed. Separate payments will be made between solid and loose rock excavations.

C. Imported Bedding Material: If imported bedding material is required as fill to replace stony soil (stones less than 1 cy), it shall be considered incidental to pipe installation and no separate payment shall be made. If imported bedding material is required to replace unsuitable native material (weak structural properties), payment shall be at the unit price shown on the Bid Schedule based on the volume of compacted bedded material as computed by the Owner or Owner's Representative. Payment shall include the necessary over-excavation and the furnishing, installing, grading and compaction of the bedding. No payment shall be made for any imported material not approved by the Owner.

D. Dewatering: Dewatering shall be based on the actual number of lineal feet completed. Payment for dewatering shall be at the contract unit price shown in the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete dewatering installation.

E. Mobilization/Demobilization: Payment for mobilization/demobilization shall be at the unit price listed in the Bid Schedule. 60% of this line item may be requested upon complete mobilization to the job site and the remaining 40% may be requested upon demobilization from the job site.

F. Storm Water Pollution Prevention Plan: Payment for the preparation and implementation of the SWPPP shall be paid on a lump sum basis as shown on the Bid Schedule. Payment shall be full compensation for plan preparation including required revisions for Owner's acceptance, updates to the SWPPP during construction, permit application, inspections, installation and maintenance of controls, modification of controls as determined by inspections, removal of pollutants due to failed controls, and permit termination.

G. Seeding: Seeding shall be paid for on a lump sum basis to seed the site in accordance with these specifications. Payment for seeding shall be at the contract unit price shown in the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for complete installation.

H. Exploratory Time: Exploratory time shall be measured on an hourly basis for an actual period spent on locating the existing utility line exceeding two (2) hours. Contractor shall follow these steps:

1. Call the representative from the operating utility and make every effort to locate the existing utility line prior to excavation.
2. Locate the existing utility line for two hours at the Contractor's expense.
3. If the Contractor is unable to locate the existing utility line within two hours, the Contractor shall notify the Owner or Owner's Representative and both agree upon a start time. The start time shall be recorded. When the Contractor locates the existing utility line, the end time shall be recorded.

If the Contractor fails to notify the Owner or Owner's Representative when the Contractor will start locating the existing utility line, the Contractor will not be compensated. Payment for exploratory time shall be at the contract unit price shown in the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for locating the existing utility line.

I. Record Drawings: The record drawings shall be submitted with or prior to submitting the final invoice and shall be reviewed and approved prior to making the final payment. Payment for this item shall be merged into the other pay items.

SUBMITTAL REVIEW FORM
SECTION 01 - TRENCH EXCAVATION & BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES

	DATE	INITIALS		
			Submittal No.	
Received by ENGINEER:			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
1.02	Trench Safety Plan, including certified competent person		
1.03	Traffic Control Plan and Right of Way Permit		
1.07	Warning Tape		
1.07	Tracer Wire, Tracer Wire Access Points, and Tracer Wire Splice Kit		
1.07	Utility Line Marker		
1.07	Bollard		
1.07	Metal Marker Post and Stampable Cap		
1.08	Rock excavation methods (Solid and Loose)		
1.08	Blasting License, Credentials and Permits		
1.09	Dewatering procedures		
1.10	Extra Protection (Water Line or Sewer Line)		
1.11	Embedment and Bedding Material		
1.11	Stabilization Material		

1.11	Cement Slurry		
1.12	Soil Testing Lab		
1.12	Standard Proctor Test		
1.12	Density Testing Location Plan		
1.12	Density Test Results		
1.13	Gravel		
1.13	Pavement Patch Mix		
1.17	SWPPP		
1.18	Stake Out Plan, Survey Sub-Contractor		
1.20	Seed, Seeding Method, and Seeding Protection		

Approval:

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 02 - CAST-IN-PLACE CONCRETE

TP - 02.01 SCOPE:

Furnish all labor, materials, equipment, and incidentals as required, and perform all operations in connection with the placement of concrete in accordance with the applicable drawings and these specifications.

TP - 02.02 MATERIALS:

A. Cement: Portland cement shall conform to ASTM C150 Cement, Portland Type I, Type IA, Type II, Type IIA, Type III, or Type IIIA.

B. Concrete: Ready Mix Concrete shall conform to ASTM C94.

C. Aggregate: Aggregate shall be composed of clean, hard, durable, uncoated grains and crushed stone, free from detrimental amounts of clay, dust, soft or flaky particles, loam, shale, schist, slate, alkali, disintegrated stone, organic matter or other deleterious matter. The aggregates shall conform to ASTM C33.

D. Water: All water used for concrete shall be of potable quality.

E. Grading: Exposed horizontal surfaces shall slope approximately 1/8 inch per linear foot downward in all directions from the center.

TP - 02.03 CONCRETE REQUIREMENTS:

Property	**Unit**	**Minimum**	**Maximum**
Cement Factor	(sacks per cu. yd.)	6.0	---
Water-Cement Ratio	(gal. per sack)	---	6.0
Entrained Air	(percent)	4.0	6.0
Slump	(inches)	1.0	4.0
	Compressive Strength		
7 day	(psi)	1,800	
28 day	(psi)	3,000	

Concrete shall be uniformly plastic, cohesive and workable, i.e., can be placed without honeycomb and without voids in the surface. Workability shall be obtained without producing a separation of ingredients. Free water shall not appear on the surface. In general, a minimum amount of water required to produce a workable mixture shall be used.

TP - 02.04 WEATHER:

A. Freezing: No concrete work shall be done if the air temperature is below 40°F, except with the approval of the Owner or Owner's Representative. If approval is given to work, the water and aggregate shall be heated to at least 80°F before mixing. In all cases where the air temperature is predicted to be below 40°F, the concrete shall be insulated for at least 72-hours by insulating blankets, batt insulation with moisture proof covering, layers of dry porous material such as straw, hay, or multiple layers of impervious paper meeting ASTM C 171. No concrete shall be poured against frozen ground. The use of salt or other

compounds to prevent concrete from freezing shall not be permitted. Any work that has been injured by freezing shall be removed and replaced at the Contractor's expense.

B. Ambient Temperature Above 80 °F: The concrete temperature shall not exceed 95 °F, unless appropriate and approved admixtures are provided in the concrete mix. Concrete placement and finishing shall be completed as quickly as conditions permit. The concrete shall be protected against thermal shrinkage cracking due to rapid drops in concrete temperature greater than 40 °F during the first 24 hours. Acceptable protection materials to prevent these drops include: insulating blankets, batt insulation with moisture proof covering, layers of dry porous material such as straw, hay, or multiple layers of impervious paper meeting ASTM C 171. These materials shall not be applied until the concrete surface temperature has become steady or is beginning to decline.

TP - 02.05 CURING:

Fresh concrete shall be adequately protected from heavy rains and mechanical injury. All concrete shall be kept moist and protected from rapid drying or freezing for at least seven days. Concrete surfaces shall be kept moist by spraying with liquid membrane coating. Foundations and thrust blocks may be cured by covering with water saturated soil or backfill. All concrete shall be cured at least 72 hours prior to stripping forms or structural loading. Horizontal surfaces shall be covered with burlap as quickly as it can be safely applied, and then saturated by sprinkling. After 24-hours, burlap may be removed and water applied directly to the concrete surfaces. Suitable plastic covering may be substituted if no detrimental effects occur.

TP - 02.06 TRANSIT MIXED CONCRETE:

Ready-mixed concrete from a central batching plant and mixed in transit will be permitted with the Owner or Owner's Representative's approval. A time stamped plant batch certification sheet shall be provided by the concrete supplier listing the batch components for approval by the Owner or Owner's Representative.

TP - 02.07 FIELD TESTING:

Four test-cylinders shall be taken for each 50 cubic yards of concrete placed or portion thereof. If the Owner or Owner's Representative suspects, by visual inspection, slump, or other tests, that any other concrete appears substandard, additional test cylinders shall be required. The Contractor shall provide cylinder molds at the construction site and shall have the cylinders tested by an approved laboratory, with the Contractor bearing all costs. If any test cylinder falls below 3,000 psi at 28 days, this shall be sufficient cause to reject that portion of concrete. The Contractor shall remove and replace defective concrete with acceptable material at his own expense. The test cylinders shall comply with ASTM C31 for making and curing test specimens in the field.

The Contractor shall also perform one slump test and one air entrainment test for each ready-mixed concrete batch from a truck.

Field testing will not be required for non-structural concrete placement such as pre-cast manhole bases, concrete collars, yard hydrant concrete pads, fence post concrete anchors, monitoring well concrete pads, control panel concrete pads, cleanout collars, manhole collars, and drop manhole concrete encasements.

TP - 02.08 PLACING CONCRETE:

Before placing concrete, the Contractor shall provide 72-hour advance notice to permit proper inspection of forms and reinforcement by the Owner or Owner's Representative.

After completion of mixing, the concrete shall be rapidly conveyed to and deposited in the forms. Consolidate the concrete immediately after placing by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

Concrete shall not be placed against surfaces of absorbent material that are dry and concrete shall not be placed against surfaces that have free water. The concrete shall be placed in such a manner as to prevent excessive crawling and segregation of the aggregate. No concrete shall be used that has partially set before final placing, nor shall retempering of the concrete be permitted. All concrete shall be placed in the forms no more than 90-minutes after mixing.

TP - 02.09 FORMS:

The Contractor shall provide forms that will produce correctly aligned concrete. The centering of the forms shall be true and rigid and thoroughly braced both horizontally and diagonally. Forms shall be sufficiently strong to carry the dead weight of the concrete as a liquid without deflection, and tight enough to prevent leakage of mortar. The inside of forms shall be coated with an approved oil or thoroughly wetted. The Owner or Owner's Representative shall be notified prior to removal of form work.

The final concrete structure shall be inspected for alignment, elevation, and concrete quality. Final concrete structure alignment and elevation shall be checked by use of land surveying instruments.

Should the concrete structure alignment, elevation, and/or quality test results be determined unsatisfactory by the Owner or Owner's Representative, the entire structure or parts of the structure will be rejected. All further alignment or elevation corrections, or any concrete removal and/or replacement, shall be at the Contractor's expense.

Honeycombed and void areas in the concrete shall be removed and patched to produce a sound concrete product by a method selected by the Contractor and approved by the Owner or Owner's Representative.

TP - 02.10 MORTAR:

Mortar shall be made of one part masonry cement, three parts sand, and only a sufficient amount of water to make a workable plastic mix. Retempered mortar shall not be used.

TP - 02.11 GROUT:

Surface aesthethic grout with non-structural or adhesive properties shall be made of one part Portland cement, two parts sand, and only a sufficient amount of water to make a workable plastic mix. Re-tempered grout shall not be used.

TP - 02.12 SLURRY:

Concrete slurry used for road crossings shall meet the requirements of the Federal Highway Administration FP-14 Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, Section 614 Lean Concrete Backfill.

TP - 02.13 MEASUREMENT AND PAYMENT:

Concrete and other work or materials required by this section shall not be measured and paid separately. Rather, they shall be included in the unit or lump sum bid prices of those items shown on the Bid Schedule that require the inclusion of such materials or work, even if not specifically mentioned within the measurement and payment sections of those particular pay items.

SUBMITTAL REVIEW FORM

SECTION 02 – CAST-IN-PLACE CONCRETE

	DATE	INITIALS	Submittal No.	
Received by ENGINEER:			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No. Manufacturer, etc.)	Action by Owner
2.04	Concrete Protection		
2.05	Concrete Compound		
2.06	Concrete Mix		
2.07	Concrete Testing Laboratory		
2.07	Strength, Slump, & Air Test Results		

	Signature	Date:
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 03 - REINFORCING STEEL

TP - 03.01 SCOPE:

Furnish all labor, materials, equipment and incidentals as required, and perform all operations in connection with the placement of reinforcing steel and wire fabric reinforcing, complete, in strict accordance with the applicable drawings and these specifications

TP - 03.02 MATERIAL:

Reinforcing bars shall meet the requirements of the Standard Specifications for Billet-Steel Bar (intermediate grade) for Concrete Reinforcement, ASTM A615. Welded wire mesh shall meet the requirements of the Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement, ASTM A185. The bars and wire mesh shall be placed in accordance with the approved shop drawings. Any excess rust or scale shall be removed by wire brushing prior to concrete placement. The use of cold twisted bars will not be permitted. Wire fabric shall be used only when specified and shall be the type shown on the drawings and approved by the Owner or Owner's Representative.

Tie wire size is shown in the plans and shall conform to ASTM A1064.

TP - 03.03 METHOD OF CONSTRUCTION:

All reinforcement shall be free from dirt, oil, paint, grease, mill scale and loose or thick rust. When bending is required, it shall be accurately done without the use of heat, and bars having cracks or splits at the bends shall be rejected. All reinforcement shall be placed in the exact position shown on the drawings, and shall be securely held in position by wiring to and blocking from the forms, and by wiring together at intersections, such that it will not be displaced during depositing and compacting of concrete. Precast concrete blocks, concrete masonry units, or metal chairs shall be used for supports where applicable. Rock supports will not be allowed.

Placing and fastening of reinforcement in each section of the work shall be approved by the Owner or Owner's Representative before any concrete is deposited in the section. All joints or splices shall be made by using approved clamps, welding or by lapping the ends of the bars a distance of at least 40 times their nominal diameters unless otherwise noted on the plans. Lap adjoining wire mesh by no less than one full mesh and lace securely with wire.

Cutting and bending, placement, welding, handling and storage, and installation of reinforcement shall be in accordance with applicable American Concrete Institution (ACI), American National Standards Institute (ANSI), and Concrete Reinforcing Steel Institute (CRSI) standards.

TP - 03.04 MEASUREMENT AND PAYMENT:

Reinforcing steel shall not be measured and paid separately. Rather they shall be included in the unit or lump sum bid prices of those items shown on the Bid Schedule that require the inclusion of reinforcing steel, even if not specifically mentioned within the measurement and payment sections of those particular pay items.

SUBMITTAL REVIEW FORM, SECTION 03 – REINFORCING STEEL

	Date	Initials		
			Submittal No.	
Received by ENGINEER:			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
3.02	ASTM chemical & physical test certificates		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 04 - WATER TRANSMISSION AND DISTRIBUTION MAIN

TP - 04.01 SCOPE:

The work covered by this Section consists of furnishing all labor, equipment and materials in connection with the construction of water mains, including piping, valves, hydrants, other appurtenances and connection of the water mains to the structures for community water systems, all installed in strict accordance with the plans and technical provisions.

TP - 04.02 GENERAL:

The waterlines shall be constructed in the locations and of the sizes, materials and pressure class shown on the plans, or as directed by the Owner or Owner's Representative. All permits, permissions or other authorizations required by the tribal or municipal utility authority for tapping and connection are the responsibility and cost of the Contractor. Excavation, trenching, backfilling, compaction and any needed dewatering shall be in accordance with Section 01 of these Technical Provisions. Staking, utility locates and existing system abandonment shall be conducted in accordance with Section 01 of these Technical Provisions.

Pipe joints, fitting and appurtenance installation shall be in accordance with the manufacturer's recommendations. All pipes and joints shall be approved by the Owner or Owner's Representative prior to backfilling. The work will not be accepted until satisfactory backfilling, compaction, testing and cleanup is complete. Final grading should prevent surface water runoff from pooling around installed facilities. If the work does not meet the specified requirements of this Section, the Contractor shall remove and replace and re-test, as necessary, at the Contractor's expense. The Contractor shall leave each premise in a neat and orderly condition, restoring it as near as possible to its original condition and to the approval of the Owner or Owners' Representative.

TP - 04.03 MATERIALS:

Materials shall be inspected to verify that they meet these specifications and match the approved submittals. Materials not meeting these requirements shall not be permitted to be installed. Install all materials and equipment in strict accordance with the manufacturer's recommendations, applicable codes and regulations, and these specifications.

The unloading, handling, and storage of the pipe and materials shall be conducted in a safe manner. Handle pipe with padding between metal machinery and pipe. Keep dirt and foreign material away from pipe interiors and sealing surfaces. Lower pipe carefully into the trench without dropping, rolling or dumping the pipe.

A. General: Inspect all materials prior to installation to ensure that they are in new condition. Ensure that pipe, fittings and materials are free from defects and damage at the time of delivery and prior to installation in the trench. Plastic pipe with scratches, gouges, or grooves deeper than 10% of the wall thickness or ultraviolet discoloration shall be rejected. Remove all materials from site that are defective, damaged, used, unsound, or that otherwise do not meet the specifications within 24-hours of discovery.

B. Pipe: All pipe shall be listed under the National Sanitation Foundation (NSF) Part 61. The standard pipe length shall be 20 feet. Each length of pipe shall be clearly marked with the following: Manufacturer, Nominal Pipe Size, PVC Cell Classification, Type PSM PVC Sewer Pipe, ASTM Designation and Pipe Class.

1. Polyvinyl Chloride Pipe (PVC): PVC pipe shall meet the requirements of NSF 14.

a) PVC Pipe and Fittings (2-inch): PVC pipe shall be SDR 21 (200 psi). Each joint of pipe shall carry the NSF seal of approval for pipes for potable water. Pipe shall conform to ASTM D2241 and ASTM D1784. Fittings shall be 2-inch SDR-21 gasketed fittings with the PVC material

conforming to ASTM D1784, NSF 14, joints conforming to ASTM D3139, and gaskets (elastomeric seals) conforming to ASTM F477.

b) PVC Pipe and Fittings (4-inch to12-inch): PVC pipe and joints shall conform to the requirements of ANSI/AWWA C900 DR 18 or C909 DR18 pressure class 235 (minimum), Standard for Polyvinyl Chloride (PVC) Pressure Pipe, with gaskets meeting ASTM F477 joints conforming to ASTM D3139, and gaskets (elastomeric seals) conforming to ASTM F477 or as otherwise defined on the Bid Schedule.

c) PVC Pipe and Fittings (14-inch and larger): All 14-inch and larger PVC pipe shall conform to the requirements of AWWA C905 with gaskets meeting ASTM F477 and joints in compliance with ASTM D3139 and gaskets conforming to ASTM F477.

2. Ductile Iron Pipe (DIP): All ductile iron pipe shall be manufactured in accordance with the requirements of ANSI/AWWA C151/A21.51 for centrifugally cast ductile iron pipe. Pipe shall be manufactured in accordance with ANSI/AWWA C111/A21.11 for rubber gasket joints for ductile iron pressure pipe and fittings.

a) Pipe thickness shall meet the requirements of ANSI/AWWA C150/A21.50 for thickness design of ductile iron pipe.

b) Pipe shall be cement mortar lined and seal coated meeting the requirements of ANSI/AWWA C102/A21.4 for cement mortar lining for ductile iron pipe and fittings for water.

c) Pipe shall have push-on joints, unless otherwise indicated on the plans or in the Bid Schedule.

3. High Density Polyethylene Pipe (HDPE): All HDPE used in constructing the water main shall conform to Section 28 of these Technical Provisions.

C. Ductile Iron Fittings: Ductile iron fittings shall meet ASTM A536, 350 psi pressure rating for 2-inch to 24-inch diameter fittings in accordance with ANSI/AWWA C153/A21.53. Ductile and gray iron fittings shall conform to AWWA C110 and AWWA C111. Refer to manufacturer's recommendations for allowable deflection of fittings.

Flanged ends on fittings shall meet ANSI/AWWA C115/A21.15 and ANSI B16.1 class 125 flanges. Fittings shall be cement mortar lined in accordance with ANSI/AWWA C104/A21.4 or shall be epoxy lined. Fittings shall be coated with an asphaltic seal coat on the outside only in accordance with ANSI/AWWA C153 and C104/A21.4 and referenced in ANSI/AWWA C153/A21.53. Gaskets shall be styrene butadiene rubber (SBR) meeting ANSI/AWWA C111/A21.11. Fittings shall have t-bolts and nuts manufactured of low alloy steel meeting ANSI/AWWA C111/A21.11 and ASTM A307. Fittings shall be listed under the National Sanitation Foundation (NSF) Part 61.

D. Mechanical Joint Restraints:

1. General: Mechanical joint restraints shall be manufactured of DI in accordance with ASTM A536 with the following additional requirements or exceptions. Joint restraint thrust bolts and nuts shall be ¾" low alloy (mild) steel. Mechanical joint restraints shall be incorporated into the design of a follower gland. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts in accordance with AWWA C111 and C153. A fully restrained joint shall have the same working pressure rating as the pipe itself.

2. Design: The restraint mechanism shall consist of numerous individually activated gripping surfaces to maximize restraint capability. The gripping surfaces shall be wedges that are designed to spread the bearing surfaces on the pipe. Twist-off nuts, sized the same as tee-head bolts, shall be used to ensure the proper actuating of restraining devices. When the nut is sheared off, a standard hex nut shall remain.

3. Pressure Rating: The mechanical joint restraint device shall be as listed below:

Type of Pipe	Sizes (Inches)	PSI	Safety Factor
DI	3 to 16	350	2
	20 to 36	250	2
PVC	Various	Equal to that of the pipe being used	2

4. Acceptable Models and Manufacturers:

Mechanical Joint Restraint – PVC Pipe		
Manufacturers	**Models**	**Sizes (Inches)**
EBAA Iron, Inc.	Megalug 2000 PV Series	4 to 20
Sigma Corporation	One-Lok SLCE Series	4 to 20
Star Pipe Products	StarGrip 4000 Series	4 to 20

Mechanical Joint Restraint – DI Pipe		
Manufacturers	**Models**	**Sizes (Inches)**
EBAA Iron, Inc.	Megalug 1100 Series	3 to 24
Romac Industries	RomaGrip	3 to 24
Sigma Corporation	One-Lok SLDE Series	3 to 12
Star Pipe Products	StarGrip 3000 Series	3 to 24
Uni-Flange (Ford)	UFR 1400 Series	3 to 24

Bell-Spigot Restraint – PVC Pipe		
Manufacturers	**Models**	**Sizes (Inches)**
EBAA Iron, Inc.	Series 1500 TD	4 to 12
	Series 1500	4 to 12
Ford Meter Box	Ford 1390	4 to 12
Star	Series 1100	4 to 12

Bell-Spigot Restraint – DI Pipe		
Manufacturers	**Models**	**Sizes (Inches)**
American	Fastgrip Gasket	4 to 16
EBAA Iron, Inc.	Megalug 1700 Series	3 to 20
	Series 1500 TD	4 to 12
Star Pipe Products	StarGrip 3100P Series	3 to 20
U.S. Pipe	Field Lok Gasket	4 to 16

Bolt-Through Mechanical Joint Restraint
Foster Adaptor

Hydrants and Valve Restraint – DI Pipe
Mueller Aquagrip Restraint Device

E. Gate Valves: Gate valves shall conform to the latest revision requirements of AWWA C509 or C515 for resilient-seated gate valves. All valves shall be equal to the AVK Series 25 or 65 or the American Flow Control Series 2500, or approved equal.

1. General:

   a) Gate valves shall be of cast iron or ductile iron body construction, bronze mounted, solid wedge, resilient seal, with a 2-inch square stem-operating nut, 200 psi operating pressure or higher, counterclockwise opening, inside screw, with O-ring seals.

   b) The Contractor shall provide to the Owner, at no additional cost, one gate valve wrench 6 foot long with "T" handle.

   c) Mechanical restraint joints shall be used unless otherwise indicated.

   d) When a valve is required near a fitting, such as a tee, the valve shall be secured with mechanical joint restraints to the fitting.

2. Markings: The name, monogram or initials of the manufacturer shall be legibly cast on the valve body. The make of valves furnished shall be easily identifiable by catalog numbers.

3. Valve Stems: All valves shall be furnished with valve stems made from 300 or 400 series stainless steel and shall be non-rising stems (NRS).

4. Lining: All interior ferrous surfaces exposed to fluid flow shall be epoxy coated to a minimum dry film thickness of 6 mils. Epoxy linings shall be factory applied by an electrostatic or thermosetting process in accordance with the manufacturer's printed instructions. The epoxy materials used shall be 100% powder epoxy or liquid epoxy that conforms to the requirements of AWWA C-550.

5. Coating: All exterior ferrous surfaces, except finished or bearing surfaces, shall be factory coated with two coats of asphaltic varnish conforming to Federal Specifications TT-V-51c, or shall be epoxy coated as required above for interior surfaces.

F. Gate Valve Boxes: All gate valves shall be provided with a $5^{1}/_{4}$-inch inner-diameter shaft, 2-piece sliding extension type cast iron valve box. The gate valve box shall be Tyler Union 6855 Domestic Heavy Duty, or approved equal.

1. General:

   a) All boxes shall extend from the body of the valve to the finished grade.

   b) The vertical column of the box shall be designed so that the top section may be adjusted while in position.

   c) The cast iron lid shall be 5-1/4" Domestic Heavy Duty Drop Lid with a pentagon nut and the word "WATER" cast on the lid.

   d) For the concrete collar, the concrete shall conform to Section 02 of the Technical Provisions and the reinforcing steel shall conform to Section 03 of the Technical Provisions.

2. Extension stems: When the valve operating nut is more than four feet below the top of the valve box, stainless steel extension stems equal to TROY VALVE Stainless Steel Valve Extension Stems shall be provided. The top of the extension shall be 3 ½ to 4 feet below the top of the valve box.

3. Debris Cap:

   a) Each valve box shall have a debris cap designed to prevent debris such as dirt and sand from passing around the cap and down into the valve housing and installed just below the valve cover.

   b) The cap shall be held in place by a mechanism which will not damage the valve housing.

   c) The cap must withstand, without slippage, a minimum vertical force of 50 pounds at a loading rate of 1 inch/minute.

   d) The debris cap and bottom of valve cover shall be separated by a minimum of 1 inch and not to exceed 2 inches.

   e) The cap shall be manufactured with corrosive-resistant material and fit the valve box's 5¼" diameter shaft. Caps shall be debris cap model number DC455 or DC457 manufactured by SW Services, LLC or approved equal. The debris cap shall be installed according to the manufacturer's recommendations.

G. Combination Air Valve: The valve shall have the features of both an air release and an air/vacuum release valve. The valve shall have either a single or dual body with a large orifice. The valve shall be an ARI D-040, or approved equal.

1. General:

   a) Size range of the valve shall be from 1-inch to 2-inch, or as specified on the design plans.

   b) The body and all operating parts shall be made of high strength corrosion-resistant materials.

   c) Working pressure shall be a minimum of 250 psi.

   d) The valve shall have the ability to automatically release small pockets of air during normal operation.

   e) The valve shall have the ability to automatically discharge or admit large volumes of air during filling and draining.

   f) Utility marker shall conform to Section 01 of the Technical Provisions.

   g) Concrete shall conform to Section 02 of the Technical Provisions and reinforcing steel shall conform to Section 03 of the Technical Provisions.

2. ARV Vault:

   a) Diameter of the vault shall be 48-inches or as shown on the design plans.

   b) Vault shall be composed of precast reinforced manhole barrel sections and shall have a 28-day compressive strength of at least 3,000 psi.

   c) Minimum height of sections shall be 24 inches. If two or more manhole sections are used to construct the vault, the joints between precast manhole sections shall be sealed with Ram Nek bituminous rope type sealer, or equal.

   d) The sections shall be grouted to a smooth finish on the interior and exterior of the manhole.

   e) Grout for jointing shall be as specified in Section 02 of the Technical Provisions.

   f) All connections between pipe and manhole walls shall be sealed with non-shrinking grout.

g) The depth of the vault from interior floor to the underside of the access hatch shall not exceed 48 inches.

h) If depicted on the plans, the drain pipe shall be 4-inch SDR 35 pipe. The pipe material shall transition to 4-inch DI pipe at the outlet end (10-foot minimum length) and where bury depth is less than 1-foot. Install #8 steel mesh at outlet end anchored with a 4-inch DI flange adapter and 4-inch DI rectangular accessory bolt pack kit.

3. Vault Concrete Collar and Vault Lid:

a) Concrete collar shall be reinforced with #4 steel hoops centered horizontally and vertically.

b) Vault lid (access hatch cover) shall be a Halliday Series R1R Model R1R48, or approved equal.

c) Opening of the lid shall be over the larger area of the vault as shown on the detail.

d) The frame edge for the vault lid shall be coated with bituminous coating where in contact with the concrete vault for proper sealing.

e) Four (4) stainless steel lag-bolts with a minimum bolt diameter of 3/8-inch shall be used to mount the frame to the inside wall of the vault. An appropriate concrete anchoring system such as expanding lead lag-shields shall be used. The bolts shall be installed in an equally spaced, four quadrant pattern as shown on the plans or directed by the Owner's Representative.

f) The underside of the lid shall be insulated in cold climates, as shown on the design plans or directed by the Owner or Owner's Representative. The insulation can be field installed or can be factory installed by the manufacturer. Field installed insulation shall be completed using 2-inch polystyrene insulation board with appropriate compatible adhesive or an approved securing mechanism, as directed by the Owner's Representative.

4. ARV Inlet (Riser) and Outlet (Discharge) Piping:

a) Material of the inlet and outlet pipe shall be rigid and non-corrodible. Joining of dissimilar metals should be avoided. If approved by the Owner and show in the plans, dielectric unions may be installed, if dissimilar metals are used. The material of the inlet and outlet pipe shall be as specified on the design plans and detail drawings.

b) The pipe material from the tee/saddle or compression fitting elbow at the bottom of the vault, to the Schedule 80 PVC union shall be brass. The pipe material from the Schedule 80 PVC union to the outlet end of the gooseneck shall be galvanized steel. For the Horizontal Offset Option, the pipe material from the water main to the bottom compression fitting elbow in the vault shall be PE 4710. Appropriate reducers shall be used for the outlet or inlet of the ARV piping, as shown on the design plans and detail drawings.

c) No pipe, valve or fitting on the inlet or outlet line shall be smaller than the ARV inlet or outlet.

d) The stabilizing bracket for the riser piping shall be a Unistrut P1381 Angular Fitting, Unistrut P1000 1 5/8" Solid Channel and Unistrut Cush-A-Clamp, or approved equal.

e) Full port true union type ball valve and fittings shall match the material and size of the riser pipe.

f) Sample tap shall be non-threaded cross wheel style, NSF 61 approved. The Contractor shall provide a valve operating stem key for the sample tap to the operating utility.

g) The above grade outlet of the discharge line (air relief line) shall be a screened return bend as shown on the detail drawing. The screen shall be #24 mesh non-corrodible copper, bronze, or brass.

h) When the ARV is located directly above the water main connection, the connection shall be made with either a tee or a tapping saddle. The tee and reducer shall meet the requirements of TP 04.03.C. The saddle and corporation stop shall be meet the requirements of TP-05.

i) When the ARV is offset from the water main connection, the corporation stop, saddle, PE pipe and fittings shall meet the requirements of TP-05.

H. Blow-off Hydrant Assembly: Blow-off shall be non-freezing, self-draining type, with 6-inch or 4-inch MJ inlet, non-turning operating rod and shall open to the left (counter clockwise). The blow-off assembly shall be a Kupferle Foundry model 7600-4", or approved equal.

1. General:

a) All working parts shall be brass and shall operate with a 2-inch gate valve wrench.

b) When open, valve shall be completely unobstructed, and drain hole shall be covered.

c) Inlet shall be 6-inch or 4-inch FIP, as shown on the plans and details.

d) Outlet shall be 4-inch FIP.

e) Concrete shall conform to Section 02 of the Technical Provisions and reinforcing steel shall conform to Section 03 of the Technical Provisions.

2. Portable Discharge Riser: 4-inch aluminum piping and fittings, 4-inch camlock male to female NPT (quick connect), dimensions and configuration shown on the detail drawings. Portable discharge riser to be constructed by the Contractor and provided to the Owner.

3. Fire Hose and Quick Connect Adapter: 4-inch single jacket fire hose, 50 feet, minimum, 125 psi service pressure. Adapter: stainless steel 4-inch male camlock to male NPT (quick connect). Hose to be provided by the Contractor to the Owner.

4. Blow-off Valve Vault and Cover: Vault shall be reinforced concrete pipe, 24-inch inside diameter. Riser grade rings with tar sealer may be used. Frame and cover shall be heavy duty cast iron, concealed pickslots, gasketed, with Penta Head security bolts, centered over the valve box, stamped "WATER" on top of the lid, Neenah 1295B, or approved equal. Contractor shall provide a Penta Head Wrench and Socket to the Owner.

5. Drain Pipe: If depicted on the plans, the drain pipe shall be 4-inch SDR 35 pipe. The pipe material shall transition to 4-inch DI pipe at outlet end and where bury depth is less than 1-foot. The DI pipe shall be a minimum of 10 feet long. Install #8 steel mesh at outlet end anchored with a 4-inch DI flange adapter and 4-inch DI rectangular accessory bolt pack kit.

I. Tapping Sleeves: Tapping sleeves shall be stainless steel with mechanical joint seals and class 125 outlet flange, Mueller H-304SS, or approved equal.

J. Warning Tape and Tracer Wire: Warning Tape and Tracer Wire (including tracer wire access boxes and tracer wire splice kits) shall be in accordance with Section 01 of the Technical Provisions.

K. Markers and Bollards: Markers and Bollards shall be in accordance with Section 01 of the Technical Provisions.

L. Filter Fabric: Class A 6 oz. nonwoven or woven polypropylene or polyester fabric.

M. Fire Hydrants: Conform to AWWA C502.

1. New hydrants shall conform to the requirements of AWWA C502 (AWWA Standard for Dry Barrel Fire Hydrants).

2. Unless otherwise indicated, hydrants shall be equipped with two National Standard 2 ½-inch hose nozzles and one National Standard 4 ½-inch pumper nozzle.

3. The hydrant inlet connection shall be sized for a 6-inch pipe. The hydrant valve shall open against line pressure and shall be no less than 4 ¼ -inches.
4. The bury depth shall be adequate to maintain the minimum cover over the pipe per TP-4.04.C.
5. The hydrant shall be designed so that all renewable parts can be changed without digging up the hydrant.
6. Hydrants shall be equipped with traffic safety flanges designed to break away in the event of horizontal impact.
7. The operating nut and nuts on each hydrant cap shall be 1 ½-inch National Standard pentagon nuts. Direction of opening shall be counterclockwise, as shown by an arrow cast on the hydrant.
8. Exterior shop coating of the hydrant top section shall be chrome yellow.
9. The hydrant shall have weep holes to allow the hydrant to drain, unless directed otherwise by the Owner's Representative.
10. Concrete shall conform to Section 02 of the Technical Provisions and reinforcing steel shall conform to Section 03 of the Technical Provisions.
11. Acceptable models: Mueller Super Centurion 250, Waterous (American Flow Control) WB-67, or approved equal.

TP - 04.04 PIPE CONSTRUCTION REQUIREMENTS:

Trenching, backfilling and compaction operations shall be performed as specified in Section 01 of the Technical Provisions. Pipe and fittings shall be installed in accordance with the manufacturer's printed specifications and instructions, to the standards of AWWA for installing the type of pipe used, and in accordance with this technical provision.

