REQUEST FOR QUOTES

PROJECT PH22-F90-G, RN32-24

CONSTRUCTION OF INDIVIDUAL SEPTIC SYSTEM REPLACEMENTS FOR EXISTING SITES IN FALLON, NV

FALLON PAIUTE-SHOSHONE TRIBE

CHURCHILL COUNTY, NEVADA

MARCH 2025

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ADVERTISEMENT FOR QUOTES

FALLON PAIUTE-SHOSHONE TRIBE
CHURCHILL COUNTY, NEVADA
INDIVIDUAL SEPTIC SYSTEM REPLACEMENTS

General Notice

The **FALLON PAIUTE-SHOSHONE TRIBE** (Owner) is requesting Quotes for the construction of the following Project:

INDIVIDUAL SEPTIC SYSTEM REPLACEMENTS
PH22-F90-G, RN32-24

Quotes for the construction of the Project will be received by the Fallon Paiute-Shoshone Tribe until **Tuesday, May 6, 2025 at 10:00AM** local time. Quotes can be submitted by email to John Schafer, Public Works Director at publicworks@fpst.org , and CC Sophia Lopez, Project Engineer at sophia.lopez@ihs.gov.

The Project includes the following Work:

Work at 1796 Graham Lane, Fallon NV 89406:
Installation of one (1) pressurized mound septic system, to include connection to the existing sewer stub-out, installation of sewer service piping, two-way cleanout, one (1) 1,200-gallon septic tank, one (1) 500 gallon dosing tank, one (1) septic pump, pressurized mound drainfield and manifold piping, electrical connection, and abandonment of one (1) existing septic tank.

Work at 1525 Agency Road, Fallon NV 89406:
Replacement of one (1) 1,200-gallon septic tank, two-way cleanout and abandonment of one (1) existing septic tank.

All work shall be done in accordance with the Technical Provisions and Construction Drawings.

Quotes are requested for the following Contract: **PH22-F90-G, RN032-24; INDIVIDUAL SEPTIC SYSTEM REPLACEMENTS**

The Project has an expected duration of **30** days.

Obtaining the Request for Quotes (RFQ) Package

The Issuing Office for the RFQ Package is:

Tribal Administration Building
565 Rio Vista Road
Fallon, NV 89406

The RFQ Package may be requested in PDF format via email by contacting the Owner, John Schafer, Public Works Director at publicworks@fpst.org, and CC Sophia Lopez, Project Engineer at sophia.lopez@ihs.gov.

Indian Preference

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 Quote by this enterprise does not exceed the lowest Quote 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 Quote opening. Any contractor claiming Indian preference shall give evidence, as required by the Owner, to support its claim prior to Quote opening. Any Quoter claiming Indian preference shall complete the Indian Owned Economic Enterprise Qualification Statement included in the RFQ Package.

TERO Notice

The Owner has adopted a Tribal Employments Rights Ordinance (TERO) which imposes an employment rights fee to pay of the operation and commission of the tribal employment rights office services. The TERO fee is a one-time fee of 2.5% of the total amount of the contract for construction contracts over $10,000. For more information regarding TERO, see attached TERO Ordinance in the Exhibits to this Contract.

Instructions to Quoters

Quoter is required to be licensed to perform the Work in the state of **Nevada**, where the Project is located. The Quote must contain evidence of Quoter's licensure, or Quoter must certify in writing that it will obtain such licensure within the time for acceptance of Quotes and attach such certification to the Quote.

A Quote must be received no later than the date and time prescribed and via the manner (email) indicated in the Advertisement for Quotes. Quotes received after the submittal date and time prescribed, or not submitted in the designated manner, will not be accepted.

Quoters must complete the Quote Form for Construction Contract. All blank spaces for Quote prices must be filled in, in ink or typewritten, and the table must be fully completed and executed when submitted.

Owner reserves the right to reject any or all Quotes, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Quotes. Owner also reserves the right to waive all minor Quote informalities not involving price, time, or changes in the Work. Owner will reject the Quote of any Quoter that Owner finds, after reasonable inquiry and evaluation, to not be responsible. Award of the Contract will be made to the lowest responsive and responsible Quoter, with due consideration to qualified Indian Preference Quoters.

This Advertisement is issued by:

Owner: **Fallon Paiute-Shoshone Tribe**
By: **John Schafer**
Title: **Fallon Paiute-Shoshone Tribe Public Works Director**
Date:

QUOTE FORM FOR CONSTRUCTION CONTRACT

ARTICLE 1 - OWNER AND QUOTER

1.01 This Quote is submitted to:

Fallon Paiute-Shoshone Tribe

ATTN: John Schafer, Public Works Director

publicworks@fpst.org

565 Rio Vista Drive

Fallon, Nevada 89406

1.02 The undersigned Quoter proposes and agrees, if this Quote is accepted, to enter into a Contract with Owner in the form included in the RFQ Package to perform all Work as specified or indicated in the RFQ Package for the prices and within the times indicated in this Quote and in accordance with the other terms and conditions of the RFQ Package.

ARTICLE 2 - ATTACHMENTS TO THIS QUOTE

2.01 The following documents are submitted with and made a condition of this Quote:

A. A copy of a valid CONTRACTOR's license for the state in which the work resides, at the time of quote submittal or Certification of Renewal;

B. Indian Owned Economic Enterprise Qualification Statement if Quoter is claiming Indian preference.

ARTICLE 3 - BASIS OF QUOTE—UNIT PRICES

3.01 Unit Price Quotes

A. Quoter will perform the following Work at the indicated unit prices:

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
Facilities for K. Bowen at 1796 Graham Lane, Fallon NV 89406					
1	Sewer Service Line (4", Includes Fittings)	LF	10		
2	Two Way Cleanout	EA	1		
3	Septic Tank (1,200 gallons) with effluent filter, risers and safety screens	EA	1		
4	Pump Tank (500 gallons) with risers and safety screen	EA	1		
5	Effluent Pump with Controls – includes pump, float switches, control enclosure, electrical wiring, check valves, discharge pipe and fittings	EA	1		
6	Electrical Cable	LF	30		
7	Effluent Force Line	LF	20		
8	Mound Material – clean sand, fill and topsoil	LS	1		
9	Manifold Pipe	LF	40		
10	Perforated Pipe	LF	156		
11	Distribution Media – Gravel – includes filter fabric	LS	1		
12	Septic Tank Abandonment	EA	1		
13	Mound Incidentals – includes plowing native soil, seeding, protective cover for seeing, observation ports	LS	1		
Facilities for J. Downs at 1525 Agency Road, Fallon NV 89406					
14	4" Sewer Pipe	LF	10		
15	Two Way Cleanout	EA	1		
16	Septic Tank (1,200 gallons) with effluent filter, risers and safety screens	EA	1		
17	Septic Tank Abandonment	EA	1		
				Construction Subtotal	

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
	TERO (2.5% of the total contract price)				
	Total of all extended prices for Estimated Quantities of Work				**$**

B. Quoter acknowledges that:

1. each Quote Unit Price includes an amount considered by Quoter to be adequate to cover Contractor's overhead and profit for each separately identified item, and

2. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Quotes, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

3.02 Total Quote Price

Total Quote Price (Total of Unit Price Quotes)	$

ARTICLE 4 - [DELETED]

ARTICLE 5 - [DELETED]

ARTICLE 6 - TIME OF COMPLETION

6.01 Quoter agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Article 4 and Article 14 of the Contract for Construction of a Small Project on or before the dates or within the number of calendar days indicated in the Contract.

6.02 [DELETED]

6.03 [DELETED]

6.04 Quoter accepts the provisions of the Contract as to liquidated damages.

ARTICLE 7 - QUOTER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

7.01 Quote Acceptance Period

A. This Quote will remain subject to acceptance for 60 days after the Quote opening, or for such longer period of time that Quoter may agree to in writing upon request of Owner.

7.02 Instructions to Quoters

A. Quoter accepts all of the terms and conditions of the Instructions to Quoters and Advertisement for Quotes.

7.03 Receipt of Addenda

A. Quoter hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 8 - QUOTER'S REPRESENTATIONS AND CERTIFICATIONS

8.01 Quoter's Representations

A. In submitting this Quote, Quoter represents the following:

1. Quoter has examined and carefully studied the RFQ Package, including Addenda.

2. Quoter has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Quoter is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Quoter has considered the information known to Quoter itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the RFQ Package; and the Technical Data identified or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Quoter, if selected as Contractor; and (c) Quoter's (Contractor's) safety precautions and programs.

5. Based on the information and observations referred to in the preceding paragraph, Quoter agrees that no 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.

6. Quoter 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 RFQ Package.

7. Quoter has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Quoter has discovered in the RFQ Package, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

8. The RFQ Package are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

9. The submission of this Quote constitutes an incontrovertible representation by Quoter that without exception the Quote and all prices in the Quote are premised upon performing and furnishing the Work required by the RFQ Package.

8.02 Quoter's Certifications

A. The Quoter certifies the following:

1. This Quote is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2. Quoter has not directly or indirectly induced or solicited any other Quoter to submit a false or sham Quote.

3. Quoter has not solicited or induced any individual or entity to refrain from submitting a quote.

4. Quoter has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:

    a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the quoting process.

    b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the quoting process to the detriment of Owner, (b) to establish quote prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

    c. Collusive practice means a scheme or arrangement between two or more Quoters, with or without the knowledge of Owner, a purpose of which is to establish quote prices at artificial, non-competitive levels.

    d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the quoting process or affect the execution of the Contract.

QUOTER hereby submits this Quote as set forth above:

Quoter:

_____

(typed or printed name of organization)

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

If Quoter is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Address for giving notices:

_____

_____

Quoter's Contact:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

Quoter's Contractor License No.: (if _____

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."

CONTRACT FOR CONSTRUCTION OF A SMALL PROJECT

This Contract is by and between **Fallon Paiute-Shoshone Tribe** (Owner) and

(Contractor).

Owner and Contractor hereby agree as follows:

ARTICLE 1 - THE WORK

1.01 Work

A. Work includes all labor, materials, equipment, services, and documentation necessary to construct the Project defined herein. The Work may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

B. The Contractor shall complete all Work as specified or indicated in the Contract Documents. The Project is generally described as follows:

1. Work at 1796 Graham Lane, Fallon NV 89406:

   Installation of one (1) pressurized mound septic system, to include connection to the existing sewer stub-out, installation of sewer service piping, two-way cleanout, one (1) 1,200-gallon septic tank, one (1) 500-gallon dosing tank, one (1) septic pump, pressurized mound drainfield and manifold piping, electrical connection, and abandonment of one (1) existing septic tank.

   Work at 1525 Agency Road, Fallon NV 89406:

   Replacement of one (1) 1,200-gallon septic tank, two-way cleanout and abandonment of one (1) existing septic tank.

   All work shall be done in accordance with the Technical Provisions and Construction Drawings.

2. The Site of the Work includes property, easements, and designated work areas described in greater detail in the Contract Documents but generally located at 1796 Graham Lane, Fallon NV 89406 and 1525 Agency Road, Fallon NV 89406. Site maps and photos are included in the Exhibits to this Contract.

ARTICLE 2 - CONTRACT DOCUMENTS

2.01 Intent of Contract Documents

A. It is the intent of the Contract Documents to describe a functionally complete project. The Contract Documents do not indicate or describe all of the Work required to complete the Project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with the Owner and Engineer. This Contract supersedes prior negotiations, representations, and agreements, whether written or oral. The Contract Documents are complementary; what is required by one part of the Contract Documents is as binding as if required by other parts of the Contract Documents.

B. During the performance of the Work and until final payment, Contractor and Owner shall submit all matters in question concerning the requirements of the Contract Documents, or relating to the acceptability of the Work under the Contract Documents to the Engineer. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

C. Engineer will render a written clarification, interpretation, or decision on the issue submitted, or initiate a modification to the Contract Documents.

D. Contractor, and its subcontractors and suppliers, shall not have or acquire any title to or ownership rights to any of the Drawings, Specifications, or other documents (including copies or electronic media editions) prepared by Engineer or its consultants.

2.02 Contract Documents Defined

A. The Contract Documents consist of the following documents:

1. This Contract.
2. Specifications listed in the Table of Contents.
3. Drawings as listed on the Drawing Sheet Index.
4. Addenda.
5. Exhibits to this Contract (enumerated as follows):
   a. Exhibit 1 – Site Maps and Photos
6. The following which may be delivered or issued on or after the Effective Date of the Contract:
   a. Work Change Directives (EJCDC C-940).
   b. Change Orders (EJCDC C-941).
   c. Certificate of Substantial Completion

ARTICLE 3 - ENGINEER

3.01 Engineer

A. The Engineer for this Project is **Indian Health Service**.

ARTICLE 4 - CONTRACT TIMES

4.01 Contract Times

A. The Work will be substantially completed within **30** days after the Effective Date of the Contract and completed and ready for final payment within **30** days after the Effective Date of the Contract.

4.02 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence in the performance of the Contract, and that Owner will incur damages if Contractor does not complete the Work according to the requirements of Paragraph 4.01. Because such damages for delay would be

difficult and costly to determine, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner **$50.00** for each day that expires after the Contract Time for substantial completion.

4.03 Delays in Contractor's Progress

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor or their subcontractors or suppliers.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times.

D. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor or Contractor's subcontractors or suppliers.

4.04 Progress Schedules

A. Contractor shall develop a progress schedule and submit to the Engineer for review and comment before starting Work on the Site. The Contractor shall modify the schedule in accordance with the comments provided by the Engineer.

B. The Contractor shall update and submit the progress schedule to the Engineer each month. The Owner may withhold payment if the Contractor fails to submit the schedule.

ARTICLE 5 - CONTRACT PRICE

5.01 Payment

A. Owner shall pay Contractor in accordance with the Contract Documents at the following unit prices for each unit of Work completed:

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
Facilities for K. Bowen at 1796 Graham Lane, Fallon NV 89406					
1	Sewer Service Line (4", Includes Fittings)	LF	10		
2	Two Way Cleanout	EA	1		
3	Septic Tank (1,200 gallons) with effluent filter, risers and safety screens	EA	1		

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
4	Pump Tank (500 gallons) with risers and safety screen	EA	1		
5	Effluent Pump with Controls – includes pump, float switches, control enclosure, electrical wiring, check valves, discharge pipe and fittings	EA	1		
6	Electrical Cable	LF	30		
7	Effluent Force Line	LF	20		
8	Mound Material – clean sand, fill and topsoil	LS	1		
9	Manifold Pipe	LF	40		
10	Perforated Pipe	LF	156		
11	Distribution Media – Gravel – includes filter fabric	LS	1		
12	Septic Tank Abandonment	EA	1		
13	Mound Incidentals – includes plowing native soil, seeding, protective cover for seeing, observation ports	LS	1		
Facilities for J. Downs at 1525 Agency Road, Fallon NV 89406					
14	4" Sewer Pipe	LF	10		
15	Two Way Cleanout	EA	1		
16	Septic Tank (1,200 gallons) with effluent filter, risers and safety screens	EA	1		
17	Septic Tank Abandonment	EA	1		
				Construction Subtotal	
				TERO (2.5% of the total contract price)	
Total of all extended prices for Estimated Quantities of Work					**$**

Payment will be made in an amount equal to the total of all extended prices for actual Work completed. The extended price is determined by multiplying the unit price times the actual quantity of that Work item completed. Actual quantities installed will be determined by the Engineer.