A. General:

1. Install water mains and appurtenances in the locations and of the sizes and materials shown on the plans and Bid Schedule.
2. Pipe, fittings, valves, and hydrants shall be carefully handled to avoid damage.
3. Contractor to provide staking in accordance with Section 01 of these Technical Provisions.
4. Locating existing utilities shall be the responsibility of the Contractor in coordination with a representative from the operating utility.
5. Existing water mains shall be properly abandoned in place and all facilities located at ground surface shall be removed and disposed of at the Contractor's expense.

B. Pipe Protection:

1. No pipe shall be laid when trench or weather conditions are unsuitable for such work.
2. Under no circumstances shall pipe be laid in water. Trenches shall be kept free from water at all times.
3. The interior of all pipe shall be thoroughly cleansed of all foreign matter before being lowered into the trench and shall be kept clean during laying operations by use of plugs or other approved devices.
4. As the work progresses, the interior of the pipe shall be cleared of all dirt and superfluous materials of every description.
5. Promptly remove all debris that enters the pipeline and swab the area with 1% hypochlorite solution.

6. At all times when work is not in progress, all open ends of pipe and fittings shall be securely closed with a water tight plug so that no trench water, rodents, earth, or other substances will enter the pipe or fittings.

C. Pipe Installation:

1. All pipe shall be laid to the depth shown on the plans, or at such depths as may be established by the Owner or Owner's Representative in order to connect the new pipe to the existing water mains.
2. Unless otherwise specified, the pipe shall be laid to a depth that will provide for a cover of at least 3 feet from the top of the pipe to finished grade.
3. Each section of pipe shall rest upon undisturbed earth, or compacted bedding materials, with recesses excavated to accommodate joints.
4. When trench bottom is soft and cannot support the pipe, a further depth and/or width shall be excavated and refilled to grade with stabilization and bedding material as specified in Section 01 of these Technical Provisions.
5. Joints with pipes of differing materials shall be made with appropriate adapters approved by the Owner or Owner's Representative, but in no case will threading of the PVC pipe wall be allowed.
6. Where required, PVC pipe shall be cut square using a powered cutoff saw, carpenter's fine tooth handsaw, or hacksaw. Once cut, the pipe shall be machine or hand beveled to give a one-half inch tapered end.

D. Pipe Deflection:

1. Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflecting the joints.
2. The amount of deflection at each pipe joint shall not exceed the manufacturer's printed recommended deflections.
3. When rubber gasketed pipe is laid on a curve, the pipe shall be jointed in a straight alignment and then deflected to the curved alignment. Trenches shall be made wider on curves for this purpose.
4. Any pipe that has its grade or joint disturbed after laying shall be taken up and relayed.

E. Backfill and Acceptance:

1. The Contractor shall make every effort to backfill all excavation by the end of each workday.
2. Work covered by this section will not be accepted until the backfilling, compaction and testing connected with the work has been completed satisfactorily.
3. Any section of water main that is found to be defective in material, alignment or joints before acceptance shall be corrected to the satisfaction of the Owner's Representative.
4. Any section of pipe already laid and found to be defective shall be taken up and replaced with new pipe without additional expense to the Owner.

F. Mechanical Joint Restraints: MJ Restraints shall be installed at all bends, caps, tees, crosses, valves, fire hydrants and flush hydrants (blowoff valve assemblies). Pipe joints adjacent to restrained bends and fittings shall be restrained in accordance with the plans and details.

1. General:
   a) Mechanical joint restraints shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.

b) Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

2. Special Anchoring Retainer Glands:

a) Install in accordance with manufacturer's recommendations.

b) Fully restraint all joints within 20 feet of a fitting with appropriate restraint. Owner or Owner's Representative may specify that an additional restraint be used for pipe sections near critical fittings.

G. Concrete Thrust Blocks:

1. Thrust Blocks:

a) Concrete thrust blocks shall be used on 2 inch PVC pipe, as shown in the plans.

b) Concrete thrust blocks shall not be used on any water pipe greater than 2 inches in diameter unless specified and approved by the Owner or Owner's Representative and shown on the plans or detail drawings.

c) When thrust blocking is approved by the Owner's Representative, concrete blocking shall bear against solid undisturbed earth at the sides and bottom of the trench excavation and shall be shaped so as not to block weep holes or obstruct access to the joints of the pipe or fittings.

d) Concrete shall not come into direct contact with mechanical joint restraints, if necessary, polyethylene wrap shall be used as a barrier.

2. Concrete:

a) Concrete shall conform to Section 02 of the Technical Provisions and reinforcing steel shall conform to Section 03 of the Technical Provisions.

b) The concrete shall have minimum 28 day compression strength of 3,000 psi.

c) The concrete shall not cover nuts and bolts of joints or fittings.

d) Polyethylene wrap shall be placed on fitting bolts to prevent hardening of concrete on connections.

e) Under no circumstances shall concrete thrust blocks be allowed on vertical bends in lieu of mechanical restrained joints.

H. Warning Tape: Warning Tape shall be installed on all water mains in accordance with Section 01 of the Technical Provisions.

I. Tracer Wire: Tracer Wire (including tracer wire access boxes and tracer wire splice kits) shall be installed on all water mains in accordance with Section 01 of the Technical Provisions.

TP - 04.05 WATER AND SEWER LINE SEPARATION REQUIREMENTS:

Water lines located near sewers present conditions for serious potential cross contaminations. Protection from cross contamination can be provided by separation of the facilities and use of special piping materials. Water and sewer line separation requirements shall strictly adhere to the requirements set forth in Section 01 of these Technical Provisions.

TP - 04.06 INTERCONNECTIONS TO EXISTING MAINS:

A. Interconnections:

1. An interconnection is the connection of a new pipeline to an existing pipeline.

2. An interconnection includes excavation, backfill, compaction, tapping sleeve, adapters, mechanical joint restraints, random lengths of pipe and any other supplies and materials required.

3. Interconnections do not include connections within the new work or service connections. Only those connections of new water mains to existing water mains which require that the existing main be cut or tapped are considered interconnections.

4. Connections to existing valves, fittings, or pipe ends which have been plugged or capped are not considered interconnections. Removal of the plugs, caps, and thrust blocks is considered incidental to normal installation of the new pipe.

5. Shutoff of mains will not be permitted overnight, over weekends or on tribal or federal holidays.

6. Only start work when all the materials, equipment and labor are on site. Once work on the connection has commenced, it shall proceed continuously without interruption, and as rapidly as possible until completed.

7. Any joints not pressure tested for leakage shall be visually inspected under system pressure prior to backfilling. Visual inspection of joints shall be completed under system pressure in the presence of the Owner or Owner's Representative. Repair and retest any joint with leakage until no leakage is visible, at no cost to the Owner.

B. Tapping Permit and Schedule:

1. A tapping permit (if required) shall be obtained by the Contractor from the operating utility and all work shall be performed in conformance with approved tapping permit.

2. If a tapping permit cannot be obtained, the time and method of connection to existing water mains shall be approved by both the operating utility and by the Owner or Owner's Representative (when these two entities are not the same) prior to such connections.

3. The Contractor shall notify the Owner or Owner's Representative and operating utility at least two (2) working days in advance of any water service disruption due to shutting off any portion of the existing water main. Each connection with an existing water line shall be made at a time and under conditions which will least interfere with water service to customers affected thereby as authorized by the operating utility and as evidenced by an approved tapping permit. The Contractor shall coordinate with the Owner and operating utility to notify the residents affected by water shutoff of the time and day of shutoff a minimum of two (2) working days in advance.

C. Tapping into Existing Main:

1. Connections to existing mains shall be made as shown on the drawings.

2. If the connection is a dry connection, the tee used shall meet the requirements of TP-04.03C.

3. If the connection is a wet connection, a stainless steel tapping sleeve shall be used. Stainless steel tapping sleeves shall be equipped with a ¾ inch diameter test plug and internal gasket as specified in TP-04.03.I.

4. Tapping valves shall have ends and seat rings of sufficient size to permit the use of full size cutters of either the Mueller, Ford or Smith type tapping machines.

5. Tapping sleeve valves shall be flanged on one end to fit the tapping sleeve and a flange hub-end or mechanical joint on the other.

6. All connections shall be made in a neat and professional manner. Such connections shall be made to the satisfaction of the operating utility and to the Owner or Owner's Representative.

7. Proper tools and fittings to suit actual conditions encountered in each case shall be utilized. The cutting of pipe for inserting fittings or closure pieces shall be done in strict accordance with

recommendations of the pipe manufacturer and without damage to the pipe or coating, and so as to leave a smooth end at right angles to the axis of the pipe.

8. The interconnection shall be marked and shown in the record drawings.

D. Contamination and Disinfection:

1. Great care shall be taken to prevent pipeline contamination when cutting into and making connections with existing pipelines used for the conveyance or distribution of water for domestic or public use.
2. The Contractor shall cooperate with the operating utility in locating services, and shall conduct his/her operations in such a manner that no trench water, mud, or other contaminating substances are allowed to enter the connected line or lines at any time during the progress of the work.
3. Disinfection procedures for connecting to existing mains shall adhere to AWWA C651 Section 4.7, (Disinfection Procedures When Cutting Into or Repairing Existing Mains).
4. The interior of all pipe, fittings, and valves, installed in such connections, shall be swabbed or sprayed with a 1% hypochlorite solution before they are installed, as directed by the AWWA standard referenced above.
5. All fittings and appurtenances removed in the connection process shall remain the property of the operating utility unless specified otherwise.

E. Provisions for Asbestos-Cement Pipe:

1. If Asbestos-Cement (AC) Pipe is being replaced, the AC pipe shall be abandoned in place.
2. The project may include taps/cuts into the existing AC pipe. Other unexpected or unavoidable breaks into the existing AC pipe are possible.
3. The Contractor shall comply with all applicable Federal, State, Local, EPA, OSHA, and Arizona, Nevada, California and Utah Departments of Transportation regulations pertaining to exposure to and handling, containment, transport, and disposal of asbestos material.
4. If the bidding Contractor is not licensed to perform these services in the state the project is being constructed, the Contractor shall retain the services of a licensed Asbestos Abatement sub-contractor to perform said services.
5. Further, the Contractor/Sub-Contractor must utilize the services of a commercial hauler that is registered with the respective state's environmental regulatory agency to transport asbestos. The Contractor/Sub-Contractor must dispose of any asbestos waste material generated as a result of the construction project at a solid waste facility authorized for asbestos waste disposal.
6. The Contractor, per OSHA requirements, must train field personnel in the identification of asbestos containing material.
7. The Contractor must submit the following items with the bid:
    a) Name and license number of the Asbestos-Abatement Contractor that will be responsible for the work described above.
    b) References (including the owner's name, address and phone number) for at least five comparable projects performed by the Asbestos-Abatement contactor.
    c) A work plan describing work procedures, equipment to be used, transportation procedures and final disposal facility for asbestos material.
    d) A health and safety plan which includes air-monitoring procedures as required by OSHA.

TP - 04.07 SETTING GATE VALVES AND BOXES:

A. General:

1. Install valves at locations indicated on the plans
2. Valve installation shall be as per these specifications and as shown on the detail drawings.
3. All valves, including gate valves, air release valves, and blow-off assemblies, shall be set, jointed and restrained to the pipe in the manner as set forth in the AWWA Standards for the type of connecting ends furnished.
4. Before installing the valve assembly, care shall be taken to see that all foreign material and objects are removed from the interior of the valve.

B. Setting Valves and Valve Boxes:

1. Valves and valve boxes shall be set plumb and valve boxes shall be placed over the valve or valve operator in such a manner that the valve box does not transmit shock or stress to the valve.
2. Support gate valves on a 4-inch concrete block set on compacted base during assembly and fully restrain the valve to the water main piping as shown on the detail drawings.
3. Center the valve box over the valve nut.
4. Backfill shall be placed and compacted around the valve box. The valve box shall be maintained plumb and centered over the valve nut during backfilling and compaction.
5. The valve shall be opened and closed to verify that all moving parts are in working order.
6. The cast iron valve box cover shall be set flush with elevated concrete collar or flush with the road surface.
7. Install a debris cap in the valve box meeting the requirements of TP 04.03.F.3 and as shown in the detail drawing.

C. Concrete Collar:

1. After installing the gate valve box, the Contractor shall properly compact the area around the gate valve box prior to installing the concrete collar to ensure that there is no settlement.
2. A 32-inch diameter OR a 24-inch square by 4-inch thick reinforced concrete pad shall be poured around each valve box as shown on the plan and detail drawings or instructed by the Owner or Owner's Representative.
3. A tracer wire access box shall be set in the concrete collar and next to the valve box with the tracer wire routed and connected as shown in the detail drawing.
4. Before the concrete has set, the Contractor shall neatly scribe in the concrete pad the size of the valve, material of pipe and orientation of the pipe with two arrows.

D. Valve Markers:

1. For valves outside of the right of way, the Contractor shall install two offset permanent Metal Marker Posts for all water main valves installed under this contract.
2. The marker posts shall be equidistant (4 feet typical) at a 45 degree angle from the valve to the main.
3. Set marker post with 36-inches of post above grade with label facing roadway and valve between roadway and post.

4. Stencil the size of the valve and the distance to the valve legibly on the aluminum cap. Dimensions and thickness shall meet requirements shown in applicable TP 01 Detail. Metal marker post shall meet the requirements of and be installed in accordance with Section 01 of these Technical Provisions.

5. For valves within the right of way, the Contractor shall install a Utility Line Marker to locate the valve. Utility line markers shall meet the requirements of and be installed in accordance with Section 01 of these Technical Provisions.

TP - 04.08 SETTING COMBINATION AIR VALVES AND VAULTS:

Combination air valves shall be installed in accordance with the manufacturer's printed specifications and instructions. The air valve vault shall be installed in accordance with the applicable sections of TP-01.

A. General:

1. The air release valve and vault shall meet the requirements of TP 04.03.G.

2. Install air release valves and vaults at locations indicated on the plans and as shown in the detail drawings.

3. All air release valves shall be set, jointed and restrained to the pipe in the manner as set forth in the AWWA Standards for the type of connecting ends furnished.

4. Before installing the valve assembly, care shall be taken to see that all foreign material and objects are removed from the interior of the valve.

5. Utility marker shall be installed as shown on the detail drawing and in accordance with TP-01.

B. Setting Vault:

1. Vault shall be set plumb and level on solid concrete masonry blocks and gravel base as shown on the detail drawings. The diameter of the gravel base shall be 6-feet minimum. Gravel shall be placed below the vault and in the vault to the depth shown in the detail drawings.

2. If a drain pipe is shown in the plans, the depth of the gravel below the vault shall be 6-inches minimum. If there is not a drain pipe is shown in the plans, the depth of the gravel below the vault shall be 12-inches minimum.

3. Manhole sections, and adjustment rings if required, shall be grouted in place when the manhole is constructed. The grout shall be spread evenly over the entire mating surface. The maximum number of adjustments rings shall be indicated on the plans. The jointing and sealing materials shall be approved by the Owner or Owner's Representative prior to installation.

4. Backfill shall be placed and compacted around the vault. The vault shall be maintained plumb during backfilling and compaction.

5. Penetrations in the vault walls shall be made as shown in the detail drawings. All vault penetrations shall be sealed with approved grout material.

C. Concrete Collar:

1. After installing the concrete vault, the Contractor shall compact the area around the vault prior to installing the concrete collar to ensure that there is no settlement.

2. A 12-inch wide by 6–inch thick (minimum) reinforced circular concrete pad shall be poured around the vault as shown on the plan and detail drawings or as instructed by the Owner or Owner's Representative.

3. The concrete collar shall have a minimum slope of 1/12 away from the vault.

4. The above grade galvanized outlet piping shall penetrate the concrete collar as shown on the detail drawing. The penetration shall be sealed with approved grout.

5. The vault lid shall be securely bolted to the inside wall of the vault per the manufacturer's recommendations. The lid shall be oriented, bolted and sealed in accordance with TP 04.03.G.3. The lid shall be set 4-inches above finished grade with the concrete collar sloping as shown on the detail drawing. A pad lock shall be provided with the lid and keyed as requested by the operating utility.

D. Setting Valve and Piping:

1. The water main line shall be tapped at the location shown on the plans or as instructed by the Owner or Owner's Representative.

2. The inlet line shall be connected to the water main using a water tight connection as shown on the plans. The Contractor shall use the approved connecting fittings including tees, reducers, service saddles, corp stops and piping. Mechanical restraints shall be used as necessary to secure the connection.

3. Where the air release valve and vault are offset horizontally from the water main, the horizontal sections of piping shall have a minimum of 1% slope upwards to allow for the upward movement of air from the water main.

4. The size of the air release valve and fittings, as well as the inlet and outlet piping for the valve shall be as sized by the Owner's Representative and as indicated on the plans.

5. The location and configuration of the air release valve and fittings, as well as the inlet and outlet piping for the valve shall be as indicated on the detail drawings. The riser piping assembly shall be located 12-inches to 18-inches from the vault wall.

6. The internal vault piping shall be supported with a rigid non-corrosive bracket assembly as shown in the detail drawings. This bracket shall be anchored to the internal concrete vault wall with the specified concrete anchor bolts and concrete anchoring system per TP 04.03.G.3.

7. Vinyl tape shall be wrapped around all galvanized steel pipe that is in contact with soil or concrete.

8. The ball valve, sample tap and air release valve shall be tested after installation to verify that all moving parts are in working order.

E. Drain Pipe:

1. The drain pipe shall only be installed if depicted on the plans (where the vault can drain to daylight).

2. The drain pipe shall be constructed to the alignment and length shown on the plans. The drain pipe shall be constructed as shown in the detail drawings.

3. Excavation, backfilling and compaction for the installation of the drain pipe shall meet the requirement of TP 01.

4. The inlet invert of the drain pipe shall be set at the top of the gravel in the vault. The drain pipe inlet edge shall be flush with the interior wall of the vault.

5. The outlet shall be screened per the detail drawings. The outlet screen shall be secured to the end of the drain pipe using the appropriate ductile iron fittings specified in TP 04.03.G.2.h. The outlet screen shall be wire brushed, sprayed with rust neutralizer and then coated with epoxy paint to protect the screen against corrosion.

6. Rip rap shall be installed for erosion protection around the drain pipe outlet.

TP - 04.09 SETTING BLOW-OFF HYDRANT ASSEMBLIES AND VAULTS:

Blow-off hydrants shall be installed in accordance with the manufacturer's printed specifications and instructions. The vault shall be installed in accordance with the applicable sections of TP-01.

A. General:

1. The hydrant shall meet the requirements of TP 04.03.H.
2. Install blow-off hydrants and auxiliary gate valves at the locations indicated on the plans and as shown on the detail drawing.
3. Utility marker shall be installed as shown on the detail drawing and in accordance with TP-01.
4. The hydrant and auxiliary gate valve shall be tested upon completion.
5. The portable discharge riser shall be constructed per TP 04.03.H.2 and shall be provided to the Owner.

B. Auxiliary Gate Valve and Valve Box:

1. The auxiliary gate valve and valve box shall be installed in accordance with TP 04.07. The concrete collar around the auxiliary gate valve and valve box shall be installed in accordance with TP 04.07.C and the drawings.
2. The auxiliary gate valve and valve box shall be located adjacent to the blow-off hydrant per the detail.
3. The pipe length and material type between the blow-off hydrant and the auxiliary gate valve and between the auxiliary gate valve and the water main shall be as designated on the plans and details.
4. Fully restraint joints between the water main tee and the auxiliary gate valve, and between the auxiliary gate valve and the blow-off hydrant.
5. Under no condition shall the diameter of the auxiliary pipe and auxiliary gate valve be less than 4-inches for blow-off hydrants. The pipe and auxiliary valve size shall match that of the blow-off hydrant inlet, as shown on the drawings.
6. Tracer wire and tracer wire access box shall be installed in accordance with the detail drawing and the provisions of TP 01.
7. Rip rap consisting of a minimum 4-inch to 6-inch angular diameter shall be compacted around concrete collar. The rip rap shall be placed around the collar at the required distance and thickness provided in applicable detail. Filter fabric shall be installed between rip rap and native soil as shown in details.

C. Installing Blow-off Hydrant:

1. Blow-off Hydrants shall stand plumb and shall have their nozzles pointed vertically upwards. The hydrant shall be set centered within the concrete vault.
2. Hydrant shall be restrained to the auxiliary pipe according to the manufacturer's recommendation. Contractor shall provide the required bolts, nuts and gaskets for the mechanical joint connection (MJ DI Transition Accessory Pack with Gland) and shall torque the bolts according to manufacturer's recommendation.
3. The hydrants shall be set so that the top of the discharge riser is 12-inches max from the top of the vault cover.
4. The hydrant interior shall be free of all dirt or foreign matter before installation.

D. Hydrant Base:

1. Set hydrant on compacted gravel base and on solid concrete blocks as shown in the detail drawing.

2. A gravel seepage area (drain pit) shall be provided around the weep hole near the hydrant. Gravel shall be installed as per the detail drawing.

3. A suitable concrete thrust block shall be constructed at the base of the hydrant in accordance with the detail drawings. Once the hydrant is set, concrete shall be poured against undisturbed earth in such a manner that the weep hole is kept free from all concrete or mortar. If the weep hole is covered either partially or wholly, the hydrant shall be cleaned in place and the gravel and concrete removed and replaced with new gravel and concrete.

4. Filter fabric shall be placed 4-inches below the top of the gravel drain pit as shown on the detail drawing.

E. Setting Vault:

1. Vault shall be set plumb and level on solid concrete masonry blocks and gravel base as shown on the detail drawings. Gravel from the drain pit shall extend into the vault to the depth shown in the detail.

2. Penetrations in the vault walls (if depicted in the plans) shall be made as shown in the detail drawings. All vault penetrations shall be sealed with approved grout material.

3. Backfill shall be placed and compacted around the vault. The vault shall be maintained plumb during backfilling and compaction.

F. Concrete Collar:

1. After installing the concrete vault, the Contractor shall compact the area around the vault prior to installing the concrete collar to ensure that there is no settlement.

2. A 6-inch wide by 6–inch thick (minimum) reinforced circular concrete pad shall be poured around the blow-off vault as shown on the plan and detail drawings or instructed by the Owner or Owner's Representative.

3. The concrete collar shall have a minimum slope of 1/12 away from the vault.

4. The cast iron frame and cover shall be anchored to the concrete collar and installed per the manufacturer's recommendations. The base of the frame shall be set 2-inches above finished grade.

5. Rip rap consisting of a minimum 4-inch to 6-inch angular diameter shall be compacted around concrete collar. The rip rap shall be placed around the collar at the required distance and thickness provided in applicable detail. Filter fabric shall be installed between rip rap and native soil as shown in details.

G. Drain Pipe:

1. The drain pipe shall only be installed if depicted on the plans (where the vault can drain to daylight).

2. The drain pipe shall be constructed to the alignment and length shown on the plans. The drain pipe shall be constructed as shown in the detail drawings.

3. Excavation, backfilling and compaction for the installation of the drain pipe shall meet the requirement of TP 01.

4. The inlet invert of the drain pipe shall be set at the top of the gravel in the vault. The drain pipe inlet edge shall be flush with the interior wall of the vault.

5. The outlet shall be screened per the detail drawings. The outlet screen shall be secured to the end of the drain pipe using the appropriate ductile iron fittings specified in TP 04.03.H.5. The outlet screen shall be wire brushed, sprayed with rust neutralizer and then coated with epoxy paint to protect the screen against corrosion.

6. Rip rap shall be installed for erosion protection around the drain pipe outlet.

TP - 04.10 SETTING HYDRANTS:

A. General:

1. Install hydrants and auxiliary valves at the locations indicated on the plans.
2. The hydrant shall meet the requirements of TP 04.03.M. It shall be the Contractor's responsibility to order the correct bury depth hydrant or to inform the Owner or Owner's Representative of the necessity for risers when the need becomes apparent.
3. Hydrant installation shall be as shown on the detail drawing. All hydrants shall be tagged or covered until fully operational.

B. Auxiliary Gate Valve and Valve Box:

1. An auxiliary gate valve and valve box shall be located adjacent to the hydrant per the detail drawing.
2. The pipe length and material type between the fire hydrant and the auxiliary gate valve and between the auxiliary gate valve and the main shall be as designated on the details and plans.
3. Fully restraint joints between the tee and the auxiliary gate valve, and between the auxiliary gate valve and the hydrant.
4. Under no condition shall the pipe and valve diameter be less than 6-inch for fire hydrants.

C. Installing Hydrant:

1. Hydrants shall stand plumb and shall have the pumper nozzles oriented perpendicular to the street or in the direction approved by the Owner or Owner's Representative.
2. The hydrants shall be set so that the bury depth indicator on the hydrant barrel is at final grade.
3. Set hydrant with the breakaway traffic flange at an elevation of 2-inches above finished grade. The hydrant interior shall be free of all dirt or foreign matter before installation.
4. The Contractor shall use a hydrant operating wrench to turn the nozzle cap, pin and lug type hose couplings and hydrant operating nut. The Contractor shall replace any components they damage due to using improper tools.

D. Hydrant Base:

1. Set hydrant on compacted base.
2. A gravel seepage area (drain pit) shall be provided around the weep hole near the hydrant. Gravel shall be installed as per the detail drawing. Place gravel from 18-inches below to 6-inches above the weep hole opening.
3. A suitable concrete thrust block shall be constructed at the base of each hydrant in accordance with the plans and details. Once the hydrant is set, concrete shall be poured against undisturbed earth in such a manner that the weep hole is kept free from all concrete or mortar. If the weep hole is covered either partially or wholly, the hydrant shall be removed and cleaned and the gravel and concrete removed and replaced with new gravel and concrete.
4. Filter fabric shall be placed above the gravel drain pit as shown on the detail drawing.

TP - 04.11 POLYETHYLENE WRAPPING:

Where called for in the plans and specifications or directed by the Owner or Owner's Representative, pipe (ductile iron), valves, and fittings shall be encased in a polyethylene protective wrapping referred to hereafter as poly-wrap.

A. Materials: The poly-wrap shall be of virgin polyethylene, not less than 8 mils in thickness, formed into tubes or sheets as may be required. Naturally pigmented material may be used where exposure to ultra violet light will be less than 48 hours. Otherwise the material shall be pigmented with 2 to 2 1/2 percent of well dispersed carbon black with stabilizers.

The poly-wrap shall be secured as specified below with 2 inches wide pressure sensitive plastic tape not less than 10 mils thick. Tape shall be Scotchrap No. 50, Polyken No. 900, Tapecoat CT, Johns-Manville No. V-10 Trantex, or approved equal. The minimum tube sizes for each pipe diameters are indicated in the table below:

Polywrap Flat Tube Widths		
Nominal Pipe Diameter (inches)	**Tube Widths with push-on joints (inches)**	**Tube Widths with mechanical joints (inches)**
4	14	16
6	17	20
8	21	24
10	25	27
12	29	30

B. Installation:

1. The polyethylene tubing shall be cut into lengths approximately 2 feet longer than the pipe sections.
2. With the pipe suspended from the center, the tube shall be slipped over the spigot end and bunched up between the point of support and the spigot end.
3. After the pipe is installed into the bell of the adjacent pipe, the pipe shall be lowered to the trench bottom and the supporting sling removed from the center of the pipe.
4. The pipe shall then be raised at the bell end enough to allow the tube to be slipped along the full length of the barrel with enough left at each end to overlap the adjoining pipe about 1 foot.
5. A shallow bell hole must be made at each joint to facilitate installation of the polywrap.
6. Pull the bunched-up polywrap from the preceding length of pipe, slip it over the end of the new length of pipe, and secure in place with one circumferential turn of tape plus enough overlap to assure firm adhesion.
7. Slip the end of the polywrap from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Tape polywrap in place.
8. The loose wrapping on the barrel of the pipe shall be pulled snugly around the barrel of the pipe, and excess material folded over the top of the pipe and the folds held in place by means of short strips of adhesive tape, at about 3 foot intervals along the pipe.
9. Repair any rips, punctures or other damage to the tube with the adhesive tape or pieces of tube material secured with tape.
10. Bends and reducers in the line shall be covered with polyethylene in the same manner as pipe.

TP - 04.12 PRESSURE TESTING:

Pressure testing shall be performed in accordance with these specifications. Use the Pressure Test Form at the end of this section. All water main pipe shall be pressure tested for leaks, including 2-inch pipe that is considered a water main. All pipelines shall be tested for water tightness up to the individual building service meter.

A. Concrete Thrust Blocking: Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, the pressure tests shall not be made until at least 48 hours after installation of the concrete thrust blocking, unless otherwise approved by the Owner or Owner's Representative.

B. Equipment and Scheduling:

1. Contractor shall provide all necessary equipment, including but not limited to, an appropriate pump, water container, water meter, pressure gauge, valve, and hydrant or corporation stop connection, and shall perform all work required in connection with the tests.
2. Contractor shall coordinate with the Owner and Owner's Representative so they may witness the entire duration of each pressure test.
3. Prior to requesting the Owner or Owner's Representative to witness the pressure test, the Contractor shall have all equipment set up completely ready for operation and shall have previously successfully performed the test to verify that the test section will pass.
4. The Contractor shall notify the Owner or Owner's Representative a minimum of two (2) working days in advance of the date that the Contractor plans to perform the pressure tests.
5. The test equipment shall be provided by the Contractor and is subject to inspection by the Owner or Owner's Representative.

C. Procedure: Arrangements for water used in pipeline testing and payment for the water shall be coordinated with the operating utility.

1. Test Preparation:

a) Pressure gauges used in testing shall be liquid filled and graduated at a maximum in 5 psi increments.

b) Two gauges will be used simultaneously for verification of the gauges' functionality with one gauge placed at the highest point and one at lowest point of the section being tested.

c) Prior to the test, the pipeline will be pressured to 10 psi above the test pressure, and then the pressure will be decreased to the test pressure so that gauge responsiveness can be observed.

d) Each section tested shall be slowly filled with water, with care being taken to expel all air from the mains and service lines, if installed.

e) If necessary, the pipes shall be tapped at high points to vent the air.

f) The test pressure shall be 150 psi (measured at the lowest point of elevation in the test section).

g) No section shall be tested that is greater than 2,500 feet in length or that has greater than 25 psi pressure change due to elevation.

h) In no case shall the test pressure be allowed to exceed the design pressure for pipe, appurtenances or thrust restraints.

i) The test shall be conducted in such a manner that existing lines and service user's plumbing is not damaged. Damage caused by testing shall be corrected at the expense of the Contractor.

j) All connections, blow offs, hydrants, house services up to the meter yoke, and valves shall be tested with the main as far as is practicable.

k) Air testing of water mains shall not be allowed.

l) Verify that all fire hydrant lead valves and main valves within the test section are open.

m) The test shall not begin until the pipe has been filled with water for at least 24 hours to allow for absorption.

2. Performing Test:

   a) The test section shall be slowly filled, at a velocity below 1 ft/s with potable water and all air shall be vented from the line. Install corporation stops at high points, if necessary, to facilitate air removal, and cap off after successful completion of the test.

   b) Pressurize the main to 150 psi as measured at the lowest elevation along the test section.

   c) The test shall have a minimum duration of two hours with the two hour period beginning when the test pressure is attained and the pump ceases operation.

   d) Any time the test pressure drops 5 psi, the pressure shall be restored to full test pressure and the quantity of water used shall be recorded.

   e) The quantity of water required to restore the pressure shall be accurately determined by pumping through a positive displacement water meter with a sweep unit hand registering 1 gallon per revolution.

   f) At the conclusion of the test period, the Contractor shall pump the test section to full test pressure and record the total water used during the test.

3. Method of Water Measurement:

   a) Supply a means of accurate water measurement that is compatible with the pressurizing equipment (e.g. pump and hoses) such as water meter or water container with gradations. The measuring equipment must meet the approved submittal.

   b) The Contractor shall keep a record of all pressure tests.

   c) Minimum information recorded at the time of the test shall include the contract number, contractor name, date, time, stationing or other description of the test section, length and diameter of the test section, total allowable leakage, leakage detected, pass or fail indication and printed name of recorder.

   d) Copies of field pressure tests records shall be submitted to the Owner to show compliance with these requirements before payment is requested.

   e) Add total amount of water required to re-pressurize the line during and at the end of the test and compare with the allowable leakage as calculated in the Pressure Test Form.

   f) Allowable maximum leakage is 0.04 gallons per inch diameter per 24 hours per coupling.

   g) Visible leakage will not be allowed.

   h) All leaks shall be repaired and additional tests conducted until leakages are less than the allowable maximum. All repairs shall be made in a manner approved by the Owner and shall be at the expense of the Contractor.

   i) Disinfection and leak testing may be conducted concurrently.

TP - 04.13 FLUSHING & DISINFECTION OF MAINS:

A. Flushing before Disinfection:

1. Unless the Owner or Owner's Representative approves the Tablet Disinfection Method, the mains shall be flushed prior to disinfection.

2. Flush with potable water to provide 3 volumetric exchanges in the pipeline at a minimum velocity of 3 feet per second.

3. Pig line after flushing if sediment or debris is still visible in the discharge.

B. General:

1. The water mains, fittings and any existing facilities affected by the work shall be disinfected in accordance with AWWA C-651 (AWWA Standard for Disinfecting Water Mains) with water containing a minimum of 25 mg/l of chlorine.

2. This concentration may be obtained by installing temporary gas chlorination equipment, by introduction of a calcium hypochlorite (HTH) solution at several points, or by inserting soluble chlorine tablets in the pipeline as it is laid.

C. Disinfection Methods:

1. Tablet Method:

   a) This method is allowed only with Owner or Owner's Representative concurrence that storage, handling and installation of pipe were completed such that the pipe interior remained dry, clean and void of sediment and debris.

   b) Introduce tablets or granules to produce a free chlorine concentration of 25 mg/l during pipeline installation.

   c) If tablets are used, only those containing pure calcium hypochlorite will be allowed. Tablets containing any kind of stabilizer are prohibited.

   d) Since some stabilizers contain known or suspected carcinogens the Owner or Owner's Representative may require a certification of purity.

   e) Tablets shall be fastened to the top of the pipe with an NSF 61 approved adhesive such as Dow 732. The number of tablets required is given by Table 2, AWWA C-651.

2. Continuous Feed Method:

   a) Feed a chlorine solution into water entering the main such that the water will have a 25-mg/l free chlorine concentration.

   b) Continue feeding until the entire pipeline to be disinfected is filled with the chlorinated water.

   c) At the end of the 24-hours, there must be at least 10-mg/l free chlorine residual as evidenced by residual tests taken at approximately 1,200 foot intervals along the main.

3. Slug Method:

   a) Feed a chlorine solution into water entering the main such that the water will have a 100-mg/l free chlorine concentration.

   b) Apply the solution continuously and sufficiently to ensure that a column of water with 100 mg/l free chlorine residual is formed in the pipe.

   c) Ensure that all parts of the main and its appurtenances are exposed to the column for at least 3 hours.

   d) Check the residual of the column at 1,200 foot intervals along the main. If it drops below 50 mg/l, inject additional chlorine solution into the entire column such that its residual is raised to 100 mg/l.