ARTICLE 6 - BONDS AND INSURANCE

6.01 Bonds

A. Removed. Bonds are not required for this contract.

6.02 Insurance

A. Before starting Work, Contractor shall furnish evidence of insurance from companies that are duly licensed or authorized in the jurisdiction in which the Project is located with a minimum AM Best rating of A-VII or better. Contractor shall provide insurance in accordance with the following:

1. Contractor shall provide coverage for not less than the following amounts, or greater where required by Laws and Regulations:

a. Workers' Compensation:

State:	Statutory
Employer's Liability:	
Bodily Injury, each Accident	$ 500,000
Bodily Injury By Disease, each Employee	$ 100,000
Bodily Injury/Disease Aggregate	$ 100,000

b. Commercial General Liability:

General Aggregate	$ 250,000
Products - Completed Operations Aggregate	$ 500,000
Personal and Advertising Injury Each Occurrence (Bodily Injury and Property Damage)	$ Applicable Federal

c. Automobile Liability herein: $ 200,000

Bodily Injury:	
Each Person	$ 200,000
Each Accident	$ 500,000
Property Damage:	
Each Accident	$ 20,000
Combined Single Limit of:	$ 500,000

B. All insurance policies required to be purchased and maintained will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the insured and additional insured.

C. Automobile liability insurance provided by Contractor shall provide coverage against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

D. Contractor's commercial general liability policy shall be written on a 1996 or later ISO commercial general liability occurrence form and include the following coverages and endorsements:

1. Products and completed operations coverage maintained for three years after final payment;

2. Blanket contractual liability coverage to the extent permitted by law;

3. Broad form property damage coverage; and

4. Severability of interest; underground, explosion, and collapse coverage; personal injury coverage.

E. The Contractor's commercial general liability and automobile liability, umbrella or excess, and pollution liability policies shall include and list Owner and Engineer and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each as additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis.

1. Additional insured endorsements will include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

2. Contractor shall provide ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent for design professional additional insureds.

F. Umbrella or excess liability insurance shall be written over the underlying employer's liability, commercial general liability, and automobile liability insurance. Subject to industry-standard exclusions, the coverage afforded shall be procured on a "follow the form" basis as to each of the underlying policies. Contractor may demonstrate to Owner that Contractor has met the combined limits of insurance (underlying policy plus applicable umbrella) specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policies and an umbrella or excess liability policy.

G. The Contractor shall provide property insurance covering physical loss or damage during construction to structures, materials, fixtures, and equipment, including those materials, fixtures, or equipment in storage or transit.

H. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 15.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

7.01 Supervision and Superintendence

A. Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, safety, and procedures of construction.

B. Contractor shall assign a competent resident superintendent who is to be present at all times during the execution of the Work. This resident superintendent shall not be replaced without written notice to and approval by the Owner and Engineer except under extraordinary circumstances.

C. Contractor shall at all times maintain good discipline and order at the Site.

D. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday.

7.02 Other Work at the Site

A. In addition to and apart from the Work of the Contractor, other work may occur at or adjacent to the Site. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

7.03 Services, Materials, and Equipment

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be new, of good quality and shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise may be provided in the Contract Documents.

7.04 Subcontractors and Suppliers

A. Contractor may retain subcontractors and suppliers for the performance of parts of the Work. Such subcontractors and suppliers must be acceptable to Owner.

7.05 Quality Management

A. Contractor is fully responsible for the managing quality to ensure Work is completed in accordance with the Contract Documents.

7.06 Licenses, Fees and Permits

A. Contractor shall be a **Nevada** licensed contractor.

B. Contractor shall pay all license fees and royalties and assume all costs incident to performing the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others.

C. Contractor shall obtain and pay for all construction permits and licenses unless otherwise provided in the Contract Documents.

7.07 Laws and Regulations; Taxes

A. Contractor shall give all notices required by and shall comply with all local, state, and federal Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages if Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations.

C. Contractor shall pay all applicable sales, consumer, use, and other similar taxes Contractor is required to pay in accordance with Laws and Regulations.

7.08 Record Documents

A. Contractor shall maintain one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved shop drawings in a safe place at the Site. Contractor shall annotate them to show changes made during construction. Contractor shall deliver these record documents to Engineer upon completion of the Work.

7.09 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.

B. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. All persons on the Site or who may be affected by the Work;

2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

C. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by Contractor, or anyone for whose acts the Contractor may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Contract Documents or to the acts or omissions of Owner or Engineer and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor).

D. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

E. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor shall act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.10 Shop Drawings, Samples, and Other Submittals

A. Contractor shall review and coordinate the shop drawing and samples with the requirements of the Work and the Contract Documents and shall verify all related field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information.

B. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

C. With each submittal, Contractor shall give Engineer specific written notice, in a communication separate from the submittal, of any variations that the shop drawing or sample may have from the requirements of the Contract Documents.

D. Engineer will provide timely review of shop drawings and samples.

E. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs.

F. Engineer's review and approval of a separate item does not indicate approval of the assembly in which the item functions.

G. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of shop drawings and submit, as required, new samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

H. Shop drawings are not Contract Documents.

7.11 Warranties and Guarantees

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

7.12 Correction Period

A. 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 Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by

Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly and without cost to Owner, correct such defective Work.

7.13 Indemnification

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts they may be liable.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 Owner's Responsibilities

A. Except as otherwise provided in the Contract Documents, Owner shall issue all communications to Contractor.

B. Owner shall make payments to Contractor as provided in this Contract.

C. Owner shall provide Site and easements required to construct the Project.

D. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, unless stated elsewhere in the Contract Documents, Owner shall have sole authority and responsibility for such coordination.

E. The Owner shall be responsible for performing inspections and tests required by applicable codes.

F. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

G. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

H. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

I. Owner has the authority to reject work if Contractor fails to perform Work in accordance with the Contract Documents.

J. Owner will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work.

K. Owner will seek technical advice of Engineer prior to making decisions regarding the design, technical matters, or the Contract Documents.

L. Owner will furnish an "Owner's Site Representative" to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not the Engineer's consultant, agent, or employee. Owner's Site Representative will be John Schafer.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 Engineer's Status

A. The Engineer shall act as owner's technical advisor during the construction period of this Contract. If directed by the Owner, Contractor may submit copies (originals sent to the Owner) of information such as submittals, progress payments, change order requests, etc. to the appropriate IHS office when technical assistance is required and requested by the Owner. The IHS Engineer will submit any and all recommendations to the Owner for its decision. All direction to the Contractor shall come from the Owner with the technical advice of IHS.

B. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any subcontractor, any supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

C. Engineer will make visits to the Site at intervals appropriate to the various stages of construction. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work.

D. Engineer will provide recommendations to the Owner regarding the requirements of the Contract Documents, and judge acceptability of the Work.

E. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

F. All discussions about the Contract with the Owner's Contractor that includes IHS employees shall be conducted by and with direct participation of Owner's employees. The IHS may not make commitments or give direction to the Owner's Contractor. IHS employees cannot represent the Owner and Owner's employees cannot represent the IHS.

G. At the request of the Owner, IHS will provide oversight and technical assistance on Contractor submittals, progress payments, change order requests, and other project related information submitted by the Tribal Contractor and make recommendations to the Owner.

H. The IHS and Owner shall inspect all sanitation facilities constructed through Tribal procurement to ensure construction meets contract specifications. The procurement documents shall also note that the IHS inspector does not have authority to modify the

Contract or issue direction to the Contractor. Following construction inspection, the IHS will advise the Owner on whether the construction meets the IHS interpretation of the Contract requirements.

I. The Engineer will provide Resident Project Representation (RPR) services for this project. The RPR will be Engineer's representative, but will not be Owner's agent. Contractor should be advised of the fact that his Contract is with the Owner, with Federal oversight to ensure the Work complies with all applicable Federal requirements. IHS inspection will only perform quality assurance for the Federal government and the Owner but their presence will not be inferred as quality control for the Contractor nor is implying any contractual relationship. IHS inspection of facilities constructed through Tribal procurement is only part of the Federal oversight responsibility.

ARTICLE 10 - CHANGES IN THE WORK

10.01 Authority to Change the Work

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work.

10.02 Change Orders

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in the Work which are: (a) ordered by Owner or (b) agreed to by the parties or (c) resulting from the Engineer's decision, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

3. Changes in the Contract Price or Contract Times or other changes which embody the substance of any final binding results under Article 12.

B. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 11 - DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS

11.01 Differing Conditions Process

A. If Contractor believes that any subsurface or physical condition including but not limited to utilities or other underground facilities that are uncovered or revealed at the Site either differs materially from that shown or indicated in the Contract Documents or is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except

in an emergency), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. After receipt of written notice, Engineer will promptly:

1. Review the subsurface or physical condition in question;

2. Determine necessity for Owner obtaining additional exploration or tests with respect to the condition;

3. Determine whether the condition falls within the differing site condition as stated herein;

4. Obtain any pertinent cost or schedule information from Contractor;

5. Prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and

6. Advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

ARTICLE 12 - CLAIMS AND DISPUTE RESOLUTION

12.01 Claims Process

A. The party submitting a claim shall deliver it directly to the other party to the Contract and the Engineer promptly (but in no event later than 10 days) after the start of the event giving rise thereto.

B. The party receiving a claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the claim through the exchange of information and direct negotiations. All actions taken on a claim shall be stated in writing and submitted to the other party.

C. If efforts to resolve a claim are not successful, the party receiving the claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the claim within 45 days, the claim is deemed denied.

D. If the dispute is not resolved to the satisfaction of the parties, Owner or Contractor shall give written notice to the other party of the intent to submit the dispute to the Fallon Paiute-Shoshone Tribal Court unless the Owner and Contractor both agree to an alternative dispute resolution process.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION OF DEFECTIVE WORK

13.01 Tests and Inspections

A. Owner and Engineer will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access.

B. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

C. If any Work that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense.

13.02 Defective Work

A. Contractor shall ensure that the Work is not defective.

B. Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. The Contractor shall promptly correct all such defective Work.

E. When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. If the Work is defective or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

ARTICLE 14 - PAYMENTS TO CONTRACTOR

14.01 Progress Payments

A. The Contractor shall prepare a schedule of values that will serve as the basis for progress payments. The schedule of values will be in a form of application for payment acceptable to Engineer. The unit price breakdown submitted with the quote will be used for unit price work. Break lump sum items into units that will allow for measurement of Work in progress.

14.02 Applications for Payments:

A. Contractor shall submit an application for payment in a form acceptable to the Engineer, no more frequently than monthly, to Engineer. Applications for payment will be prepared and signed by Contractor. Contractor shall provide supporting documentation required by the Contract Documents. Payment will be paid for Work completed as of the date of the application for payment.

B. Beginning with the second application for payment, each application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work

have been applied on account to discharge Contractor's legitimate obligations associated with prior applications for payment.

14.03 Retainage

A. The Owner shall retain **10%** of each progress payment until the Work is substantially complete.

14.04 Review of Applications

A. Within 10 days after receipt of each application for payment, the Engineer will either indicate in writing a recommendation for payment and present the application for payment to Owner or return the application for payment to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. The Contractor will make the necessary corrections and resubmit the application for payment.

B. Engineer will recommend reductions in payment (set-offs) which, in the opinion of the Engineer, are necessary to protect Owner from loss because the Work is defective and requires correction or replacement.

C. The Owner is entitled to impose set-offs against payment based on any claims that have been made against Owner on account of Contractor's conduct in the performance of the Work, incurred costs, losses, or damages on account of Contractor's conduct in the performance of the Work, or liquidated damages that have accrued as a result of Contractor's failure to complete the Work.

14.05 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

14.06 Substantial Completion

A. The Contractor shall notify Owner and Engineer in writing that the Work is substantially complete and request the Engineer issue a certificate of substantial completion when Contractor considers the Work ready for its intended use. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Engineer will make an inspection of the Work with the Owner and Contractor to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor and Owner in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete or upon resolution of all reasons for non-issuance of a certificate identified in 14.06.B, Engineer will deliver to Owner a certificate of substantial completion which shall fix the date of substantial completion and include a punch list of items to be completed or corrected before final payment.

14.07 Final Inspection

A. Upon written notice from Contractor that the entire Work is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion

thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.08 Final Payment

A. Contractor may make application for final payment after Contractor has satisfactorily completed all Work defined in the Contract, including providing all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents and other documents.

B. The final application for payment shall be accompanied (except as previously delivered) by:

1. All documentation called for in the Contract Documents;

2. Consent of the surety to final payment;

3. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any liens or other title defects, or will so pass upon final payment;

4. A list of all disputes that Contractor believes are unsettled; and

5. Complete and legally effective releases or waivers (satisfactory to Owner) of all lien rights arising out of the Work, and of liens filed in connection with the Work.

C. The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

14.09 Waiver of Claims

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 60 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension.

15.02 Owner May Terminate for Cause

A. Contractor's failure to perform the Work in accordance with the Contract Documents or other failure to comply with a material term of the Contract Documents will constitute a default by Contractor and justify termination for cause.

B. If Contractor defaults in its obligations, then after giving Contractor and any surety ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. Declare Contractor to be in default, and give Contractor and any surety notice that the Contract is terminated; and

2. Enforce the rights available to Owner under any applicable performance bond.

C. Owner may not proceed with termination of the Contract under Paragraph 15.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

D. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

E. In the case of a termination for cause, if the cost to complete the Work, including related claims, costs, losses, and damages, exceeds the unpaid contract balance, Contractor shall pay the difference to Owner.

15.03 Owner May Terminate for Convenience

A. Upon seven days written notice to Contractor, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for, without duplication of any items:

1. Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. Other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

15.04 Contractor May Stop Work or Terminate

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner, and provided Owner does not remedy such suspension or failure within that time, either stop the Work until payment is received, or terminate the Contract and recover payment from the Owner.

ARTICLE 16 - CONTRACTOR'S REPRESENTATIONS

16.01 Contractor Representations

A. Contractor makes the following representations when entering into this Contract:

1. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, 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.

3. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on:

a. The cost, progress, and performance of the Work;

b. The means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and

c. Contractor's safety precautions and programs.

5. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no 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.

6. 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.

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

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

9. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that, without exception, all prices in the Contract are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 17 - MISCELLANEOUS

17.01 Cumulative Remedies

A. The duties and obligations imposed by this Contract and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as

a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.02 Limitation of Damages

A. Neither Owner, Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

17.03 No Waiver

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

17.04 Survival of Obligations

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 Contractor's Certifications

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract.

17.06 Controlling Law

A. This Contract is to be governed by the law of the Fallon Paiute-Shoshone Tribe.

17.07 Tribal Sovereignty

A. No provision of this contract or in this RFQ constitutes a waiver of Owner's absolute sovereign immunity. The Contract acknowledges that the Fallon Paiute-Shoshone Tribe, and any employee, official, agent, department, or entity thereof is absolutely immune from suit of claim of any kind.

ARTICLE 18 - FEDERAL REQUIREMENTS

18.01 IHS Not a Party.

A. This project is financed in whole or in part by the Indian Health Service Sanitation Facilities Construction Program (IHS) pursuant to, 42 U.S.C. 2004a, Public Law 86-121, Indian Sanitation Facilities Act. Neither the IHS, nor any of its departments, entities, or employees is a party to this contract.

B. IHS employees cannot represent the Owner and Owner's employees cannot represent the IHS.

18.02 Conflict of Interest.

A. Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest or other interest in or a tangible personal benefit from the Contractor. Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.

18.03 Tribal Taxes and Tribal Employment Rights Ordinance (TERO)

A. 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 Tribe 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 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 delivers 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 pre-construction meeting.

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

Jessica Miles, Tax and TERO Administrator
Office Location – 565 Rio Vista Drive, Fallon NV
Telephone (775) 423-6075, ext. 1017
Email – taxdirector@fpst.org

B. 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.

18.04 Small, Minority, and Women’s Businesses

A. Contracting with small and minority businesses, women's business enterprises, and labor surplus area firms. If Contractor intends to let any subcontracts for a portion of the work, Contractor must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible. Affirmative steps must include:

1. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

2. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;

3. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;

4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and

5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

18.05 Anti-Kickback

A. Contractor shall comply with the Copeland Anti-Kickback Act (40 U.S.C 3145) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Buildings or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that Contractor or subcontractor must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. Owner shall report all suspected or reported violations to IHS.

18.06 Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended

A. Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

18.07 Equal Employment Opportunity

A. The Contract is considered a federally assisted construction contract. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

18.08 Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)

A. Contractors that apply or quote for an award exceeding $100,000 must file the required certification. The Contractor certifies to the Owner and every subcontractor certifies to the Contractor that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining the Contract if it is covered by 31 U.S.C. 1352. The Contractor and every subcontractor must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the Owner.

18.09 Environmental Requirements. When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental conditions:

A. Waters of the U.S. – When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands or other Waters of the U.S.

B. Historic Preservation – Any excavation by Contractor that uncovers an historical or archaeological artifact or human remains shall be immediately reported to Owner and a representative of IHS. Construction shall be temporarily halted pending the notification

process and further directions issued by IHS after consultation with the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO).

C. Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of IHS. Construction shall be temporarily halted pending the notification process and further directions issued by IHS after consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service.

18.10 Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708)

A. Where applicable, for contracts awarded by the Owner in excess of $100,000 that involve the employment of mechanics or laborers, the Contractor must comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, the Contractor must compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

18.11 Debarment and Suspension (Executive Orders 12549 and 12689)

A. A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

18.12 Davis – Bacon Act, as amended (40 U.S.C. 3141-3148)

A. If this contract is in excess of $2,000, the Contractor must comply with the requirements of the Davis – Bacon Act (40 U.S.C. 3141-3144 and 3146-3148) as supplemented by Department of Labor regulations (29 CFR part 5). In accordance with the statute, the Contractor must pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, the Contractor must be required to pay wages not less than once a week. The Owner must place a copy of the current prevailing wage determination issued by the Department of Labor in the solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination.

IN WITNESS WHEREOF, Owner and Contractor have signed this Contract.

This Contract will be effective on _____ (which is the Effective Date of the Contract).

OWNER:	CONTRACTOR:
Fallon Paiute-Shoshone Tribe	
By:	By:
Title:	Title:
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest:	Attest:
Title:	Title:
Address for giving notices:	Address for giving notices:
	License No.: (where applicable)
(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 this Contract.)	***NOTE TO USER: Use in those states or other jurisdictions where applicable or required.***

WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner: **Fallon Paiute-Shoshone Tribe**

Engineer: **Indian Health Service**

Contractor:

Project: **Individual Septic Systems Replacement**

Contract Name:

Date Issued:

Owner's Project No.:

Engineer's Project No.: **PH22-F90-G, RN32-24**

Contractor's Project No.:

Effective Date of Work Change Directive:

Contractor is directed to proceed promptly with the following change(s):

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User - Check one or both of the following

☐ Non-agreement on pricing of proposed change. ☐ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: $ _____ **[increase]** [**decrease**] [**not yet estimated**].

Contract Time: _____ days [**increase**] [**decrease**] [**not yet estimated**].

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

	Recommended by Engineer	Authorized by Owner
By:		
Title:		
Date:		

CHANGE ORDER NO.: [Number of Change Order]

Owner: **Fallon Paiute-Shoshone Tribe**
Owner's Project No.:

Engineer: **Indian Health Service**
Engineer's Project No.: **PH22-F90-G, RN32-24**

Contractor:
Contractor's Project No.:

Project: **Individual Septic Systems Replacement**

Contract Name:

Date Issued:
Effective Date of Change Order:

The Contract is modified as follows upon execution of this Change Order:

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	**Change in Contract Times [State Contract Times as either a specific date or a number of days]**
Original Contract Price: $ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. **[Number of previous Change Order]**: $ _____	**[Increase] [Decrease]** from previously approved Change Orders No.1 to No. **[Number of previous Change Order]**: Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: $ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: $ _____	**[Increase] [Decrease]** this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: $ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)	Accepted by Contractor
By: _____	_____
Title: _____	_____
Date: _____	_____
Authorized by Owner	Approved by Funding Agency (if applicable)
By: _____	_____
Title: _____	_____
Date: _____	_____

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: **Fallon Paiute-Shoshone Tribe**

Engineer: **Indian Health Service**
Contractor:
Project: **Individual Septic Systems Replacement**
Contract Name:

Owner's Project No.:
Engineer's Project No.: **PH22-F90-G, RN032-24**
Contractor's Project No.:

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

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

[List attachments such as punch list; other documents]

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.

Engineer

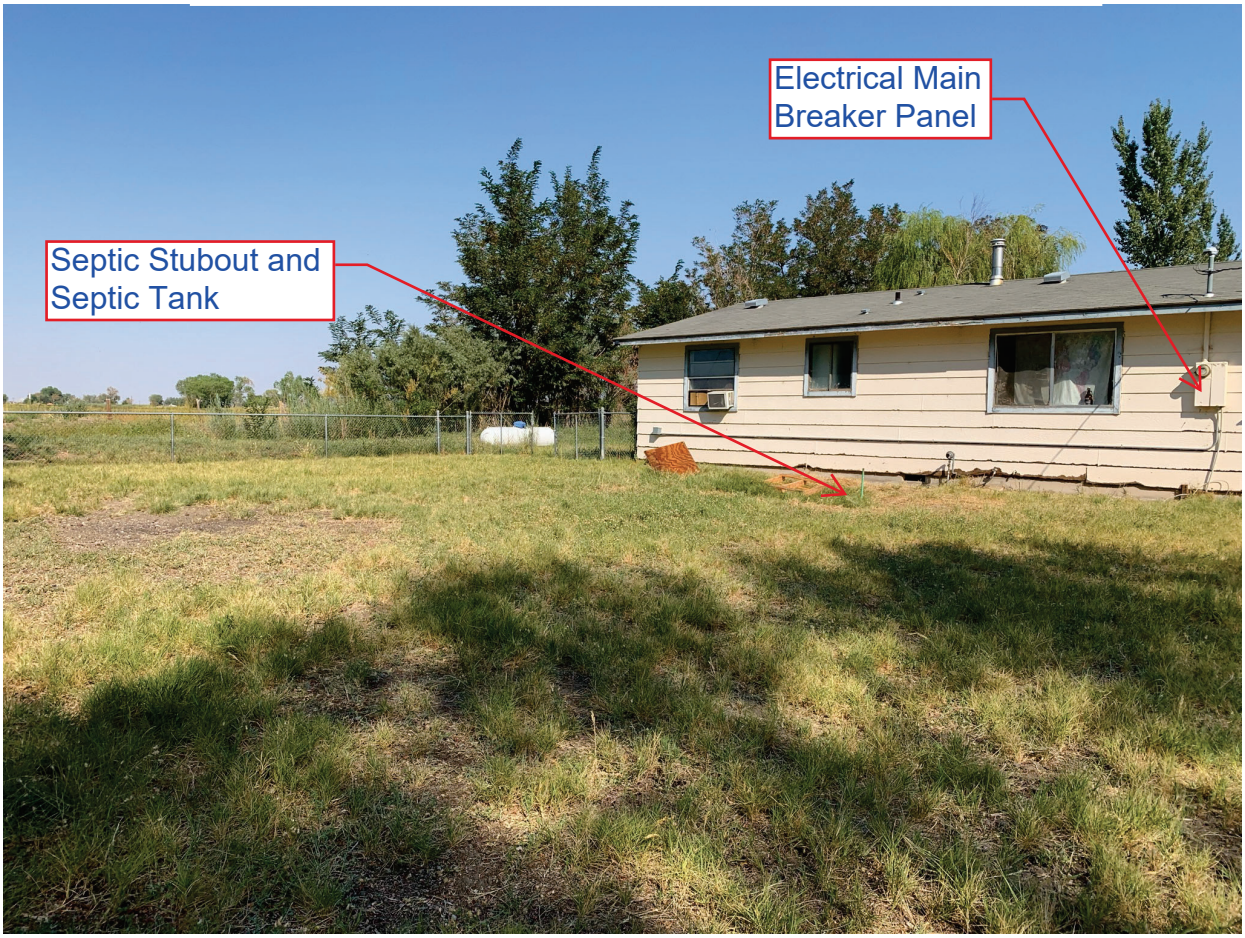
By *(signature)*: _____

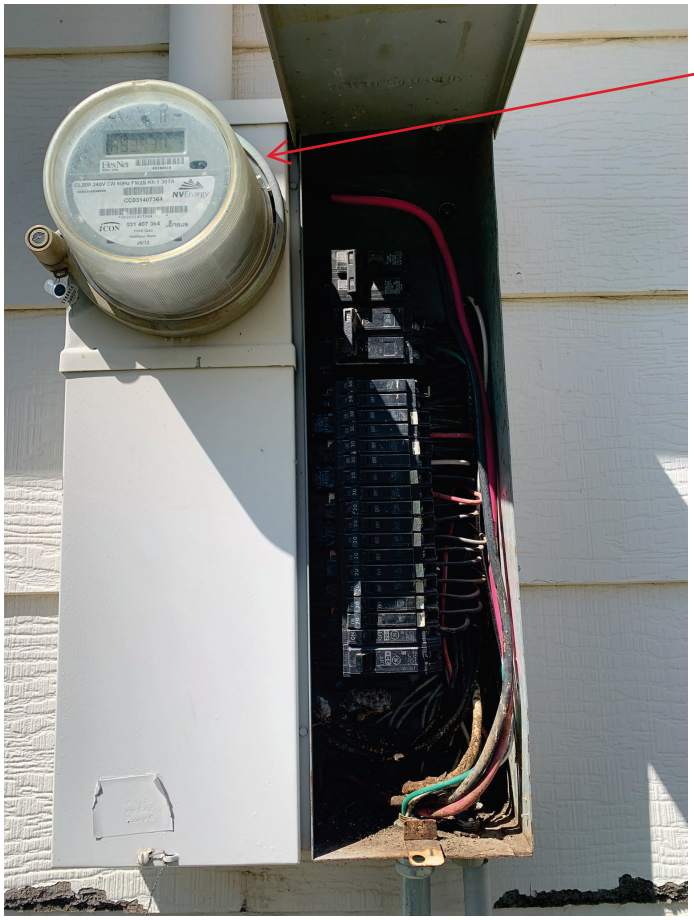
Name *(printed)*: _____

Title: _____

Exhibit 1: Site Photos and Maps

K. Bowen Site at 1796 Graham Lane, Fallon NV 89406





J. Downs Site at 1525 Agency Road, Fallon NV 89406

TECHNICAL PROVISIONS

SECTION 00 MODIFYING PROVISIONS

SECTION 01 TRENCH EXCAVATION & BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES

SECTION 02 CAST-IN-PLACE CONCRETE

SECTION 03 REINFORCING STEEL

SECTION 07 SEWER SERVICE LINES

SECTION 13 INDIVIDUAL PRESSURE DOSED SEWAGE DISPOSAL SYSTEM

TECHNICAL PROVISIONS

SECTION 00 – MODIFYING TECHNICAL PROVISIONS

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

A. Technical Provision Section 1 (TP-01.07)
General:
Tracer Wire, Markers and Bollards are not required for this contract.

B. Technical Provision Section 1 (TP-01.11.A)
Remove and Replace with:
Bedding and backfill materials shall be carefully deposited in layers not to exceed 12-inches, loose measurement, and compacted per TP-1.10. For type III locations (TP-1.10) the last layer may be mounded and left in a uniform, neat condition.

C. Technical Provision Section 1 (TP-01.11.C.3)
Change:
…durable granular material having maximum size of 6-inches, graded so...
To:
…durable granular material having maximum size of 3/4-inches, graded so...

D. Technical Provision Section 1 (TP-01.12)
General:
Compaction required only for the water and sewer service line installations. Compaction is prohibited within 5 feet of the drain field trenches. Compaction testing is not required, but the Owner reserves the right to test for compaction if deemed necessary to meet required compaction by the owner's representative.

E. Technical Provision Section 1 (TP-01.17)
A Storm Water Pollution Prevention Plan (SWPPP) is not required for this contract

F. Technical Provision Section 1 (TP-01.21)
Seeding is not required for this contract

G. Technical Provision Section 1 (TP-01.23.E)
Mobilization/Demobilization is not included for this contract

SECTION 13 –INDIVIDUAL PRESSURE DOSED SEWAGE DISPOSAL SYSTEM

A. Technical Provision Section 13 (TP-13.03.D)
Change:
…The effluent filters shall be equal to a Zabel Filter Model A1800.
To:
… The effluent filter shall be the Orenco FTP0822-14B or approved equal in writing by owner.

B. Technical Provision Section 13 (TP-13.07.C)

Remove and Replace with:

Septic Tank: Payment for the septic tank shall be at the contract unit price shown on the Bid Schedule, and shall be full compensation for furnishing all labor, equipment, materials and incidentals required for complete installation; including excavation, setting, leveling, backfilling, effluent filter, septic tank risers, rope for the concrete tank lids/covers, safety screens, compaction and final cleanup.

C. Technical Provision Section 13 (TP-13.07.D)

Remove and Replace with:

Pump Tank: Payment for the pump tank shall be at the contract unit price shown on the Bid Schedule, and shall be full compensation for furnishing all labor, equipment, materials and incidentals required for complete installation; including excavation, setting, leveling, backfilling, pump tank, tank risers, rope for the concrete tank lids/covers, safety screens, compaction and final cleanup.

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		
Received by ENGINEER:			Submittal No.	
Received by OWNER:			Project No.	
			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 06 - GRAVITY SANITARY SEWERS

TP - 06.01 SCOPE:

The work covered by this section consists of furnishing all plant, labor, equipment, materials and incidentals, in connection with the construction of gravity sewer mains, manholes and appurtenances, in accordance with the plans and specifications.

TP - 06.02 GENERAL:

All facilities shall be constructed in the locations to the grades and of the sizes shown on the plans. Locating existing utilities shall be the responsibility of the Contractor in coordination with a representative from the operating utility. Excavation, trenching, backfilling, compaction and any needed dewatering shall be completed in accordance with Section 01 of the Technical Provisions, unless specifically altered under other requirements of this specification section.

Any section of sewer that is found defective in material, alignment, grade or joint shall be corrected so as to meet these plans and specifications. If the work does not meet the specified requirements of this section, the Contractor shall remove and replace at the Contractor's expense.

TP - 06.03 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. Inspect all materials prior to installation to ensure that they are in new condition. Inspect pipe and fittings for defects. Plastic pipe with scratches, gouges, or grooves shall be rejected. Plastic pipes with discoloration shall be rejected. Remove all materials from site that are discolored, defective, damaged, used, unsound, or that otherwise do not meet the specifications.