   For the Continuous Feed & Slug Test Methods, ensure that the chlorine solution is introduced within 10-feet of the end of the section being disinfected and for all cases is being withdrawn or wasted from the most extreme point relative to the point of water introduction. If branches exist, ensure that the chlorinated solution reaches all portions of the branches.

D. Flushing after Disinfection:

1. After at least 24 hours contact time with the disinfection solution, the line shall be thoroughly flushed.
2. Flush chlorinated water in an environmentally safe manner. In no case shall direct disposal to surface water be permitted.
3. Check the chlorine residual at the time of disposal.
4. If disposal to a community sewer system is available, neutralize the chlorine residual if the free residual is above 10 mg/l.
5. If disposal is to the ground surface or ditch, neutralize chlorine residual if free residual is > 1 mg/l.
6. Flushing shall continue until all visible debris has been removed and the chlorine concentration is the same as in the existing system, or not more than 0.4 mg/l in a new or unchlorinated system.

E. Bacteriological Testing:

1. After disinfection and flushing, but before the water main is placed into service, the Contractor shall collect two bacteriological samples, 24 hours apart, at the service farthest from the water source for each system or independent extension.
2. The samples shall be forwarded to a State or EPA certified laboratory for water testing and analysis. The laboratory fees, shipping fees, etc. shall be paid for by the Contractor.
3. If the results are negative, the system may be put into service.
4. If either of the samples are positive, the system shall be disinfected again and a samples resubmitted for testing. This shall be repeated until negative results are obtained.
5. Contractor shall provide the Owner or Owner's Representative with documentation of results within 24 hours of laboratory results. Successful (negative) bacteriological test results and the required chlorine residual at the connection point to the existing system will be required prior to acceptance and beneficial use.

TP - 04.14 CLEANUP:

Upon completion of the work, the entire site shall be cleared of all debris, and the ground surface shall be finished to smooth and uniform slopes. Cleanup shall be considered an incidental item and no additional payment shall be made for it. All fences, clotheslines, gravel driveways or other obstructions removed during construction shall be left in a condition at least equal to their condition prior to construction.

TP - 04.15 RECORD DRAWINGS:

Record Drawings shall meet the requirements of TP 01 and the Supplementary Conditions of the contract.

TP - 04.16 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT:

All payments will be based on completed work performed in strict accordance with the plans and specifications, and the respective prices and payment shall constitute full compensation for all work completed, including incidentals. No separate payment will be made for thrust blocks, excavation, trenching, compaction and backfilling or other incidental items of work required under this section, and all such costs pertinent to these items shall be included in the applicable unit prices.

A. Water Pipe: Water pipe shall be measured in linear feet along the centerline of the pipe, including fittings, for each of the various sizes of water pipe installed. Payment for water pipe shall be at the contract unit price shown in the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, bedding, stabilization

material, compaction, backfilling, pipe installation, fittings, thrust blocks, mechanical joint restraints, water main warning tape, water main tracer wire, tracer wire access box, hydrostatic pressure testing, disinfection, flushing, bacteriological testing, record drawings, final grading, seeding and final cleanup.

B. Gate Valves: Payment for water main gate valves shall be measured each for the various sizes of gate valves installed. Payment for valves shall be at the contract unit price shown in the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, related valves boxes, materials, and incidentals required for a complete installation, including excavation, gate valves, valve box, debris cap, concrete block, mechanical joint restraints, reinforced concrete pad, tracer wire access box, rip rap, marker posts, compaction, backfilling, record drawings, and final cleanup.

C. Fire Hydrants: Payment for hydrants shall be at the contract unit price shown in the Bid Schedule for each type of hydrant shown on the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, tee or tapping sleeve connection to the main, mechanical joint restraints, auxiliary piping, gate valve and box, reinforced concrete pad, tracer wire access box, rip rap, hydrant, thrust block, seepage gravel, concrete blocks, filter fabric, compaction, backfilling, record drawings, and final cleanup.

D. Interconnections: Payment for interconnections shall be at the contract price shown in the Bid Schedule. Payment shall be full compensation for excavation, fittings, tapping sleeves, adapters, thrust blocks, mechanical restrained joints, markers, compaction, backfilling and any other supplies and materials.

E. Water and Sewer Main Crossings: All costs associated with completion of water and sewer main crossings shall be merged with other bid items and will not be considered a separate item for payment.

F. Combination Air Release and Vacuum Valve and Vault: Payment for combination air release and vacuum valves shall be measured each for various sizes of valves installed. Payment for combination air valves shall be at the contract unit price shown in the Bid Schedule. Payment shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, connection to water main, connection fittings, piping, combination air and vacuum valve, ball valve, sample tap, union, pipe support, screened gooseneck, seepage gravel, concrete vault, reinforced concrete collar, frame and cover, drain pipe and screen, drain pipe outlet erosion protection, bollards, compaction, backfilling, record drawings, and final cleanup.

G. Blow-off Hydrant Assembly: Payment for blow-off assembly shall be at the contract unit price shown in the Bid Schedule. Payment shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, tee or tapping sleeve connection to the main, mechanical joint restraints, auxiliary piping, gate valve and box, reinforced concrete collars, tracer wire, tracer wire access box, rip rap, seepage gravel, concrete blocks, thrust block, filter fabric, blow-off valve, RCP vault, CI frame and locking cover, penta head wrench and socket, portable discharge riser, fire hose, utility marker, compaction, backfilling, record drawings, and final cleanup.

H. Testing: No separate payment will be made for pressure testing, disinfection, flushing, and bacteriological testing. All costs associated with completion of all required testing shall be merged with other bid items and will not be considered a separate item for payment.

PRESSURE TEST FORM: METHOD AND RECORD

(Water Pressure Pipes)

Project: _____ Owner: _____

Location: _____ Date: _____

Project #: _____

Contractor: _____

Inspector: _____

Tester: _____

Test Section Area: _____

Test Section Location: From Station: _____ To Station: _____

(I) CALCULATE ALLOWABLE LEAKAGE (for 2 hour test at 150 psi for PVC):

$$L = \frac{N \times D}{300}$$

L = Allowable leakage: _____ gallons

D = Diameter of pipe: _____ inches

N = Number of joints in test section: _____

(II) CONDUCT AIR VOLUME TEST:

1. Pressurize line to 150 psi
2. Remove volume of water equal to amount of allowable leakage
3. Recheck pressure to assure a significant change (10 psi min.) from 150 psi.

(III) CONDUCT PRESSURE TEST:

1. Re-pressurize line to 150 psi
2. Add water as necessary to maintain pressure between 140 and 150 psi for test period (2 hours)
3. Upon completion of test period add water to increase the pressure back to 150 psi
4. Measure total volume of water added in steps 2 & 3. ***If the volume of water added exceeds allowable leakage, the test failed.***

Time	Air Volume Test			Pressure Test			Pass Y/N	Owner Witness Signature
	Initial Pressure (psi)	H_2O removed (gal)	Final Pressure (psi)	Initial Pressure (psi)	Final Pressure (psi)	Total H_2O Added (gal)		
	step 2.1	step 2.2	step 2.3	step 3.3	step 3.3	steps 3.2–3.4		

REMARKS:

_____

_____

_____

"I CERTIFY THE ABOVE REFERENCED SECTION OF WATER MAIN HAS BEEN PRESSURE TESTED AND PASSED IN ACCORDANCE WITH THE PROVISIONS OF THIS SPECIFICATION."

_____

Contractor's Representative Date

_____

Owner's Representative or Inspector Date

SUBMITTAL REVIEW FORM, SECTION 04

WATER TRANSMISSION AND DISTRIBUTION MAIN

	DATE	INITIALS	Submittal No.	
Received by ENGINEER:			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
04.03B1	PVC Pipe		
04.03B2	DI Pipe		
04.03C	DI Fittings (Bends, Tees)		
04.03D	Pipe Restraint		
04.03E	Gate Valve		
04.03F	Gate Valve Box & Lid		
04.03F2 04.03F3	Extension Stem & Debris Cap		
04.03G	Combination Air Release Valve Assembly		
04.03G2, G3, G4	ARV Vault, Cover, Fittings, Valves, Bracket & Piping		
04.03H	Blow-off Assembly		
04.03H2, H3, H4 & H5	Blow-off Vault, Cover, Portable Discharge Riser, Hose, Drain Pipe		
04.03I	Tapping Sleeve		

04.03L	Filter Fabric		
04.03M	Hydrant		
04.11	Poly-wrap		
04.10	Pressure Testing Method & Equip		
04.12	Pressure Test Results		
04.13.C	Disinfection Method		
04.13.E	Water Testing Lab & Bacteriological Results		
04.06	Method of Connection to Existing Water Main		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 17 - PUMP CONTROL SYSTEMS

TP - 17.01 SCOPE:

This specification includes the furnishing, installation, and testing of a pump control system, including modification of existing components.

A. Remove existing controls equipment from existing concrete tank and re-install controls components on new welded steel tank.

B. Remove any and all unused or abandoned components within the pump control system

TP - 17.02 EXISTING SITE DESCRIPTION:

The Water Treatment Plant (WTP) removes arsenic from the water and provides water to the distribution system. The WTP is supplied by two (2) wells that are located in a pump house near the WTP. The WTP remote terminal unit (RTU) receives the water level of the existing Concrete Tank via an underground copper telemetry line. The pump controllers for the two (2) wells call the pumps to run when the Concrete Tank reaches the low set point. Two (2) finished water pumps in the WTP provide treated water to the Concrete Tank and distribution system. The Concrete Tank provides water for the distribution system and the Elevated Tank at the Stillwater community. The tank level is determined using a submersible level transducer. The Elevated Tank is supplied water through a control valve between the colony and the Stillwater community. This will need to be incorporated in controls to ensure adequate supply and pressure in the Stillwater community.

A. Existing Concrete Tank RTU Components:

1. Remote Sensing System: SignalFire A2 Long Range Radio with 3xD Lithium battery pack – (A2-A2D1-3XD-STDANT)

2. Sensor: Keller Acculevel 0-15 PSI 40’ Cable

Existing RTU components on the Concrete Tank were installed in 2023 by Sierra Controls, LLC.

TP - 17.03 PUMP CONTROL SYSTEM COMPONENTS:

A. Tank Level Monitor: A liquid level transmitter is used to continuously monitor the water level in the storage tank. The existing liquid level transmitter RTU components (remote sensing system and sensor) shall be removed from the existing tank and safely stored throughout construction.

TP - 17.04 SYSTEM OPERATION:

The control system operation shall be modified during construction to maintain water pressure throughout the distribution system. The two (2) existing finished water pumps information is below. Under normal operating conditions the water pressure on the finished water side of the WTP is approximately 45 PSI. Flow through the WTP is approximately 325 GPM and the WTP capacity is 350 GPM. The finished water pumps are rated for 325 GPM with total head of 45 PSI.

Finished Water Pumps (2):
Model: Goulds Pump Model 6SHK6
Size: 2 ½ X 3 – 6
HP: 20

Existing Control Settings:

Setting No.	Water Storage Tank Level	Control Function
1	25 feet	High Water Alarm/Overflow
2	24.5 feet	Stop well pumps
3	20.0 feet	Start well pump (pumps alternate)

Ferric Chloride is the reducing agent that turns Arsenic III to Arsenic V which is filtered out by ultrafiltration. Feed rates are 0.3g/L NaOCl and 8 mg/L FeCl pre-treatment. The chemical feed pumps are interconnected with the pump start and flow switches throughout the WTP so that the chemical feed pumps operate only when a well pump has been called to start and flow is detected.

TP - 17.05 INSTALLATION:

All material and equipment shall be installed per these specifications and the manufacturer's requirements. All wiring required for a complete and operational system shall be provided. Field tests shall be required to demonstrate that the system operates as intended. All installation of electrical components shall be performed by a licensed controls electrician.

A. Temporary Controls: The Contractor shall prepare a temporary controls plan for construction and submit to the Owner for approval. The temporary controls plan shall indicate the method for ensuring continuous water supply to the community throughout construction including after work hours and weekends. In the planned event that water supply will be interrupted, the Contractor shall provide a minimum of two (2) weeks' notice to the Owner for approval.

B. Tank Level Monitor: Upon completion of the new welded steel tank, the Contractor shall re-install the RTU components as shown in the construction drawings. The liquid level sensor shall be installed in the water storage tank per manufacturer recommendations in the pressure transducer enclosure mount. The junction box containing the termination enclosure shall be mounted near the tank hatch as shown in the construction drawings. The remote sensing system shall be re-installed on the enclosure mount per manufacture's recommendations.

TP - 17.06 TESTING AND STARTUP

All elements of the pump control system shall be tested to demonstrate that the total system satisfies all of the requirements of this Technical Provision. The system supplier shall provide all testing materials and equipment. The system supplier shall coordinate and schedule all of the testing and startup work with the Owner and Owner's representative. At minimum, the testing shall include the requirement as follows:

A. Field Tests: All system components shall be checked to verify that they have been installed properly and that all terminations have been made correctly. Witnessed field tests shall be performed on the complete system. Each function shall be demonstrated to the satisfaction of the Owner and the Owner's representative. Each test shall be witnessed and signed off by the system supplier and the Owner or Owner's representative upon satisfactory completion.

TP - 17.07 TRAINING

One day of training, at minimum, shall be provided by the system supplier. Training shall educate the Owner and maintenance personnel with the required level of system familiarity to provide a common working knowledge concerning all significant aspects of the pump control system.

TP - 17.08 MEASUREMENT AND PAYMENT:

All measurement and payment will be based on completed work in strict accordance with the drawings, specifications, and the respective unit bid prices. Payment shall constitute full compensation for all work completed, including incidentals. Separate payment will not be made for excavation, backfill or other items of work required by this specification. All such costs pertinent to these items shall be included in the applicable unit prices.

A. Temporary Controls: Payment for preparing and implementing the temporary controls plan shall be at a lump sum price included in the temporary water storage and controls line item in the bid schedule. Payment shall be full compensation for furnishing all labor, equipment, materials, and incidentals, required to maintain water service to the community throughout construction.

B. Tank Level Monitor: Payment for re-installing the tank RTU (remote sensing system and sensor) shall be included in the work for the Water Storage Tank line item in the bid schedule.

SUBMITTAL REVIEW FORM

SECTION 17 – PUMP CONTROL SYSTEM

	DATE	INITIALS	Submittal No.	
Received by ENGINEER:			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
17.05A	Temporary Controls Plan		
17.05A	Temporary Controls Components		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 28 - HIGH DENSITY POLYETHYLENE (HDPE) MAIN & FITTINGS

TP - 28.01 SCOPE:

The work covered by this section consists of furnishing all labor, equipment, materials and incidentals, in connection with the construction of high density polyethylene (HDPE) pipe and fittings for water and wastewater applications, in accordance with these drawings and specifications. HDPE pipe and fittings shall conform to all applicable standards and procedures as referenced in this specification and meet all applicable testing and material properties as described by the applicable standards referenced in this specification.

TP - 28.02 GENERAL:

HDPE pipes and fittings shall be acceptable for use with water and wastewater and shall be supplied by a single manufacturer. Any material used for potable water shall be listed and approved for potable water in accordance with NSF/ANSI 61. Approximately every 5 feet, the pipe shall be marked showing the NSF-61 seal of approval, the manufacturer's name, pipe diameter, DR rating, material type/classification, pressure class, and production date.

The pipe shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications. Pipe shall be manufactured by Performance Pipe, WL Plastics, JM Eagle, or equal as approved by the Owner or Owner's Representative.

Work covered by this section will not be accepted until the backfilling and testing connected with the work has been completed satisfactorily. Any section of HDPE that is found defective in material, alignment, or joints before acceptance shall be corrected to the satisfaction of the Owner or Owner's Representative.

TP - 28.03 MATERIALS:

A. Pipe and Fitting Material:

1. Materials used for the manufacture of polyethylene pipe, tube and fittings shall be PE 4710 high density polyethylene.
2. HDPE pipe sizes 4-inch diameter and larger shall be ductile iron pipe size (DIPS) complying with ANSI/AWWA C906.

B. HDPE Pipe Fittings:

1. Fittings shall have pressure class ratings not less than the pressure class rating of the pipe to which they are joined and shall be manufactured from PE 4710 material in accordance with this specification.
2. All fittings shall meet the requirements of AWWA C906. All fittings shall be molded or fabricated by the manufacturer. No Contractor fabricated fittings shall be used.
    a) Molded butt fusion fittings, including flange adapters and mechanical (MJ) adapters, shall comply with ASTM D3261.
        i. The polyethylene flange adapters at pipe material transitions shall be backed up by stainless steel flanges conforming to ANSI B16.1 and shaped as necessary to suit the outside dimensions of the pipe. The flange adapter assemblies shall be connected with corrosion resistant bolts and nuts of Type 316 Stainless Steel as specified in ASTM A726 and ASTM A307. All bolts shall be tightened to the manufacturer's specified torques. Bolts shall be tightened alternatively and evenly. After installation apply a bitumastic coating to bolts and nuts.

ii. MJ adapters shall be provided with stainless steel stiffeners.

b) Fittings shall be manufactured by Georg Fischer Central Plastics or equal as approved by the Owner or Owner's Representative

C. Warning Tape and Tracer Wire: Warning tape and tracer wire shall be installed in accordance with Section 01 of these Technical Provisions.

D. Markers and Bollards: Marker and bollards shall be installed in accordance with Section 01 of these Technical Provisions.

TP - 28.04 JOINING METHOD:

A. Heat Fusion: Joints shall be butt-fused per ASTM D2657 and the manufacturer's recommendations except as where indicated otherwise on the plans. Ensure that adjoining HDPE pipes are of the same grade and dimensions. Do not remove the butt-fused joint bead, unless approved by the Owner.

1. Fusible HDPE pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's guidelines.

2. Fusible HDPE pipe will be fused by qualified fusion technicians, as documented per PPI TN-42 and ASTM F3190. Certifications shall be provided for all qualified fusion technicians that will be fusing the HDPE pipe.

3. Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following elements:

a) Heat Plate: Heat plates shall be in good condition with no deep gouges or scratches. Plates shall be clean and free of any debris or contamination. Heater controls shall function properly; cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's guidelines.

b) Carriage: Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.

c) General Machine: Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.

d) Data Logging Device: An approved data logging device with the current version of the pipe supplier's recommended and compatible software shall be used. Data logging device operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.

e) Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion of fusible HDPE pipe. The software shall register and/or record the parameters required by the pipe supplier and these specifications. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

f) Other equipment specifically required for the fusion process shall include the following:

i. Pipe rollers shall be used for support of pipe to either side of the machine.

ii. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement, extreme temperatures, and /or windy weather, per the pipe supplier's recommendations. The fusing working area under

the canopy shall be kept clean and free from dust, water and high wind conditions.

iii. An infrared (IR) pyrometer for checking pipe and heat plate temperatures.

iv. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.

v. Facing blades specifically designed for cutting fusible HDPE pipe shall be used.

B. Electrofusion: Heat fusion is the preferred method for welding HDPE pipe, but certain projects may benefit from the use of electrofusion. For this reason, it shall be considered an acceptable joining method on a site-by-site basis. The use of electrofusion must be approved by the Owner or Owner's Representative.

C. Mechanical Connections:

1. Mechanical Compression Fitting for Small Diameter Pipes:

a) All service brass shall comply with AWWA C-800. Any components in contact with potable water will also comply with the latest requirements of the Federal Safe Drinking Water Act. Brass or bonze body fitting shall be designed to prevent collapsing and pullout using a threaded compression nut, an elastomer compression ring or pack joint, a stiffener, and/or a grip ring.

b) Fittings shall not contain lead and shall be Mueller Insta-tite, Ford (Pack Joint, Quick Joint, or Grip Joint) or equal as approved by the Owner or Owner's Representative.

2. HDPE Connection to PVC and Ductile Iron Pipe:

a) Flange and Mechanical Joint (MJ) Adapter:

i. Acceptable mechanical fittings for use with HDPE pipe and fittings shall be mechanical fittings that are qualified by the mechanical fitting manufacturer for use with HDPE pipe and fittings.

ii. Adapter assemblies shall be connected with corrosion resisting bolts and nuts of Type 316 Stainless Steel as specified in ASTM A726 and ASTM A307. All bolts shall be tightened to the manufacturer's specified torques. Bolts shall be tightened alternatively and evenly. After installation apply a bitumastic coating to bolts and nuts.

iii. Mechanical fittings for use with HDPE pipe shall provide restraint against longitudinal separation that is inherent to the design of the joint. Mechanical joints that do not provide restraint against pull-out or push-off are prohibited.

iv. Mechanical connections to non-HDPE devices and appurtenances shall be by bolted flange adapter or MJ adapter. Flange adapter and MJ adapter connections shall be assembled, installed and tightened in accordance with flange adapter or MJ adapter manufacturer's instructions. Flange bolt tightening shall be in accordance with PPI TN-38 and backed up by stainless steel flanges conforming to ANSI B16.1 shaped as necessary to suit the outside dimensions of the pipe.

v. HDPE to PVC and ductile iron pipe shall use MJ ductile iron sleeve equal to Tyler Union C153 sleeve or approved equal. Anchoring retaining glands shall be approved equal of EBAA Iron Megalug. Stiffeners shall be Cascade HDPE stainless steel stiffener or equal as approved by the Owner or Owner's Representative.

TP - 28.05 INSTALLATION:

A. Lengths of pipe shall be assembled by the butt-fusion process. All pipe so joined shall be made from the same class and type of raw material made by the same raw material supplier. Pipe shall be furnished in standard laying lengths not to exceed 50 feet and no shorter than 20 feet.

B. HDPE pipe shall be installed in accordance with the instruction of the manufacturer, as shown on the drawings and as specified herein. A factory qualified joining technician as designated by the pipe manufacturer shall perform all heat fusion joints.

C. HDPE shall be installed either by Open Trench Construction or Directional Bore Method as outlined in these Technical Provisions.

1. Open Trench Installation: Trenching and backfilling operations shall be performed as specified in Section 01 of these Technical Provisions.

2. Directional Bore Installation: Directional boring shall be performed as specified in Section 56 of these Technical Provisions.

D. Care shall be taken in loading, transporting, and unloading to prevent damage to the pipe. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before installation, and no piece shall be installed which is found to be defective. Any damage to the pipe shall be repaired as directed by the Owner or Owner's Representative. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner by the Contractor, at his own expense.

E. Under no circumstances shall the pipe or accessories be dropped into the trench or forced through a directional bore upon "pull-back".

F. Care shall be taken during transportation of the pipe such that it will not be cut, kinked or otherwise damaged.

G. Ropes, fabric or rubber protected slings and straps shall be used when handling pipes. Chains, cables or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe.

H. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects, which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

I. Pipe shall be stored on clean level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. The maximum allowable depth of cuts, scratches or gouges on the exterior of the pipe is 5 percent of the wall thickness. The interior pipe surface shall be free of cuts, gouges or scratches.

J. Pipe shall be laid to lines and grade shown on the drawings with bedding and backfill as shown on the details.

K. When laying pipe is not in progress, including lunchtime, the open ends of the pipe shall be closed by fabricated plugs, or by other approved means.

L. Sections of pipe with cuts, scratches or gouges exceeding 5 percent of the pipe wall thickness shall be removed completely and the ends of the pipeline rejoined.

M. The pipe shall be joined by the method of thermal butt fusion. All joints shall be made in strict compliance with the manufacturer's recommendations.

N. Mechanical connections of the polyethylene pipe to auxiliary equipment such as valves, pumps and tanks

shall be through flanged connections which shall consists of the following:

1. A polyethylene flange or MJ shall be thermally butt-fused to the stub end of the pipe.
2. A 316 stainless steel back up ring shall mate with a 316 stainless steel flange.
3. 316 stainless steel bolts and nuts shall be used.

O. Flange connections shall be provided with a full-face neoprene gasket.

P. All HDPE pipe must be at the temperature of the surrounding soil at the time of backfilling and compaction.

Q. If defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional cost to the Owner. All pipe and fittings shall be thoroughly cleaned before installation, shall be kept clean until they are used in the work and when laid, shall conform to the lines and grades required.

TP - 28.06 PIPE CLEANING:

At the conclusion of the work, thoroughly clean all of the new pipe lines to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period by forcing a cleaning swab through all mains 6-inch or greater. Flushing velocities shall be a minimum of 2.5 feet per second. All flushing shall be coordinated with the Owner or Owner's Representative. Debris cleaned from the lines shall be removed from the job site.

TP - 28.07 TESTING:

A. Hydrostatic pressure leak tests of PE pressure piping systems should be conducted in accordance with ASTM F 2164.

B. All HDPE water mains shall be disinfected after or during pressure testing in accordance with Section 04 of these Technical Provisions.

C. All HDPE mains shall be pressure tested. Contractor shall supply all labor, equipment, material, gages, pumps, meters and incidentals required for testing. Each main shall be pressure tested upon completion of the pipe laying and backfilling operations, including placement of any required temporary roadway surfacing.

D. All mains shall be tested at the lowest elevation in the test section at 150 percent of the system design pressure of the pipe unless otherwise approved by the Owner or Owner's Representative.

E. Maximum length of pipe allowed during each pressure test shall be approved by the Owner or Owner's Representative.

F. The pipeline test section must be restrained against movement in the event of catastrophic failure. Joints at the main connection points or other locations may be requested to be exposed by the Owner or Owner's Representative for leakage examination, provided that restraint is maintained.

G. The testing equipment capacity and the pipeline test section should be such that the test section can be pressurized and examined for leaks within test duration time limits. Lower capacity testing and pressurizing equipment may require a shorter test section.

H. Test equipment and the pipeline test section should be examined before pressure is applied to ensure that connections are tight, necessary restraints are in place and secure, and components that should be isolated or disconnected are isolated or disconnected. All low pressure filling lines and other items not subject to the test pressure should be disconnected or isolated.

I. For pressure piping systems where test pressure limiting components or devices have been isolated, or

removed, or are not present in the test section, the maximum allowable test pressure for a leak test duration of 8 hours or less is 1.5 times the system design pressure at the lowest elevation in the section under test. If lower pressure rated components cannot be removed or isolated from the test section, the maximum test pressure is the pressure rating of the lowest pressure rated component that cannot be isolated from the test section. Test pressure is temperature dependent. At ambient or water temperatures > 80 degrees F, use manufacturer's recommendation for test pressure.

J. Pressure testing procedure shall be per manufacturer's recommendations or as follows:

1. Fill line slowly with water. Maintain flow velocity less than 2 feet per second. The test section should be completely filled with the test liquid, taking care to bleed off any trapped air.
2. Expel air completely from the line during filling and again before applying test pressure. Air shall be expelled by means of taps at points of highest elevation.
3. The test procedure consists of initial expansion and test phases. For the initial expansion phase, the test section is pressurized to 10% above the test pressure and allowed to stand without makeup pressure for two to three hours, to allow for diametric expansion or pipe stretching to stabilize.
4. For the test phase, make-up test liquid is added as required to reach and maintain 10% below the test pressure for four (4) hours. This is the target test pressure. If the pressure remains steady (within 5% of the target test pressure) for an hour, leakage is not indicated.
    a) If leaks are discovered, depressurize the test section before repairing leaks. Correctly made fusion joints do not leak. Leakage at a butt fusion joint may indicate imminent catastrophic rupture. Depressurize the test section immediately if butt fusion leakage is discovered. Leaks at fusion joints require the fusion joint to be cut out and redone.
    b) If the pressure leak test is not completed due to leakage, equipment failure, etc., the test section should be de-pressurized and repairs made. Allow the test section to remain depressurized for at least eight (8) hours before retesting.
5. Upon completion of the test, the pressure shall be bled off from a location other than the point where the pressure is monitored. The pressure drop shall be witnessed by the Owner or Owner's Representative at the point where the pressure is being monitored and shall show on the recorded pressure read-out submitted to the Owner.
6. All visible leaks are to be repaired regardless of the amount of leakage.

TP - 28.08 SITE CLEAN UP:

Upon completion of the work, the entire site shall be cleared of all debris, and the ground surface shall be finished to smooth and uniform slopes. Cleanup shall be considered an incidental item and no additional payment shall be made for it.

TP - 28.09 MEASUREMENT AND PAYMENT:

This section is intended to be a supplement for other technical provisions. Measurement and payment for HDPE pipe shall be included in the applicable section specifying the intended use, such as water pipe, water service line, sewer force main, or other pipe indicated as HDPE in the Bid Schedule or plans.

SUBMITTAL REVIEW FORM,

SECTION 28 – HDPE PIPE

	DATE	INITIALS	Submittal No.	
Received by ENGINEER:			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
28.03A 28.03B	HDPE Pipe and Fittings		
28.04	Joining Method		
28.04	Certifications		
28.04	Equipment		
28.07	Pressure Test Results		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 31 - WELDED STEEL WATER STORAGE TANK AND FOUNDATION

TP-31.01 SCOPE:

These provisions set forth the minimum requirements for design, fabrication, construction and testing of a carbon welded steel, ground supported, potable water storage tank. Work under these provisions includes:

A. Design of the tank, under-tank piping, tank appurtenances, the tank foundation and preparation of all submittals by a Professional Engineer who is licensed to practice in the state in which the tank will be constructed. The Engineer will be required to provide references for past work, including at least five comparable reservoirs that the Engineer has designed that are now in service.

B. Site clearing and grading and any necessary access road improvements which are shown on the plans or required by the contractor for access to the site.

C. Furnishing all materials, labor, equipment and supervision for the fabrication and erection of welded carbon steel water storage tanks with appurtenances.

D. The Owner or Owner's Representative shall supply the Contractor with a soils investigation of the site, prepared by a Professional Engineer licensed in the State where the tank will be erected. Recommendations for the type of foundation to be used, the depth of the foundation to be constructed, the maximum design soil bearing pressure, relevant seismic design information and the calculated factor-of-safety shall also be provided.

E. Tank plumbing as shown on detail drawings and tank site layout drawing.

F. Tank coating and disinfection per requirements of Section 34 of these Technical Provisions.

TP-31.02 REFERENCE STANDARD:

Design, specifications, fabrication and erection of the carbon steel water-storage tank shall be in strict accordance with AWWA D100-11, AWWA Standard for Welded Steel Tanks for Water Storage, or the latest edition, published by the American Water Works Association, Denver, Colorado, except as modified by requirements of these specifications and applicable drawings.

TP-31.03 RELATED REQUIREMENTS:

A. Technical Provisions - Section 01: Trench Excavation and Backfill for Pipelines and Appurtenant Structures.

B. Technical Provisions - Section 02: Concrete

C. Technical Provisions - Section 03: Reinforcing Steel

D. Technical Provisions - Section 04: Water Transmission and Distribution Mains

E. Technical Provisions – Section 28: HDPE Pipe

F. Technical Provisions - Section 34: Coatings for Welded Steel Water Storage Tanks

TP-31.04 QUALIFICATIONS:

The Contractor and subcontractors shall be specialists in the design, fabrication, erection and coating of the type of reservoir proposed. The Contractor is required to provide references for past work (owner's name, address and phone number) including five (5) comparable reservoirs that the Contractor (and subcontractors) have constructed that are now in service. The Contractor and all subcontractors shall have a demonstrable minimum of five (5) years' experience in the proposed scope of work.

TP-31.05 SITE PREPARATION:

The Contractor shall be responsible for site clearing, grading, and any necessary access road improvements shown on the plans or required by the contractor for access to the site.

TP-31.06 GUARANTEE & WARRANTY:

The Contractor shall guarantee the structure against all defective materials and/or workmanship, if furnished by the contractor, for a period of 24 months from the date of substantial completion in accordance with Section 1.3 of AWWA D100-11. See TP-34 Coatings for Welded Steel Storage Tanks, (Sec. 34.05.H) for coatings guarantee and warranty requirements.

TP-31.07 DRAWINGS AND SUBMITTALS TO BE FURNISHED:

Drawings and Submittals shall be in accordance with AWWA D100-11.

A. The prospective bidder must submit two copies each of the following items with the bid:

   1. A drawing showing the dimensions of the tank including the diameter, top capacity level (TCL), shell height including plate thickness, type and thickness of the roof, thickness of the bottom plates, and thickness of the bottom annular ring. Also, the maximum wind or seismic gross moment and shear on the foundation system shall be identified.
   2. The number, identifying names and sizes of all accessories.
   3. Coating system submittal as identified in TP-34.
   4. Factory origin of the tank.
   5. A list of five (5) comparable welded tanks installed by the Contractor and now in service in the United States. The list shall contain the name, address and phone number of the organization which owns the tank.

B. After contract award, and prior to fabrication for approval by the Owner or Owner's Representative, the successful bidder must submit four copies each of the following numbered items prior to fabrication for approval by the Owner or the Owner's Representative:

   1. Tank drawings, showing principal dimensions and details of the tank, including roof supports and all appurtenances.
   2. Foundation drawings in accordance with the provided geotechnical report, showing appropriate dimensions and details of the foundation including reinforcing bar placement (if applicable), structural fill and backfill requirements. The design shall include specifications for any structural fill materials including required gradation and compaction requirements.

      a) If the calculations show the tank to be stable without anchorages at the critical wind and earthquake conditions, an aggregate filled steel ring foundation may be used. If anchorages are required, their design is part of this submittal requirement.

      b) If the tank steel is to come in contact with the on-site soil, either an epoxy coating or plastic barrier shall be installed to protect it from corrosion.

      c) Retainer Ring: If a steel retaining ring is to be installed, it shall be 18 inches high, at least 1/4 inch thick, and shall have a minimum-diameter that is two feet greater than the reservoir base. Individual segments of the ring shall be joined by bolted lap-joints the pattern of which shall be based on supportive design calculations. The steel ring shall be placed into crushed aggregate base material to a minimum depth of 10 inches below outside finished grade. A minimum of six-inches (6") shall be above the outside finished grade. Compacted

aggregate inside the ring shall be flush with the top of the ring at all points around its perimeter.

d) The Contractor shall take care in placing the steel ring so that the top of the ring does not deviate in elevation by more than 0.1 foot and so that the deviation from roundness does not exceed 0.1 foot.

3. Design calculations covering design loads versus allowable for dead load, live load, wind and seismic load for all structural components of tank and foundation. The design calculations, loads and stresses shall conform to the requirements of applicable sections of AWWA D100-11. All equations and all calculations shall be shown. All factors shall be defined and the sources of coefficients identified.
4. Detail drawings of the required accessories.
5. Steel mill reports with certification that the appropriate ASTM and AWWA standards have been met.
6. Details of all welded joints.
7. Certificates for welders and welding operators demonstrating qualifications in accordance with AWWA D100-11.
8. All submittal drawings and design sheets shall have been reviewed and approved by a Registered Professional Engineer, who is licensed to practice in the state in which the tank will be constructed, and shall bear the Engineer's registration stamp and endorsement.
9. Gradation and moisture-density curves for foundation backfill, if used.
10. The manufacturer's name, brochures, models, dimensions and any other pertinent information necessary to describe the following:
    a) Piping materials,
    b) gate valves and boxes,
    c) flapper valves, and
    d) type of forms and methods of forming for the concrete foundation (if applicable).

C. Upon review of the above submittals by the Owner or Owner's Representative, the Contractor shall make all required changes to the submitted drawings. The Contractor shall submit four sets of Ledger-size (11" x 17") revised construction drawings to the Owner or Owner's Representative for final approval. The approved drawings shall then govern the work detailed thereon. There shall be no deviation from the approved drawings and specifications, except upon written order from the Owner or Owner's Representative.

D. Approval of the Contractor's drawings by the Owner or Owner's Representative will relate only to their general conformity with the contract drawings and specifications and shall not guarantee detail dimensions, quantities or structural suitability. Approval of Contractor supplied drawings and specifications shall in no way relieve the Contractor's responsibility to meet the requirements of the contract documents, unless a deviation from the contract documents is clearly requested and explicit written approval of the deviation is provided by the Owner or Owner's Representative as a contract change.

TP-31.09 MATERIALS:

Materials shall be in accordance with Section 2 of AWWA D100-11.

A. Tank Steel: Carbon or stainless steel if specified.

B. Piping, General: Inlet, outlet, overflow, other pipes and all fittings for fluid use shall be in accordance with applicable detail drawings, and as specified below.

1. Steel Pipe: Per AWWA D100-11.
2. Ductile Iron Pipe and Fittings: See Section 04 of the Technical Provisions.
3. PVC Plastic Pipe: See Section 04 of the Technical Provisions.
4. HDPE Pipe: See Section 28 of the Technical Provisions.

C. Pipe Fittings: Pipe fittings used for connections to the tank shall be mortar-lined ductile iron with specified end fittings such as mechanical joints and flanged-ends that are designed to mate with the type of pipe on which they are used.

D. Concrete: Concrete and concrete work, including reinforcement shall conform to Section 02 of these technical provisions and shall have minimum 3,000 psi, 28-day compressive strength unless higher strength concrete is specified in the contractor's approved design submittals. Copies of design mix and batch tickets shall be provided to the Owner or Owner's Representative.

E. Reinforcing Steel: See Section 03 of the Technical Provisions. Reinforcement size, configuration, spacing and lapping shall be reviewed and approved by the Owner or Owner's Representative prior to allowing the placement of concrete.

F. Gate Valves and Boxes: See Section 04 of the Technical Provisions.

G. Flapper Valve: The overflow/drain line flapper valve shall be a Clow Model F 3012 or approved equal/alternative, such as Tideflex Series TF-1 duckbill check (pinch) valve with the sealing lips installed in a vertical position.

The last ten-feet (10') of the drain line, prior to the flapper valve, shall be installed level to allow the hinged flapper valve to properly close.

H. Structural Roof Design: In order to minimize, or eliminate, lapping steel roof sheets which are not fully coated, roof support structural members and associated welds, the tank roof shall be of the radius-knuckle design which utilizes pre-curved pie-shaped roof plates to structurally tie the roof to the sideshell. This design can also eliminate the need for center column supports up to a certain tank diameter. When center column support is required, the column should bear on plates with fully welded points of contact on both the floor and roof steel. Roof shall be designed by the Contractor's Registered Professional Engineer.

I. Roof Lap Joints and Roof-Plate Side-Wall Joints: Any Owner or Owner's Representative approved interior roof lap joints and/or roof-plate side-wall joints inside the tank that are not fully welded shall be sealed using NSF 61 certified caulking (Sikaflex®-1a+ or approved equal) after the joints have been coated per Section 34.

J. Store all structural materials, fabricated or plain, above ground on platforms, skids or other supports prior to and during construction. Keep material free from dirt, grease and other foreign matter. Protect material from corrosion.

TP-31.10 GENERAL DESIGN:

Tank Designs shall be in accordance with Section 3 of AWWA D100-11. Use of Section 14 "Alternative Design Basis" will not be allowed.

A. The design snow load allowance shall not be reduced due to temperature.

B. Special wind conditions will not be required.

C. Seismic design will be required. See "Soil Investigation Report" for seismic data.

D. No special corrosion allowance will be required.

E. Flush type clean-out fittings will not be required.

F. Inlet and outlet piping shall be specified in the drawings. If a separate inlet and outlet piping system is required, the inlet piping invert shall be raised to the design elevation where reduced tank-head activates the tank re-filling process. Tank influent shall diffuse horizontally through an array of reduced-diameter inlet nozzles for improved mixing of tank contents. Per the engineered design drawings, inlet piping shall include a check valve, or valves, to prevent backflow from the tank through the inlet piping. Pinch-valves (Tide-Flex or approved equals) may be installed on the diffusion array for this purpose. Tank outlet piping shall be equipped with a check-valve to prevent water from entering the tank through the outlet piping. Outlet piping shall be vertically and horizontally separated from the inlet piping to the maximum practical extent. Inlet and outlet piping shall enter and exit the tank per the design drawings.

TP-31.11 TANK SIZE:

The capacity of the tank shall be a minimum of that shown on the construction plan set and as discussed in the provided "Soil Investigation Report".

TP-31.12 ACCESSORIES:

Accessories shall be in accordance with Section 7 of AWWA D100-11

A. Safety: The minimum OSHA 29CFR Part 1910 requirements for accessories including ladders and hatches shall be followed.

B. Design: All accessories shall be designed by the tank manufacturer's Registered Professional Engineer.

C. Manways: The reservoir shall be equipped with two circular 36-inch diameter shell manways with hinged and bolted watertight covers and other requirements as described in Section 7.4.4 AWWA D-100. The manways shall be located 180-degrees opposed around the tank circumference.

D. Silt Stop: If required by the Owner or Owner's representative, a removable silt stop will be installed on all pipe penetrations entering the bottom of the tank per Section 5.2 of AWWA D100-11. The number and location of pipe connections and size and type of pipe to be accommodated shall be as shown on the detail drawings.

E. Overflow and Drain: The tank shall be equipped with an exterior overflow extended to the ground which shall be of the type and size specified on the detail drawings. The overflow pipe and intake shall be designed for a maximum flow rate equal to 200% of the storage tank design influent flow rate. The overflow pipe may be connected to the tank drain line if shown on the construction drawings. A flapper valve elevated two (2) pipe diameters above a splash pad and rip-rap shall be installed on the end of the overflow line according to the design drawings. The overflow and drain line flapper valve shall be a Clow Model F 3012 or approved equal/alternative, such as Tideflex Series TF-1 duckbill check (pinch) valve with the sealing lips installed in a vertical position.

F. Ladders: The reservoir shall have an exterior ladder located for direct access to the roof hatch. The ladder shall originate at ground level and have a steel safety cage running from the top of the ladder to within 8.5 feet of the bottom. The bottom 6 feet of the cage shall have no openings wider than 4-inches, achieved either by use of additional bars or coverage with extruded diamond steel mesh. The bottom portion of the ladder (from grade to 8.5 feet above grade) shall be equipped with a lockable ladder cabinet as shown on the drawings.

Ladder side rails shall be at least 2 x 3/8 inch flat steel spaced no greater than 16 inches apart. For tanks taller than 30-feet, offset fixed ladder sections with landing platforms shall be installed per

OSHA Part 1910 requirements. If required by the Owner or Owner's Representative, ladder safety devices such as those that incorporate lifebelts, friction brakes, and sliding attachments shall be provided by the contractor for all ladders. Hatch covers suitable for padlocking shall be provided. The ladder and cage shall be painted with the same coating as the outside of the tank or shall be hot dipped galvanized iron or aluminum.

A hot dipped galvanized iron or aluminum guard rail around the full perimeter (360°) of the tank roof shall be provided at the top of the ladder.

Interior ladders shall be provided if specifically required by the Owner or Owner's Representative.

G. Roof Access: The contractor shall furnish safe walkway access to roof hatches and vents. Such access shall be reached from the exterior tank ladder (refer to AWWA D-100 for minimum requirements versus roof slope).

H. Roof Access Hatch: The roof access hatch cover shall be designed with a stop to prevent the cover from coming into contact with the reservoir roof when fully open.

1. The access hatch shall be installed near, or adjacent to, the outside ladder and shall have a minimum 24-inch opening or as required by OSHA. The opening shall have a curb which rises at least four inches (4") above the surface of the roof. A hinged and skirted hatch-cover with a length and width that exceeds the access hatch dimensions by two inches (2") shall vertically overlap the curb by two-inches (2"). The cover shall include a hasp and staple with a standard padlock to fasten it securely. A 1/4 inch NSF61 neoprene gasket seal shall be fixed to the underside of the hatch-cover to assure that bugs and air-borne debris cannot enter the tank through the hatchway.

2. If specified on the engineering plans/drawings, a 12-inch square float-switch hatch shall be installed. The hatch-cover curb shall extend six inches (6") above the roof decking. A hinged and skirted hatch-cover with a length and width that exceeds the float-switch hatch dimensions by two inches (2") shall overlap the curb by two inches. The cover shall include a hasp and staple with a standard padlock to fasten it securely. A 1/4-inch NSF61 neoprene gasket-seal shall be fixed to the underside of the hatch cover to assure that bugs and air-borne debris cannot enter the tank through the hatch. The hinged hatch cover shall be designed with a stop to prevent the cover from coming into contact with the reservoir roof when fully open. The hatch shall have a minimum 12-inch square opening and a ¼-inch thick NSF/ANSI 61 certified gasket material seal shall be provided.

I. Vent: A screened vent assembly shall be located on the top-center of the roof and shall have sufficient capacity to pass air such that at the maximum design flow rate of water entering or leaving the tank, excessive interior tank-pressure, or vacuum, will not develop. Unless specified otherwise on the design drawings, and depending on regional regulatory requirements, the screen shall be 24, 16 or 12 mesh stainless steel and shall be constructed to prohibit insects, animals and debris from entering the tank. The overflow pipe shall not be considered a tank vent. The vent shall be easily dismantled for cleaning. The bottom of the vent screen shall be a minimum of 18" or 2 times the diameter of the vent pipe, whichever is greater, above the tank roof. The vent shall be in conformance with the provisions of Section 7.5, AWWA D100. The entire top and screened area of the vent shall be shrouded by a removable mushroom-style cover which terminates a minimum of four inches (4") below the screened area. The vent shall be designed to operate when clogged or frosted over (see AST Vent by Advance Tank and Construction Company or approved equal). In the event that the screen frosts over or becomes clogged with foreign material, a fail-safe system will relieve excess pressure or vacuum. The relief mechanism shall not be damaged by the occurrence and shall return automatically to the original operating position after the clogging is

cleared. Unless otherwise specified, the vent shall have a locking mechanism to prevent access to the tank. The vent-body shall be aluminum construction.

J. Water Level Indicator: The water level indicator shall be half-scale and capable of showing the water level from full to empty by utilizing heavy duty pulleys to allow target travel along the indicator board. The indicator shall be located on the tank side which is most clearly visible from nearby public roads or as directed by the Owner or Owner's Representative.

Weatherproof pulley assemblies (Gauging Systems Inc. or approved equal) shall be fastened securely to the tank as shown on the drawings. All pulleys, clevises, clamps and other fastenings on the cables shall be stainless steel, and fitted with bolts or screws of like materials. Openings in the roof to accommodate the cable shall not exceed ½-inch in diameter. These openings shall include NSF61 gaskets or grommets for proper sealing and protection.

The water-level indicator board shall be constructed from aluminum channel, minimum 6-inches wide, 2.8 lb. per ft., and shall be fastened securely to the top half of the reservoir. Markings and numerals shall be painted on the tank indicator in 2-foot graduations from full to empty. The target shall be 1/4-inch steel plate, 12 inches in diameter, finished with red enamel and shall slide freely along the indicator board.

The float shall be minimum of 15 inches in diameter, and be constructed of 3/16-inch stainless steel. The float shall travel on two guide cables of 1/8-inch stainless steel. It shall be of adequate weight and buoyancy to function properly with the specified gage and pulley assembly. The water level indicator shall be half-scale and capable of showing the water level from full to empty and shall utilize heavy duty pulleys to allow target travel along the indicator board.

K. Nameplate: A nameplate shall be filled out with the required information and securely fastened to the tank. Minimum information shall include company name and address, year of erection, design capacity, diameter, height, base elevation, and overflow elevation.

L. Padlocks: The Contractor shall supply and install permanent tumbler padlocks for all tank hatches, the site access gate(s) and on-site control valve vaults. All padlocks shall be keyed alike. Contractor shall coordinate with the Tribal Utility to determine if the new padlocks should match existing keys. A spare padlock with two keys shall be provided.

M. Confined Space Entry Sign: The Contractor shall install one 14-inch by 10-inch aluminum confined space sign near each entry port to the tank. The sign shall be mounted to the tank in a manner subject to the approval of the project engineer. The sign shall be equal to a model W-DA225 as manufactured by Allstate Sign & Plaque Corporation.

N. Site Work, Grading & Fencing: See TP-01 and TP-60 of the Specifications.

TP-31.13 WELDING:

Welding shall be in accordance with AWWA D100-11 Section 8 Butt Joints. For base materials of thickness greater than 3/8 in., joints shall be double-welded and shall be either partial joint penetration or complete joint penetration welds at the option of the contractor's design professional.

A. The Contractor shall employ the services of a licensed independent welding inspector and all costs, including inspection, shall be included in the bid and paid by the Contractor. Welders shall be qualified by ASME Section IX requirements in all positions. It shall be the responsibility of this welding inspector to carry out inspection in accordance with provisions of Section 11 of AWWA D100-11.

B. Inspection shall include either spot radiographs or test segments or both at the option of the Contractor and shall be done in accordance with Section 11 of AWWA D100-11. The Engineer

may designate up to 50 percent of the test sites. The welding inspector's written report must be received and accepted by the Owner or Owner's Representative before painting begins. A record of defective weld repairs and spot radiographs of repaired joints should be maintained at the work site.

C. When welding of the reservoir bottom is completed, it shall be tested and made completely tight. The joints shall be tested by air pressure or vacuum as specified in AWWA D100-11, Section 11.10.1.2.

TP-31.14 FABRICATION:

Fabrication shall be in accordance with Section 9 AWWA D100-11.

TP-31.15 ERECTION:

Erection shall be in accordance with Section 10 AWWA D100-11.

TP-31.16 INSPECTION AND TESTING:

Inspection and testing shall be in accordance with Section 11 AWWA D100-11.

A. The Owner will hire a qualified independent inspector to perform mill and shop inspections. The contractor shall schedule fabricating, welding, blasting and priming of the tank assemblies and accessories in batches to facilitate inspection by the independent inspector and/or Owner's Representative and to keep travel costs for inspections at a minimum.

B. Copies of the steel mill test reports shall be furnished to the Owner or Owner's Representative.

C. The Owner will hire a qualified inspector(s) to inspect the contractor's work including, but not limited to, the inspections described in this section.

D. The Contractor shall submit a written report, complying with this section, at the conclusion of welding work. This welding inspection report shall be signed by a licensed independent welding inspector. The report must be received and accepted by the Owner or Owner's Representative before steel coating begins.

E. The radiograph and inspection records shall be delivered to the Owner or Owner's Representative prior to acceptance of the structure. Any welding tests that do not meet AWWA requirements shall be noted. Records of all welding tests shall be maintained at the worksite. All repairs shall be made in accordance with AWWA D100-11.

F. Inspection of complete joint penetration welded-shell butt joints and load-bearing risers in contact with water shall be made by the radiographic method in AWWA D100-11.

G. The tank shall be field tested as per AWWA Section 11 after it is completed and before it is coated as follows:

1. Vacuum testing shall be performed on all welded surfaces on the tank floor with a minimum of 2 psi vacuum pressure using soapsuds, linseed oil, or other suitable material for the detection of leaks. Any leaks found shall be corrected before erection continues. Tanks with concrete bottoms are exempt from this requirement.

2. Following completion of erection and cleaning of the tank, the structure shall be tested for liquid-tightness by filling the tank to its overflow elevation. Arrangements for the provision of water for this purpose shall be made between the Contractor and the Owner.

3. Any leaks disclosed by this test shall be corrected by the contractor in accordance with the manufacturer's recommendations, AWWA D100-11 and as approved by the Owner. The tank shall be refilled and retested after repairs are complete.

TP-31.17 FOUNDATION DESIGN:

Foundation design shall be in accordance with Section 12 AWWA D100-11.

A. Backfill: Pipe cover shall be a minimum of 36 inches as shown on the detail drawing. Backfill requirements inside and/or underneath the tank foundation shall be as specified by the tank foundation designer.

B. Geotechnical Investigation: A geotechnical investigation of the project site, which addresses specific foundation design criteria, has been conducted and this information is provided for the Contractor's reference as part of the Bidding Documents.

C. Excavation and Backfill: Existing soils and rock shall be excavated and removed as necessary to install the proposed select subgrade and foundation materials and to establish final site grade and drainage. The elevations for excavation and grading and the approximate existing contour lines are shown on the plans.

D. Inspection & Testing: A representative from an independent geotechnical firm shall be on site during earthwork operations in order to verify that the soils encountered are consistent with those identified in the geotechnical report and to conduct inspection and testing.

1. Compaction testing is required for native subgrade, engineered fill, ring foundation footing and trench backfill.

2. Unless specified otherwise in the design drawings, the contractor shall be required to conduct one (1) compaction test per requisite thickness of backfill lift (per the geotechnical report) during foundation backfilling. Successive compaction tests shall be a minimum of 10-feet apart linearly around the circumference of the foundation.

3. Contractor shall furnish written certification showing all test results to document construction in accordance with the geotechnical requirements within 2 working days of completion of foundation construction.

4. A written report shall be provided by the Contractor's engineer including all test results and a copy of written certification as part of Closeout Submittals. The final report shall be signed and stamped by a Professional Engineer.

5. The Owner or Owner's Representative shall be notified if materials encountered are not consistent with soils as characterized in the geotechnical report. Unsuitable bearing conditions caused by the contractor's operations shall be remedied at the contractor's expense. Unsuitable bearing conditions that occur naturally shall be at the Owner's expense.

E. Concrete Testing: Shall be in accordance with Section 02 of the Technical Provisions.

TP-31.18 SEISMIC DESIGN:

Seismic design shall be in accordance with Section 13 AWWA D100-11.

TP-31.19 CLEANUP AND MAINTENANCE OF SITE:

After completing all construction, the Contractor shall remove all debris and waste materials from the site. The Contractor shall preserve the grading and drainage facilities constructed by others and ensure that surface water drainage is away from the tank.

TP-31.20 CERTIFICATION:

At the time of the final inspection, the Contractor shall provide to the Owner, or Owner's Representative, a notarized statement signed by a principal of the contracting company. The certificate shall state that the tank and foundation were designed, fabricated, erected and inspected in accordance with AWWA D100-11 as applicable. A 23-month warranty inspection shall be completed by the contractor per TP-34 of the specifications.

TP-31.21 AS-BUILT DRAWINGS:

Upon completion of all construction, and prior to final payment, the Contractor shall provide the Owner or Owner's Representative a redlined set of construction drawings and/or shop drawings showing any changes or deviations made to any part of the contracted work. The as-built drawings shall be of content and clarity satisfactory to the Owner or Owner's Representative.

TP-31.22 METHOD OF MEASUREMENT AND BASIS FOR PAYMENT:

A. Tank Foundation: The tank foundation shall be measured on a lump sum basis. Payment for the tank foundation shall be at the contract bid price shown on the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals, required for a complete design and installation, including foundation design by a registered professional engineer (Geotechnical or Structural), excavation, compaction testing, concrete, concrete testing, reinforcing steel, backfilling and final cleanup.

B. Tank Plumbing: Tank plumbing shall be measured on a lump sum basis. Payment for the tank plumbing shall be at the contract bid price shown in the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals, required for a complete installation, including excavation, compaction testing, inlet and outlet piping, connections to existing water mains, hydrostatic testing, bacteriological testing, overflow and drain line piping, gate valves and boxes, concrete collars, splash pad, rip rap flap valve, fittings, required pipe coatings, locator tape and tracer wire (if required), backfilling and final cleanup.

C. Water Storage Tank: The water storage tank shall be measured on a lump sum basis. Payment for the water storage tank shall be at the contract price shown in the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals, required for a complete installation, including tank design by a registered professional engineer (Structural), tank materials, fabrication, erection, all accessories, final cleanup and as-built preparation.

SUBMITTAL REVIEW FORM

SECTION 31 – WELDED STEEL STORAGE TANK

	Date	Initials		
Received by ENGINEER:			Submittal No.	
Received by OWNER:			Project No.	
			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
31.04	Qualifications		
31.07	Drawings Submittals		
31.09	Piping		
31.09	Pipe Fittings		
31.09	Flapper Valve		
31.16	Mill Reports, Radiograph and inspection records		
31.17	Geotechnical and Concrete Testing Records/Reports		
31.17	Foundation Design		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 34 - COATINGS FOR WELDED STEEL WATER STORAGE TANKS

TP - 34.01 SCOPE:

The work of this section includes the coating of all interior tank surfaces, the coating of all exterior tank surfaces, coating systems, surface preparation, application, testing, and disinfection.

TP - 34.02 RELATED WORK SPECIFIED ELSEWHERE (If Applicable):

See TP-31 Welded Steel Water Storage Tank and Foundation

TP - 34.03 REFERENCE SPECIFICATIONS AND STANDARDS:

Without limiting the general aspects of other requirements in these specifications, all surface preparation, coating of interior and exterior surfaces and inspection shall conform to the applicable requirements of the Steel Structures Painting Council, NACE International, ASTM (American Society for Testing and Materials), AWWA (American Water Works Association) and the coating system manufacturer's printed instructions. The following individual reference documents shall specifically apply to the welded steel tank coating process:

A. ASTM (American Society for Testing and Materials)

1. ASTM D 520 - Standard Specification for Zinc Dust Pigment
2. ASTM D 4417 - Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
3. ASTM E 337 - Standard Practice Test Method for Measuring Humidity with a Psychrometer
4. ASTM D610 - Standard Methods of Evaluating Degree of Rusting on Painted Surfaces
5. ASTM D5402 - Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs

B. AWWA (American Water Works Association)

1. AWWA D102-17 - Coating Steel Water Storage Tanks
2. AWWA C210-15 - Liquid Epoxy Coatings and Linings for Steel Water Pipe and Fittings
3. AWWA D100-11 - Welded Steel Tanks for Water Storage

C. ANSI (American National Standards Institute)

1. ANSI/ASC 29.4 - Exhaust Systems: Abrasive Blasting Operations – Ventilation and Safe Practice
2. ANSI/NSF Standard 61 - Drinking Water Components

D. Consumer Product Safety Act, Part 1303

E. Environmental Protection Agency, EPA 524.2 Revision 4 Purgeable VOCs by GC/MS

F. NACE International

1. NACE Publication TPC2 - Coatings and Linings for Immersion Service: Safety, Surface Preparation, Curing, Inspection
2. NACE Standard RP0178 - Standard Recommended Practice: Fabrication Details, Surface Finish Requirements and Proper Design Considerations for Tanks and Vessels to be Lined for Immersion Service
3. NACE Standard RP0188 - Standard Recommended Practice: Discontinuity (Holiday) Testing of Protective Coatings
4. NACE Standard RP0287 - Field Measurement of Surface Profile of Abrasive Blast-Cleaned Steel Surfaces Using a Replica Tape

5. NACE Standard RP0288 - Standard Recommended Practice, Inspection of Linings on Steel and Concrete

G. OSHA (Occupational Safety & Health Administration), 1915.35 Standards 29 CFR – Painting

H. SSPC (Steel Structures Painting Council)

1. SSPC-SP2 - Hand Tool Cleaning
2. SSPC-SP3 - Power Tool Cleaning
3. SSPC-PA-1 - Shop, Field and Maintenance Painting
4. SSPC-PA-2 - Measurement of Dry Film Thickness with Magnetic Gages
5. SSPC-PA-3 - Guide to Safety in Paint Application
6. SSPC-Guide 12 - Guide for Illumination of Industrial Painting Project
7. SSPC-VIS 1-89 - Pictorial Surface Preparation Standards for Painting Steel Surfaces
8. SSPC Paint - Two Component Weather-Resistant Aliphatic Polyurethane Topcoat, Spec 36 Performance-Based

I. SSPC/NACE Joint Standards

1. SSPC-SP5/NACE 1 - White Metal Blast Cleaning
2. SSPC-SP6/NACE 3 - Commercial Blast Cleaning
3. SSPC-SP7/NACE 4 - Brush-Off Blast Cleaning
4. SSPC-SP10/NACE 2 - Near-White Metal Blast Cleaning

J. The decision of the Owner or Owner's Representative shall be final as the interpretation and/or conflict between any of the referenced specifications and standards contained herein.

TP - 34.04 CONTRACTOR:

A. The Contractor shall have five years of practical experience and successful history in the application of the specified product to surfaces of steel water tanks. The contractor shall substantiate this requirement by furnishing a list of references and job completions.

B. The Contractor shall submit a written statement from the coatings manufacturer stating that the Contractor is familiar with the materials specified and that the contractor employs workers who are capable of performing the work specified herein.

C. The personnel performing the work shall be knowledgeable and have the required experience and skill to adequately perform the work for this project in accordance with SSPC-PA1 "Shop, Field and Maintenance Painting".

TP - 34.05 QUALITY ASSURANCE:

A. General: Quality assurance procedures and practices shall be utilized to monitor all phases of surface preparation, application and inspection throughout the duration of the project. Procedures or practices not specifically defined herein may be utilized provided they meet recognized and accepted professional standards and are approved by the Owner or Owner's Representative.

B. Surface Preparation: Surface preparation will be based upon comparison with "Pictorial Surface Preparation Standards for Painting Steel Surfaces: SSPC-VIS 1-89", ASTM D2200-95, "Standard Methods of Evaluating Degree of Rusting on Painted Surfaces", ASTM D 4417-91, Method A and/or Method C or NACE Standard RP0287-87. In all cases the written standard shall take precedence over the visual standard. In addition, NACE Standard RP0178-91, along with the Visual Comparator, shall be used to verify the surface preparation of welds.

C. Application: No coating materials shall be applied when:

1. The surrounding air temperature or the temperature of the surface to be coated or painted is below the minimum surface temperature for the products specified herein,
2. rain, snow, fog or mist is present,
3. surface temperature is less than 5°F above the dew-point, and
4. air temperature is expected to drop below the minimum temperature for the products specified within six hours after application of coating.

Dew-point shall be measured by use of an instrument such as a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychometric Tables. If any of the above conditions are prevalent, coating or painting shall be delayed or postponed until conditions are favorable. The day's coating or painting shall be completed in time to permit sufficient film drying time prior to damage by atmospheric conditions.

D. Inspection: The Owner or Owner's Representative shall retain the services of an independent NACE certified inspector for this project. At a minimum, the inspector shall inspect the surface prior to abrasive blasting, after abrasive blasting but prior to application of coating materials, and between subsequent coats of material. Final inspection shall take place after all coatings are applied, but prior to placing the tank into service. The Contractor will insure that sufficient scaffolding and/or rigging is in place so that the inspector shall be able to safely conduct the required inspections.

E. Thickness and Holiday Checking: The Owner's retained independent NACE certified inspector shall check the dry film thickness (DFT) of coatings and linings with a non-destructive, magnetic-type thickness gauge, as per SSPC-PA 2 "Measurement of Dry Film Thickness with Magnetic Gages". References in PA 2 which allow 80% of the minimum thickness specified are not acceptable. The inspector will use an instrument such as a Tooke Gauge if a destructive test is deemed necessary by the Owner or Owner's Representative. The Owner-retained independent NACE certified inspector shall check the integrity of interior coated surfaces below the high water mark with a low voltage holiday detector in accordance with NACE Standard RP0188. The non-destructive holiday detector shall not exceed 67.5 volts, nor shall a destructive holiday detector exceed the voltage recommended by the manufacturer of the coating system. A 1-ounce solution of non-sudsing type wetting agent, equal to Kodak Photo-Flo, and one gallon of tap water shall be used to perform the holiday testing. All pinholes and/or holidays shall be marked and repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities will be permitted in the final coating.

F. Inspection Devices: Until final acceptance of the coating, the Owner-retained independent NACE certified inspector shall furnish inspection devices in good working condition for detection of holidays and measurement of dry film thickness of coatings. Depending upon the thickness gauge utilized, the Owner-retained independent NACE certified inspector shall also furnish U.S. Department of Commerce, and National Bureau of Standards certified thickness calibration plates and/or plastic shims, to test the accuracy of dry film thickness gauges and certified instrumentation to test the accuracy of holiday detectors. Dry film gauges and holiday detectors shall be made available for use by the Owner or Owner's Representative at all times until final acceptance of the coating application. Holiday detection devices shall be operated in the presence of the Owner or Owner's Representative. The contractor shall furnish wet film thickness gauges to provide quality control of the coating thickness during application.

G. MEK Double Rub Test: After the tank has reached "full cure" in accordance with the recommendations and written published data sheets of the coating manufacturer, the Owner-retained independent NACE certified inspector shall perform MEK double rub tests in accordance with ASTM D5402 to verify curing of the interior coating system.

H. Warranty and Inspection: The Contractor shall guarantee interior and exterior coatings for a minimum of two (2) years. A certificate of the two-year coating guarantee, shall be signed and dated by the principal of the contracting company and shall be presented to the Owner at the acceptance inspection. In addition, an accompanying signed letter of warranty support/concurrence from the coating product manufacturer shall also be provided at the time of the acceptance inspection. At the contractor's expense, the coating will be inspected internally and externally approximately 22 months after the date of initial storage tank acceptance. At the

Owner's preference, the inspection may be accomplished by draining the tank (facilitated by owner) or by utilizing a scuba diver or a submersible remote-controlled drone while the tank remains in service/on-line. Any and all coating system defects found during the inspection shall be repaired in accordance with this specification and to the approval of the owner's representative. All associated labor and material costs associated with those repairs shall be the responsibility of the contractor. The Owner will schedule the inspections and notify the Contractor at least two (2) weeks in advance so that a contractor's representative may be present for the inspections.

TP - 34.06 SAFETY AND HEALTH REQUIREMENTS:

A. General: In accordance with requirements set forth by regulatory agencies applicable to the construction industry and manufacturer's printed instructions and appropriate technical bulletins and manuals, the Contractor shall provide and require use of personal protective lifesaving equipment for persons working on or about the project site. The Contractor's work force shall comply with the provisions outlined in SSPC-PA-3 "A Guide to Safety in Paint Application".

B. Head and Face Protection and Respiratory Devices: Equipment shall include protective helmets which shall be worn by all persons while in the vicinity of the work. In addition, workers engaged in or near the work during sandblasting shall wear eye and face protection devices and air purifying half-mask or mouthpiece respirators with appropriate filters.

1. All pressurized air hoses shall be static-discharge-proof.
2. Blasting air- hoses shall be equipped with "dead-man" control devices to provide direct cut-off of blasting equipment when needed.
3. Air-hoods with positive-pressure type breathing apparatus for all personnel operating blasting equipment.

C. Ventilation: Ventilation shall be used continuously during preparation, application, and curing activity and shall be configured in a manner to effectively remove dust and residual contaminants during preparation activity and to remove volatilized solvents during application activity. Utilize OSHA approved forced air ventilation to control all hazardous exposure conditions. All equipment shall be intrinsically safe and explosion-proof. Ventilation shall provide an acceptable number of air changes and reduce the concentration of air contaminants to the degree that a hazard does not exist. Air circulation and exhausting of solvent vapors shall be continued until coatings have fully cured.

D. Sound Levels: Whenever the occupational noise exposure exceeds maximum allowable sound levels, the Contractor shall provide and require the use of approved ear protection devices.

E. Illumination: Adequate illumination shall be provided while work is in progress, including explosion-proof lights and electrical equipment. Whenever required by the Owner or Owner's Representative, the Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected. The level of illumination for inspection purposes shall be determined by the Owner or Owner's Representative.

F. Temporary Ladders and Scaffolding: All temporary ladders and scaffolding shall conform to all applicable OSHA safety requirements. They shall be erected where requested by the Owner or Owner's Representative to facilitate inspection and shall be moved by the Contractor to locations requested by the Owner or Owner's Representative.

TP - 34.07 PRODUCT DELIVERY, STORAGE & HANDLING:

A. All materials shall be brought to the jobsite in original sealed containers. Materials shall not be used until the Owner or Owner's Representative has inspected the contents and obtained data from information on containers or labels. Materials exceeding storage life recommended by the manufacturer shall be rejected.

B. All coating materials shall be stored in enclosed structures to protect them from weather and excessive heat or cold. Flammable coatings must be stored to conform to City, County, State and Federal safety codes for flammable coating materials. At all times coatings shall be protected from freezing.

TP - 34.08 GENERAL REQUIREMENTS:

A. Throughout this technical specification document, materials are specified in accordance with AWWA D102-17 Standard for Coating Steel Water Storage Tanks. Approved material suppliers are those reputable organizations who have well-established performance histories and 10 years or more experience producing compliant NSF-61 approved linings and exterior corrosion resistant coatings. Equivalent materials which are produced by other manufacturers may be submitted for written approval of the Owner or Owner's Representative. Approved material manufacturers include but are not limited to the following:

1. Akzo Nobel
2. Carboline
3. PPG
4. Sherwin Williams
5. Tnemec

B. Requests for product substitution shall include manufacturer's literature for each product giving name, product number, generic descriptive information, solids by volume, recommended dry film thickness, recommended application methods and certified lab test reports showing results to equal the performance criteria of the products specified herein. The certified test reports shall be produced by a nationally known, independent, ISO 9001 certified testing laboratory. Comparative tests between pre-approved coating material product(s) and contractor-requested substitution(s) shall address all specific criteria as may be specified by the Owner or Owner's Representative. In addition, a documentation list of five projects on which the requested substitute-products were successfully utilized shall be submitted to the Owner or Owner's Representative for review prior to approval for the use of the substitute coating product(s).

C. Any requests for product substitution shall be made at least 14 days prior to the bid date.

D. Manufacturer's color charts shall be submitted to the Owner or Owner's Representative at least 30 days prior to coating application. The General Contractor and the Painting Contractor shall coordinate work so as to allow sufficient time (normally seven to ten days) for paint to be delivered to the job site.

TP - 34.09 GENERAL REQUIREMENTS:

A. All materials shall be lead-free as defined by the Consumer Product Safety Act, Part 1303.

B. All zinc dust pigment contained in any zinc-rich material shall meet the requirements of ASTM D 520 Type III with regard to zinc content and purity.

C. All materials for the interior of the tank shall meet the requirements of ANSI/NSF Standard 61 for potable water contact.