A. Pipe, Joints and Fittings:

1. PVC Gravity Sewer Pipe: Sewer pipe shall be PVC and shall conform to all requirements of product standard ASTM D3034 for pipe diameters up to 15 inches and ASTM F679 for 18-inch to 48-inch diameter sewer mains.

    a) Sewer pipe shall meet the pipe compound requirements of ASTM D1784 and shall be made with PVC 1120 resin, Type I, Grade I. Pipe stiffness shall meet ASTM D2412.

    b) Pipe shall be nominal size, SDR-35.

    c) Joints shall be furnished with one end belled. The joint shall be integral bell and spigot with a Rieber rubber gasket. The integral bell shall meet ASTM D3212. The gaskets shall be as recommended by the pipe manufacturer and shall meet ASTM F477. Lubricants used for the joint installation shall meet the requirements of the pipe manufacturer.

    d) 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.

2. Ductile Iron Pipe: All ductile iron pipe shall be in accordance with AWWA C151 and shall be in 18 to 20 foot lengths with single rubber gasket (push-on) joints in accordance with AWWA C111.

a) All 8-inch pipe will be minimum Class 50 in accordance with AWWA C150.

b) Each length of pipe shall be clearly marked with the following: Manufacturer, Nominal Pipe Size, ASTM Designation and Pipe Class.

3. Fittings: Fittings for gravity sewer pipe, including but not limited to wyes, tees, saddles, bends, crosses, sleeves, plugs, caps, reducers, and glands, shall be the same material as the sewer main being connected. Saddles fastened to pipe with external bands are not acceptable on new pipe. All of the fittings listed above, other than wyes, shall require approval from the Owner and Owner's Representative and shall only be installed when shown on the plans.

a) PVC fittings shall conform to PVC gravity sewer pipe requirements provided in this section.

b) Ductile iron fittings shall conform to the requirements of AWWA C110 with the joints meeting the requirements of AWWA C111.

B. Manholes:

1. General: All concrete used for cast in place shall conform to Section 02 of these Technical Provisions. Concrete and reinforcement shall conform to ASTM C478. Reinforcing steel shall also conform to Section 03 of these Technical Provisions.

2. Lines and Grades: All manhole locations shall be as shown on the plans unless field changes are necessary and approved by the Owner or Owner's Representative.

a) Sewer line cut stakes shall be provided by the Contractor, at each manhole and at the midpoint between each manhole at a minimum.

b) A minimum of 2 offset stakes shall be provided for each cut stake. Further information on staking is found in Section 01 of these Technical Provisions.

3. Manhole Frames and Covers: Frames and covers shall be grey cast iron casting and shall conform to plans and details in all essentials of design.

a) The cover shall have a lifting pocket and shall not be vented.

b) Castings shall conform to ASTM A-48, Class 30 and shall maintain AASHTO HS-20 traffic loading requirements.

c) The bearing surfaces of the frames and covers shall be machined and the cover shall seat firmly onto the frame without rocking.

d) Combined weight of frame and cover shall be 280 lbs minimum.

e) Covers shall be the types and shall be imprinted as shown on the plans or standard details.

f) The manhole and covers shall be set as shown on the plans or as directed by the Owner.

g) Frames and covers shall be Neenah R-1595, Jensen Model A-1024 or approved equal. The manhole lid shall be cast with the word "SANITARY SEWER".

h) Manhole inserts shall be installed in each manhole. The inserts shall be manufactured from ultra-high density polyethylene meeting the requirements of ASTM D-1248, Class A, Category 5 with a minimum uniform thickness of 1/8". The lift strap shall be made of a woven polypropylene web. Manhole inserts shall manufactured by Parson Environmental, Sealing Systems, Inc., or approved equal.

4. Steps:

a) Steps shall be cast iron or 1/2-inch Grade 60, steel reinforced copolymer polypropylene plastic not less than 12 inches in width.

b) If the polypropylene steps are utilized, care shall be taken to install them exactly according to the manufacturer's recommendations. All steps must be installed by manufacturer.

c) Steps shall be centered over the manhole outlet (unless otherwise shown on the plans or requested by the Owner), spaced 16 inches apart and aligned to form a continuous ladder.

5. Adjustment/Grade Rings:

a) General:

i. Adjustment/grade rings shall be made of concrete, HDPE or approved equal and shall be H25 traffic rated.

ii. Ring sealant shall provide a watertight seal.

b) Concrete:

i. Concrete grade rings shall be reinforced.

ii. Concrete grade rings shall be provided by the same manufacturer of the manholes for which they are being installed.

c) HDPE:

i. Adjustment rings shall be available in a variety of thicknesses.

ii. Adjustment rings shall be corrosion proof, and shall be resistant to UV, heat and hydrogen sulfide gas.

iii. Adjustment rings shall be available in slope rings to allow for easy adjustments to any grade.

iv. Adjustment rings shall be composed of high density polyethylene and shall be Ladtech Systems or approved equal

6. Manhole Bases:

a) Precast bases with precast channels shall be pre-approved by the Owner or Owner's Representative. The Contractor shall submit detail drawings showing the size, placement, and spacing of reinforcing bars for both pre-cast and cast-in-place manhole bases.

b) Bottom manhole sections shall have integral precast base or floor slabs.

c) Bases shall be 8 inches thick and bedded on 8 inches of compacted gravel meeting the requirements of TP 01.

d) Cast-in-place bases may be accepted on a site specific basis and as approved by the Owner or Owner's Representative.

e) Cast-in-place base slabs shall be constructed of reinforced Class A concrete formed, poured and vibrated as a monolithic pour onto an 8" gravel base.

f) Concrete for cast-in-place manhole bases shall be batched from a concrete batch plant and shall meet or exceed the compressive strength of the barrel and cone sections. On-site, field mixed concrete shall not be allowed. Cast-in-place manhole base bench and channel shall receive a smooth trowel finish.

7. Standard Manholes:

a) Standard manholes are those which have a depth, measured from the invert of the outlet pipe to the top of the cover, greater than 6 feet.

b) Standard manholes shall be constructed with a 4-foot inside diameter and 5-inch thick precast concrete sections and shall be constructed as shown on the detail drawing.

c) Cone sections shall be eccentric, 5-inch thick, precast concrete.

d) The base slab for standard manholes shall be 8- inches thick for manholes up to 13 feet deep and 12-inches thick for manholes between 13 feet and 20 feet deep. For standard manholes deeper than 20 feet deep, structural calculations are required to determine the base thickness.

8. Shallow Manholes:

a) Shallow manholes shall have a depth of 6 feet or less.

b) They shall be constructed with a 4-foot inside diameter and a 5-inch thick precast concrete section.

c) Shallow manholes shall have an 8-inch thick reinforced concrete flat top cover and base slab. They shall be constructed as shown on the detail drawings.

9. Drop Manholes:

a) Manholes shall have drop piping provided for sewer entrances at an elevation of 24 inches or more above the manhole invert.

b) Where the difference in elevation between the incoming sewer and the manhole invert is less than 24 inches, the invert shall be filleted to prevent solids deposition.

c) Drop manholes should be constructed with an outside drop connection in accordance with the details.

d) As shown in the detail, the entire outside drop connection piping on the exterior of the manhole shall be encased in ¾" crushed rock.

10. Diversion Manholes:

a) Diversion manholes shall have a depth of 6 feet or less and shall be constructed with a 4-foot inside diameter and a 5-inch thick precast concrete section.

b) They shall have 8-inch thick reinforced concrete cover and base slabs.

c) Diversion manholes shall be constructed as shown on the detail drawings.

d) Each diversion manhole shall be provided with a fiberglass gate frame and gate. The fiberglass gate frame shall have a thickness of 3/16-inch. The gate frame shall have a channel that is ¼-inch. The fiberglass gate shall be ¼-inch thick. The gate frame and gate shall be constructed as shown on the detail drawings.

11. Manhole Coating: Coating shall only be applied at the manhole locations shown on the plans.

a) The inner surface of the new manhole sections and rings shall be lined with solvent free, 100% solids epoxy product as manufactured by Raven Lining Systems, Oklahoma, or approved equal.

b) The coating shall include a prime coat – 8 mils of AquataPoxy A-10 and a top coat of 100-125 mils of Raven 405. Total Dry Film thickness of epoxy coating system shall be a minimum of 105 mils.

c) Surface preparation, application methods and safety measures shall follow the manufacturer's recommendation.

12. Joints: Joints between precast manhole sections elements shall be sealed with a flexible gasket equal to Ram-Nek, ConSeal, or equal resin sealant, and grouted.

13. Waterstops:

a) All pipe penetrations through the manhole shall be equipped with waterstop devices conforming to ASTM C923.

b) Waterstop devices shall be equal to Kor-N-Seal 106-406 Series manufactured by Trelleborg, PSX: Positive Seal manufactured by Press-Seal Gasket Corporation, Z-Lok Connector manufactured by A-Lok Products, or Newby Waterstops by Newby Rubber Inc.

c) All penetrations shall then be grouted to provide a watertight penetration.

C. Sewer Main Cleanouts:

1. The cleanouts shall be constructed of the same pipe material and size as the sewer main, with a reinforced concrete collar, and cast iron frame and cover.

2. The frame and cover to be furnished on cleanouts shall be a Neenah R 1791-A, Star Pipe Product VB-0029 or approved equal. Lids shall be furnished standard with concealed, watertight pickhole, sealed with gasket, and fastened with stainless steel bolts.

3. All concrete for sewer main cleanouts shall have a 28 day compressive strength of 3,000 psi and be in accordance with Section 02 of these Technical Provisions.

D. Warning Tape: Warning tape shall be installed in accordance with Section 01 of the Technical Provisions.

E. Markers and Bollards: Marker and bollards shall be installed in accordance with Section 01 of these Technical Provisions.

TP - 06.04 TRENCH EXCAVATION AND BACKFILL:

Trenching and backfilling operations shall be performed as specified in Section 01 of these Technical Provisions.

TP - 06.05 WATER AND SEWER LINE SEPARATION REQUIREMENTS:

Water and sewer pipeline separation shall be maintained in accordance with Section 01 of these Technical Provisions.

TP - 06.06 INSTALLATION OF GRAVITY SEWER LINES:

Pipe joints and fitting installation shall be in accordance with the manufacturer's recommendation.

A. Trenches:

1. Excavation, trenching and backfill shall meet the requirements of Section 01 of these Technical Provisions.

2. The bottom of the trench shall be shaped to give uniform support to the pipe.

3. Trenches shall be kept free from water and the pipe shall not be laid when conditions of the trench or weather are unsuitable for such work.

4. At all times when work is not in progress, all open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substances will enter the pipe.

5. If the maximum width of the trench at the top of the pipe specified in Section 01 of these Technical Provisions is exceeded for any reason other than at the direction of the Owner or Owner's Representative, the Contractor shall install such concrete cradling, encasement, gravel base or other bedding as may be required to satisfactorily support the added load of the backfill.

B. Pipe Laying:

1. Installation of pipe and fittings, including joint lubrication and assembly shall be in accordance with the manufacturer's recommendations.

2. Pipe laying shall proceed upgrade (from lowest elevation to highest elevation), with the spigot end pointing in the direction of the flow (bell pointing upstream).

3. Each pipe shall be laid true to line and grade as shown on the plans, and in such a manner as to form a close concentric joint with the adjoining pipe. Ensure that vertical alignment does not deviate from 0.05% or 0.1 feet, whichever is less, from the design grade show in the plans.

4. The grade between manholes and cleanouts shall be uniform.

5. As the work progresses, the interior of the sewer pipe shall be cleared of all dirt and extraneous materials of every description.

6. Warning tape shall be installed along the sewer main between the manholes and cleanouts.

7. All sewer main line stub-outs shall be plugged. A PVC cap shall be solvent welded to the main line stub out. A piece of No. 3 rebar, 1-foot in length shall be installed to mark the main line stub out. Bury the rebar 6 inches below ground surface. A PE marker painted green shall also be installed at this same location.

TP - 06.07 INSTALLATION OF MANHOLES:

A. General:

1. Manholes shall be installed at the locations and elevations shown on the site plans.

2. Bases, walls and cones shall conform to the plans and details.

3. Manholes shall be installed so that the walls are vertically plumb.

B. Manhole Channel:

1. The manhole shall be positioned such that the pipes intersect in the center of the manhole circle. The invert channels will be formed directly in the concrete.

2. Manhole invert channels shall be smooth and semi-circular in shape, conforming to the inside of the adjacent sewer pipe section.

3. The invert shall be finished smoothly with a semi-circular cross section. Flat-bottomed inverts shall not be acceptable. Inverts with humps, low spots, or roughness of finish which will catch solid materials will not be acceptable. Inverts shall not be brush finished.

4. A minimum invert elevation drop of one-tenth of a foot (0.1 feet) from the entrance to the outlet shall be provided in all manholes where there is a change in direction or change in grade.

5. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the manhole will permit. S-curves will not be acceptable.

6. Changes in sizes and grade of the channels shall be made gradually and evenly.

7. For those manholes where the sewer pipe does not change grade or direction the invert may be constructed by laying a full section of sewer pipe through the manhole. The top half of the pipe shall be removed after the concrete sets. Concrete bench shall be to the spring-line of the pipe.

C. Manhole Benches:

1. The floor of the manhole outside the channels (benches) shall be smooth and shall be sloped no less than ½ inch per foot (4 percent) and a max of 2 inches per foot (16 percent).

2. No lateral sewer, service connection, or drop manhole pipe shall discharge onto the surface of the bench.

D. Manhole Sections:

1. Joints between precast manhole sections shall be sealed with "Ram Nek" bituminous rope type sealer or equal.
2. Install joint sealants around entire circumference of each manhole joint.
3. Place sealant on the lower horizontal surface of the joint. Ensure that a watertight seal is provided at the joint.
4. The sections shall then be grouted to a smooth finish on the interior and exterior of the manhole. Grout for jointing shall be as specified in Section 02 of these Technical Provisions. Grouting joint of the manhole exterior shall be completed after joint sealant seals the joint completely. Manhole testing for water tightness may be completed prior to grouting the manhole exterior.
5. Contractor shall obtain approval from the Owner prior to using tape as a substitute for grout. Tape shall be Viscotaq or equal.
6. 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.
7. The jointing and sealing materials shall be approved by the Owner or Owner's Representative prior to installation.
8. For shallow manholes, install top slab section with the opening over the outlet of the manhole.

E. Adjustment/Grade Rings:

1. The maximum number of adjustment/grade rings shall be (3) or as indicated on the plans. Manholes in traffic areas shall have at least one adjustment ring.
2. All adjustment ring joints shall be sealed and watertight. For HDPE adjustment rings, install joint sealants in all joints between adjustment rings. For concrete adjustment rings, grout in place on the inside and outside when the manhole is constructed.
3. The total thickness of adjustment rings shall not exceed 18 inches. Maximum spacing between the top of the manhole cover and the first step shall be 28 inches. This spacing can be reduced by having the manhole manufacturer add another step closer to the top of the cone, if shown in the drawings. Steps shall not be added in the field by the Contractor.
4. No cracked or damaged adjustment rings shall be installed.

F. Frame, Cover and Collar:

1. The manhole frames and covers shall be set to the elevations shown on the plans.
2. In roadways, the top of the frame and cover shall be even with the road wearing surface.
3. A 42-inch diameter reinforced concrete collar shall be installed on the frame, cover, and the adjustment rings.
4. The tops of all manholes shall have a concrete collar of the dimensions shown in the details. The collar shall cover the thickness of the ring and the top joint with the first grade ring.
5. In unimproved areas, the collar shall extend from the top of the cover to the bottom of the lowest adjustment ring. The surface of the concrete collar shall have a smooth finish.

G. Drop Manholes:

1. Type and location of drop manholes are shown on the plans and shall be constructed in accordance with the details.

2. Install an outside manhole drop where the invert of the inlet pipe is more than 24-inches higher than the invert of the outlet pipe.

3. Use the same material that is used for the sewer main pipe to construct the drop piping.

4. The exterior piping of the drop manhole shall be supported/encased by ¾" crushed rock at 100% relative compaction. The encasement material shall be carefully placed to avoid damage to the piping or fittings and to the integrity of the joints.

H. Pipe to Manhole Connections:

1. Install sanitary sewer main pipe to manhole using approved gasket per manufacturer's recommendations.

2. All connections between sewer pipe and manhole walls shall be made using approved water stops and be sealed with non-shrinking grout in such a manner to make the manholes water tight.

3. Manholes shall not be acceptable if any evidence of infiltration into them is found. The Contractor shall take whatever actions are necessary, at his expense, to ensure that the manholes are completely watertight.

TP - 06.08 INSTALLATION OF SEWER MAIN CLEANOUTS:

Where indicated on the plans, a cleanout shall be furnished and installed by the Contractor in lieu of a manhole. The cleanout shall be constructed as shown on the detail drawings. Excavation, backfill and compaction shall meet the requirements of TP 01. When identified in the plans, the sewer main cleanout may be installed with a single long sweep 90 degree fitting in lieu of the two 45 degree fittings.

TP - 06.09 CONNECTION TO EXISTING MANHOLES:

Connection of newly constructed sewer mains to existing manholes shall be of either the drop or at-grade type as indicated in the plans and listed on the Bid Schedule. If connecting to an existing manhole, Contractor shall core drill the new penetration into the wall of the existing manhole and shall reshape the existing channel and bench wall to accommodate the new flow line. Reconstruction of manhole bases and inverts, all necessary piping, and associated work required to complete the connection shall comply with the provisions of this Technical Provision.

TP - 06.10 MANHOLE ABANDONMENT:

Manholes designated to be abandoned shall be removed a minimum of three (3) feet below the finished surface. Frame and cover castings shall be carefully removed and delivered to the Owner. Prior to backfilling, pipe connected to the manhole shall be plugged or sealed as approved by Owner or Owner's Representative. Removed portions of the manhole may be crushed and included as backfill to fill the remaining manhole. No crushed manhole debris shall be allowed in the final three (3) feet below finished grade. Backfilling and compaction shall be in accordance with TP-01 of the Technical Specifications and final backfill shall be brought up to surrounding grade.

TP - 06.11 SEWER MAIN AND MANHOLE TESTING:

A. Sewer Main Testing General:

1. General:

a) Sewer main testing shall be done after the trenches are backfilled and final grading is finished.

b) Contractor shall furnish all materials, labor and equipment to perform the required tests. All tests shall be performed in the presence of the Owner's Representative.

c) All sections of sewer not passing the tests shall be replaced in accordance with Owner's Representative approved methods. Repairs and retesting shall be performed at the Contractor's expense. Retests shall be performed until tests pass the requirements.

2. Sewer Main Flushing:

a) The Contractor shall flush all sewer lines before testing to remove sand, silt and other foreign material which might have entered the pipe during construction.

b) Water used for flushing shall be domestic quality or as approved by the Owner or Owner's Representative and shall be coordinated with the operating utility.

c) All equipment and water for the flushing shall be furnished by the Contractor.

d) The Contractor shall dispose of all water and foreign matter after flushing in an approved manner.

B. Sewer Main Alignment: Lamping shall be performed by the Contractor in the presence of the Owner or Owner's Representative using mirrors to observe the pipe reflection from the surface. The ground surface from where the lamping takes place shall be properly shored or benched for personnel safety. Any deviation from true line or grade may be cause for rejection of the line. Deviations exceeding 0.1 feet from the true line or grade which prevents water from draining by gravity from the sewer system, including manholes, shall be corrected such that the facilities meet these specifications and plans. For horizontal alignment, a deviation allowance of 0.1 feet inside the pipe may be accepted by the Owner or Owner's Representative.

C. Sewer Main Water Tightness: Tests for water tightness in the gravity sewer mains shall be made by the Contractor in a manner approved by and in the presence of the Owner or Owner's Representative. Testing for water tightness in gravity sewer mains may be accomplished by either of the following two methods:

1. Low Pressure Air Test: Testing shall conducted in accordance with ASTM F-1417. Testing gauge for the air test shall have a minimum division of 0.1 psi. No one shall enter a manhole when a line into it is pressurized.

a) Test Requirements & Setup:

i. Plug all pipe outlets with test plugs capable of holding under the test pressures. Install plugs and brace as necessary to ensure that the plugs will not blow out when the main is under pressure.

ii. Test each newly installed section of gravity sewer line between manholes.

iii. Slowly introduce air pressure to approximately 4.0 psig. Never exceed a pressure of 9.0 psig. Do not enter manhole once pipe is pressurized.

iv. Allow pressure to stabilize for at least five (5) minutes.

v. Adjust pressure to 3.5 psig or the increased test pressure as determined below if groundwater is present. Start the test.

b) Test Procedure

i. Determine the test duration for a sewer section with a single pipe size from the table below:

Low Pressure Air Test – Test Times	
Sewer Main Diameter (inches)	**Test Time (Minutes/100 Feet of Sewer)**
4	0.3
6	0.7
8	1.2
10	1.5

12	1.8
24	3.6

ii. Record the drop in pressure during the test period. If the air pressure has dropped more than 1.0 psig during the test period, the line is presumed to have failed. If the 1.0 psig air pressure drop has not occurred during the test period, the test shall be discontinued, and the line will be accepted.

iii. If the line fails, determine the source of the air leakage, make corrections and retest. The Contractor has the option to test the section in incremental stages until the leaks are isolated. After the leaks are repaired, retest the entire section between manholes.

iv. Individual service lines shall be tested by plugging the service line termination prior to connecting to the home or building, and plugging sewer cleanouts, and then testing concurrently with main section to which it is connected.

2. Exfiltration/Infiltration:

a) All equipment and water for these tests shall be furnished by the Contractor. This test will be made after the line has been completely backfilled.

b) Infiltration testing shall be completed under existing ground water conditions.

c) Exfiltration testing shall be conducted under an internal pipeline test pressure generated by a water level at least 4 feet above the highest elevation of the sewer main crown to be tested.

d) The test shall be run for a minimum of a four hour period.

e) The sewer and manhole connections shall not leak under either external or internal water pressure in excess of 0.158 gallons per hour per 100 feet of pipe per inch of diameter of pipe. A suitable meter or method of measuring the quantity of water used is necessary.

f) Leakage by either infiltration or exfiltration greater than specified above shall be corrected by the Contractor at his expense.

D. Deflection Test: The maximum allowable deflection (reduction in vertical inside diameter) for PVC pipe shall be five percent (5%). However, up to seven and one half percent (7½ %) may be allowed 30 days after final backfilling. Deflection testing is required in all cases between all manholes. All locations with excessive deflection shall be excavated and repaired by re-bedding or replacement of the pipe. Acceptable methods of deflection testing include use of properly sized go-no-go mandrels or deflectometer. Acceptable mandrel dimensions for SDR 35 PVC pipe are included in the following table. To be considered successful, the mandrel shall pass through the entire length of sewer main in one smooth pass without additional mechanical force. Deflection testing is not required for ductile iron sewer mains.

Sewer Main Diameter (inches)	Madrel O.D. (inches)
6	5.31
8	7.09
10	8.84
12	10.51
15	12.86

E. Video Inspection: If required by the Contract and included in the Bid Schedule, the Contractor shall provide the Owner with a post construction video inspection record of the new sewer pipeline. The video shall clearly show all joints, seals, connecting pipes, and manholes. Video inspection shall be paid by the Owner as a pay item separate from pipe installation, flushing, and other testing requirements. The video

shall be provided on any of the following media (DVD, USB Flashdrive, SD Card or MicroSD Card). The video format shall be viewable on Windows Media Player.

F. Manhole Testing:

1. General:

a) Tests for water tightness of manhole shall be made by the Contractor in a manner approved by and in the presence of the Owner or Owner's Representative.

b) Existing manholes to which a new main is connected do not need to be tested.

c) All newly-constructed manholes shall be tested for watertightness. New manholes shall be tested immediately after assembly and prior to backfilling.

d) If the manhole fails the initial test, necessary repairs shall be made and the manhole shall be retested.

e) All lift holes shall be plugged with an approved non-shrink grout.

f) Pipes entering the manhole shall be plugged, taking care to securely brace the plug.

g) Care must be taken not to break any seals during backfill operations. If the Owner suspects seals broken during backfilling, he shall require a second test after backfilling.

h) The Contractor shall be responsible for cost of the retest and repairs if second test fails.

i) One of the following methods shall be used; either vacuum or hydrostatic testing.

2. Vacuum Testing:

a) Vacuum testing should be conducted in accordance with ASTM C-1244 (Vacuum Test for Concrete Manholes), except as modified below.

b) The vacuum test head shall be installed per the manufacturer's recommendations.

c) A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches.

d) The manhole shall pass if the time is greater than 60 seconds for 48-inch diameter, 75 seconds for 60-inch, and 90 seconds for 72-inch diameter manholes.

3. Hydrostatic Testing:

a) Hydrostatic testing shall be conducted in accordance with ASTM C-969 except as modified below.

b) The mains into and out of the manhole shall be plugged with a suitable device such as a tethered pneumatic plug.

c) The manhole shall be filled with water to the ring.

d) After a period of at least one hour to allow for concrete absorption and to allow the water level to stabilize, the manhole shall be refilled and the water level shall be checked.

e) The hydrostatic test shall then begin and shall be administered for a period of 4 hours.

f) If the water level is found to drop more than 1 inch per foot of depth of the manhole over this 1 hour duration, then the leakage shall be considered excessive and the Contractor shall be required to make all necessary repairs and retest the manhole.

g) The exterior of the manhole shall be inspected during this period for visible evidence of leakage.

h) Visible moisture, sweating, or beads of water on the exterior of the manhole shall not be

considered leakage, but any water running across the concrete surface will be considered leakage and shall be repaired to the satisfaction of the Owner's Representative regardless of the volume of water lost during the test.

TP - 06.12 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. 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. Cleanup shall be considered an incidental item and no additional payment shall be made for it, but rather its costs shall be merged with the applicable pay item irregardless of whether cleanup is specifically included in the measurement and payment section. Seeding shall be completed in accordance with Section 01 of these Technical Provisions.

TP - 06.13 RECORD DRAWINGS:

The Contractor shall be responsible for keeping accurate records of all installed items under this section of the specifications, and indicating revisions of the Owner furnished 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 for all manholes and cleanouts; 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 other utilities encountered. Also to be noted on the plans is the final elevation of all manhole lids, inverts, and the ground immediately adjacent to the manhole lid and the distance and angles between the manholes. Further information on record drawings is contained in TP-01 and 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 or Owner's Representative in determining progress under this contract.

TP - 06.14 MEASUREMENT AND PAYMENT:

A. Gravity Sewer Main: Gravity sewer main shall be measured in linear feet along the centerline of the pipe, center to center of the manhole without deduction for fittings or diameter of manholes, for each of the various sizes and types of pipe installed. Payment for sewer pipe shall be at the contract unit price for the various sizes and types of sewer main installed as shown on the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, materials, testing (alignment, water tightness and deflection), and incidentals required for a complete installation, including but not limited to excavation, bedding, stabilization material, laying and jointing pipe, exfiltration/infiltration testing or air testing, supplying water, plugging, measuring, flushing, backfilling, record drawings, and final cleanup.

B. Standard Manholes: Standard manholes shall have a depth greater than 6 feet when measured from the invert of the outlet pipe to the top of the cover, and shall be measured each. Payment shall be at the contract unit price for the various depths of manholes installed as shown on the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, material, testing and incidentals required for a complete installation, including but not limited to excavation, concrete, frame and cover, steps, adjustment of height, invert forming, connection to sewer lines, backfilling, record drawings, and final cleanup.

C. Shallow Manholes: Shallow manholes shall have a depth of 6 feet or less when measured from the invert of the outlet pipe to the top of the cover, and shall be measured each. Payment shall be at the contract unit price shown on the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, materials, testing and incidentals required for a complete installation, including but not limited to excavation, concrete, frame and cover, steps, adjustment of height, invert forming, connection to sewer lines, backfilling, record drawings, and final cleanup.

D. Drop Manholes: Drop manholes shall be measured each. Payment shall be at the contract unit price shown on the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, material, testing and incidentals required for a complete installation, including but not limited to excavation, crushed rock, frame and cover, steps, adjustment of height, invert forming, drop pipe, connection to manhole, connection to sewer line, backfilling, record drawings, and final cleanup.

E. Diversion Manholes: Diversion manholes shall be measured each. Payment shall be at the contract unit price shown on the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, material, testing and incidentals required for a complete installation, including but not limited to excavation, concrete, frame and cover, gate frame and gates, steps, adjustment of height, invert forming, connection to sewer line, backfilling, record drawings, and final cleanup.

F. Sewer Main Cleanouts: Sewer main cleanouts installed at the terminal end of a sewer main shall be measured each. Payment shall be at the contract unit price on the Bid Schedule, which shall be full compensation for furnishing all labor, equipment, material, and incidentals required for a complete installation, including but not limited to excavation, concrete, frame and cover, fittings, backfilling, record drawings, and final cleanup.

G. Connection to Existing Manhole: Connections to existing manholes shall be measured each. Payment shall be at the contract unit price shown in the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, material, and incidentals required for a complete installation, including but not limited to excavation, cutting into the existing manhole, grouting, fittings, removing the existing invert, pouring and forming a new invert, backfilling, record drawings, and final cleanup.

H. Manhole Abandonment: Abandonments of manholes shall be measured each. Payment shall be at the contract unit price shown in the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, material, and incidentals required for a complete abandonment, including the removal of the top section, plugging connecting sewer pipes, backfilling the manhole, and compacting the soil to prevent subsidence and to bring it to the same level as the surrounding grade, record drawings, and final cleanup.

I. Sewer Video Inspection: Post construction sewer video inspection shall be measured in linear feet along the centerline of the televised pipe. Payment for sewer video inspection shall be at the contract unit price shown in the Bid Schedule. This price shall be full compensation for furnishing all labor, equipment, materials, video records, and incidentals required for a complete inspection. Recordings shall be provided on the specified media and in the specified format.

SUBMITTAL REVIEW FORM
SECTION 06 - SANITARY SEWER

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
06.03.A.1	PVC Sewer Pipe		
06.03.A.2	Ductile Iron Pipe		
06.03.A.3	Fittings		
06.03.B	Manholes (Base, Riser, Cone)		
06.03.B.3 & B.5	Manhole Frame, Cover, Adjustment/Grade Rings		
06.03.B.4	Manhole Steps		
06.03.B.12	Waterstops		
06.03.B.11	Manhole Jointing & Sealing Materials		
06.03.C	Sewer Main Cleanouts		
06.11	Sewer Main Testing (Alignment, Deflection, Watertightness, Video)		
06.11	Manhole Testing (Vacuum/Hydrostatic)		

	Signature	Date
CONTRACTOR:		
OWNER		

TECHNICAL SPECIFICATIONS

SECTION 07 - SEWER SERVICE LINES

TP - 07.01 SCOPE:

The work covered under this section consists of furnishing all equipment, labor, materials, and incidentals necessary for the complete installation of a sewer service line and accessories, in strict accordance with the applicable drawings, the provisions of ASTM D2321 (latest revision), and these Technical Provisions.