D. All high gloss clear coat products shall incorporate the use of a fugitive dye to aid in the proper application and coverage of such coats.

TP - 34.10 MATERIAL PREPARATION:

A. Mix and thin materials according to manufacturer's latest printed instructions.

B. Do not use materials beyond manufacturer's recommended shelf life.

C. Do not use mixed materials beyond manufacturer's recommended pot life.

TP - 34.11 TANK INTERIOR COATING SYSTEMS:

The following AWWA D102-17 interior coating system(s) (ICS) are approved for usage under this specification:

A. AWWA D102-17, ICS 1-Modified, High-Solids, Epoxy Lining System:

1. Coating Type: High solids epoxy, two component, minimum 65% volume solids
2. Designated Surfaces:

a) Interior of tank roof plates, rafters, center column, and knuckle. Terminate lining four-inches (4") above the high water line or overflow drain.

b) Interior dry surfaces of pedestal style tank.

3. Surface preparation prior to abrasive blast cleaning: Weld flux and spatter shall be removed by power tool cleaning. Sharp projections shall be ground to a smooth contour. All welds shall be ground to a smooth contour as per NACE Standard RP0178 and herein.

4. Surface Preparation: Per SSPC-SP10 near-white metal blast cleaning, anchor profile shall be 2.0 to 3.0 mils as per ASTM D 4417, Method C or NACE Standard RP0287.

5. Lining System:

a) Shop Primer: High-solids epoxy

b) Field Primer (Unprimed weld seams and touch-up areas only): High solids epoxy

c) Stripe Coat**:** High solids epoxy, 4 – 8 mils DFT

d) 1st Coat**:** High solids epoxy, 9 – 14 mils DFT

e) 2nd Coat**:** High solids epoxy, 9 – 14 mils DFT

Total dry film thickness shall be a minimum of 18 mils.

B. AWWA D102-17, ICS 3, Ultra High Solids Epoxy or ICS 4, 100% Solids Polyurethane Lining System:

1. Coating Type:

a) Ultra-High solids epoxy, minimum 96% volume solids, or

b) 100% volume solids elastomeric aromatic polyurethane

2. Designated Surfaces: Interior tank shell, floor, base plates, and columns. Terminate lining two to four inches onto installed high solids epoxy system. Use manufacturer approved methods for tie-in procedures.

3. Surface Preparation Prior to Abrasive Blast Cleaning: Weld flux and spatter shall be removed by power tool cleaning. Sharp projections shall be ground to a smooth contour. All welds shall be ground to a smooth contour as per NACE Standard RP0178 and herein.

4. Surface Preparation: Per SSPC-SP10 Near-white metal blast cleaning, anchor profile shall be 3.0 to 5.0 mils as per ASTM D 4417, Method C or NACE Standard RP0287.

5. Lining System:

a) Shop Primer: N/A

b) Field Primer (unprimed weld seams and touch up areas only): N/A

c) Stripe Coat**:** High solids epoxy or Ultra High solids epoxy or polyurethane as approved by submitted manufacturer.

d) 1st Coat**:** Ultra high solids epoxy or 100% solids aromatic polyurethane

Total dry film thickness shall be a minimum of 20 mils.

TP - 34.12 TANK EXTERIOR COATING SYSTEM:

The AWWA D102-17 outside coating system (OCS) is approved for usage under this specification.

A. AWWA OCS 5-Modified, High Solids Epoxy, Aliphatic Polyurethane Coating System:

1. Coating type:

a) Epoxy high solids, two component, minimum 65% volume solids, complying with SSPC-Paint 42, or

b) Aliphatic polyurethane, two component, minimum 65% volume solids, complying with SSPC-Paint 36, Level 3.

2. Surface preparation prior to abrasive blast cleaning: Weld flux and spatter shall be removed by power tool cleaning. Sharp projections shall be ground to a smooth contour. All welds shall be ground to a smooth contour as per NACE Standard RP0178 and herein.

3. Surface preparation: SSPC-SP6 Commercial Blast Cleaning. Anchor profile shall be 1.5 to 2.0 mils as per ASTM D 4417, Method C or NACE Standard RP0287.

4. Coating system:

a) Shop primer**:** High solids epoxy, 4 – 8 mils DFT

b) 2nd coat**:** High solids epoxy, 5 – 10 mils DFT

c) 3rd coat**:** Aliphatic polyurethane, 3 -5 mils DFT

Total dry film thickness shall be a minimum of 12 mils.

B. Exterior tank floor (underside): If the underside of the tank floor has been blasted with a wheel abrader, apply 2.0-3.0 dry mils of corrosion resistant alkyd industrial enamel coating.

C. Interior roof laps: All interior roof lap joints shall be sealed with Sikaflex-1A after the coating system has been installed.

D. Buried steel pipe interior pipe coating: Per ANSI/AWWA C210-15, Liquid Epoxy Coatings and Linings for Steel Water Pipe and Fittings, all steel pipes entering and exiting the tank shall be coated on the interior of the pipe with 16 to 20 mils (dry film thickness) of an approved liquid epoxy up to the point where the steel pipe is converted to PVC, HDPE or ductile iron (typically approximately 5 feet outside the tank foundation).

E. Buried Steel Pipe Exterior Coating: All steel pipes entering and exiting the tank shall be coated on the exterior of the pipe with 20 mils of Coal Tar Epoxy up to the point where the steel pipe is converted to PVC or ductile iron (typically 5 feet outside the tank foundation).

TP - 34.13 SURFACE PREPARATION – GENERAL:

A. All surface preparation, coating and painting shall conform to applicable standards of the Steel Structures Painting Council, NACE International and the manufacturer's printed instructions. Materials applied to the surface prior to the approval of the Owner or Owner's Representative shall be removed and re-applied to the satisfaction of the Owner or Owner's Representative at the expense of the contractor.

B. All work shall be performed by skilled craftsmen qualified to perform the required work in a manner comparable with the best standards of practice. Continuity of personnel is highly important and shall be coordinated as a priority with the Owner or Owner's Representative.

C. The Contractor shall provide a supervisor at the work site during cleaning and application operations. The supervisor shall have the authority to sign change orders, coordinate work and make decisions pertaining to the fulfillment of the contract.

D. Dust, dirt, oil, grease or any foreign matter that will affect the adhesion or durability of the coating or paint must be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags.

E. Coating and painting systems include surface preparation, prime coating and finish coatings. Unless otherwise approved in writing by the Owner or Owner's Representative, prime coating shall be field applied. Where prime coatings are shop applied, the Contractor shall instruct suppliers to provide the prime coat compatible with the specified finish coat. Any off-site work which does not conform to this specification which is subjected to damage during transportation, construction or installation shall be thoroughly cleaned and touched-up in the field as directed by the Engineer.

F. The Contractor shall use repair procedures which insure the complete protection of all adjacent primer-coated surfaces. The specified repair method and equipment may include wire-brushing, hand or power tool

cleaning, or dry air blast cleaning. In order to prevent injury to surrounding painted surfaces, blast cleaning may require use of lower air pressure, a smaller nozzle and/or abrasive blast particles, or shorter blast nozzle distances from surface shielding and masking. If damage is too extensive or uneconomical to touch-up, the entire item shall be blasted and then coated or painted as directed by the Owner or Owner's Representative.

G. The Contractor's coating and painting equipment shall be designed for application of the materials as specified and shall be maintained in first class working condition. Compressors shall have suitable traps and filters to remove water and oils from the air. The Contractor's equipment shall be subject to approval by the Owner or Owner's Representative.

H. Application of the first coat shall follow immediately after surface preparation, cleaning and stripe coat application, if applicable, before rust bloom occurs or the same day, whichever is less. Any cleaned areas not receiving first coat within this period shall be re-cleaned prior to application of the first coat. The use of dehumidification equipment shall first be reviewed by the Owner or Owner's Representative and coatings manufacturer prior to deviating from this provision.

I. Prior to assembly, all surfaces made inaccessible after assembly shall be prepared as specified herein and shall receive the coating or paint system specified.

TP - 34.14 SURFACE PREPARATION:

A. The latest revision of the following surface preparation specifications of the Steel Structures Painting Council (SSPC) shall form a part of this specification. The summaries listed below are for informational purposes; consult the actual SSPC specification for full detail.

1. Solvent Cleaning (SSPC-SP1): Removal of oil, grease, soil and other contaminants by use of solvents, emulsions, cleaning compounds, steam cleaning or similar materials and methods which involve a solvent or cleaning action.

2. Hand Tool Cleaning (SSPC-SP2): Removal of loose rust, loose mil scale and other detrimental foreign matter to a degree specified by hand chipping, scraping, sanding and wire-brushing

3. Power Tool Cleaning (SSPC-SP3): Removal of loose rust, loose mil scale and other detrimental foreign matter by power wire-brushing, power impact tools or power sanders.

4. White Metal Blast Cleaning (SSPC-SP5/NACE No. 1): Air blast cleaning to a gray-white uniform metallic color until each element of surface area is free of all visible residues.

5. Commercial Blast Cleaning (SSPC-SP6 NACE No. 3): Air blast cleaning until at least two-thirds of each element of surface area is free of all visible residues.

6. Brush-Off Blast Cleaning (SSPC-SP7 NACE No. 4): Air blast cleaning to remove loose rust, loose mil scale and other detrimental foreign matter to a degree specified.

7. Near-White Metal Blast Cleaning (SSPC-SP10 NACE No. 2): Air blast cleaning until at least 95% of each element of surface area is free of all visible residues.

8. Power Tool Cleaning to Bare Metal (SSPC-SP11): Differs from SSPC-SP3 in that it requires removal of all corrosion products and a surface profile not less than 1 mil.

B. Slag, weld metal accumulation and spatters not removed by the Fabricator, Erector or Installer shall be removed by chipping and/or grinding. All sharp edges shall be peened, ground or otherwise blunted as required by the Owner or Owner's Representative. All grinding and finishing of welds, edges, etc. shall be performed prior to solvent cleaning and abrasive blasting. Welds shall be prepared as per NACE Standard RP0178 for all interior and exterior surfaces:

1. Butt Welds: Shall be ground smooth and free of all defects, designation "D".

2. Lap Welds: Shall be ground smooth and blended, designation "D".

3. Fillet Welded Tee Joint: Shall be ground smooth and blended, designation "D".

C. Field blast cleaning for all surfaces shall be by dry method unless otherwise directed. Blast nozzles shall be

venturi-type nozzles with a minimum pressure at the nozzle of 90 psi.

D. Particle size of abrasives used in blast cleaning shall be that which will produce a 1.5 - 2.5 mil (37.5 microns - 65.0 microns) surface profile or in accordance with recommendations of the manufacturer of the specified coating or paint system to be applied.

E. If the profile of the blasted steel exceeds the profile specified above, the Contractor shall be required to do one or both of the following:

1. Re-blast the surface using a finer aggregate in order to produce the required profile.

2. Apply a thicker prime coat, if possible given the limitations of the products being applied, in order to adequately cover the blast profile

F. Abrasive used in blast cleaning operations shall be new, washed, graded and free of contaminants that would interfere with adhesion of coating or paint and shall not be reused unless specifically approved in writing by the Owner or Owner's Representative.

G. Blast cleaning is not be allowed when the steel surface temperature is less than 5°F above the dew point temperature of the air in contact with the steel surface, or if the relative humidity of the air in contact with the steel surface is greater than 85 percent.

H. All blasted surfaces shall have the first coat of paint applied before rust or contamination can occur. In no case will finish blasted areas remain unprimed for more than 8 hours. At the end of each painting day there shall remain unpainted a 6-inch to 12-inch border of blasted steel. When blast cleaning resumes the following work day, this border shall be re-blasted up to and including 1-inch to 3-inches of the previous applied coating.

I. During blast cleaning operations, caution shall be exercised to insure that existing coatings are not exposed to abrasion from blast cleaning.

J. The Contractor shall keep the area of his work and the surrounding environment in a clean condition. The Contractor shall not permit blasting materials to accumulate as to constitute a nuisance or hazard to the accomplishment of the work, the operation of the existing facilities or to the surrounding environment.

K. Blast cleaned surfaces shall be cleaned prior to application of specified coatings or paint. All surfaces shall be free of dust, dirt, and other residue resulting from the abrasive blasting operation. No coatings or paint shall be applied over damp or moist surfaces.

L. All welds shall be neutralized with a suitable chemical compatible with the specified coating or paint.

M. Pitted areas on the tank interior shall be repaired by filling with a manufacturers approved 100% epoxy filling or patching compound or by welding. Epoxy filler shall be feathered smooth. Filler shall be applied prior to the application of the finish coat. No protrusions or spatter will be allowed. Pits deeper than 1/8" shall be filled by welding.

N. Surface preparation for the specific system shall be as noted in Sections TP-34.11 and TP-34.12.

TP - 34.15 NON-VISIBLE CONTAMINANTS:

A. Chloride, sulfate and ferrous ions (Fe^{2+}) tests shall be performed on the interior metal portions of the tank after sandblasting but prior to the application of coatings. The maximum allowable limit of these non-visible contaminants is:

1. The maximum level of chlorides is 30 milligrams per square meter or 3 micrograms per square centimeter.

2. The maximum level of sulfates is 100 milligrams per square meter or 10 micrograms per square centimeter.

3. The maximum level of ferrous ions (Fe^{2+}) is 50 milligrams per square meter or 5 micrograms per square centimeter.

B. If testing shows amounts present in the test solution to be greater than the limits listed herein, the Contractor

shall clean the surface of the entire tank interior with a 5,000 psi water blast with fine entrained abrasive until the levels in the test solutions are below the maximum acceptable level. Alternate cleaning methods may be allowed with prior approval of the Owner or Owner's Representative. Surface shall be re-blasted as specified in TP-34.11 and TP-34.12 at no additional cost to the Owner.

C. The Contractor shall provide a written statement from the coating manufacturer stating that the maximum acceptable levels are not less than those listed herein. Results of the testing shall be provided to the Owner or Owner's Representative before any coatings are applied.

D. When exterior coats are to be applied on subsequent days, or when the shroud is dropped between coats, the previously-applied coating shall be thoroughly pressure-washed to remove any fallout and/or salt that may have settled on the surface.

TP - 34.16 APPLICATION, GENERAL:

A. Coating application shall conform to the requirements of the Steel Structure Painting Council Paint Application Specification SSPC-PA1, latest revision, for "Shop, Field and Maintenance Painting".

B. Thinning shall be permitted only as recommended by the manufacturer and approved by the Owner or Owner's Representative, and utilizing the thinners stated in Sections TP-34.11 and TP-34.12.

C. Each application of coating shall be applied evenly, free of brush marks, sags, runs, with no evidence of poor workmanship. Care shall be exercised to avoid lapping on glass or hardware. Coatings shall be sharply cut to lines. Finished surfaces shall be free from defects or blemishes.

D. Protective coverings or drop cloths shall be used to protect floors, fixtures and equipment. Care shall be exercised to prevent coatings from being spattered onto surfaces which are not to be coated. Report to the Owner or Owner's Representative surfaces from which materials cannot be satisfactorily removed.

E. When two coats of coating are specified, where possible, the first coat shall contain sufficient approved color additive to act as an indicator of coverage or the two coats must be of contrasting color.

F. Film thickness per coat as specified in Sections TP-34.11 and TP-34.12 are the minimum required. If roller application is deemed necessary, the Contractor shall apply additional coats as to achieve the specified thickness.

G. All material shall be as specified.

TP - 34.17 COATING SYSTEMS APPLICATION:

A. After completion of surface preparation as specified for the specific system, coating materials shall be applied as noted in Sections in conformance with, and as referenced by, this Technical Specification.

B. Care shall be taken so as to eliminate overspray and dry spray on the tank interior. Where such conditions are encountered, the surface shall be cleaned of all over spray and dry spray prior to the application of the succeeding coat.

C. Areas rendered inaccessible after tank erection such as the spaces between roof plates and rafters shall receive the full coating system prior to erection and/or assembly.

D. If specified/permitted by the coating system manufacturer, full prime coat may be applied directly over stripe coat while stripe coat is wet.

TP - 34.02 CURE:

A. General: Each coating system cures as a function of ambient temperature and coatings cure faster at higher temperatures and slower at lower temperatures. Coating times as are specified by manufacturer's literature shall be strictly followed during all coating and recoating processes. No modifications and/or exceptions to the specified cure times will be permitted.

B. Final cure: Minimum final cure time shall be in accordance with the manufacturer's supplied product data sheets and in accordance with NSF 61 certification requirements. Ventilation equipment shall be operated at an exchange rate of two (2) air changes per hours. The roof hatch and manholes shall be left open for the remainder of the final cure.

TP - 34.18 DISINFECTION:

A. Disinfection shall be performed after protective coatings have been applied to the interior surfaces and allowed to thoroughly cure.

B. Prior to disinfecting, the complete interior shall be washed down with clean water and thoroughly flushed.

C. The Contractor shall disinfect the finished tank, and tank plumbing before they are placed into service. The tanks shall be thoroughly cleaned and disinfected according to AWWA C652-11, Method I, II, or III, as will be specified by the Owner or Owner's Representative. The tank and piping shall not be accepted or placed into service until the Owner or Owner's Representative receives from the Contractor a confirming negative bacteriological test. If the tank does not pass the bacteriological test, the Contractor, at no cost to the Owner, will be responsible for re-disinfection until acceptable results are obtained. Water required for disinfection procedures shall be provided by the Owner.

D. Depending on the inspection method utilized, disinfection shall be verified and/or repeated after any and all warranty inspections.

TP - 34.19 SOLVENT VAPOR REMOVAL:

A. All solvent vapors shall be completely removed by suction-type exhaust fans and blowers before placing tank in operating service.

B. All solvent vapors will be exhausted both during and after coating application as per AWWA D 102-17 to allow the proper curing of the coating material.

C. Ventilation shall be continued until such time as the coating has reached "full cure" as specified by the coating manufacturer.

TP - 34.20 VOC TEST:

A. After the tank has reached "full cure" as specified by the coating manufacturer, VOC tests shall be performed on the tank interior coating system. Samples shall be collected for testing by the Owner or his representative. Tests shall be performed in accordance with EPA 524.2 Revision 4 Purgeable VOCs by GC/MS. Total VOCs shall not exceed 100 ppb/100 micrograms per liter for 24 hour and 72 hour intervals.

B. If the limits cited herein are exceeded, the contractor shall take all actions necessary to reduce the total VOCs to the level specified herein. This includes, but is not limited to, continuing forced air ventilation, steam cleaning the structure, and rinsing the structure with clean potable water.

TP - 34.21 CLEAN-UP:

Upon completion of the work, all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by the Owner or Owner's Representative. Coating spots or oil stains upon adjacent surfaces shall be removed and the jobsite cleaned. All damage to surfaces resulting from the work of this section shall be cleaned, repaired or refinished to the satisfaction of the Owner or Owner's Representative at no cost to the Owner.

TP - 34.22 WORK PLAN:

Submit a written work plan describing in detail all phases of the coating operations. Address work sequencing, surface preparation, coating application, recoat and cure time projections, as well as how each step will be controlled, tested, and evaluated. Provide detailed procedures, including manufacturer's instructions, for repairing defects in the coating film such as runs, drips, sags, holidays, overspray, etc. Address safety measures, work scheduling based on expected weather condition extremes, and record keeping.

TP - 34.23 MEASUREMENT AND PAYMENT:

The tank painting shall be measured on a lump sum basis. Payment for the interior and exterior painting shall be at the unit price shown on the bid schedule, which shall be full compensation for interior and exterior coating of steel water storage tanks, including materials, coating systems, surface preparation, application, inspection, testing, disinfection, and placing the tank into service.

SUBMITTAL REVIEW FORM

SECTION 34 – COATINGS FOR WELDED STEEL STORAGE TANKS

	Date	Initials		
Received by ENGINEER:			Submittal No.	
Received by OWNER:			Project No.	
			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
34.04	Qualifications		
34.11	Tank interior coating system		
34.12	Tank exterior coating system		
34.22	Work Plan		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 60 - CHAIN LINK FENCING

TP - 60.01 SCOPE:

The work covered under this section consists of furnishing all equipment, labor, materials, and incidentals necessary for the complete installation of a chain link fence and accessories, in strict accordance with the applicable drawings, the provisions of ASTM F567 (active standard), and these Technical Provisions.

TP - 60.02 GENERAL:

The fence shall be constructed in the locations as shown on the drawings, or as directed by the Owner or Owner's representative.

TP - 60.03 MATERIALS:

A. Fence Fabric: Fence Fabric shall be zinc coated steel fabric meeting the requirements of Federal Specifications RR-F-191/1C and ASTM A392. Fabric shall be woven in a 2-inch diamond mesh and of height specified on the drawings. The weight of zinc coating shall not be less than 1.2 oz/ft^2.

1. Wire used in four-foot (4') fence fabric shall be 11-gauge (0.120 inch diameter) and shall be knuckled on the top and bottom selvage.
2. Wire used in six-foot and eight-foot (6', 8') fence fabric shall be 9-gauge (0.148 inch diameter) and shall be twisted on the top selvage and knuckled on the bottom selvage. Wire ends shall be cut at an angle.

B. Tension Wire: Tension wire shall have a marcelled pattern. The wire shall be zinc-coated, galvanized steel wire, 7 gage (0.177 inches in diameter), conforming to ASTM A824.

C. Barbed Wire: Barbed wire shall be zinc-coated steel barbed wire conforming to ASTM A121. The barbed wire shall be design number 12-4-5-14R: two twisted strands of 12-gauge wire, and 4-point, 14-gauge barbs spaced 5 inches on center.

D. Chain Link Fence Accessories: The following components shall be zinc-coated steel with a minimum zinc coating of 1.2 oz/ft^2, and galvanized after fabrication, conforming to ASTM F626. Any additional fence accessory not specifically stated shall also meet these requirements unless otherwise approved by the Owner or the Owner's representative.

1. Post and line caps: Caps shall be designed to fit securely over the outside of the posts and be watertight.
2. Rail and brace ends: No additional requirements.
3. Tie wires, clips, and fasteners: No additional requirements. Hog rings shall be included in this category.
4. Tension and brace bands: No additional requirements.
5. Tension bars: Tension bars shall have a cross section no less than 3/16-inch by 3/4-inch. The tension bar shall be of a continuous length and not shorter than 2 inches less than the nominal height of the fabric.
6. Truss rod assembly: The truss rod assembly shall consist of a steel rod not less than 3/8" in diameter and be equipped with a turnbuckle or other equivalent provision for adjustment. The assembly shall be capable of withstanding a tension of 2,000 lbs.
7. Barbed wire arms: Barbed wire arms shall be designed to fit securely over the outside of the post while supporting horizontal braces and be watertight. Arms shall be at an angle of 45-degrees and

shall be fitted with clips for attaching three strands of barbed wire. Barbed wire arms shall be of sufficient strength to withstand a weight of 250-lbs applied at the outer strand of the barbed wire.

E. Posts, Post Rails and Braces: All pipe required for construction of the fence and gates shall be round Schedule 40 steel pipe, hot-dip galvanized (interior and exterior), zinc-coated, regular grade (30,000 psi) meeting or exceeding the requirements of ASTM F1083 and ASTM F1043 Group 1A. Pipe sizes for fence components are presented in the following table.

Use	Nominal Pipe Size	Outside Diameter (in.)	Weight (lbs/ft)	Fence Industry Trade Reference
Line Post				
1. 4' Fence	1 ½"	1.900	2.72	1 7/8"
2. 6' and 8' Fence	2"	2.375	3.65	2 3/8"
Brace rail, Intermediate Rail	1 ¼"	1.660	2.27	1 5/8"
Gate Frames				
1. 4' Fence	1 ¼"	1.660	2.27	1 5/8"
2. 6' and 8' Fence	1 ½"	1.900	2.72	1 7/8"
Terminal, End, Corner & Slope/Pull Posts				
1. 4' Fence	2"	2.375	3.65	2 3/8"
2. 6' and 8' Fence	2 ½"	2.875	5.80	2 7/8"
Gate Posts				
1. 4' Fence				
Gate leaf up to 4-feet	2"	2.375	3.65	2 3/8"
Gate leaf over 4' to 10'	2 ½"	2.875	5.80	2 7/8"
Gate leaf over 10' to 18'	3 ½"	4.000	9.11	4"
2. 6' and 8' Fence				
Gate leaf up to 6-feet	2 ½"	2.875	5.80	2 7/8"
Gate leaf over 6' to 12'	3 ½"	4.000	9.11	4"
Gate post sizes for gate leaf widths greater than listed shall be as directed by the Owner.				

F. Gates and Accessories: Swing gates, complete with latches, stops, keepers, hinges, drop bar, and barbed wire, shall be provided where shown on the plans. Swing gates shall conform to ASTM F900.

1. Gate Frames: Gate Frames shall be Schedule 40 steel pipe as described in 60.03 B of this specification.
2. Gate Fabric: The fabric shall be as specified for the fence as described in 60.03A of this specification.
3. All gate accessories shall be zinc-coated with a minimum zinc coating of 1.2 oz/ft^2, galvanized after fabrication, conforming to ASTM F626 and in accordance with tests set forth in ASTM A90.
4. Hinges: Gate Hinges shall be pressed steel or malleable iron. The hinges shall be designed to permit the gate to swing a full 180 degrees. The hinges shall be of adequate strength, with large bearing surfaces for clamping in position and shall not twist or turn under the action of the gate.
5. Latches: Double gate latches shall be a plunger bar arranged to engage the gate stop. Locking devices shall be constructed so that the plunger bar cannot be raised when the gate is locked. The latching device shall have provision for a padlock and shall be designed such that both gate leaves can be locked with a single padlock. Single gate latches may be of the same style, or a forked latch may be provided. Each latch shall be provided with a padlock, Master or equal, and four keys.

6. Gate Stops: Gate stops shall be provided for all double gates and shall consist of a galvanized, hot-dipped zinc-coated Schedule 40 drop-bar and a receiving gate stop as illustrated on standard details of the construction drawings.

7. Keepers: Keepers shall be provided for each gate leaf 5 feet in width or more. Gate keepers shall consist of a mechanical device for securing the free end of the gate when in the full open position.

G. Concrete: Concrete shall be in conformance with Section 02 of the Technical Provisions.

H. Warning Signs: Warning signs shall be prepared and erected to display the information/text/message as shown in the drawings. The size of the warning signs, number of warning signs, and the location of the warning signs shall be manufactured as shown on the construction drawings.

The signs shall be constructed of sixteen (16)-gauge zinc coated steel or 0.105 inch aluminum sheeting. The letters shall be black on white background of a size approved by the Owner or Owner's Representative. The white background shall be hot sprayed with a weather resistant, flexible enamel for enduring appearance. The letters shall be silk screened with sharp clear lines painted with a weather resistant flexible enamel.

The signs shall be the product of a company regularly engaged in the manufacture of metal signs.

TP - 60.04 INSTALLATION:

The fence shall be installed in accordance with ASTM F567 except as modified in these specifications.

A. Preparation: Prior to commencing all work, the Contractor shall locate all underground utilities and structures. The Contractor shall indicate the location and slope of fence lines, gates and terminal posts for actual construction by staking and shall secure the Owner's approval that such layout is in accordance with the plans. The Contractor shall clear and grade along the fence line only as necessary to provide a uniform clearance between the fence fabric and ground and permit proper installation. The Contractor shall remove existing fence at the work site as directed by the Owner or as indicated on the plans. All ground disturbances shall be filled to match existing grades.

B. Post Location: Line posts shall be spaced equidistantly at intervals not exceeding 10 feet. Terminal posts (end, corner, gate and slope/pull posts) shall be set where an abrupt change in alignment or grade of 30-degrees or more occurs or to divide straight runs of fencing which exceed 500-feet in length.

C. Post Setting: Set posts in concrete in holes of diameter and depth as shown in the tables below. Posts shall be set in a vertical position, plumb, in line and centered in the footing. Concrete shall be placed 6" below the post and shall extend 2 inches above grade and be crowned to shed water. Forms are not required. Fence fabric shall not be stretched until the concrete has cured for at least 7-days. If solid rock or concrete is encountered, the posts shall be set as recommended by the fencing manufacturer and approved by the Owner or Owner's Representative prior to installation.

1. Four-Foot (4') Fence Post Holes:

4' FENCE POST HOLES			
Type of Post	**Diameter of Post Hole**	**Depth of Post Hole**	**Depth of post in Concrete**
Line Posts *(1.900" OD)*	8"	24"	18"
Terminal Posts *(2.375" OD)*	10"	24"	18"
Gate Posts			
1. Gate leaf less than 4' *(2.375" OD)*	10"	36"	30"
2. Gate leaf between 4' to 10' *(2.875" OD)*	12"	36"	30"
3. Gate leaf over 10' to 18' *(4.000" OD)*	16"	36"	30"
Post holes for gate leafs greater than listed shall be as directed by the Owner.			

2. Six-Foot (6') and Eight-Foot (8') Fence Post Holes:

6' and 8' FENCE POST HOLES			
Type of Post	**Diameter of Post Hole**	**Depth of Post Hole**	**Depth of post in Concrete**
Line Posts *(2.375" OD)*	10"	30"	24"
Terminal Posts *(2.875" OD)*	12"	30"	24"
Gate Posts			
1. Gate leaf less than 6' *(2.875" OD)*	12"	36"	30"
2. Gate leaf over 6' to 12' *(4.000" OD)*	16"	36"	30"
Post holes for gate leafs greater than listed shall be as directed by the Owner.			

D. Post Caps: All posts shall be fitted with watertight caps. Barbed wire arms shall be installed on line posts to perform this function.

E. Top Rail and Bottom Tension Wire: The top rail shall be supported at each post so that a continuous brace from end-to-end of each stretch of fencing is formed. The top rail shall be securely fastened to the terminal posts and joined with sleeves or couplings. Bottom Tension wires are required and shall be fastened within the bottom three-inches (3") of the fence fabric. The tension wire shall be securely fastened to all terminal, gate and corner posts. Securely fasten the tension wire to the terminal, corner and gate posts with a brace or stretcher bar band. The tension wire shall be taut and free of sag. After the fabric is stretched, fabric shall be attached to the bottom tension wire with C-rings (Hog-rings) at intervals not exceeding 12-inches. Fence fabric shall be secured to the top rails with tie wire at intervals not exceeding 18-inches.

F. Bracing: Bracing shall be provided for each terminal, corner and gate post consisting of a brace rail and truss rod assembly. Corner posts shall have bracing assemblies installed in both directions to the next line post. The brace rail shall be installed between the terminal, corner or gate post and the adjacent line post at 2/3 height of the fabric. The truss rod assembly shall be installed from the bottom of the terminal, corner or gate post to the brace rail. The truss rod assembly shall be as shown on the plans and shall be finished neatly without undue protrusion of the ends.

G. Tension Bars: Tension bars shall be threaded through the fabric and attached to the terminal, corner or gate post by brace bands or tension bands at intervals not exceeding 12-inches. Terminal and gate posts shall have one (1) tension bar installed. Corner posts shall have two (2) tension bars installed.

H. Fence Fabric:

1. Install fence fabric on the outside of the fence and gate assembly framework.

2. Position the fence fabric two-inches (2") above ground level. Fasten the fabric to terminal, corner and gate posts with tension bars as specified. Cut the fabric and fasten each span independently at all terminal, corner and gate posts. Secure and apply sufficient tension to remove all slack and provide a smooth uniform appearance before making other attachments. Attach the fence fabric to the bottom tension wires with C-rings (hog rings) at intervals not exceeding 18" and to line posts with tie wires at intervals not exceeding 12".

3. The fence fabric shall be cut by untwisting a picket and attaching each span independently to the terminal post as described. Where the fabric must be spliced, weave a single picket through the end links to form a continuous mesh and form the appropriate selvage at each end.

I. Barbed Wire: Where barbed wire is required, barbed wire shall be stretched taut to remove all sag and installed in the slots of the extension arms. Attach each strand of barbed wire to the terminal post using a brace band.

J. Summary of Fence Fabric Attachment points:

Fence Fabric Attachment to:	Attach with:	Attachment Spacing:
Terminal Post Line Post Corner Post Gate Frame Horizontal member Gate Frame Vertical member	Brace Bands & Tension Bar Tie wire Brace Bands & Tension Bar Tie wire Brace Bands & Tension Bar	12”
Tension Wire	Hog ring	18”

K. Gates: Swing gates complete with latches, stops, keepers, hinges and barbed wire shall be provided where shown on the plans. Swing gates shall conform to ASTM F900 except as otherwise specified.

1. Frames shall be made of pipe as specified in 60.03B.
2. Frames shall be made with corner fittings or welding. Protect welds by applying a zinc-rich paint in accordance with ASTM A780 and the American Galvanizer Association such as Galvax Cold Galvanizing Paint (95% Zinc) or an approved equal. Where corner fittings are used, gates shall have truss rod assemblies even if not otherwise stated. Gate leaf design shall be as stated below. Interior bracing shall be evenly spaced within the frame. Gate leaf sizes that are not encompassed by the following requirements shall be as noted on the plans or as directed by the Owner.
   a. 4’ fabric gate leaf of 3’ – 4’ width shall have one diagonal truss rod assembly.
   b. 6’ – 8’ fabric gate leaf of 3’ - 4’ width shall have one horizontal brace.
   c. 6’ – 8’ fabric gate leaf between 5’ to 8’ width shall have one horizontal brace, one vertical brace and one diagonal truss rod assembly.
3. Where barbed wire is required, the end members of the gate frames shall extend one foot above the top horizontal member to which three strands of barbed wire, uniformly spaced, shall be attached by use of bands or clips.
4. Fabric shall be attached securely to the gate frame by tension bars, brace bands, and tie wires as specified for fence construction. All fence fabric attachments to gate framing is spaced a maximum of 12”.
5. Hinge and latch offset opening space from the gate frame to the gate post shall be no greater than 3” in the closed position.
6. Gate stops for double gates shall be set in a concrete footing of minimum 12” diameter and 24” deep.
7. The gate shall be capable of being opened and closed easily by one person and installed in a manner as to prevent removal of the gate by lifting off.
8. Gates shall swing or slide in the direction indicated in the drawings. Grade clearance and all possible gate obstructions shall be considered to provide adequate operational clearance. Gates shall be true to opening and plumb in a closed position.

L. Repairs to Coatings: Where galvanized coatings are cut, broken, burned, abraded, or otherwise damaged, affected areas shall be repaired by applying zinc-rich paint in accordance with ASTM Practice A780.

TP - 60.05 GRAVEL COVER:

Gravel cover shall be installed at the locations indicated on the plans. The designated areas within the fence shall be graded, sterilized, and covered with plastic sheeting and gravel. The Contractor shall excavate the designated areas within the fence to a depth of 3 inches below the final grade and shall shape and smooth the excavated area to correct any surface irregularities. If directed by the Owner or Owner’s representative, the area shall then be

sprayed with an approved soil sterilant, equal to Primatol, to prohibit vegetation growth. The designated soil sterilant shall be applied at a rate that is in accordance with the manufacturer's recommendations. Soil sterilant shall not be applied around well-heads/water source sites. If specified by the construction drawings, the treated ground surface shall be completely covered with one layer of woven, needle punched, 5.0 ounce polypropylene landscape fabric/weed-barrier designed for professional and commercial use equal to Dewitt Pro-5 Weed Barrier. All weed-barrier fabric joints shall overlap a minimum of 12 inches.

After placement of the landscape fabric/weed-barrier sheet-stock, the entire area shall be covered with a 3 inch uniform layer of washed gravel. Care will be taken in placing the gravel to assure the landscape fabric/weed-barrier is not displaced, punctured or torn. The gravel shall be 3/4-inch to 1-1/2 inch in size and shall be subject to the Owner's approval.

TP - 60.06 CLEANUP:

The area of the fence installation shall be left neat and free of any debris caused by the erection of the fence.

TP - 60.07 MEASUREMENT AND PAYMENT:

A. Mobilization/Demobilization: When applicable, and if separate from the inclusions of TP-01, payment for mobilization/demobilization shall be at the lump sum listed in the bid schedule. Mobilization shall consist of moving all necessary materials and equipment to the site to perform the work. Demobilization includes repacking and removal of all tools, equipment and construction debris from the work area to the satisfaction of the Owner. 60% of this line item may be requested upon complete mobilization to the job site and the remainder may be requested upon demobilization from the job site.

B. Removal of Existing Fence: Payment for the removal of existing fence shall be measured in linear feet of fence removed; this price being full compensation for all labor, equipment,and incidentals required to remove and dispose of the existing fence per federal, state and local regulations.

C. Fencing: The fencing shall be measured in linear feet along the fence line, including the gates. Payment for fencing shall be at the contract unit price shown in the Bid Schedule; this price being full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including posts, rails, fabric, barbed wire, gates, signage, associated fence accessories and clean up.

D. Gravel Cover: Payment for gravel cover shall be made per cubic yard basis for furnishing all labor, equipment, materials and incidentals for placing the gravel. Such payment shall include, but not be limited to, furnishing materials, soil preparation, placement of landscape fabric/weed-barrier, labor, equipment, miscellaneous material, and clean-up.

SUBMITTAL REVIEW FORM

SECTION 60 - CHAIN LINK FENCING

	DATE	INITIALS		
Received by ENGINEER:			Submittal No.	
			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No. Manufacturer, etc.)	Action by Owner
60.03	4’ Fence Fabric		
60.03	6’ – 8’ Fence Fabric		
60.03	Posts and Rails		
60.03	Tension Wire		
60.03	Barbed Wire		
60.03	Post & Line Caps		
60.03	Rail & Brace Ends		
60.03	Tie Wire and Hog Rings		
60.03	Brace Bands and Tension Bands		
60.03	Truss Rod Assembly		
60.03	Barbed Wire Arms		
60.03	Gate Hinges		
60.03	Gate Latch		
60.03	Gate Stop		
60.03	Gate Keeper		
60.03	Warning Signs		
60.04	Zinc-rich paint		
60.05	Gravel		
60.05	Landscape fabric/weed-barrier		
60.05	Soil sterilant		
02	Concrete Mix		

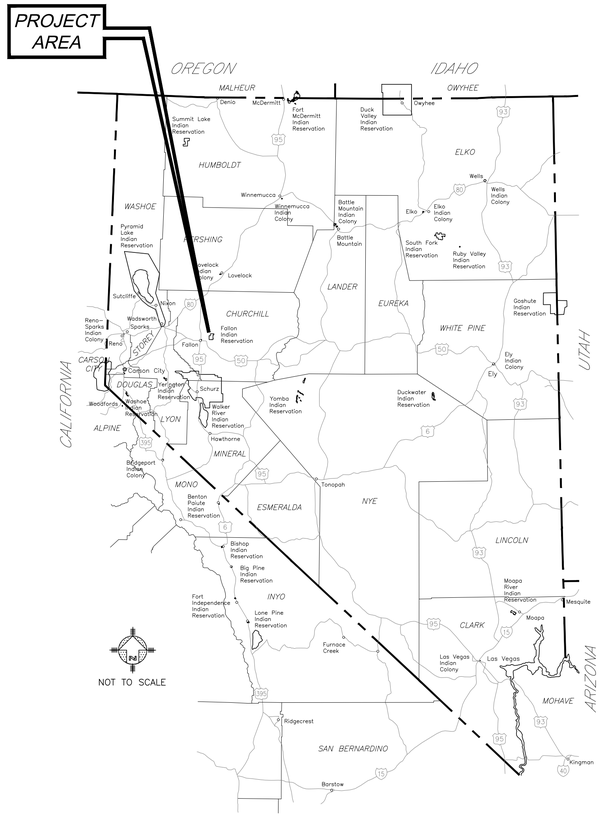
	Signature	Date:
CONTRACTOR:		
OWNER APPROVAL:		

CONSTRUCTION DRAWINGS

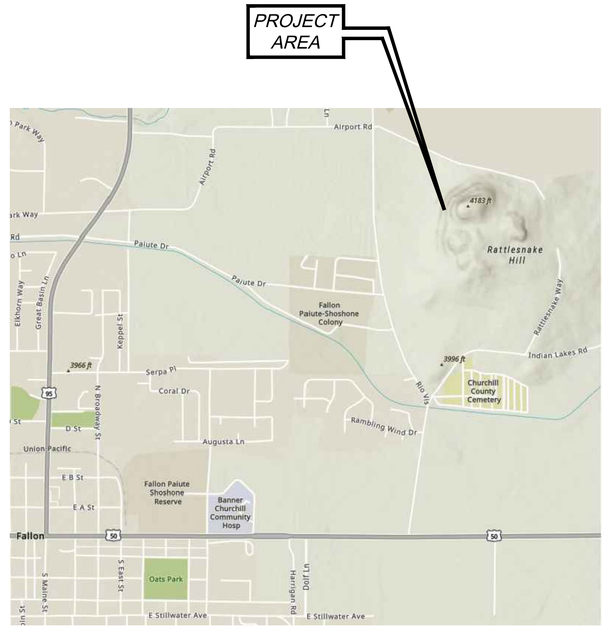
INDIAN HEALTH SERVICE
SANITATION FACILITIES CONSTRUCTION
FALLON COLONY - WATER STORAGE TANK REPLACEMENT

FALLON INDIAN RESERVATION INDIAN RESERVATION
CHURCHILL COUNTY, NEVADA

A COOPERATIVE PROJECT BETWEEN THE INDIAN HEALTH SERVICE
AND THE FALLON PAIUTE-SHOSHONE TRIBE
PROJECT NO. PH 16-U83 / 25-23



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

Sheet List Table		
Sheet #		Sheet Title
GENERAL		
01		COVER-TITLE-TABLE OF CONTENTS
02		SCHEMATIC-SCOPE OF WORK-DESIGN CRITERIA
CIVIL		
03		PROJECT OVERVIEW - SITE PLAN
04		EXISTING STORAGE TANK
05		NEW STORAGE TANK
06		TANK DETAILS I
07		TANK DETAILS II
08		TANK DETAILS III
09		FENCE DETAILS
10		WATER SYSTEM DETAILS II

INT.
REVISIONS
DATE

PROFESSIONAL ENGINEER - STATE OF NEVADA
SOPHIA LOPEZ
Exp: 12/31/25
CIVIL
No. 29756
12/26/23

INDIAN HEALTH SERVICE
OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING

RENO DISTRICT OFFICE
1150 FINANCIAL BLVD, SUITE 500
RENO, NV 89502
(775) 784-5327

INDIAN HEALTH SERVICE 1955

THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
COVER-TITLE-TABLE OF CONTENTS
PH 16-083

FILE NAME: FLLN-G-STCOVR
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

01
SHEET 01 OF 10

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MELANIE MCFALLS
775-423-6040

WATER / SEWER (FALLON TRIBE)
CODY DOWNS
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CHIEF OF TRIBAL POLICE
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SOUTHWEST GAS
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TELEPHONE/CABLE
CC COMMUNICATIONS
775-423-7171

CITY OF FALLON
CITY ENGINEER
DEREK ZIMNEY
DZIMNEY@FALLONNEVADA.GOV
775-423-5107

ENGINEERS NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR ALL METHODS, SEQUENCING, AND SAFETY CONCERNS ASSOCIATED WITH THIS PROJECT DURING CONSTRUCTION, UNLESS SPECIFICALLY ADDRESSED OTHERWISE IN THIS PLAN OR ELSEWHERE IN THE CONTRACT.
2. THE ENGINEER WILL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OR FOR SAFETY PRECAUTIONS OR PROGRAMS UTILIZED IN CONNECTION WITH THE WORK, AND WILL NOT BE RESPONSIBLE FOR THE CONTRACTORS FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE QUANTITIES AND SITE CONDITIONS DEPICTED IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE SUBJECT TO ERROR AND OMISSION. CONTRACTORS SHALL SATISFY THEMSELVES AS TO ACTUAL QUANTITIES AND SITE CONDITIONS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
4. A REASONABLE EFFORT HAS BEEN MADE TO SHOW THE LOCATIONS OF EXISTING UNDERGROUND FACILITIES AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND/OR FACILITIES CAUSED DURING THEIR CONSTRUCTION OPERATIONS.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION OF CONSTRUCTION AFFECTING UTILITIES AND THE COORDINATION OF ANY NECESSARY UTILITY RELOCATION WORK.
6. ALL PAVING, GRADING, EXCAVATION, TRENCHING, PIPE BEDDING, CUT, FILL AND BACKFILL SHALL COMPLY WITH THE RECOMMENDATIONS SET FORTH IN THE TECHNICAL PROVISIONS.
7. THE CONTRACTOR IS TO VERIFY THE ELEVATIONS OF ALL EXISTING UTILITIES AT POINTS OF TIE-IN PRIOR TO COMMENCING ANY NEW CONSTRUCTION, SHOULD ANY LOCATION OR ELEVATION DIFFER FROM THAT SHOWN ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE OWNER AND ENGINEER.
8. COORDINATION BETWEEN ALL PARTIES IS AN ESSENTIAL PART OF THE CONTRACT.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE PROJECT AND SITE CONDITIONS, AND TO WORK WITH WEATHER CONDITIONS AS THE PROJECT SITE MAY BE LOCATED IN A FLOOD PRONE AREA AND SUBJECT TO FLOODING AND ITS HAZARDS.
10. THE OWNER AND ENGINEER MUST APPROVE , PRIOR TO CONSTRUCTION, ANY ALTERATION OR VARIANCE FROM THESE PLANS. ANY VARIATION FROM THESE PLANS SHALL BE PROPOSED ON CONSTRUCTION FIELD PRINTS AND TRANSMITTED TO THE ENGINEER.
11. NOTHING CONTAINED IN THE CONTRACT DOCUMENTS SHALL CREATE, NOR SHALL BE CONSTRUED TO CREATE, ANY CONTRACTUAL RELATIONSHIP BETWEEN THE ENGINEER AND THE CONTRACTOR OR ANY SUBCONTRACTOR.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEMONSTRATE THE COMPLIANCE OF "EQUIVALENT" OR "EQUAL" ITEMS WITH THE CONSTRUCTION PLANS TO THE OWNER AND ENGINEER. EQUIVALENT ITEMS SHALL BE CONSIDERED BUT THEIR ACCEPTANCE IS NOT GUARANTEED.
13. ANY WORK/MATERIAL NOT IN CONFORMANCE WITH THE SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
14. AN APPROVED SET OF PLANS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.
15. THE CITY OF FALLON HAS GRANTED THE FALLON PAIUTE-SHOSHONE TRIBE A CONSTRUCTION EASEMENT FOR TEMPORARY WATER INFRASTRUCTURE. CONTRACTOR SHALL SUBMIT A TEMPORARY WATER PLAN FOR APPROVAL TO THE OWNER WHO WILL PROVIDE IT TO THE CITY. IT IS THE CONTRACTORS RESPONSIBILITY TO PROTECT AND SECURE TEMPORARY WATER INFRASTRUCTURE WITHIN THE CONSTRUCTION EASEMENT.

ENGINEERS NOTICE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE DRAWINGS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE DRAWINGS AND WE ASSUME NO RESPONSIBILITY AS TO THE ACCURACY OF THEIR DEPICTED LOCATION ON THESE DRAWINGS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN, AND ALL OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE DRAWINGS BY VERIFICATION OF THEIR LOCATION IN THE FIELD PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE QUANTITIES ON THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY, AND ARE NOT TO BE USED FOR BIDDING OR CONSTRUCTION PURPOSES.

SAFETY NOTICE TO CONTRACTOR

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

SCOPE OF WORK

- REMOVE THE EXISTING 250,000 GALLON CONCRETE WATER STORAGE TANK
- REMOVAL OF EXCESS ROCK
- CONSTRUCT A NEW 375,000 GALLON WELDED STEEL WATER STORAGE TANK, FOUNDATION AND TANK PLUMBING
- NEW TANK EXTERIOR/INTERIOR COATING
- PROVIDING TEMPORARY WATER STORAGE SYSTEM TO ENSURE WATER SUPPLY AND STORAGE DURING CONSTRUCTION

DATE	REVISIONS	INT.

PROFESSIONAL ENGINEER - STATE OF NEVADA
SOPHIA LOPEZ
Exp: 12/31/25
CIVIL
No. 29756
12/26/23

INDIAN HEALTH SERVICE
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INDIAN HEALTH SERVICE 1955

THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
SCHEMATIC-SCOPE OF WORK-DESIGN CRITERIA
PH 16-U83

FILE NAME: FLN-G-SYSCHEM
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

02
SHEET 02 OF 10

PROJECT OVERVIEW - SITE PLAN

DATE	REVISIONS	INT.

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THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
PROJECT OVERVIEW - SITE PLAN
PH 16-083

DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

FILE NAME: FLN-C-STPLAN-PREL
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

SHEET 03 OF 10

EXISTING STORAGE TANK

DATE	REVISIONS	INT.

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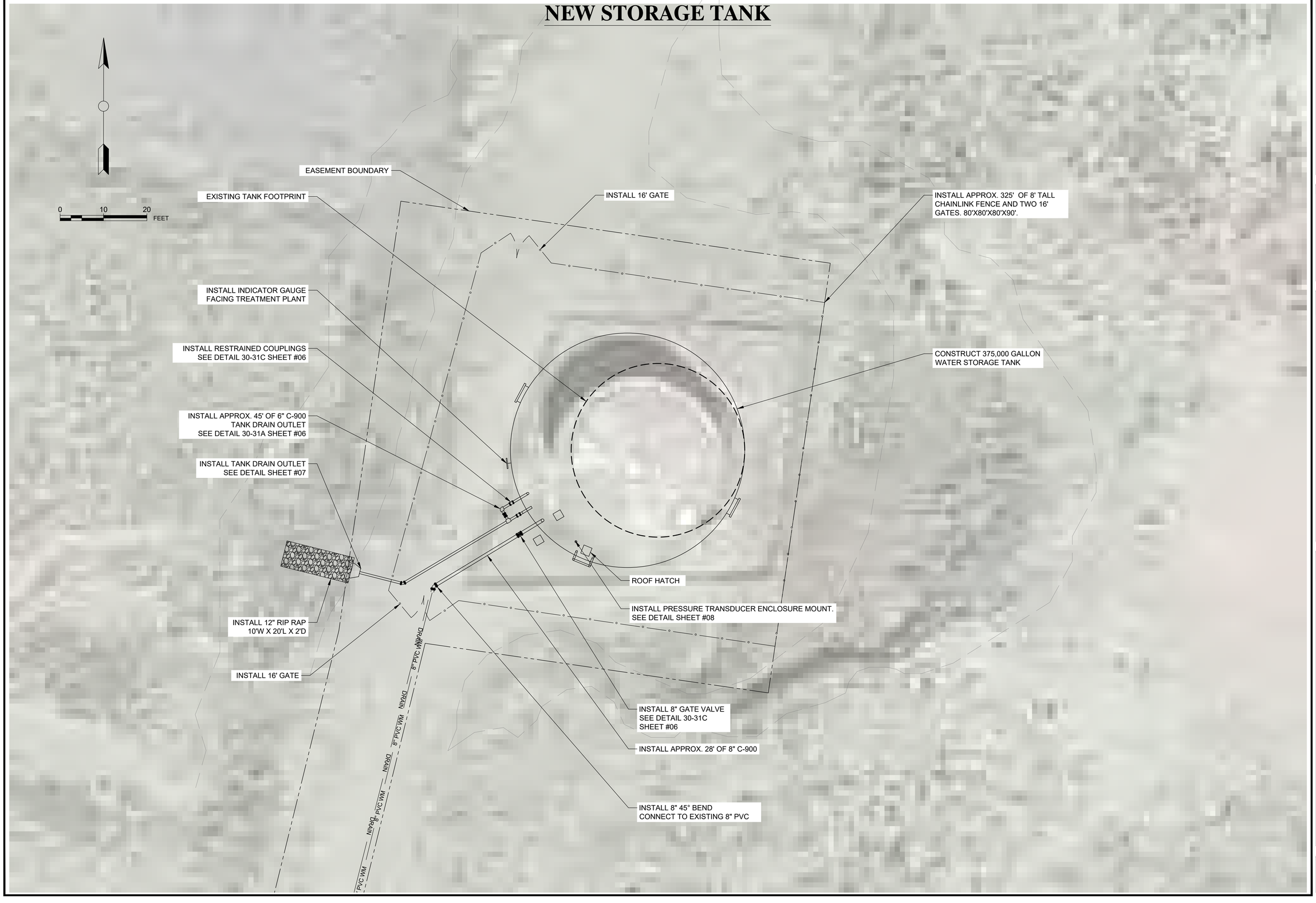
THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY – CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
EXISTING STORAGE TANK
PH 16-083

DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

FILE NAME: FLN-C-STPLAN-PRFL
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

04
SHEET 04 OF 10

NEW STORAGE TANK



DATE	REVISIONS	INT.

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FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
NEW STORAGE TANK
PH 16-U83

DRAWN BY: C.GROOMS DATE: 12/2023
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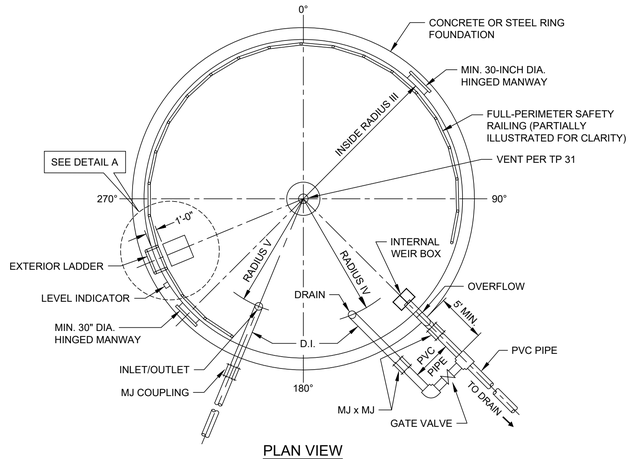
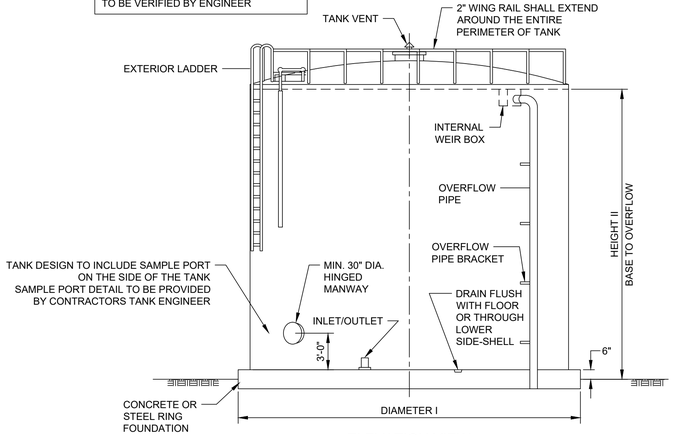
FILE NAME: FLN-C-STPLAN-PRFL
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

05
SHEET 05 OF 10



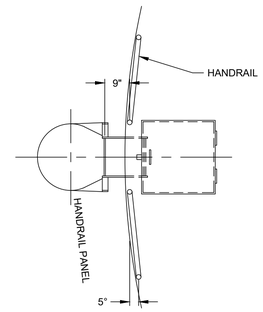
PLAN VIEW

NOTE:
POSITION OF PIPING & APPURTENANCES TO BE VERIFIED BY ENGINEER

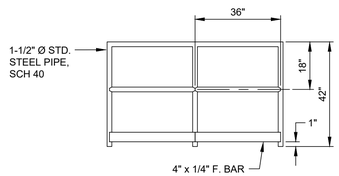


ELEVATION VIEW

30-31A **TYPICAL WATER TANK DETAILS**
Scale: NTS MODIFIED



DETAIL A



HANDRAIL DETAIL

TANK DIMENSIONS (APPROXIMATE)									
LOCATION	OVERFLOW DRAIN SIZE	DIAMETER I	DIAMETER II	RADIUS III	APPURTENANCE RADIUS IV	RADIUS V	OUTLET PIPE SIZE	INLET PIPE SIZE	WORKING VOL. (GALS.)
DESIGN									
ACTUAL									

TANK APPURTENANCE TABLE											
TANK APPURTENANCE INFORMATION	INLET	OUTLET	DRAIN	OVER-FLOW	MANWAY 1	MANWAY 2	EXTERIOR LADDER	ROOF HATCH	ROOF BLIND-FLANGE	TARGET GAUGE	OTHERS?
DIAMETER (IN.)											
DEGREE LOCATION											
CL ABOVE TANK FLOOR											

NOTE:
PER ENGINEER PREFERENCE, INLET AND OUTLET PIPING MAY ENTER THE TANK THROUGH THE FLOOR OR THROUGH THE SIDE-SHELL.

TANK PIPING SIZE				
PIPE TYPE	OUTLET	INLET	DRAIN	OVERFLOW
STEEL UNDER TANK				
STEEL EXTERIOR				

30-31C **WATER TANK INLET/OUTLET**
Scale: NTS MODIFIED

NOTES:
1. ALL ABOVE GROUND JOINTS SHALL BE FLANGED ALL BURIED JOINTS SHALL BE RESTRAINED MECHANICAL JOINTS.
2. FINAL GROUND ELEVATION SHALL SLOPE AWAY FROM TANK AT 1:10 SLOPE FOR A MINIMUM 15' FROM THE TANK IN ALL DIRECTIONS. ALL SURFACE DRAINAGE SHALL BE DIRECTED AWAY FROM THE TANK.
3. TANK BASE SHALL BE A MINIMUM OF SIX INCHES (6") ABOVE FINAL GROUND ELEVATION.
4. OVERFLOW ELEVATION TO BE LOCATED BASED ON A MINIMUM REQUIREMENT FOR FREE-BOARD.
5. FOUNDATION, YARD PIPING, AND INLET PIPE DESIGN TO BE SEALED AND SUBMITTED BY CONTRACTOR FOR APPROVAL BY OWNER.
6. EXPOSED DRAIN PIPING SHALL BE DUCTILE IRON. BURIED DRAIN PIPING MAY BE PVC.
7. INSTALL BIRD DETERRENT SPIKES PER TP 30.

DATE	REVISIONS	INT.

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THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
TANK DETAILS 1
PH 16-083

FILE NAME: FLN-C-DTWATR 1
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

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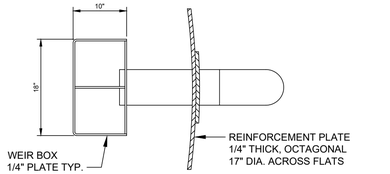
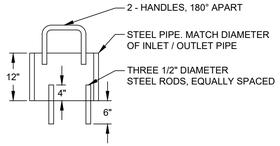
SHEET 06 OF 10

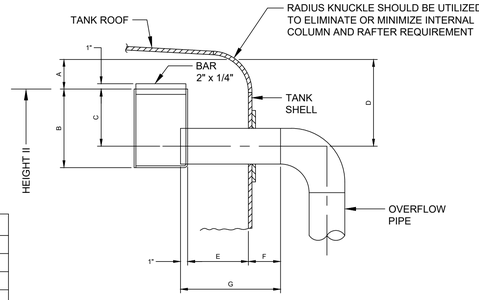




DRAIN SILT STOP (PROFILE VIEW)

N.T.S. MODIFIED

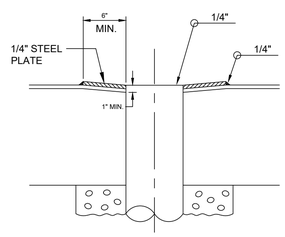
NOTES:
1) CONTRACTOR SHALL PROVIDE DIELECTRIC CONNECTION BETWEEN STEEL TANK STRUCTURE AND ALUMINUM LADDER TO PREVENT ELECTROLYTIC ACTION BETWEEN THE TWO METALS.
2) INTERIOR LADDER IS OPTIONAL PER THE PROJECT ENGINEER.



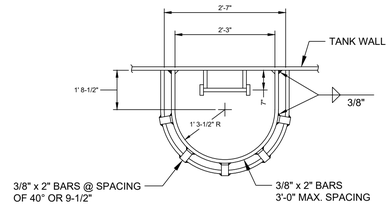
DIM (IN.)	
A	
B	
C	
D	
E	
E	
G	

OVERFLOW STRUCTURE DETAIL

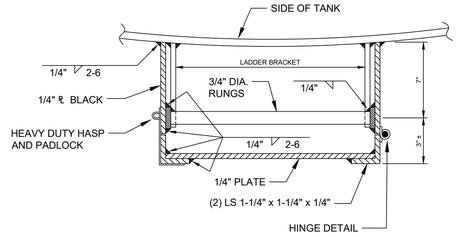
NOTE:
ALTERNATIVELY, AND IF DIRECTED BY THE ENGINEER, THE TANK DRAIN MAY ALSO PENETRATE THROUGH THE BASE OF THE TANK SIDE-SHELL.



TANK DRAIN DETAIL



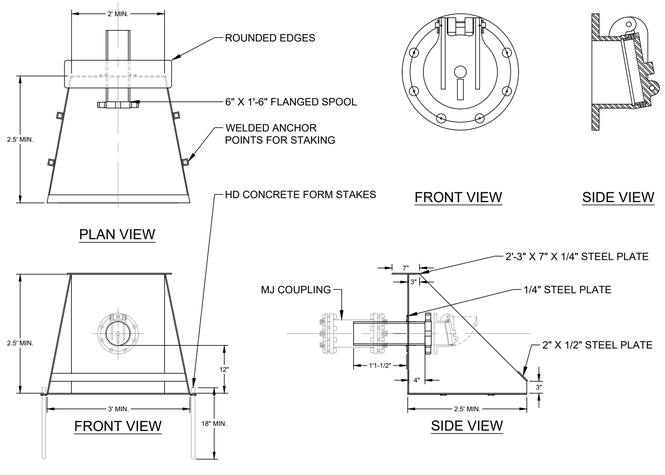
PLAN



SECTION B-B

30-31B WATER TANK OVERFLOW AND DRAIN

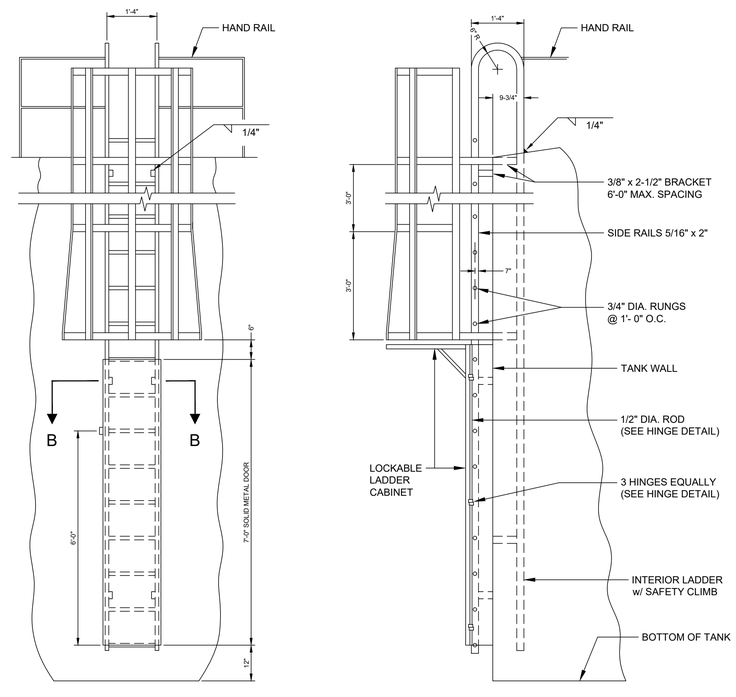
Scale: NTS



NOTE: ALL STEEL SHALL BE COATED OR GALVANIZED

TANK DRAIN OUTLET W/ GATE FLAP VALVE

N.T.S. MODIFIED



30-31F WATER TANK LADDERS

Scale: NTS PER OSHA STD.

REVISIONS	DATE	INT.

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SOPHIA LOPEZ
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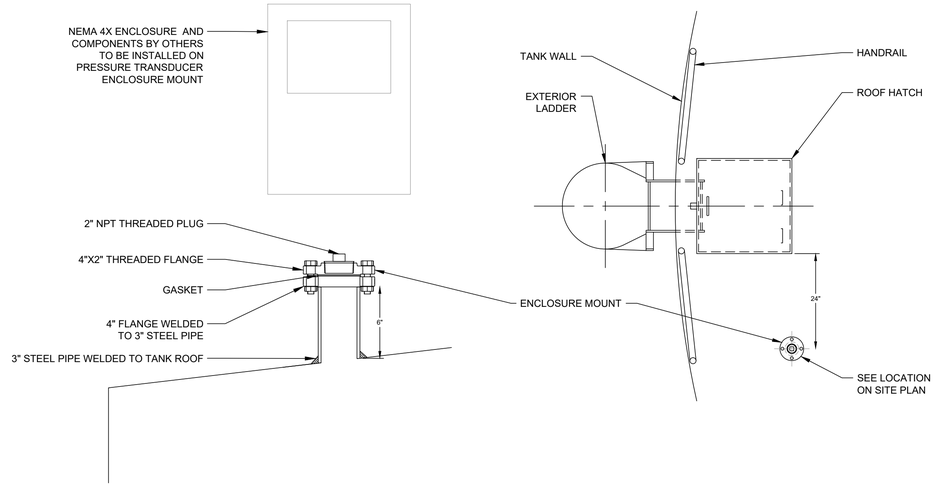
THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
TANK DETAILS II
PH 16-U83

FILE NAME: FLN-C-DTWATR I
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

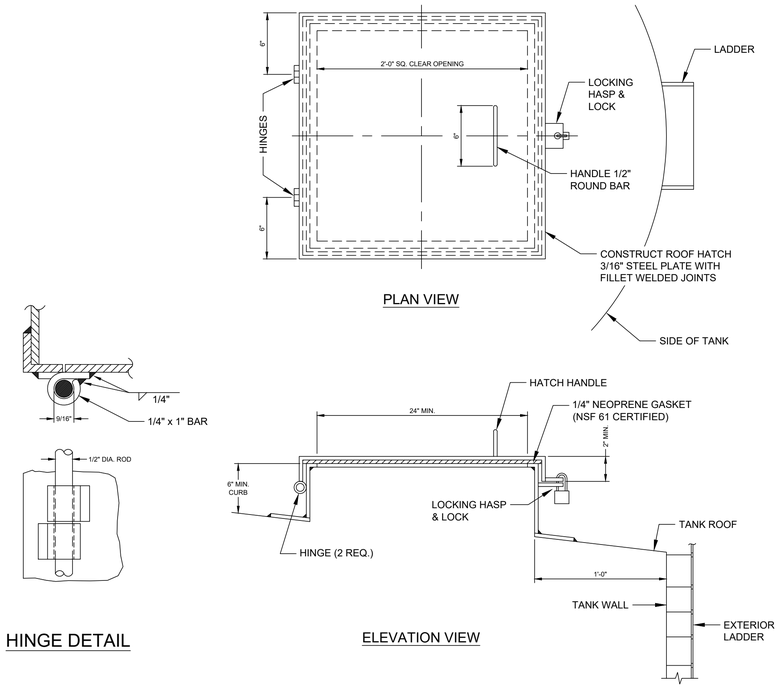
DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

07
SHEET 07 OF 10



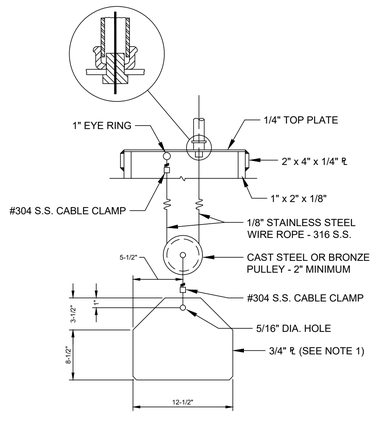
PRESSURE TRANSDUCER ENCLOSURE MOUNT

NOT TO SCALE MODIFIED

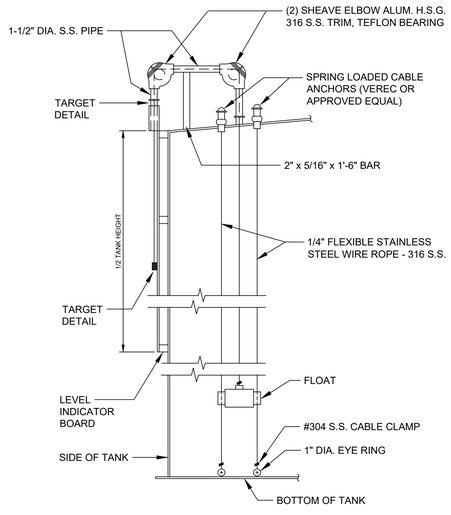


30-31G **WATER TANK ROOF HATCH**

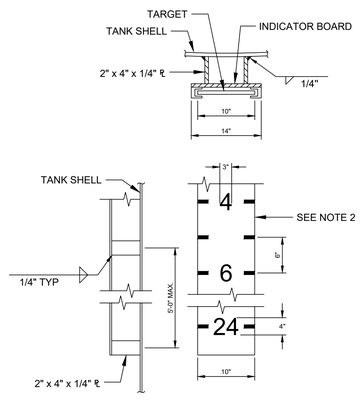
Scale: NTS



TARGET DETAIL



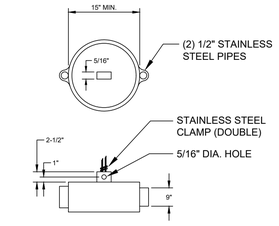
INDICATOR GAUGE INSTALLATION



LEVEL INDICATOR BOARD DETAIL

2 FT. GRADUATIONS
0 FT. THRU 24 FT.

NOTES:
PAINT ALL STEEL SAME AS TANK EXCEPT AS NOTED:
1) PAINT TARGET WITH 1 COAT RED LEAD AND 2 COATS OF RED ENAMEL.
2) PAINT GAUGE BOARD 1 COAT OF RED LEAD AND 2 COATS OF WHITE ENAMEL AND PAINT BLACK NUMERALS WITH BLACK ENAMEL (3" x 4" x 3/4")