TP - 07.02 GENERAL:

The Contractor shall provide all labor, equipment, and materials required to install the residential sewer service line indicated on the site layout plans. Installation shall include necessary fittings for connection to the building sewer stub-out, tapping of the sewer main and installation of the wye fitting or wye saddle as required. Contractor shall verify the location, size, and type of building sewer service line stub-out. Service line staking and staking for new sewer main tap shall be performed by the Contractor and approved by the Owner or Owner's Representative. Locating existing utilities shall be the responsibility of the Contractor in coordination with a representative from the operating utility. Existing sewer service lines will be properly abandoned in place and all facilities located at ground surface shall be removed and disposed of at the Contractor's expense.

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. Contractor shall contact each resident or business to verify the time that sewer service will be disconnected during service line tie-in. Connection to existing service or utilities, or other work that requires the temporary shutdown of any existing services shall be planned and coordinated with the operating utility. Excavation, trenching, backfilling, compaction and any needed dewatering shall be completed in accordance with Section 01 of the Technical Provisions, unless specifically altered under other requirements of this specification section.

Pipe joints and fitting installation shall be in accordance with the manufacturer's recommendations. The work will not be accepted until satisfactory backfilling, compaction 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 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 - 07.03 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. Inspect all materials prior to installation to ensure that they are in new condition. Inspect pipe and fittings for defects. Plastic pipes with scratches, gouges, grooves or discoloration shall be rejected. Remove all materials from site that are defective, damaged, used, unsound, or that otherwise do not meet the specifications.

A. Pipe and Fittings: All pipe and fittings required for completion of the sewer service line installation shall meet the requirements of the latest revision of ASTM D 3034.

   1. All service line piping shall be 4 inches PVC unless otherwise directed. Pipe shall be nominal size, SDR-35, 0.120 inch minimum wall thickness.

   2. Joints shall be bell-ended conforming to ASTM D 3212. All joints and connections in the pipe shall be watertight. Use elastomeric gaskets conforming to ASTM F477. Lubricants used for the joint

installation shall meet the requirements of the pipe manufacturer.

3. 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.

4. Rigid couplers shall be used for all connections, such as PVC fittings, shielded Fernco fittings, or approved equal. Non-rigid couplers equal to Fernco may be used for the first connection from the home to the sewer service line if approved by the Owner or Owner's Representative.

B. Cleanouts: Double service line (two-way) cleanout piping and fittings shall be 4-inch diameter PVC pipe matching the chosen septic drain piping material. The cleanout piping and cap shall be threaded.

1. The cleanouts shall be installed with a brass hex socket plug equal to Tyler A Low Square Head cleanout plug. The cleanout ferrule shall be a Tyler 4-3 ½ or approved equal.

2. The poly seal foam wrapped around the cleanout ferrule shall be Sill Seal underlayment foam or approved equal.

3. The double service line cleanout shall be installed in a 20-inch x 40-inch x 4-inch concrete pad (collar) as shown in the detail drawings. The wire mesh used for the concrete pad shall be ASTM approved W 1.4 (1/8 inch) wire mesh on 6 inch centers.

C. Sewer Saddles:

1. For connecting to existing PVC sewers, sewer saddles shall be PVC conforming to ASTM 3034, water tight with a gasket as manufactured by Royal Building Products (saddle wyes with locating ring and gasket), GPK Products, or approved equal.

2. For connecting to vitrified clay, concrete, or asbestos-cement sewer pipe, a neoprene rubber boot with stainless steel bands shall be used.

3. Saddles and fittings shall be of a "wye" configuration. "Tee" saddles and fittings shall not be allowed.

D. Pipe Hangers:

1. Shall be made of material compatible with the piping material.

2. Shall be of sufficient strength to support pipe at full capacity.

3. Shall not affect pipe integrity by abrading, cutting or bending of pipe.

TP - 07.04 INSTALLATION:

Verify that dimensions and elevations are as indicated on the plans.

A. Sewer Service Line: Sewer service lines shall be furnished and installed by the Contractor from the sewer main to the point of connection as shown on the plans or as directed by the Owner or Owner's Representative.

1. Connection to Building:

a) Sewer service lines shall be connected to the building stub out sewer drain with approved fittings or rigid couplers which shall be installed in accordance with the manufacturer's recommendation.

b) If clamps/bands are required on the couplers, they shall be at a minimum 300 series stainless steel. All stainless steel bands shall be wrapped in PVC tape.

c) For connecting beneath the home, place pipe hangers at a maximum distance of 4 feet apart for horizontal PVC pipe.

d) Minimum cover over solid sewer pipe shall be 12-inches or as approved and shown on the plans.

2. Pipe Slope and Bends:

   a) The grade from the building to the sewer main connection shall be uniform.

   b) Minimum slope shall be ¼-inch per foot or 2%. Maximum slope shall be ½-inch per foot or 4%.

   c) Any changes or deviations in line alignment shall be made with bends not exceeding an angle of 45 degrees and shall obtain approval from the Owner or Owner's Representative prior to making change.

   d) Connections to existing building drains which result in a change of direction of the line by more than 45 degrees requires the installation of a two way cleanout at that location.

   e) There shall be no 90-degree bend fittings in the sewer service line between the building and the sewer main.

3. Pipe Installation Requirements:

   a) Installation of pipe, including joint lubrication and assembly, pipe bending, and joint deflection shall be in accordance with the manufacturer's recommendations and ASTM D2321.

   b) Sewer service lines and connections must be constructed with maximum joint deflection not to exceed the manufacturer's recommendations and in no case shall exceed one (1) inch per foot in any joint. Larger changes in direction must be made by use of standard 1/16 or greater bends.

   c) Spigot end of pipe shall be pointed in the direction of flow (bell pointing upstream).

   d) When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth, or foreign substances will enter the pipes or fittings.

4. Warning Tape:

   a) Warning tape shall be installed along the sewer service line from the sewer main wye to the two way cleanout connection.

   b) Warning tape shall be installed in accordance with the provisions of TP 01.

5. No Building Connection:

   a) In cases where the sewer service line is not connected to the building, a PVC cap shall be solvent welded to the service line terminus within 5 feet of the proposed building.

   b) A piece of No. 3 rebar, 1-foot in length shall be installed to mark the service line terminus, as shown on the detail drawings. Bury the rebar 6 inches below ground surface.

   c) A PE marker painted green shall also be installed at this same location.

B. Cleanouts: Sewer service line cleanouts shall be installed at the locations indicated in the plans and in the manner indicated on the detail drawings. Required fittings shall be in conformance with the provisions of TP-07.03.

1. Locations:

   a) A two-way cleanout shall be installed within ten (10) feet of the building or as shown on the plans.

   b) Additional service line clean-outs shall also be two-way cleanouts and shall be installed for each series of bends totaling 90 degrees, at 100 foot intervals, or as directed by the Owner or Owner's Representative or shown on the plans.

   c) Fittings shall not be greater than 45 degrees (1/8 bend) on lines carrying untreated sewage.

   d) Cleanout shall allow for rodding/snaking the sewer line both towards the building and towards the sewer main.

2. Cleanout Configuration:

   a) Install wyes in the sewer service line to construct the cleanout and connect risers of the same material from the wye to the ground surface.

   b) Attach a no-hub iron body tapped, clean-out adapter, and threaded brass plug to the end of the riser.

   c) The cleanout shall be extended so that the top face of the threaded plug is at the finished grade of the concrete pad.

   d) Non-setting pipe-thread sealant shall be used on the plug threads, such as Teflon T Plus 2 or equal.

   e) A single layer of sill seal foam shall be wrapped around the iron body cleanout adapter between the exterior of the adapter and the concrete pad to protect against tightening from concrete expansion.

3. Concrete Pad/Collar:

   a) The concrete used shall meet the requirements of TP 02.

   b) The concrete pad shall be constructed around the cleanout at the ground surface per the detail.

   c) This concrete pad shall be reinforced with welded wire mesh with a minimum of ½-inch concrete over the mesh.

   d) Pour concrete collars on two-way cleanouts after the final site grading is complete to match finished grade.

C. Sewer Main Connection: Sewer service line connections to sewer main lines shall be made in accordance with the detail drawings and as shown on the plans, or as indicated by the Owner or Owner's Representative. The Contractor shall connect the service line to the sewer main with the appropriate sized sewer wye fitting or sewer wye saddle as shown on the detail drawings.

The time and method of connection to existing sewer mains shall be approved by the Owner or Owner's Representative prior to such connection. In no case shall a tapping method be approved that does not provide for a water tight connection to the sewer main. Any damage to sewer mains or property incurred during the tapping process shall be repaired by the Contractor at his own expense and in a method approved by the Owner or Owner's Representative.

1. Connections to New Sewer Mains:

   a) The Contractor shall furnish and install new 4-inch wye fitting branches on new sanitary sewer mains as shown in the plans.

   b) Verify the branch wye is no more than 45 degrees from horizontal.

   c) Install solvent weld cap or a plug in the wye and leave in place until service line construction begins.

   d) Install riser at an angle equal to or less than 45 degrees measured from horizontal. A single length of lateral pipe should be used for the riser section whenever possible.

   e) Extend sewer service line riser from sanitary wye to an elevation that will allow for a service line to be laid at specific approved grades.

   f) Proper compaction shall be provided beneath the riser and lateral connection to minimize or eliminate settlement from the resulting loading at this connection.

   g) In situations where sewer service lines are installed with the installation of new sewer main, the sewer service lines shall be included with the sewer main pressure testing. The individual service

lines shall be tested by plugging the service line termination point prior to connecting to the building and plugging sewer cleanouts and then testing concurrently with the sewer main section to which it is connected. The sewer service line can also be tested to a stub-out plug right before the new two way cleanout closest to the building.

2. Connections to Existing Sewer Mains:

   a) Connection to existing sewer mains shall be made with approved saddles and installed in accordance with the manufacturer's recommendation.

   b) Rotate the saddle no more than 45 degrees from horizontal.

   c) The saddle shall be fastened with a minimum of two (2) stainless steel clamps/bands using stainless steel connectors or equal for the approved saddle. All stainless steel bands shall be wrapped in PVC tape.

   d) Install riser at an angle equal to or less than 45 degrees measured from horizontal.

   e) Extend sewer service line riser from sanitary wye to an elevation that will allow for a service line to be laid at specific approved grades.

   f) Proper compaction shall be provided beneath the riser and lateral connection to minimize or eliminate settlement from the resulting loading at this connection.

TP - 07.05 WATER AND SEWER CROSSINGS:

Separation distances between sewer service lines and water lines shall meet the requirements of TP 01.

A. All water and sewer service lines within five (5) feet of the house will be considered as part of the building plumbing.

B. For new construction, all water and sewer service lines shall have a 10 foot minimum horizontal separation. This can best be accomplished by having the water and sewer service lines exit the house 10 feet apart or from different sides of the house.

If the 10 foot separation cannot be maintained, the service lines may be laid closer together than 10 feet if all of the following conditions are met:

A. Prior written approval is obtained from the Owner or Owner's Representative.

B. The top of the water service line is at least 12 inches above the bottom of the sewer service line.

C. The water and sewer lines are continuous with no joints until the 10 foot separation requirement is met.

TP - 07.06 RECORDS DRAWINGS:

The requirements of Technical Provision 01 must be met. Failure to properly identify the required items will result in the Contractor having to uncover pipe at Contractor’s expense to verify their location. The record drawings shall become the property of the Owner after contract completion. In addition to the requirements of TP-01, the drawings shall include the following at a minimum:

A. Tapping point at sewer main (sewer wye fitting or wye saddle)

B. Intersection point with other utilities

C. Location of cleanouts

D. Location of bends

E. Point of connection to the building stub-out

F. Each underground installed facility

TP - 07.07 MEASUREMENT AND PAYMENT - SEWER SERVICE LINES:

A. Sewer Service Lines: PVC sewer service pipe shall be measured in lineal feet along the centerline of the pipe, including fittings. Payment for sewer service lines 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, bedding, stabilization material, compaction, pipe installation, sewer wye or sewer saddle, connections to the sewer service cleanout, fittings, warning tape, trench backfilling, record drawings, and final clean-up.

B. Cleanouts: Payment for the two-way cleanouts shall be at the unit bid price as stated in the Bid Schedule. Payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required for complete installation; including excavation, backfill, compaction, pipe installation, fittings, connections, foam, reinforced concrete pad, record drawings, and final cleanup.

SUBMITTAL REVIEW FORM, SECTION 07- SEWER SERVICE LINES

	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
07.03.B	PVC Sewer Pipe & Fittings		
07.03.C	Cleanout, Fittings, Cap, Foam, Mesh, Concrete		
07.03.D	Sewer Main Saddle or Wye and Fittings		
	Permits (if required)		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 13 - INDIVIDUAL PRESSURE DOSED SEWAGE DISPOSAL SYSTEM

TP - 13.01 SCOPE:

The work covered by this section includes the furnishing of all labor, tools, equipment, materials, and performing all operations in connection with the installation and construction of an individual waste disposal system composed of a septic tank, pump tank with pump and controls, mound, and all connecting piping and incidental construction operations necessary to place the sewage disposal system in a fully operational condition.

TP - 13.02 GENERAL:

The individual sewage disposal systems and related facilities shall be constructed at the locations and of the sizes shown on the plans. Field changes in location and orientation may be directed by the Owner or his/her representative at the time of construction. The pump tank and effluent force line shall be constructed at the locations indicated in the plans. Excavation, trenching, and backfilling shall be in accordance with Section 01 of the Technical Provisions, unless specifically altered under other requirements of this specification section.

TP - 13.03 MATERIALS:

Inspect all materials to verify that they meet these specifications and match the approved submittals. Remove all materials not meeting these requirements. 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. Inspect all materials prior to installation to ensure that they are in new condition. Inspect pipe and fittings for defects. Plastic pipes with scratches, gouges, grooves, or discoloration shall be rejected. Remove all materials from site that are defective, damaged, used, unsound or that otherwise do not meet the specifications.

A. Pipe and Fittings: Solid pipe and fittings utilized for septic tank and drainfield construction including sewer service line (from building to septic tank), cleanouts, distribution piping (from septic tank to drainfield chambers), observation ports, and appurtenances shall meet the following:

   1. 4-inch diameter PVC SDR 35 pipe with pipe and fittings conforming to ASTM D3034 or Schedule 40 PVC pipe with pipe and fittings conforming to ASTM D1785.

   2. Gasketed joints shall be bell-ended and conform to ASTM D3212. All joints and connections in the pipe shall be watertight. Use elastomeric gaskets conforming to ASTM F477. Lubricants used for the joint installation shall meet the requirements of the pipe manufacturer.

   3. 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.

   4. Rigid couplers shall be used for all connections, such as PVC fittings, shielded Fernco fittings, or approved equal. Non-rigid couplers equal to Fernco may be used for the first connection from the home to the sewer service line if approved by the Owner or Owner's Representative.

B. Cleanouts: Double service line (two-way) cleanout piping and fittings shall be 4-inch diameter PVC pipe matching the chosen septic drain piping material. The cleanout piping and cap shall be threaded.

   1. The cleanouts shall be installed with a brass hex socket plug equal to Tyler A Low Square Head cleanout plug. The cleanout ferrule shall be a Tyler 4-3 ½ or approved equal.

   2. The poly seal foam wrapped around the cleanout ferrule shall be Sill Seal underlayment foam or approved equal.

3. The double service line cleanout shall be installed in a 20-inch x 40-inch x 4-inch concrete pad (collar) as shown in the detail drawings. The wire mesh used for the concrete pad shall be ASTM approved W 1.4 (1/8 inch) wire mesh.

C. Septic Tank: Septic tank shall be dual compartment with a minimum of 1,000 gallon liquid capacity as measured below the invert of the outlet. The actual size of the septic tank shall be as shown on the plans and in the Bid Schedule.

1. The tank shall be constructed of precast, reinforced concrete of sufficient strength to withstand hauling and handling stresses, and shall meet all state and local regulations for the state and localities for which it is installed. The steel reinforcement shall meet the requirements of TP 03.

2. Septic tank shall be water-tight and shall have a 28 day compressive strength of at least 3,000 psi.

3. Chipped and honey combed tanks shall not be approved and will be rejected if delivered and installed. The tank shall be free of excessive cracking. Cracks in the concrete which, in the opinion of the Owner or Owner's Representative could lead to leakage and/or premature failure, shall be sealed by the Contractor, at no extra cost, using approved materials. Tanks with cracks visible on both sides or cracks where metal or synthetic fiber reinforcement is visible, shall be rejected.

4. The dimensions of the septic tank shall be labeled on the detail or the plans. Minimum wall thickness shall be 3-inches. Minimum distance between inlet and outlet of the tank shall be six (6) feet. The minimum width of the tank shall be three (3) feet. The longest dimension shall be parallel to the direction of flow, unless otherwise noted on the plans. The effective length shall be greater than two (2) and less than four (4) times the effective width.

5. The septic tank shall be of monolithic construction below the liquid line. Tank shall be cast as one piece with a lid cast as the top of the tank. If tank is cast as a clamshell, with two pieces, then the joints below the liquid line shall be interlocking V-notch, shiplap or tongue and groove. All joints shall be sealed with an epoxy based sealing compound or Ram-Nek flexible gasket or equal to prevent water infiltration of exfiltration. All joints below the liquid level shall be tested prior to backfilling and shall not have any leaks.

6. The bottom of the outlet invert of the tank, for a baffle or a sanitary tee shall be at least two (2) inches lower than the bottom of the inlet invert of the tank. Install tank with the tank inlet (higher invert penetration) facing towards the building and the tank outlet (lower invert penetration) to the drainfield. A minimum of one (1) inch of clear space shall be provided between the top of the baffles or tees and the underside of the tank.

7. Tanks buried at depths exceeding 48-inches shall have a traffic rated, extra reinforced, tank lid.

8. If noted on the site plan, some sites may require installation of a special low profile septic tank. These tanks shall comply with all provisions for a standard tank but shall require a bury depth of no greater than 48 inches. Final fabrication dimensions and details of the structure shall be approved by the Owner or Owner's Representative in writing prior to fabrication and installation.

D. Effluent Filter: Effluent filters shall have a minimum diameter of 4 inch and a maximum filtration size of 1/16 inch.

1. The filters shall be designed for a maximum daily flow of 1,000 gallons per day or greater. The effluent filters shall be equal to Zable A-100 (1,200 gpd), Tuff Tite EF 6 (1,500 gpd), or approved equal. If larger capacity filters are needed for a specific site, the required size shall be as shown in the plans and in the Bid Schedule.

2. The effluent filter shall have a handle to facilitate removal of the filter for maintenance and replacement. The handle shall be placed within 12 inches of the top of the riser for accessibility.

E. Pump Tank: Pump tanks shall be a minimum of 250 gallon liquid capacity. The actual size of the pump tank shall be as shown on the plans and in the Bid Schedule.

1. The tank shall be constructed of precast, reinforced concrete of sufficient strength to withstand hauling and handling stresses and shall meet all state and local regulations for the state and localities for which it is installed. The tank shall be water-tight and shall have a 28-day compressive strength of at least 3,000 psi. The steel reinforcement shall meet the requirements of TP 03.

2. Chipped and honey combed tanks shall not be approved and will be rejected if delivered and installed. The tank shall be free of excessive cracking. Cracks in the concrete which, in the opinion of the Owner or Owner's Representative could lead to leakage and/or premature failure, shall be sealed by the Contractor, at no extra cost, using approved materials. Tanks with cracks visible on both sides or cracks where metal or synthetic fiber reinforcement is visible, shall be rejected.

3. If noted on the site plan, some sites may require installation of a special low profile pump tank. These tanks shall comply with all provisions for a standard tank but shall require a bury depth of no greater than 48-inches. Final fabrication dimensions and details of the structure shall be approved by the Owner or Owner's Representative in writing prior to fabrication and installation.

F. Septic Tank and Pump Tank Risers: Risers, a minimum of 24-inches in diameter, must be installed to provide access to the inlet of the septic tank for pumping/maintenance purposes, to the outlet of the septic tank for easy access the effluent filter, and to the opening of the pump tank that allows access to the effluent pump and effluent discharge piping system.

1. Risers shall be corrugated HDPE with a 24" HDPE UV protected heavy duty cover and stainless steel locking screws, or equal. Risers shall have a water tight connection to the tanks.

2. Risers shall have a printed warning label with information regarding the hazards present when entering a tank affixed by the Contractor or supplied by the manufacturer. This label shall be affixed to the inside and outside of the riser covers.

3. The riser system shall be installed with a safety screen device within the riser such as the Polylok 3008 SSPIPE Safety Screen or approved equal. The Contractor shall provide one (1) extra safety screen to the Tribe for each septic tank or pump tank installed.

4. Where risers are required to be more than 42-inches in height, the risers shall be made of concrete, such as concrete grade rings, with approved water tight seals to the tank and an approved compatible riser cover or approved equal. Prior approval shall be obtained from the Owner or Owner's Representative.

G. Effluent Pump: The effluent pump shall be sized for each site by the Owner's Representative. Effluent pump size and specifications for horse power, flow capacity, total dynamic head and discharge outlet size are shown on the plans.

1. Effluent Pump:

   a) Effluent pump brands shall be equal to a Peabody-Barnes, Meyers, Goulds or Liberty.

   b) The pump shall have a discharge outlet that matches the specified diameter of the effluent discharge line (pump tank piping) and the effluent service force line (from tank to sewer main).

   c) The pump motor shall have a built-in thermal overload protection with automatic reset.

   d) A stainless steel chain shall be provided for pulling the pump out of the pump tank.

2. Power Supply:

   a) The power supply shall be 120/240 volt, single phase, 3-wire service from a properly sized 1/2 pole breaker off the lighting panel in the residence on a separate, dedicated circuit.

b) The entire system shall be installed in accordance with state and local codes.

c) All wire shall be sized in accordance with the latest issue of the National Electric Code.

d) All materials shall be new and UL listed as applicable and shall meet NEC code and safety requirements.

H. Controls: The pump supplier shall furnish a control and alarm system compatible with the pump furnished under this contract.

1. Enclosure:

a) Pump control equipment shall be housed in a weatherproof enclosure equal to a NEMA Type 4 enclosure and mounted at the location shown on the plans or as specified by the Owner or Owner's Representative. The enclosure shall have a locking hasp.

b) The NEMA Type 4 Enclosure shall house a load switching motor contactor with door mounted heavy duty HAND-OFF-AUTO (HOA) switch and a service disconnect mechanism.

2. Floats:

a) Two direct acting mercury-free float switches shall be furnished for mounting in the effluent pump tank. These floats shall serve to detect ON-OFF control levels for the pump.

b) Terminal blocks shall be provided for connection of ON-OFF level control floats.

3. Alarm System:

a) An alarm system, on a circuit separate from the pump, shall be provided and installed near the residence in the location shown on the plans or as selected by the Owner or Owner's Representative and the homeowner.

b) The alarm system shall consist of a direct acting mercury-free float switch, 24-volt control transformer, for mounting in the pump chamber, red alarm light, horn, push-to-test alarm button, and a horn silence switch.

c) The alarm system shall be a Tank Alert® 1 or approved equal.

d) Upon the occurrence of an alarm condition, the high alarm sensor will close its circuit, thus energizing the red alarm light and sounding the horn or buzzer.

e) A silencing switch shall be provided to silence the audible alarm once it has been activated. The red alarm light shall remain energized as long as the silencing switch is in the "silence" position. The high alarm sensor shall continue to show as alarm condition until the operating condition has returned to normal and the silencing switch has been returned to its "normal" position".

f) The control panel meeting the above criteria shall be equal to a Rhombus Technology panel Series 112 or approved equal.

I. Electrical Cable: Electrical cable shall be Type UF direct bury 12/2 wire with ground to provide power to the effluent pump and Type UF direct bury 14/2 wire to provide power to the float switches.

1. If necessary, the underground cable shall be increased in size to limit voltage drop from power source to pump motor to two (2) percent or in accordance with pump manufacturer's recommendations.

2. Conduit used shall be rigid, non-metallic, water-tight, heat and corrosion resistant Schedule 40 PVC, appropriate for running electrical wiring above or below ground.

J. Effluent Discharge Line: (*Piping within Pump Tank*) Use Schedule 80 PVC piping, check valves, union, true-union ball valve, wye and fittings throughout the pump tank and riser assembly, as illustrated in the drawing and detail. This includes the piping from the pump discharge outlet to the tank exterior.

1. Once outside the pump tank, a compatible transition adapter/compression fitting shall be provided to join the Schedule 80 PVC piping to the Schedule 40 PVC effluent force line piping.

2. Specified check valve(s), union, true-union ball valve (shutoff) and wye fitting shall be included in the effluent discharge line piping as shown in the plans and details.

3. Pipe size of effluent discharge line to be designed per site and system conditions. The pipe and fitting sizes are shown on plans and Bid Schedule.

K. Check Valve & Ball Valve: True-union check valves and true-union ball valves shall be suitable for contact with septic tank effluent and shall be compatible with solvent weld PVC material.

1. The valves shall be the same size as the effluent discharge line.

2. The check valves installed shall be appropriate for vertical or horizontal installation (as shown on the plans). The check valve shall be either a ball or swing check valve, as noted on the plans.

3. The check valves and ball valve shall be of true-union configuration so that they may be replaced when/if necessary without having to cut and splice the piping.

L. Effluent Force Line: (*Piping between Pump Tank and Manifold)* The effluent force line connecting the effluent discharge line to the manifold pipe shall be Schedule 40 or SDR 26 PVC pipe of the diameter indicated in the Bid Schedule as "Effluent Force Line".

M. Manifold Pipe: *(Pipe from Effluent Force Line to Perforated Pipe)* The manifold pipe connecting the effluent discharge line to the perforated pipe shall be Schedule 40 or SDR 26 PVC pipe of the diameter indicated in the Bid Schedule as "Manifold Pipe".

N. Perforated Pipe: The manifold pipe connecting the effluent discharge line to the perforated pipe shall be Schedule 40 or SDR 26 PVC pipe of the diameter indicated in the Bid Schedule as "Perforated Pipe". The pipe shall be field perforated at the sizes, locations and orientation as shown on the plans.

O. Perforated Pipe Distribution Media: The plans and Bid Schedule will specify one of the following media types to house the perforated pipe in the mound system:

1. Drainfield Gravel: The drainfield gravel shall be clean and may vary in size from 1/2 inch to 2 inches, with not more than 5% fines below the 1/2 inch size. Gravel to be used must meet the approval of the Owner or his/her representative.

2. Manufactured Chambers:

a) Drainfield chamber sections shall be constructed of high strength polyethylene plastic.

b) Chambers shall be equal to INFILTRATOR Quick4 Plus High Capacity Chambers (34 inches wide x 53 inches long x 14 inches high) or ADS Arc 36HC Chambers (34.5 inches wide x 63 inches long x 16 inches high).

c) A minimum loading rating of AASHTO H-10 shall be required for wheel load protection.

P. Mound Materials:

1. Clean sand: If indicated on the plans, a minimum of 12 inches of clean sand shall be placed upon the plowed soil, below the perforated pipe distribution media. A sieve analysis of the mound sand shall be required from the Contractor as a submittal item. The following sieves shall be used for the analysis: No. 10, No. 20, No. 40, No. 60, and No. 100. The sand shall meet the following requirements:

Sieve Number	Percent Finer by Weight
8 (2.36 mm)	Greater than 80%
16 (1.18 mm)	45 – 85%
30 (0.6 mm)	15 - 60%
50 (0.3 mm)	3 - 15%
100 (0.15 mm)	Less than 4%

Written approval from the Owner or Owner's Representative shall be obtained prior to the delivery of the sand. The Owner or Owner's Representative reserves the right to conduct a field test of the mound sand and to reject aforesaid sand should it fail to meet the criteria listed above. If the sand does fail, the Contractor will remove all of the sand and clean the affected area of any remnants at no cost or penalty to the Owner, or affiliates.

2. Fill Material: Fill material may be subsoil if it is not heavy clay or glacial till, and shall be free of stones and boulders. Sandy loam soil is the preferred fill material. All fill material to be used shall be approved by the Owner or his/her representative.

Q. Filter Fabric: Should filter fabric soil protection be recommended by the chamber manufacturer as an integral part of the drainfield installation and noted in the plans:

1. The fabric material shall be a synthetic geotextile material specifically intended for drainfield use as manufactured by Hancor, Inc. or approved equal.

2. Fabric shall be approved by the Owner or Owner's Representative.

R. Observation Pipe: Observation pipes are to be 4 inch Schedule 40 PVC pipe fitted with a secure metal cover. The tubes must be stabilized so that they do not move when removing the cap. All exposed PVC shall be painted with an epoxy or enamel UV protectant paint that bonds well with PVC and is green in color, such as Krylon spray paint, or equal.

S. Paint: Paint used for all exposed PVC material shall be an epoxy or enamel UV protectant paint that bonds well with PVC and is white in color, such as Krylon spray paint, or equal.

T. Pipe Hangers: Pipe hangers shall be made of material compatible with piping material and shall be of sufficient strength to support pipe at full capacity. Pipe hangers shall not affect pipe integrity by abrading, cutting or bending pipe.

U. Expanding Foam Sealant: Foam shall be a polyurethane-based foam sealant that expands to take the shape of voids to form a durable, airtight and water resistant bond. The foam shall be UL classified, rated for interior and exterior use, adhere to metal and plastic materials and shall cure in a rigid form. Foam shall be used to seal all conduit penetrations into the control panel and pump chamber.

TP 13-04 INSTALLATION:

Verify that dimensions, elevations and slopes are as indicated on the plans. Required separation distances shall be maintained for all of the on-site wastewater treatment system components as presented in the detail or as required by the localities in which they are installed. During and after construction, the Contractor shall avoid driving over the septic tank or any other component of the on-site treatment facility.

A. Sewer Service Line: Sewer service lines shall be furnished and installed by the Contractor from the septic tank to the point of connection as shown on the plans or as directed by the Owner or Owner's Representative.

1. Connection to Building:

   a) Sewer service lines shall be connected to the building stub out sewer drain with approved fittings or rigid couplers which shall be installed in accordance with the manufacturer's recommendation.

   b) If clamps/bands are required on the couplers, they shall be at a minimum 300 series stainless steel. All stainless steel bands shall be wrapped in PVC tape

   c) For connecting beneath the home, place pipe hangers at a maximum distance of four (4) feet apart for horizontal PVC pipe.

   d) Minimum cover over solid sewer pipe shall be 12 inches or as approved and shown on the plans.

2. Pipe Slope and Bends:

   a) All 4-inch PVC piping from the building stub out sewer drain to the septic tank shall be laid at a minimum grade of 2% or 1/4-inch per foot and maximum grade of 4% or1/2-inch per foot.

   b) Any changes or deviations in line alignment shall be made with bends not exceeding an angle of 45 degrees and shall obtain approval from the Owner or Owner's Representative prior to making change.

   c) Connections to existing building drains which result in a change of direction of the line by more than 45 degrees requires the installation of a two way cleanout at that location.

   d) There shall be no 90-degree bends in the pipe between the building and the septic tank.