NOTE:
FLOAT SHALL HAVE ADEQUATE BUOYANCY TO FUNCTION WITH SPECIFIED TARGET

FLOAT DETAIL

30-31E **WATER TANK INDICATOR GAUGE**

Scale: NTS

INT.	REVISIONS	DATE

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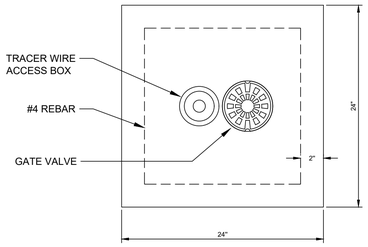
THE FALLON PAIUTE-SHOSHONE TRIBE

FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
TANK DETAILS III
PH 16-083

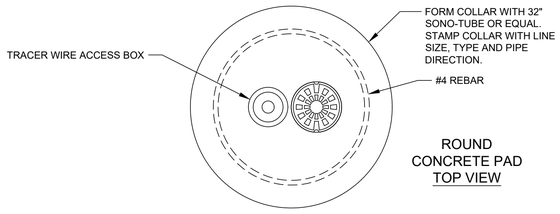
DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

FILE NAME: FLLN-C-DTWATR I
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

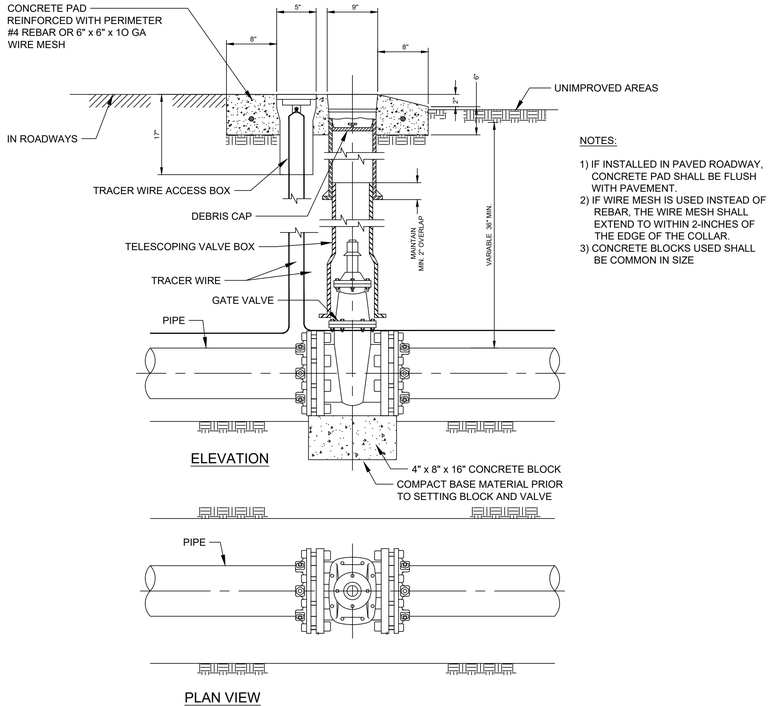
08
SHEET 08 OF 10



SQUARE CONCRETE PAD
TOP VIEW



ROUND
CONCRETE PAD
TOP VIEW



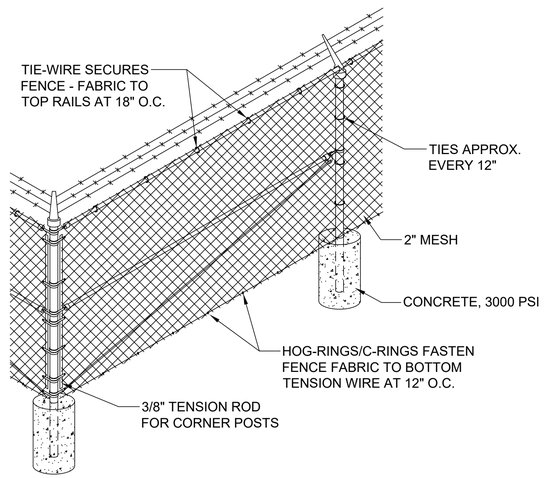
NOTES:

1) IF INSTALLED IN PAVED ROADWAY, CONCRETE PAD SHALL BE FLUSH WITH PAVEMENT.
2) IF WIRE MESH IS USED INSTEAD OF REBAR, THE WIRE MESH SHALL EXTEND TO WITHIN 2-INCHES OF THE EDGE OF THE COLLAR.
3) CONCRETE BLOCKS USED SHALL BE COMMON IN SIZE

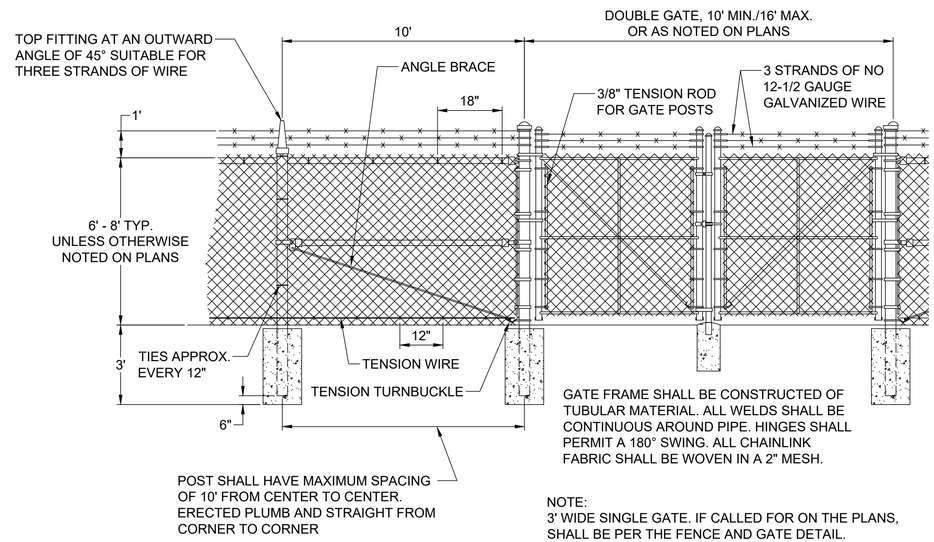
ELEVATION

PLAN VIEW

4B **GATE VALVE WITH BOX**
Scale: N.T.S.

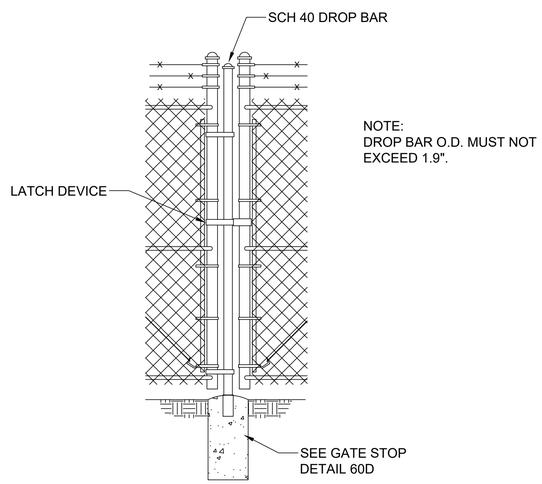


60A **FENCE POST**
Scale: NTS



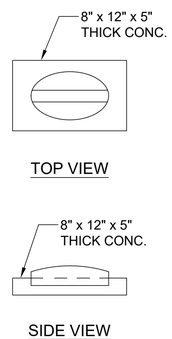
NOTE:
3' WIDE SINGLE GATE. IF CALLED FOR ON THE PLANS, SHALL BE PER THE FENCE AND GATE DETAIL.

60B **FENCE AND GATE DETAIL**
Scale: NTS



NOTE:
DROP BAR O.D. MUST NOT EXCEED 1.9".

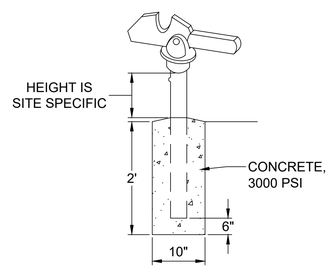
60C **DROP BAR LOCKING DEVICE**
Scale: NTS



TOP VIEW

SIDE VIEW

60D **GATE STOP**
Scale: NTS



60E **GATE KEEPER**
Scale: NTS

DATE	REVISIONS	INT.

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THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY - CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
FENCE DETAILS
PH 16-083

FILE NAME: FLLN-C-DTWATR I
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

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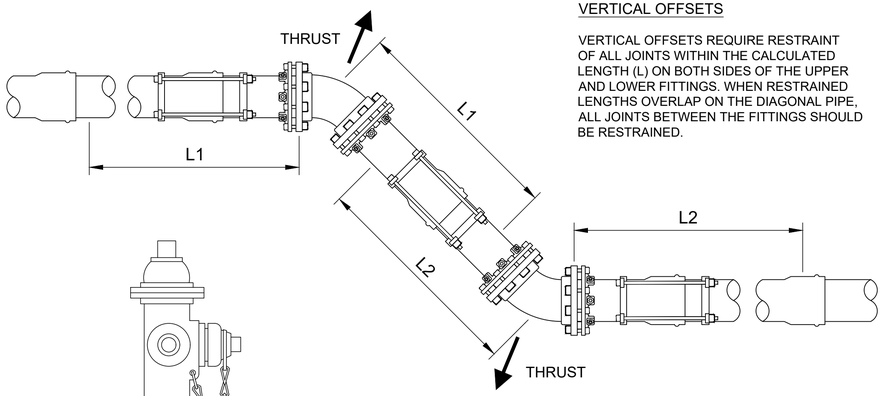
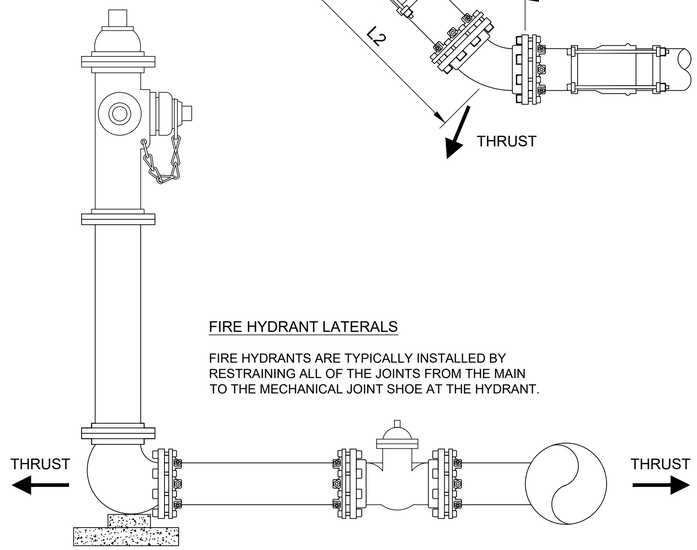
SHEET 09 OF 10



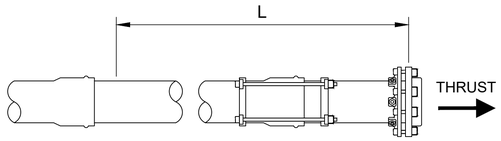
VERTICAL OFFSETS

VERTICAL OFFSETS REQUIRE RESTRAINT OF ALL JOINTS WITHIN THE CALCULATED LENGTH (L) ON BOTH SIDES OF THE UPPER AND LOWER FITTINGS. WHEN RESTRAINED LENGTHS OVERLAP ON THE DIAGONAL PIPE, ALL JOINTS BETWEEN THE FITTINGS SHOULD BE RESTRAINED.



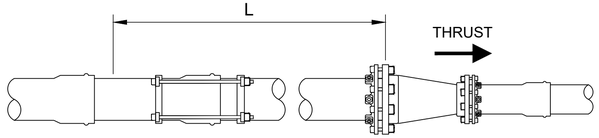
FIRE HYDRANT LATERALS

FIRE HYDRANTS ARE TYPICALLY INSTALLED BY RESTRAINING ALL OF THE JOINTS FROM THE MAIN TO THE MECHANICAL JOINT SHOE AT THE HYDRANT.



DEAD ENDS (AND IN-LINE VALVES)

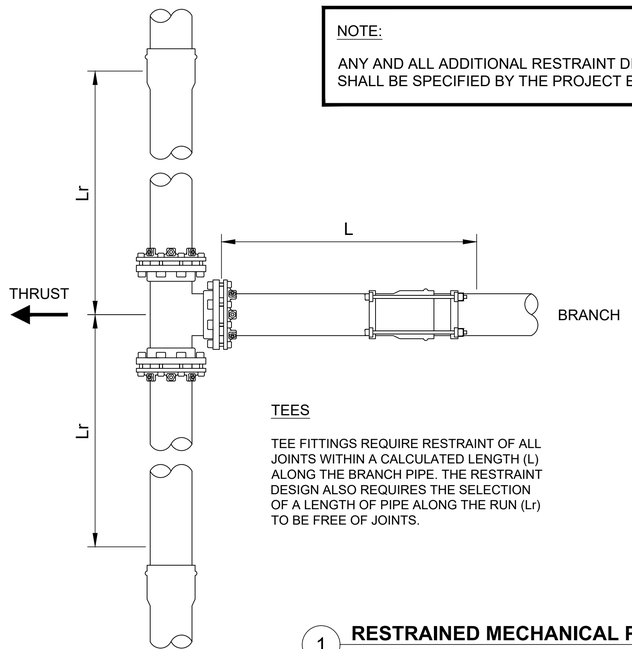
DEAD ENDS REQUIRE RESTRAINT OF ALL JOINTS WITHIN THE CALCULATED LENGTH (L) EXTENDING FROM THE CAP. IN-LINE VALVES REQUIRE RESTRAINT OF ALL JOINTS WITHIN A DISTANCE (L) EXTENDING EITHER SIDE OF THE VALVE.



PIPE SIZE	HORIZONTAL BENDS	L	VERTICAL OFFSETS	L1	L2	TEE	Lr	L	L FOR DEAD ENDS AND VALVES	REDUCERS	L
12"	90°	35'				12 x 12 x 12		17'	99'	12 x 10	29'
	45°	15'	45°	41'	15'	12 x 12 x 10	15.0	1'		12 x 8	52'
	22.5°	7'	22.5°	20'	7'	12 x 12 x 8		1'		12 x 6	72'
	11.25°	4'	11.25°	10'	4'	12 x 12 x 6		1'		12 x 4	86'
10"	90°	30'				10 x 10 x 12		54'	84'	10 x 8	28'
	45°	13'	45°	35'	13'	10 x 10 x 10	10.0	30'		10 x 6	52'
	22.5°	6'	22.5°	17'	6'	10 x 10 x 8		2'		10 x 4	68'
	11.25°	3'	11.25°	9'	3'	10 x 10 x 6		1'		10 x 3	73'
8"	90°	26'				8 x 8 x 10		50'	70'	8 x 6	30'
	45°	11'	45°	29'	11'	8 x 8 x 8	8.0	27'		8 x 4	50'
	22.5°	5'	22.5°	14'	5'	8 x 8 x 6		1'		8 x 3	57'
	11.25°	3'	11.25°	7'	3'	8 x 8 x 4		1'			
6"	90°	20'				6 x 6 x 10		58'	53'	6 x 4	28'
	45°	8'	45°	22'	8'	6 x 6 x 8	8.0	38'		6 x 3	36'
	22.5°	4'	22.5°	11'	4'	6 x 6 x 6		11'			
	11.25°	2'	11.25°	6'	2'	6 x 6 x 4		1'			
4"	90°	14'				4 x 4 x 6		25'	38'	4 x 3	13'
	45°	6'	45°	16'	6'	4 x 4 x 4	8.0	1'			
	22.5°	3'	22.5°	8'	3'	4 x 4 x 3		1'			
	11.25°	2'	11.25°	4'	2'						

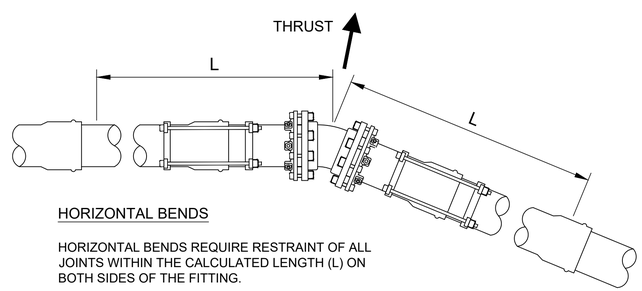
NOTE:

ANY AND ALL ADDITIONAL RESTRAINT DISTANCES (L, L1, L2, Lr) SHALL BE SPECIFIED BY THE PROJECT ENGINEER.



TEES

TEE FITTINGS REQUIRE RESTRAINT OF ALL JOINTS WITHIN A CALCULATED LENGTH (L) ALONG THE BRANCH PIPE. THE RESTRAINT DESIGN ALSO REQUIRES THE SELECTION OF A LENGTH OF PIPE ALONG THE RUN (Lr) TO BE FREE OF JOINTS.



HORIZONTAL BENDS

HORIZONTAL BENDS REQUIRE RESTRAINT OF ALL JOINTS WITHIN THE CALCULATED LENGTH (L) ON BOTH SIDES OF THE FITTING.

RESTRAINED MECHANICAL PIPE JOINT APPLICATION CRITERIA

NOTE:

ALL ABOVE REFERENCED RESTRAINT LENGTHS, "L", SHALL BE CONSIDERED AS MINIMUM VALUES. ALL CALCULATED LENGTHS ASSUME THE FOLLOWING:

1. SOIL TYPE IS SIMILAR TO GP (PER USCS), A POORLY GRADED GRAVEL-SAND MIXTURE WITH LITTLE OR NO FINES.
2. THE TEST PRESSURE IS 150 PSI.
3. THE FACTOR OF SAFETY IS 1.5 TO 1.
4. THE MINIMUM DEPTH OF BURY IS 3.0'.
5. THE PIPE IS PLACED IN A COMPACTED GRANULAR MATERIAL UP TO THE CENTERLINE OF THE PIPE, AND WITH A MINIMUM OF 4" BEDDING UNDER THE PIPE, AND COMPACTED SELECT MATERIAL UP TO THE TOP OF THE PIPE. ALL BEDDING AND COVER MATERIAL IS TO BE COMPACTED TO 80% STANDARD PROCTOR.

1 **RESTRAINED MECHANICAL PIPE JOINT DETAILS**
Scale: NTS

DATE	REVISIONS	INT.

PROFESSIONAL ENGINEER – STATE OF NEVADA
SOPHIA LOPEZ
Exp: 12/31/25
CIVIL
No. 29756
12/26/23

INDIAN HEALTH SERVICE
OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING

RENO DISTRICT OFFICE
1150 FINANCIAL BLVD, SUITE 500
RENO, NV 89502
(775) 784-5327

INDIAN HEALTH SERVICE 1955

THE FALLON PAIUTE-SHOSHONE TRIBE
FALLON COLONY – CHURCHILL COUNTY, NEVADA
WATER STORAGE TANK REPLACEMENT
WATER SYSTEM DETAILS II
PH 16-U83

DRAWN BY: C.GROOMS DATE: 12/2023
CHECKED BY: S.LOPEZ DATE: 12/2023
APPROVED BY: L.BERNASCONI DATE: 12/2023

FILE NAME: FLLN-C-DTWATR II
RN NUMBER: 25-23
PROJ ENG: SOPHIA LOPEZ

10

SHEET 10 OF 10

EXHIBITS

I. **FALLON TANK GEOTECHNICAL REPORT**
II. **RIGHT OF WAY MAPS**
III. **PROJECT PHOTOS**

FALLON TANK GEOTECHNICAL REPORT

Mr. Len George, Tribal Chairman
Fallon Paiute-Shoshone Tribe
565 Rio Vista Drive
Fallon, Nevada 89406

Project No.: 1732-02-1
July 2, 2015

RE: Geotechnical Investigation
Water Tank Replacement – Fallon Paiute-Shoshone Tribe Colony
Fallon, Nevada

Dear Mr. George:

Black Eagle Consulting, Inc. (BEC) is pleased to present the results of our geotechnical investigation and associated design and construction recommendations for the proposed water tank replacement project. The project will involve the construction of a 375,000 gallon welded steel water tank to service the Fallon Paiute-Shoshone Tribe (FPST) Colony subdivision in Churchill County, Nevada.

The purpose of this investigation was to evaluate the existing foundation materials and to provide recommendations for the design and construction of the proposed water tank and associated improvements. The project site is located in Section 29, Township 19 North, Range 29 East, Mount Diablo Meridian. The water tank site, surrounded on the north, east, and south by Rattlesnake Hill and to the west by sloping terrain leading to Rio Vista Drive, is accessed by a dirt road off of Rio Vista Drive.

Project Description

The new tank will most likely be located within the footprint of the existing concrete water tank located on Rattlesnake Hill. The existing tank is about 40 feet in diameter and about 20 feet tall. The site that supports the existing tank lies within an area of fill. Documentation of the fill placement is discussed in field reports from the original construction (Fallon Water Tank, 1981). The new tank will be slightly larger and taller (about 54 feet in diameter and about 25 feet tall). The tank shell will likely be supported on a Portland cement concrete (PCC) shallow ring foundation. The bottom of the tank will lie on compacted aggregate base. A perimeter access road surfaced with aggregate base will most likely be constructed around the tank and sloped to provide drainage away from the structure. Additional improvements will include various pipes and fittings to connect the new tank to the existing water system.

Site Conditions

The site is currently occupied by a 40-foot-diameter, 250,000 gallon concrete water tank. The water tank was built in 1981 and is constructed of concrete tilt-up panels covered by a concrete façade. The water tank has a history of leaking and attempted repairs included an interior liner and refinishing the concrete façade. Waterlines are present on site, supplying water to and draining the water tank. An electric line is also present. All utilities are private. Valve covers, electrical boxes, and markings on the tank indicate that utilities are located along the southwest corner and southern portion of the water tank. A chain-link fence topped with razor-wire surrounds the tank.

The site was previously occupied by an older water tank (located immediately north of the existing tank) that has since been removed. However, the previous tank's footings remain, with two concentric ring foundations of concrete and rebar buried in the area. Fill slopes on the west side of the existing tank are strewn with concrete and rebar debris from the demolition of the first water tank. A wire-wrapped-pipe is located in the slope heading downhill to the west from the tank pad. Northeast of the site are a series of pads occupied by communications towers.

The water tank site is located on the west side of Rattlesnake Hill, which rises approximately 180 feet above the valley below. The existing graded tank pad and access road, including cut and fill slopes, has approximately 25 feet of vertical relief. The cut slopes east of the water tank are approximately 10 to 15 feet high. The fill slopes west of the access road are approximately 6 to 8 feet high. Relief within the building pad is approximately 4 feet from the northeast corner to the southwest corner. The pad slopes gently to the west at approximately 1 to 2 percent. Drainage is accomplished by infiltration and sheet-flow to the west.

The graded tank pad is generally void of vegetation but contains sparse populations of low grasses. Native vegetation on the valley below consists of sparsely populated sagebrush and grasses up to 2 feet tall.

Site Investigation and Laboratory Testing

The water tank replacement site was explored on June 8, 2015, by excavating 3 test pits using a John Deere® 300 D rubber-tired backhoe. Locations of the test pits are shown on Plate 1 (Plot Plan). The maximum depth of exploration was 4.5 feet below the existing ground surface. Refusal was reached in all test pits due to bedrock or concrete obstructions. Bulk samples for index testing were collected from the trench wall sides at specific depths in each soil horizon. The test pits were backfilled immediately after exploration. Backfill was loosely placed and the area re-graded to the extent possible with equipment on hand.

A geologist examined and identified all soils in the field in accordance with American Society for Testing and Materials (ASTM) D 2488. During test pit exploration, representative bulk samples were placed in sealed plastic bags and returned to our Reno, Nevada, laboratory for additional evaluation. Logs of the test pits are presented as Plate 2 (Test Pit Logs). A Unified Soil Classification System (USCS) chart has been included as Plate 3 (Graphic Soils Classification Chart).

Laboratory testing on a representative sample of foundation material was analyzed to determine its in-situ moisture content (ASTM D 2216), grain size distribution (ASTM D 422), and plasticity index (ASTM D 4318). The results of these tests are shown on Plate 4 (Index Test Results). Test results were used to classify the soils according to ASTM D 2487 and to verify field logs, which were then updated as appropriate. Classification in this manner provides an indication of the soil's mechanical properties and can be correlated to published charts (Bowles, 1996; Naval Facilities Engineering Command [NAVFAC], 1986a and b) to evaluate bearing capacity, lateral earth pressures, and settlement potential.

Chemical testing was performed on representative samples of site foundation soils to evaluate the site materials' potential to corrode steel and PCC in contact with the ground. The samples were tested for pH, resistivity, redox potential, soluble sulfates, and sulfides. The results of the chemical tests are shown on Appendix A (Chemical Test Results). Chemical testing was performed by Sierra Environmental Monitoring of Reno.

The site is located on Rattlesnake Hill in the Carson Sink. The Carson Sink is a broad valley and playa located in what was the heart of Pleistocene Lake Lahontan. The Nevada Bureau of Mines and Geology (NBMG) has mapped the area as Quaternary Basalt and Quaternary Alluvium (Wilden and Speed, 1974). Morrison (1964) goes into greater detail about the Quaternary lacustrine deposits of Pleistocene Lake Lahontan and the lake's relationship to the Quaternary Basalt that forms Rattlesnake Hill. Lake Lahontan, at its maximum extent, stretched from nearly Reno (in the west) to Oregon (in the north) to Hawthorne (in the south). Vast shoreline beach deposits of sand and gravel, sand bars and spit deposits and lake bed deposits of fine sand and silt were deposited throughout its extent. After the lake receded, the fine sand and silt deposits provided a source for the development of sand dunes. Lake Lahontan cut into the sides of Rattlesnake Hill, forming slight benches or wave-cut terraces. The site soils and bedrock encountered in our exploration are consistent with the geologic map.

The materials on site that will host the proposed water tank consist of fill material derived from beach sand and gravel overlying volcanic basalt bedrock.

The fill material contains some debris and garbage, including plastic sheeting, plastic debris and woody debris. Debris generally makes up less than 5 percent of the total soil mass. The fill material consists of silty sand with gravel and is described as brown to tan, slightly moist to moist, loose to medium dense, and contains 15 percent non-plastic fines and 15 percent angular to rounded gravel. Cobbles and boulders up to 2 feet in diameter make up about 15 percent of the total soil mass. The fill material contains both rounded and angular gravel/cobbles due to mixing of the beach deposits and bedrock materials. Test pit TP-03 encountered the previous water tank's foundation consisting of two concentric concrete rings. It was not possible to break down and excavate the concrete with equipment on site.

Basalt bedrock was encountered at depths of 2.75 to 4 feet below the ground surface in test pits TP-01 and TP-02, respectively. This rock is described as dark gray to black, fresh to slightly weathered, closely to moderately spaced fractures, and very strong to extremely strong. The basalt rock consists of lava flows 2 to 4 feet thick dipping gently to the west, away from the apex of Rattlesnake Hill. The maximum fracture spacing in the rock mass is about 42 inches. Equipment on site during our field exploration (John Deere® 300 D rubber-tired backhoe) could not excavate this bedrock unit. Construction documents indicate blasting was necessary for the construction of the existing water tank building pad.

Groundwater was not encountered during exploration and is expected to lie at a depth well below that which would affect design or construction.

Geologic Hazards

Seismicity and Faults

The Carson Sink lies within an area with a high potential for strong earthquake shaking. Several earthquakes occurred in 1954 east of Fallon. The nearest earthquake was part of the Rainbow Mountain-Stillwater Earthquakes and had a maximum magnitude of 7.0 southeast of Fallon, some 12 miles east of the project.

An earthquake hazards map is not available for the project area. The published geologic map (Wilden and Speed, 1974) shows several faults located about 3 miles north and east of the project. These faults are northwest-southeast trending faults associated with the Walker Lane right lateral shear zone. Further east are historical fault ruptures from the 1954 earthquakes. Based on the geologic map, the faults in the vicinity of the project are Holocene Active Faults.

Because no faults are mapped as passing through the site, and no evidence of faulting was encountered during site exploration, no setbacks or further fault study is warranted.

Ground Motion and Liquefaction

Mapping by the United States Geological Survey (USGS, 2015) indicates that there is a 2 percent probability that a *bedrock* ground acceleration of 0.312 g will be exceeded in any 50-year interval. Only localized amplification of ground motion would be expected during an earthquake.

Because the site area is underlain by bedrock, liquefaction potential is negligible.

Flood Plains

The Federal Emergency Management Agency (FEMA) has identified the site as lying in unshaded Zone X, or outside the limits of a 500-year flood plain (FEMA, 2008).

Other Geologic Hazards

A moderate potential for dust generation is present if grading is performed in dry weather. No other geologic hazards were identified.

Discussion and Recommendations

The project will involve the replacement of the existing 40-foot-diameter, 250,000 gallon concrete water tank with a 375,000 gallon welded steel tank. Since the pad is already graded to host a water tank, minimal grading is anticipated for the replacement tank. The majority of earthwork will include fine grading for drainage and trenching for utilities and footings.

Existing documentation for construction of the concrete water tank indicates the area was blasted to notch out the bedrock and create a level area (Fallon Water Tank, 1981), and that the blasting of this material was very difficult. Remnants of the older reinforced concrete footing were removed from the existing tank footprint. The relatively thin

amount of leveling fill placed within the existing tank pad area was density tested, with all test results exceeding 90 percent relative compaction.

Materials that exist within the vicinity of the proposed replacement tank will be suitable to host the proposed structure with the exception of fill areas that include minor trash and debris. All old PCC foundations and associated improvements shall be removed from the footprint of the proposed replacement tank and any resulting void refilled with structural fill.

The recommendations provided herein are intended to minimize the risks of structural distress related to consolidation and settlement of native material and/or structural fills. These recommendations, along with proper design and construction of the water tank structure and associated improvements, work together as a system to improve overall performance. If any aspect of this system is ignored or poorly implemented, the performance of the project will suffer. Sufficient quality control should be performed to verify that the recommendations presented in this report are followed.

Structural areas referred to in this report include all areas of the tank foundation, the tank pad and access road, as well as pads for any minor structures associated with this project. All compaction requirements presented in this report are relative to ASTM D 1557.

Any evaluation of this site for the presence of surface or subsurface hazardous substances is beyond the scope of this investigation. When suspected hazardous substances are encountered during routine geotechnical investigations, they are noted in the exploration logs and immediately reported to the client. No such substances were present during our site inspection.

Construction Recommendations

1. Fill areas within the proposed replacement tank footprint that include minor trash, debris, PCC, and rebar are not suitable to host the replacement tank foundation. All areas where trash, debris, PCC, and rebar are located within 5 feet of the proposed water tank footprint shall be removed. Removal/cleaning of this debris can most likely be accomplished by hand picking. The cleaned material can be reused as structural fill following the recommendations of Items 6 and 9.

2. The base of all footing excavations or areas to receive structural fill or structural loading shall be densified to at least 90 percent relative compaction. All soils will most likely require moisture conditioning to facilitate this compaction requirement. This can be accomplished by scarifying 6 inches beneath the existing ground surface to mix additional moisture into the soil prior to compactive effort.

3. If construction takes place during a wet or rainy period, the soils may be too wet to properly compact. It is possible to air dry soils by scarifying the top 12 inches of subgrade and providing enough time for the soil to reach near optimum levels prior to compaction. Where this procedure is ineffective or where construction schedules preclude delays, mechanical stabilization will be necessary.

Mechanical stabilization may be achieved by over excavation and/or placement of an initial 12- to 18-inch-thick lift of 12-inch-minus, 3-inch-plus, well graded, angular rock fill. The more angular and well graded the rock is, the more effective it will be. This fill shall be densified with large equipment, such as a self-propelled sheeps-foot or a large loader, until no further deflection is noted. Additional lifts of rock may be necessary to achieve adequate stability. The use of a separator geotextile, such as Mirafi® 500x or equivalent, will prevent mud from pumping up between rocks, thereby increasing rock-to-rock contact and decreasing the required thickness of stabilizing fill.

4. The pad is within shallow volcanic bedrock; as such, trenching and excavation beyond the near surface fill soils in the area will be very difficult. Neat line trenching is not expected to be possible in bedrock cut areas. Extensive blasting was required during the initial construction of the existing water tank (Fallon Water Tank, 1981). As such, any cut into bedrock areas will likely require blasting or specialized equipment.

5. Temporary trenches with near-vertical side walls within the existing fill soils should be stable in to a depth of approximately 4 feet when left open for 24 hours or less. Temporary excavations to greater depths in soils will require laying back of side walls at a slope no steeper than 1.5H:1V (horizontal to vertical) to maintain adequate stability. Temporary excavations in the bedrock areas will be stable as vertical excavations for longer periods, as approved by the engineer. All trenching and excavation should conform to Occupational Safety and Health Administration (OSHA) standards.

6. In place fill soils will be suitable for structural fill provided debris, trash, PCC, rebar, and particles larger than 4 inches are removed. Oversized rock can be stockpiled for later use as erosion protection. Trash, debris, PCC, and rebar should be removed from the site. If imported structural fill is required on this project, we recommend it satisfy the specifications presented in Table 1 (Guideline Specification for Imported Structural Fill).

TABLE 1 - GUIDELINE SPECIFICATION FOR IMPORTED STRUCTURAL FILL*		
Sieve Size	**Percent by Weight Passing**	
4 Inch	100	
3/4 Inch	70 – 100	
No. 40	15 – 70	
No. 200	5 – 30	
Percent Passing No. 200 Sieve	**Maximum Liquid Limit**	**Maximum Plastic Index**
5 – 10	50	20
11 – 20	40	15
21 – 30	35	10
*These recommendations are intended as guidelines to specify a readily available, prequalified material. Adjustments to the recommended limits can be provided to allow the use of other granular, non-expansive material. Any such adjustments must be made and approved by the engineer, in writing, prior to importing fill to the site.		

7. Whenever possible, structure foundations shall not be placed partially on bedrock and partially on structural fill. Where structure foundations will be placed partially on bedrock and partially on structural fill due to cut and fill operations or the proposed pad grade, differential settlement of the structural fill may be on the order of 1 percent of the maximum fill height, which would result in differential settlement of structure foundations. Such differential settlement should be minimized. Measures to minimize such differential settlement may include providing a gradual transition from the bedrock to structural fill, over-excavating a portion of the bedrock and backfilling with structural fill, and/or extending the footing to the cleaned bedrock.

8. Bedding and initial backfill 12 inches over water lines will require imported materials that conform to the requirements of the *Standard Specifications for Public Works Construction* (*SSPWC*, 2012). In particular, bedding and initial backfill shall consist of Type A bedding sand densified to at least 90 percent relative compaction. Native soils will provide adequate final backfill as long as particles larger than 4 inches are excluded, and native soils shall be placed in maximum 8-inch-thick loose lifts that are compacted to a minimum of 90 percent relative compaction in all structural areas.

9. Any structural fill within the tank footprint shall be placed in maximum 12-inch-thick (loose) lifts, each densified to at least 95 percent relative compaction. Non-structural fill shall be densified to at least 85 percent relative compaction to minimize consolidation and erosion. Grading shall not be performed with or on frozen soils.

10. The water tank perimeter ring footing shall extend a minimum of 2 feet below the finished grade for frost protection.

11. If trench excavations are open for extended periods of time or if disturbed soils are encountered within the foundation subgrade at the time of concrete placement, loose soils should be removed to expose undisturbed structural fill. Any resulting over-excavation can be backfilled with compacted structural fill or additional concrete. The base of all excavations shall be dry and free of loose soils at the time of concrete placement.

12. The base of the tank, where not supported by the concrete ring footing or center column concrete footing, shall be underlain by a minimum 6 inches of Type 2, Class B, aggregate base (*SSPWC*, 2012) that is densified to a minimum 95 percent relative compaction (ASTM D 1557).

13. Fill slopes shall be graded at a maximum of 2H:1V, as discussed below in the **Geotechnical Design Criteria** section. The existing fill/rubble slope on the eastern side of the existing tank can likely be cleaned and removed to provide more access for the tank. Any resulting bedrock cut slope will be stable to near vertical conditions for a maximum height of 10 feet, provided it is thoroughly cleaned of loose material. Fill slopes graded to 2H:1V should be stabilized using a 4-inch-minus rock rip-rap. A drainage swale (brow ditch) should be constructed along the crest of all slopes to route runoff away from slopes and towards drainage features.

14. Dust potential at this site is moderate during dry periods. Temporary (during construction) and permanent (after construction) erosion control will be required for all disturbed areas. The contractor shall prevent dust from being generated during construction. The owner will be responsible for mitigation of dust after accepting the project.

15. In order to minimize erosion and downstream impacts to sedimentation from this site, best management practices with respect to storm water discharge shall be implemented.

16. Adequate surface drainage shall be provided so moisture is directed away from the tank and surrounding finished grade surface. Drainage swales should be provided to direct runoff away from the tank and shall be located at both the top and bottom of any cut slopes.

17. All concrete slabs, if planned for any associated minor structures, shall be directly underlain by a minimum of 4 inches of Type 2, Class B, aggregate base (*SSPWC*, 2012) that is densified to at least 95 percent relative compaction (ASTM D 1557).

18. All placement and curing of concrete shall be performed in accordance with procedures outlined by the American Concrete Institute (ACI, 2008) and this report. Concrete shall not be placed on frozen soils.

Geotechnical Design Criteria

1. The tank shall be designed following the 2012 *International Building Code* (International Code Council [ICC], 2012). On the basis of our observations in the field and knowledge of the geologic setting where the proposed water tank will lie (i.e., volcanic bedrock), it is our opinion that Site Class D is appropriate for this site. With that assumption, the recommended seismic design criteria are presented in Table 2 (Seismic Design Criteria Using 2012 *International Building Code*).

TABLE 2 - SEISMIC DESIGN CRITERIA USING 2012 *INTERNATIONAL BUILDING CODE* (USGS, 2015)	
Approximate Latitude	39.489
Approximate Longitude	-119.754
Spectral Response at Short Periods, S_s, percent of gravity	78.1
Spectral Response at 1-Second Period, S_1, percent of gravity	27.3
Site Class	D
Occupancy Category	II
Site Coefficient F_a, decimal	1.18
Site Coefficient F_v, decimal	1.85
Site Adjusted Spectral Response at Short Periods, S_{MS}, percent of gravity	92.7
Site Adjusted Spectral Response at Long Periods, S_{M1}, percent of gravity	50.5
Design Spectral Response at Short Periods, S_{DS}, percent of gravity	61.8
Design Spectral Response at Long Periods, S_{D1}, percent of gravity	33.7

2. The tank ring footing (strip footing) and any center columns shall be underlain by properly prepared compacted structural fill and can be designed for a net maximum allowable bearing pressure of 2,500 pounds per square foot (psf). The minimum widths of the tank ring footing and the center column footings shall be 12 and 24 inches, respectively. This bearing value may be increased by one-third for total loads. With this allowable bearing pressure, total foundation movements of ¾ of an inch or less should be anticipated. Differential movements between footings with similar loads, dimensions, and base elevations should not exceed ½ inch. Differential movement between the tank ring footing and the center column footing could approach ¾ inch. Some of this differential movement will occur during construction; however, we anticipate that the majority of expected movement will occur soon after the tank has been filled for the first time.

3. Lateral loads, such as wind or seismic, may be resisted by passive soil pressure and friction on the bottom of the footings. The recommended coefficient of base friction is 0.45 and has been reduced by a factor of 1.5 on the ultimate soil strength. Design values for active and passive equivalent fluid

pressures are 35 and 440 psf per foot of depth, respectively. These design values are based on spread footings bearing on compacted structural fill and backfilled with compacted structural fill.

4. It is not anticipated that the construction of new slopes will be required. The proposed tank footprint will progress through both/either structural fill and/or volcanic bedrock. Strength characteristics of both materials will be stable when sloped at a maximum of 2H:1V for both cut and fill conditions.

5. Laboratory testing was performed to evaluate the corrosion potential of the soils with respect to metal pipe in contact with the ground. The results of the laboratory testing indicate that the site foundation soils exhibit low corrosion potential (American Water Works Association [AWWA], 1999). As a result, metal pipe in contact with the ground will not require corrosion protection.

6. Soluble sulfate content has been determined for representative samples of the site foundation soils. The sulfate was extracted from the soil at a 10:1 water to soil ratio in order to assure that all soluble sodium sulfate was dissolved. The results are reported in milligrams of sulfate per kilogram of soil and can be directly converted to percent by dividing by 10,000. The percent sulfate in the soil is used to determine the sulfate exposure Class (S) from the information presented in Table 3 (Sulfate Exposure Class).

TABLE 3 - SULFATE EXPOSURE CLASS*

			Water-Soluble Sulfate (SO_4) in Soil, Percent by Weight	Dissolved Sulfate (SO_4) in Water, ppm
S Sulfate	Not Applicable	S0	$SO_4 < 0.10$	$SO_4 < 150$
	Moderate	S1	$0.10 \leq SO_4 < 0.20$	$150 \leq SO_4 < 1,500$ Seawater
	Severe	S2	$0.20 \leq SO_4 \leq 2.00$	$1,500 \leq SO_4 \leq 10,000$
	Very Severe	S3	$SO_4 > 2.00$	$SO_4 > 10,000$

*From Table 4.2.1 Exposure Categories and Classes. ACI 318, *Buildings Code and Comments.*

The results of the testing, presented as Appendix A (Chemical Test Results), indicate that concrete in contact with the site foundation soils should be designed for Class S0 Sulfate exposure. Therefore, Type II cement can be used for all concrete work.

Closing

All plans and specifications should be reviewed for conformance with this geotechnical report and approved by the engineer prior to submitting them to the building department for review.

The recommendations presented in this report are based on the assumption that sufficient field testing and construction review will be provided during all future phases of construction. We should review the final plans and specifications to check for conformance with the intent of our recommendations. Prior to construction, a pre-job conference should be scheduled to include, but not be limited to, the owner, architect, civil engineer, general contractor, earthwork and materials subcontractors, building official, and engineer. The conference will allow parties to review the project plans, specifications, and recommendations presented in this report and discuss applicable material quality and mix design requirements. All quality control reports should be submitted to and reviewed by the engineer.

This report has been prepared in accordance with generally accepted geotechnical practices. The analyses and recommendations submitted are based on site inspection and our experience near the project area. This report does not reflect soil variations that may become evident during the construction period, at which time re-evaluation of the recommendations may be necessary. We recommend our firm be retained to perform construction observation in all phases of the project related to geotechnical factors to ensure compliance with our recommendations.

This report has been produced to provide information allowing the engineer to design the project. The owner is responsible for distributing this report to all designers and contractors whose work is affected by geotechnical aspects. In the event that there are changes in the design, location, or ownership of the project from the time this report is issued, recommendations should be reviewed and possibly modified by the geotechnical engineer. If the geotechnical engineer is not granted the opportunity to make this recommended review, he or she can assume no responsibility for misinterpretation or misapplication of his or her recommendations or their validity in the event changes have been made in the original design concept without his or her prior review. The geotechnical engineer makes no other warranties, either expressed or implied, as to the professional advice provided under the terms of this agreement and included in this report.

We appreciate being of service to you on this project. If you have any questions, or require any additional information, please do not hesitate to contact us.

Sincerely,

Black Eagle Consulting, Inc.

Jeff Wilbrecht, P.E.
Project Engineer

JW:PV:cr

Enclosures: Plate 1 – Plot Plan
Plate 2 – Test Pit Logs
Plate 3 – Graphic Soils Classification Chart
Plate 4 – Index Test Results

Appendix A – Chemical Test Results

Copies to: Addressee (4 copies and PDF via email)
Mr. Randy Pitts, F&P Construction (PDF via email)

References:

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PLATES

SCALE: 1"=60'
(APPROXIMATE)

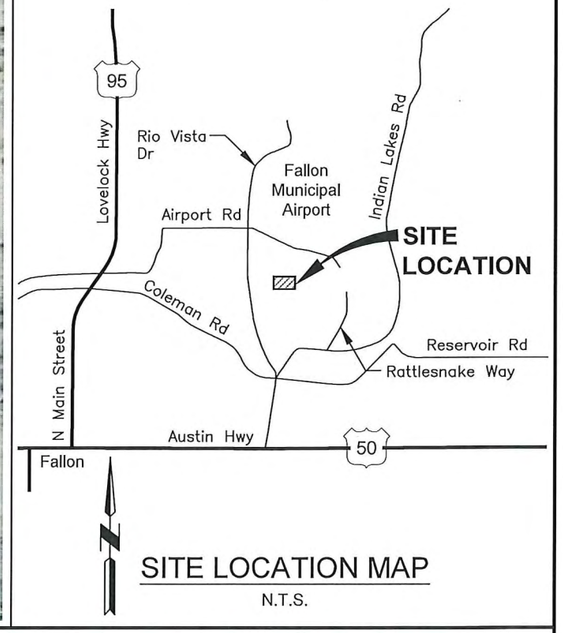
LEGEND

TP-01 APPROXIMATE TEST PIT LOCATION

APPROXIMATE AREA OF BURIED CONCRETE FOUNDATION

NOTES

1. BASE MAP PROVIDED BY GOOGLE EARTH, INC.



SITE LOCATION MAP

N.T.S.

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Geotechnical & Construction Services
1345 Capital Boulevard, Suite A
Reno, Nevada 89502-7140
Telephone: 775/359-6600
Facsimile: 775/359-7766

FALLON PAIUTE-SHOSHONE TRIBE

PLOT PLAN

WATER TANK REPLACEMENT

FALLON, NEVADA

Project No.
1732-02-1

Plate 1

TEST PIT LOG

TEST PIT NO.: TP-01 | DATE: 6/8/2015

TYPE OF HOE: John Deere 300 D | DEPTH TO GROUND WATER (ft): NE

LOGGED BY: JP | GROUND ELEVATION (ft): 4065 (GPS)

SAMPLE NO.	SAMPLE TYPE	PENETROMETER (tsf)	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
A	GRAB		3.3	NP		SM		**Silty Sand with Gravel (Fill)** Brown, slightly moist, loose to medium dense, with 15% non-plastic fines, 70% mostly fine sand, and 15% angular to subrounded fine to coarse gravel. Angular cobbles up to 8 inches in diameter make up about 15% of the total soil mass (tsm). Fill material containing plastic sheeting and plastic debris. The sheeting is present about 2 feet below the ground surface (bgs) throughout the test pit. Debris make up less than 5% of the tsm.
					2			
B	GRAB							**Basalt Bedrock** Basalt lava flows 2 to 4 feet thick. Dark gray, fresh to slightly weathered, close to moderately spaced fractures, very strong to extremely strong. Maximum fracture spacing 42 inches. Excavates as a poorly graded gravel with cobbles and boulders. Cobbles and boulders make up about 40% of the tsm. Boulders up to 3.5 feet in diameter were present in the existing cut, east of the test pit. Refusal in bedrock.
					4			
					6			

N 4372465 E 349152 UTM NAD83

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Fallon Paiute Shoshone Tribe
Water Tank Replacement Project
Fallon, NV

PROJECT NO.: 1732-02-1

PLATE: 2

SHEET 1 OF 1

BORING_LOG 1732021.GPJ BLKEAGLE.GDT 6/18/2015

TEST PIT LOG

TEST PIT NO.: TP-02 | DATE: 6/8/2015

TYPE OF HOE: John Deere 300 D | DEPTH TO GROUND WATER (ft): NE

LOGGED BY: JP | GROUND ELEVATION (ft): 4063 (GPS)

SAMPLE NO.	SAMPLE TYPE	PENETROMETER (tsf)	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
A	GRAB				2	SM		**Silty Sand with Gravel (Fill)** Brown, moist, medium dense, with an estimated 15% non-plastic fines, 70% mostly fine sand, and 15% subrounded to rounded gravel up to 3 inches in diameter. From 1.5 to 4 feet bgs subrounded and angular cobbles and boulders up to 2 feet in diameter make up about 15% of the tsm.
					4			**Basalt Bedrock** Basalt lava flows 1 to 5 feet thick. Dark gray, fresh to slightly weathered, close to moderately spaced fractures, very strong to extremely strong. Maximum fracture spacing 42 inches. Excavates as a poorly graded gravel with cobbles and boulders. Cobbles and boulders make up about 40% of the tsm. Boulders up to 3.5 feet in diameter were present near the exploration area. Refusal in bedrock.
					6			

N 4372463 E 349131 UTM NAD83

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Fallon Paiute Shoshone Tribe
Water Tank Replacement Project
Fallon, NV

PROJECT NO.: 1732-02-1

PLATE: 2

SHEET 1 OF 1

BORING_LOG 1732021.GPJ BLKEAGLE.GDT 6/18/2015

TEST PIT LOG

TEST PIT NO.: TP-03 DATE: 6/8/2015

TYPE OF HOE: John Deere 300 D DEPTH TO GROUND WATER (ft): NE

LOGGED BY: JP GROUND ELEVATION (ft): 4067 (GPS)

SAMPLE NO.	SAMPLE TYPE	PENETROMETER (tsf)	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
					2	SM		**Silty Sand with Gravel (Fill)** Brown, moist, medium dense, with an estimated 15% non-plastic fines, 70% mostly fine sand, and 15% subrounded to rounded gravel up to 3 inches in diameter. Subrounded and angular cobbles up to 12 inches in diameter make up about 15% of the tsm. Debris is present in the fill material (~5% of the tsm) consisting of plastic toys and wood. Steel rebar is present protruding from the ground surface, two concrete footings were encountered, each approximately 6-inches-wide and 24-inches-tall. The abandoned footings appear to be from the original water tank located north of the existing water tank. Within the test pit excavation, the footings appear to be an interior and exterior ring footing. The woody debris appears to be from the construction of the footings. Refusal due to multiple concrete foundations.
					4			
					6			

N 4372477 E 349142 UTM NAD83

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Fallon Paiute Shoshone Tribe
Water Tank Replacement Project
Fallon, NV

PROJECT NO.: 1732-02-1

PLATE: 2

SHEET 1 OF 1

BORING_LOG 1732021.GPJ BLKEAGLE.GDT 6/18/2015

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE			GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
FILL MATERIAL				--	FILL MATERIAL, NON-NATIVE

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

EXPLORATION SAMPLE TERMINOLOGY

Sample Type	Sample Symbol	Sample Code
Auger Cuttings		Auger
Bulk (Grab) Sample		Grab
Modified California Sampler		MC
Shelby Tube		SH or ST
Standard Penetration Test		SPT
Split Spoon		SS
No Sample		

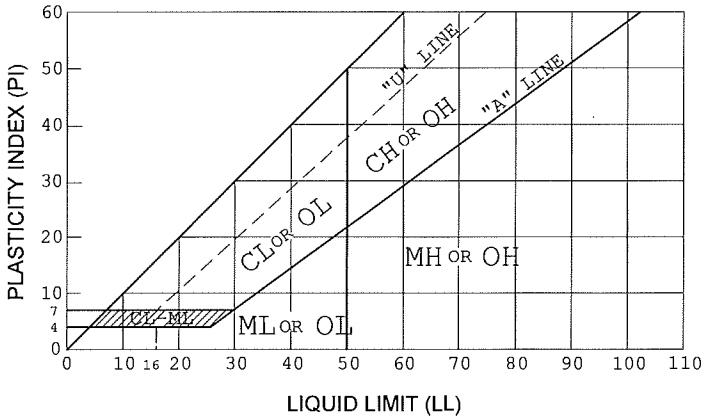
GRAIN SIZE TERMINOLOGY

Component of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Sand	# 4 to #200 sieve (4.75mm to 0.074mm)
Silt or Clay	Passing #200 sieve (0.074mm)

RELATIVE DENSITY OF GRANULAR SOILS

N - Blows/ft	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
greater than 50	Very Dense

PLASTICITY CHART



FOR CLASSIFICATION OF FINE-GRAINED SOILS AND FINE-GRAINED FRACTION OF COARSE-GRAINED SOILS

CONSISTENCY OF COHESIVE SOILS

Unconfined Compressive Strength, psf	N - Blows/ft	Consistency
less than 500	0 - 1	Very Soft
500 - 1,000	2 - 4	Soft
1,000 - 2,000	5 - 8	Firm
2,000 - 4,000	9 - 15	Stiff
4,000 - 8,000	16 - 30	Very Stiff
8,000 - 16,000	31 - 60	Hard
greater than 16,000	greater than 60	Very Hard

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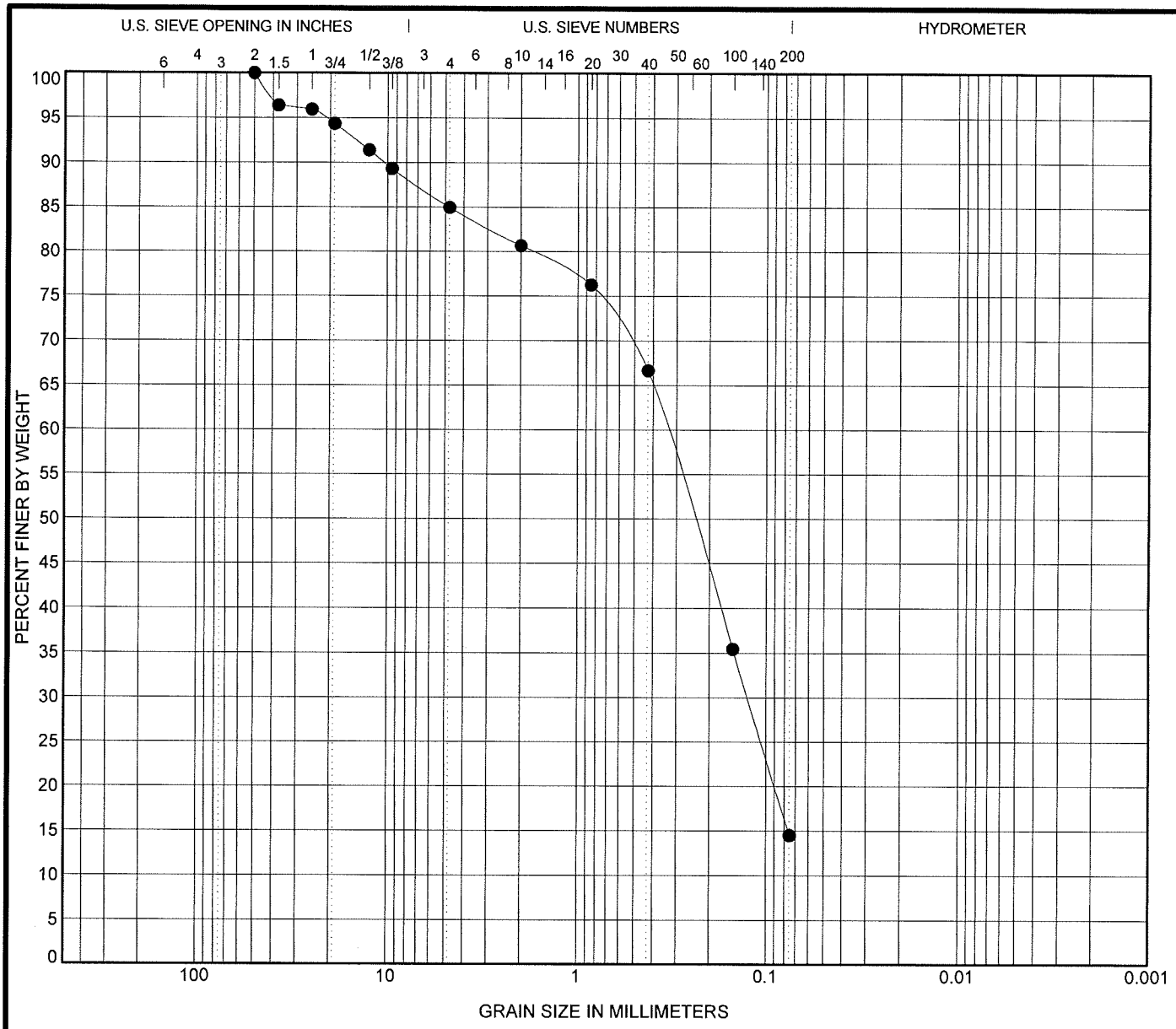
USCS Soil Classification Chart

Project: Water Tank Replacement Project
Location: Fallon, NV
Project Number: 1732-02-1 Plate: 3



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		USCS Classification	LL	PL	PI	Cc	Cu
● TP-01	0.0'	**SILTY SAND with GRAVEL (SM)**	**NP**	**NP**	**NP**		

Specimen Identification		D100	D60	D30	D10	MC %	%Gravel	%Sand	%Silt	%Clay
● TP-01	0.0'	**50**	**0.34**	**0.125**		**3.3**	**15.0**	**70.5**	**14.5**	

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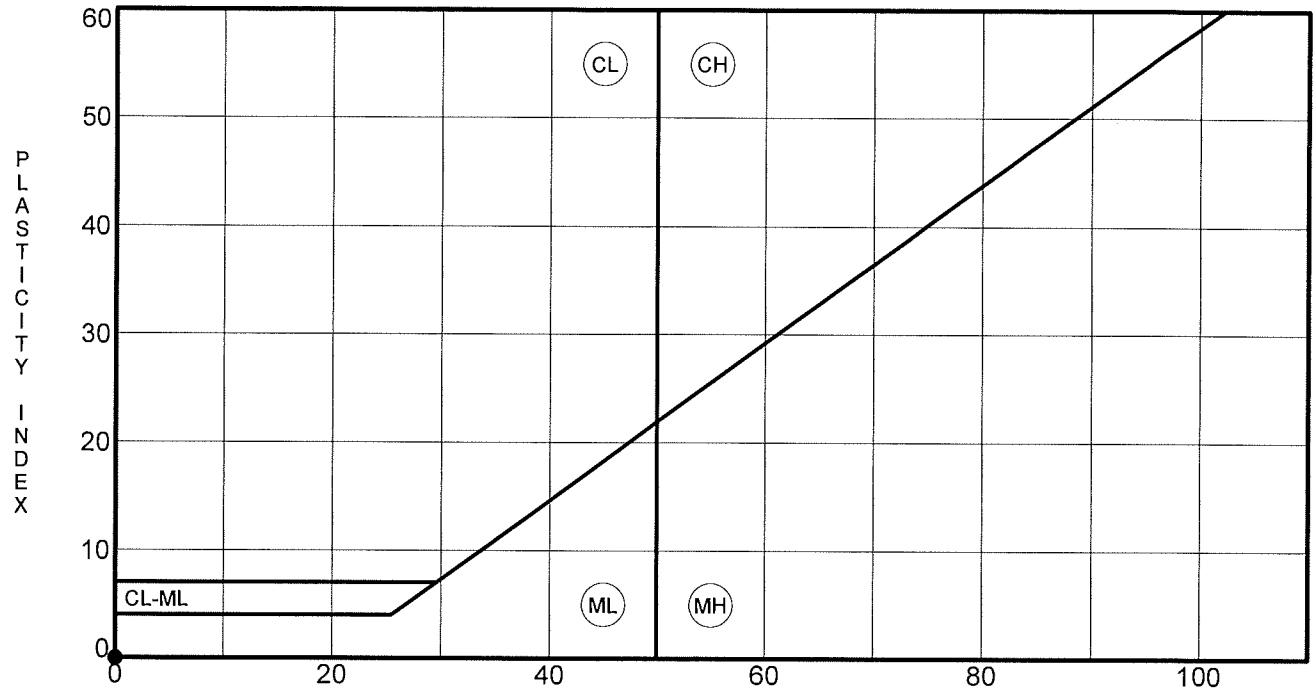
GRAIN SIZE DISTRIBUTION

Project: Water Tank Replacement Project
Location: Fallon, NV
Project Number: 1732-02-1 Plate: 4a

US GRAIN SIZE2 1732021.GPJ US LAB.GDT 6/15/2015



Specimen Depth in Feet.

Specimen Identification	LL	PL	PI	Fines	USCS Classification
● **TP-01 A 0.0'**	**NP**	**NP**	**NP**	**15**	**SILTY SAND with GRAVEL (SM)**

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ATTERBERG LIMITS RESULTS

Project: Water Tank Replacement Project
Location: Fallon, NV
Project Number: 1732-02-1 Plate: 4b

APPENDIX A

CHEMICAL TEST RESULTS

Laboratory Report
Report ID: 142168

Sierra Environmental Monitoring, Inc.

Black Eagle Consulting, Inc.
Attn: Jeff Wilbrecht
1345 Capital Blvd., Suite A
Reno, NV 89502-7140

Date: 6/18/2015
Client: BEC-100
Taken by: J. Payne
PO #:

Analysis Report

Laboratory Accreditation Number: NV-0015

Laboratory Sample ID	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S201506-034I	1732-02-1 TP-01-A	6/8/2015	9:45 AM	6/9/2015

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
pH - Saturated Paste	SW-846 9045A	9.38	pH Units		Mott	6/15/2015	
pH - Temperature	SW-846 9045A	27.0	°C		Mott	6/15/2015	
Redox Potential	SM 2580 B	16	MV		Faulstich	6/17/2015	
Resistivity	EPA 120.1	3000	ohm cm		Malkiewich	6/16/2015	
Sulfate - Ion Chromatography	EPA 300.0	46	mg/Kg	2	Faulstich	6/16/2015	JI
Sulfide	EPA 376.1	NEGATIVE	Pos/Neg	1	Faulstich	6/17/2015	

Data Flag Legend:

JI - The batch MS and/or MSD were outside acceptance limits. The batch LCS was acceptable.

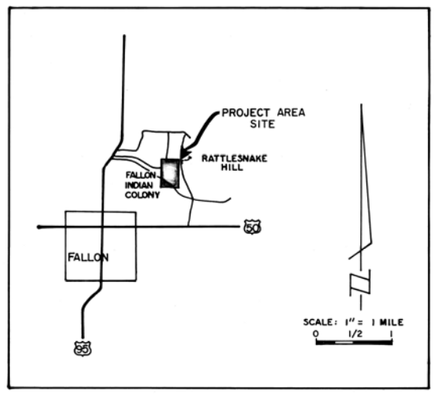
John Kobza, Ph.D
Laboratory Director

1135 Financial Blvd.
Reno, Nv 89502-2348
Phone (775) 857-2400 Fax
(888) 398-7002
jnava@sem-analytical.com

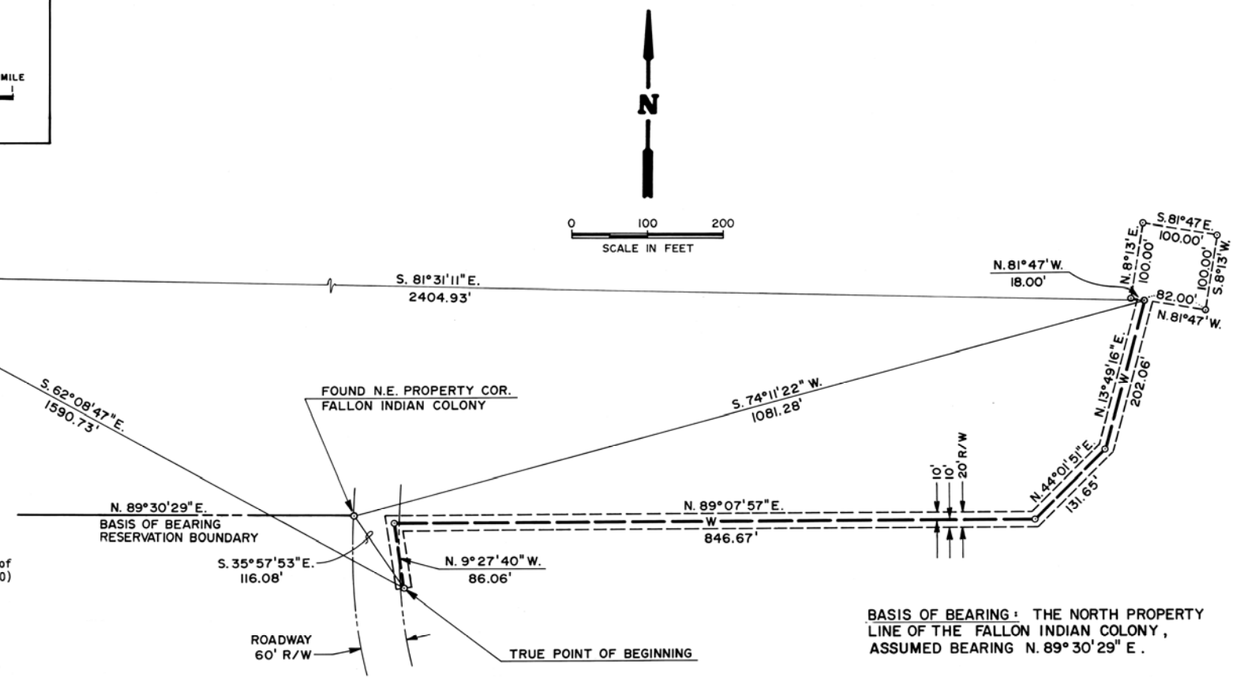
John Faulstich
Quality Assurance Manager

RIGHT OF WAY MAPS

FALLON INDIAN COLONY
CHURCHILL COUNTY, NEVADA
"AS-BUILT" WATER TANK & MAIN
RIGHTS-OF-WAY
PROJECT NO. PH 80-416



LOCATION MAP



BASIS OF BEARING: THE NORTH PROPERTY LINE OF THE FALLON INDIAN COLONY, ASSUMED BEARING N. 89°30'29" E.

LEGAL DESCRIPTION
FALLON WATER TANK AND MAIN

An underground water main and above ground water storage tank easement of varying width beginning with twenty feet (20.0) in width going ten feet (10.0) on each side of the following described centerline:

A portion of the North 1/2 of the Northwest quarter of Section 29, Township 19 North, Range 29 East.

Commencing at the true point of beginning, which lies a distance of 1590.73' at a bearing with an assumed basis of bearing of the North boundary of the Fallon Indian Colony being N 89° 30' 29" E, of S 62° 08' 47" E, from the found Northwest corner of said Section 29.

Thence N 9° 27' 40" W, for 86.06 feet:

Thence N 89° 07' 57" E, for 846.67 feet;

Thence N 44° 01' 51" E, for 131.65 feet;

Thence N 13° 49' 16" E, for 202.06 feet; to the point of terminus of water line easement; a point which lies 2404.93 feet at a bearing of S 81° 31' 11" E, from said corner of Section 29.

The true point of beginning of the water tank site is the said point of terminus of the water line easement.

Thence N 81° 47' W, for 18.00 feet;

Thence N 8° 13' E, for 100.00 feet;

Thence S 81° 47' E, for 100.00 feet;

Thence S 8° 13' W, for 100.00 feet;

Thence N 81° 47' W, for 82.00 feet to the true point of the beginning.

The above describing the permanent utility easement. The construction easement shall lie in the same location but shall be 25 feet greater in width for the water line and 50 feet greater in length and width at the tank site.

ENGINEER'S AFFIDAVIT

State of Arizona
County of Maricopa

Robert E. Hatten, being duly sworn, states that he is a Registered Professional Engineer; that he was retained by the Department of Health and Human Services, United States Public Health Service, Indian Health Service; that he requested the survey of a community utility right-of-way as per legal description and described and shown on this map, to be granted to the Department of Health And Human Services, United States Public Health Service, Indian Health Service, hereinafter designated the applicant, that the survey of such right-of-way was made under his supervision and under applicant's authority, on the 30th day of July, 1981, and that such survey is accurately represented on this map.

Robert E. Hatten
Robert E. Hatten, P.E.
Chief, Sanitation Facilities Construction Branch

Subscribed and sworn to me this 29th day of September, 1981.

Rita J. Ruiz
Notary Public in and for Maricopa County, Arizona
My commission expires March 2 1985

ROBERT E. HATTEN STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

OFFICIAL SEAL
RITA J. RUIZ
Notary Public - Arizona
Principal Offices in
Maricopa County
My Commission Expires Mar. 2, 1985

PREPARED BY: Ernest L Ceponis — PROJECT ENGINEER — 9-18-81 DATE

REVIEWED BY: Gordon Hilleas — DISTRICT ENGINEER — 9-18-81 DATE

REVIEWED BY: Robert E. Hatten PE — CHIEF, S.F.C.B. — 9-24-81 DATE

APPROVED BY: Larry Barton — DIRECTOR, O.E.H. — 9/25/81 DATE

14-83	D.A.M.	COMPUTED TRAVERSE LINES REVISION	DRAWN BY: DUC / O.T. DATE: 6/81 / 12-16-83	CHECKED BY: D.A.M. / G.L.W DATE: 9-81 / 2-13-84	DEPARTMENT OF HEALTH, AND HUMAN SERVICES PUBLIC HEALTH SERVICE INDIAN HEALTH SERVICE	LOCATION: FALLON INDIAN COLONY CHURCHILL COUNTY, NEVADA	TITLE: "AS-BUILT" WATER TANK & MAIN RIGHTS-OF-WAY

DISTRICT: NEVADA
SHEET NO. 1 OF 1 TOTAL SHTS

PROJECT SITE PHOTOS


Excess rock to be removed


Existing concrete tank
and fencing.


Existing gate on
access road to tank


Open, gradual sloping area north of existing tank for potential temporary water storage


Open, gradual sloping area on top of hill just east of the existing tank for potential temporary water storage