3. Pipe Installation Requirements:

   a) Installation of pipe, including joint lubrication and assembly, solvent welding, pipe bending and joint deflection shall be in accordance with the manufacturer's recommendations.

   b) Sewer service lines and connections must be constructed with maximum joint deflection not to exceed the manufacturer's recommendations and in no case shall exceed 1 inch per foot in any joint. Larger changes in direction must be made by use of standard 1/16 or greater bends.

4. No Building Connection:

   a) In cases where the sewer service line is not connected to the building, a PVC cap of like material shall be solvent welded to the service line terminus within 5 feet of the proposed building.

   b) A piece of No. 3 rebar, 1-foot in length shall be installed to mark the service line terminus, as shown on the detail drawings. Bury the rebar 6 inches below ground surface.

   c) A PVC marker painted green shall also be installed at this same location.

B. Cleanouts: Sewer service line cleanouts shall be installed at the locations indicated in the plans and in the manner indicated on the detail drawings. All required fittings shall be in conformance with the provisions of TP-13.03 and the details.

1. Locations:

   a) A two-way cleanout shall be installed within ten feet of the building or as shown on the plans.

   b) Additional service line clean-outs shall also be two-way cleanouts and shall be installed for each series of bends totaling 90 degrees, at 100 foot intervals, or as directed by the Owner or Owner's Representative or shown on the plans.

   c) Fittings shall not be greater than 45 degrees (1/8 bend) on lines carrying untreated sewage.

   d) Cleanout shall allow for rodding/snaking the sewer line both towards the building and towards the septic tank.

2. Cleanout Configuration:

   a) Install wyes in the sewer service line to construct the cleanout and connect risers of the same material from the wye to the ground surface.

   b) Attach a no-hub iron body tapped, clean-out adapter, and threaded brass plug to the end of the riser.

   c) The cleanout shall be extended so that the top face of the threaded plug is at the finished grade of the concrete pad.

   d) Pipe-thread sealant shall be used on the plug threads, such as Teflon T Plus 2 or equal.

   e) A single layer of sill seal foam shall be wrapped around the iron body cleanout adapter between the exterior of the adapter and the concrete pad to protect against tightening from concrete expansion.

3. Concrete Pad/Collar:

   a) The concrete used shall meet the requirements of TP 02.

   b) The concrete pad shall be constructed around the cleanout at the ground surface per the detail.

   c) This concrete pad shall be reinforced with welded wire mesh with a minimum of ½-inch concrete over the mesh.

   d) Pour concrete pad on two-way cleanouts after the final site grading is complete to match finished grade unless directed otherwise by the Owner or Owner's Representative.

C. Septic Tank: The septic tank shall be installed at the location and elevation shown in the plans and detail drawings. Install tank in accordance with the manufacturer's recommendations. The septic tank shall be installed no closer than 10 feet from the building.

1. Setting Tank:

   a) Excavation shall be the minimum required to provide proper bedding and placement of the tank.

   b) Prior to setting the tank, all rocks and other foreign material which might damage the tank upon placement shall be removed from the excavation.

   c) The Contractor shall set the tank on a 6-inch thick (minimum) bed of sand or gravel to facilitate leveling the tank. The base bedding shall be compacted to 85% Standard Proctor Density (ASTM D698).

   d) The base bedding shall present a smooth, uniform and level surface.

   e) Seal the tank inlet and outlet with temporary plugs until connections are made to the inlet and outlet lines.

2. Sealed Joints:

   a) Seal all joints between inlet piping, outlet piping and risers as approved by the Owner's Representative.

   b) The sewer service line shall be sealed with a rubber gasket (boot-type fitting) or masonry grouted at connection points to the inlet and discharge openings of the septic tank to prevent ground water infiltration. Grout shall conform to Section 02 of the Technical Provisions.

3. Backfilling Tank:

   a) Prior to backfilling, the tank elevation shall be checked at all corners to assure that placement is level and at the appropriate depth.

b) Backfill in 12-inch layers and thoroughly compact in a manner that will not produce undue strain on the tank.

c) Final backfill material shall be mounded 6-inches above the natural ground surface to allow for settlement.

d) Do not exceed 48-inch cover unless tank is designed for a deeper bury depth and approval is obtained from the Owner's Representative. Tanks buried at depths exceeding 48-inches shall have require a traffic rated, extra reinforced tank lid.

4. Groundwater:

a) If groundwater is present, dewater in accordance with TP 01.

b) All work in setting the tank shall be done under dry conditions.

c) In these conditions, the septic tank may need be filled with water to prevent flotation of the tank.

5. Effluent Filter: An approved effluent filter shall be installed in a sanitary tee/baffle on the septic tank outlet piping.

D. Effluent Filter:

1. Install effluent filter in conformance to the manufacturer's installation instructions.

2. Center and secure the filter assembly under the outlet manhole opening of the septic tank. Solvent weld tee/baffle to 4-inch PVC tank outlet pipe to house the filter, as necessary. Extend piping a minimum of 12-inches beyond the outside of the septic tank before connecting to the pump tank PVC piping.

3. Install filter handle and extend handle to within 12-inches of the top of the access riser for ease of accessibility.

E. Pump Tank: The pump tank shall be installed at the location and elevation shown in the plans and detail drawings. Install tank in accordance with the manufacturer's recommendations. If required, install vent on pump tank in accordance with state and local codes.

1. Setting Tank:

a) Excavation shall be the minimum required to provide proper bedding and placement of the tank.

b) Prior to setting the tank, all rocks and other foreign material which might damage the tank upon placement shall be removed from the excavation.

c) The Contractor shall set the tank on a 6-inch thick (minimum) bed of sand or gravel to facilitate leveling the tank. The base bedding shall be compacted to 85% Standard Proctor Density (ASTM 698).

d) The base bedding shall present a smooth, uniform and level surface.

e) Seal the tank inlet and outlet with temporary plugs until connections are made to the inlet and outlet lines.

2. Sealed Joints:

a) Install matching 4-inch PVC pipe material (Schedule 40 or SDR 35) from the septic tank to the pump tank at a minimum slope of 1%.

b) Seal all joints between inlet piping, outlet piping, vent pipe, riser, etc. as approved by the Owner's Representative.

c) The sewer service line shall be sealed with a rubber gasket (boot-type fitting) or masonry grouted

at connection points to the inlet and discharge openings of the pump tank to prevent ground water infiltration. Grout shall conform to Section 02 of the Technical Provisions.

3. Backfilling:

   a) Prior to backfilling, the tank elevation shall be checked at all corners to assure that placement is level and at the appropriate depth.

   b) Backfill in 12-inch lifts and thoroughly compact in a manner that will not produce undue strain on the tank.

   c) Final backfill material shall be mounded 6-inches above the natural ground surface to allow for settlement.

   d) Do not exceed 48-inch cover unless tank is designed for a deeper bury depth and approval is obtained from the Owner's Representative. Tanks buried at depths exceeding 48-inches shall have a traffic rated, extra reinforced tank lid.

4. Groundwater:

   a) If groundwater is present, dewater in accordance with TP 01.

   b) All work in setting the tank shall be done under dry conditions.

   c) The pump tank may need be filled with water to prevent flotation of the tank.

F. Septic Tank and Pump Tank Risers: The Contractor shall install the approved covered risers for the inlet and outlet of the septic tank and the outlet of the pump tank.

1. The top of the riser covers shall be set at least 6 inches above finished grade.

2. All septic tank risers shall be connected to the top of the tank with a Ram-Nek flexible gasket or equal water-tight material and shall be grouted to the top of the tank to eliminate water infiltration.

3. A ¼-inch minimum diameter nylon or poly-rope shall be attached to the septic tank concrete access covers/lids. Connect end of the rope to a hook inside of the tank riser within 24 inches of the top of the riser to facilitate the removal of the concrete access covers/lids inside the risers. The rope shall extend to 12-inches above grade.

4. The safety screen device shall be installed on each riser in accordance with the manufacturer's recommendation.

5. The stainless steel screws on the riser covers shall be secured tightly.

G. Effluent Pump: Install specified pump from the drawings in accordance with manufacturer's recommendations and at the location and configuration shown in the plans and detail drawings.

1. Set pump level on concrete block(s) or pump stand at the bottom of the pump chamber.

2. Connect effluent discharge line piping and fittings as shown in the detail drawing.

3. Connect end of pump chain to a hook inside of the pump tank riser within 24 inches of the top of the riser to allow for removal of the pump directly up through the riser and cover.

H. Electrical Controls and Cable: Electrical connections to the pump, floats, alarm and control panel shall be completed in accordance with the manufacturer's recommendations.

1. All buried electrical cable (pump power cable and 3 float-switch cables) shall be placed in one trench or installed in approved rigid watertight conduit as shown on the plans. All exposed wiring shall be enclosed in approved conduit.

2. Mount floats in the pump tank at the elevations shown on the drawings and details, as directed by

manufacturer's specifications and as approved by the Owner's Representative.

3. Wire the pump to a new breaker in main breaker box (15A/2P breaker) and provide a dedicated circuit to the pump control panel.
4. Wire splicing shall be water proof, in accordance with NEC and easily accessibly in the pump tank riser for future replacement of wiring as needed.
5. Install the alarm system on a circuit separate from the pump.
6. Seal all conduit openings entering the control panel and pump chamber with expanding foam.
7. Install the control enclosure box and alarm system within sight of the pump tank and near the residence in the location shown on the plans or as selected by the Owner or Owner's Representative and the homeowner. Mount the control panel on a 4"x4 pressure treated mounting-post rated for ground contact.
8. If requested by the Owner or Owner's Representative, install bollards to protect the pump tank riser and pump controls at the locations shown on the plans.

I. Effluent Discharge Line and Valves: The effluent discharge line shall be installed in accordance with the detail plans and these specifications.

1. Connect Schedule 80 piping to effluent pump discharge outlet.
2. Install the approved check valve(s) at the locations shown on the details. A check valve shall be installed between the pump and union (near discharge outlet of the pump).
3. The discharge line must have a union installed inside the tank, within reach of the riser, to allow for removal of the pump through the riser by only disconnecting the union. Place union within 24-inches of the top of the tank riser.
4. In cold climates, provide a weep hole in the effluent discharge line or provide insulation along the service force line. The weep hole shall be a ¼" hole drilled in the effluent discharge line just above the check valve such that the effluent discharge line and the service force line drains back into the tank after a pumping cycle to prevent freezing. The freeze prevention measure shall be approved by the Owner or Owner's Representative.
5. The effluent discharge line shall penetrate through the corrugated riser wall, just above the pump tank as shown on the plans and details. The piping through this penetration shall be secure and sealed to prevent water infiltration.
6. Once beyond the pump tank, the Contractor shall adapt the effluent discharge line to the force line.
7. All effluent discharge piping size, length, orientation and spacing shall be in accordance with the detail and drawing or as approved by the Owner or Owner's Representative.

J. Effluent Force Line: The effluent force line shall be installed in accordance with the detail, plans and these specifications.

1. The pipe diameter of the effluent force line shall be as specified on the design plans and as listed on the Bid Schedule.
2. The effluent force line shall be connected to the effluent discharge line piping (Schedule 80 PVC) from the tank with appropriate adapters and compression fittings.
3. The effluent force line shall slope up continuously to the sewer main unless otherwise directed by the Owner or Owner's Representative. If the pipe does not slope up continuously and there are high points in the sewer service force line, a wastewater air release valve may be added to the contract per the Owner or Owner's Representative, as needed.

4. Install effluent force line piping at a bury depth of 3-feet or greater. In colder regions, as directed by the Owner or Owner's Representative, install insulation board over sewer force line in traveled/traffic areas if service force line bury depth is less than 3 feet and if there is no ¼" weep hole drilled in the effluent discharge piping for drain-back into the pump tank. If insulation board is required and shown in the plans, it shall meet the material specification of TP 01 and shall be installed in accordance with TP 01.

K. Manifold Pipe: The manifold pipe connecting the effluent force line, from the point of entry into the drainfield gravel or chambers, to the perforated pipe shall be installed as per the drawings.

L. Perforated Pipe: Install piping per design completed and/or approved by the Owner & Owner's Representative and as shown in the drawings. Field perforate lateral piping per approved plan using a sharp drill bit. Remove all burrs and filings from the interior of the pipe.

M. Perforated Pipe Distribution Media:

1. Drainfield Gravel:

   a) A 9 inch gravel layer shall be placed with a crawler tractor as shown in detail drawing.

   b) The drainfield gravel shall be clean and may vary in size from 1/2 inch to 2 inches, with not more than 5% fines below the 1/2 inch size.

   c) The perforated pipe shall be installed within the drainfield gravel such that there is approximately 6 inches of gravel below the pipe and 3 inches above the pipe.

   d) The perforations shall face downwards at the 6 o'clock position.

   e) The top of the gravel shall be covered with synthetic material TYPAR Style 3151 or equal.

2. Chambers:

   a) Place the chamber sections in the trench and connect in accordance with the manufacturer's installation instructions.

   b) Chamber sections shall be maintained at a level grade throughout the entire length. Chamber sections shall be checked with a construction level upon placement to preclude high or low sections.

   c) The header pipe shall be level.

   d) Distribution piping to and between chamber trenches shall be connected in accordance with the chamber manufacturer's recommendations.

   e) Perforations shall be located and oriented as shown in the drawings

   f) End caps shall be installed at the end of each drainfield lateral as recommended by the chamber manufacturer.

   g) At each downward facing perforation, a splash plate shall be placed on the native soil within the leaching chamber to prevent erosion. This splash plate may be an HDPE splash plate made by the manufacturer of the leaching chamber, a concrete block, or a patio block, as approved by the Owner's Representative. Splash pad used shall be at minimum 2 inches by 8 inches by 8 inches, or approved equal.

   h) Place filter fabric over the chambers prior to backfilling.

N. Mound Construction:

1. The Contractor shall remove excessive vegetation from the mound area by clearing and mowing. Surface preparation shall be accomplished by plowing, with a moldboard or chisel type plow, parallel

to the contours (if the site is sloped). Preparation of the mound area by scratching the surface topsoil with the teeth of a backhoe may be allowed with approval of the Owner or Owner's Representative. The plowing depth shall be a minimum of 7 or 8 inches below original grade and the soil must be dry and crumbly. No plowing shall be done when the moisture content of the soil, at a depth of 7 to 8 inches, is such that rolling a sample between the hands forms a roll. Approval for surface soil preparation shall be obtained from the Owner or Owner's Representative. Once plowing is completed, no vehicular traffic or material stockpiles will be allowed on the mound basal area and/or the designated down-slope area. Application of the mound basal sand must be completed immediately after surface plowing has been accomplished.

2. A minimum of 12 inches of clean sand shall be placed upon the plowed soil, below the drainfield gravel. The sand shall be placed by dumping along the upslope side and/or ends of the plowed area. Under no circumstances shall the dump truck wheels be allowed on the plowed area. The Contractor shall use a crawler tractor with a blade to spread the sand over the plowed area, keeping at least 6 inches of sand under the tracks at all times to minimize compaction.

3. A layer of fill material shall be placed above the perforated pipe distribution media as shown in the detail drawing. This fill material layer shall be a minimum of 12 inches deep at the center of the mound and a minimum of 6 inches deep at the sides.

4. The entire mound shall be covered with a minimum of 6 inches of topsoil. Application and coverage shall be as recommended by the seed supplier.

5. The mound shall be mulched, as approved by the Owner or Owner's Representative, to assure proper seed germination and eliminate erosion of the mound area. The Contractor shall be responsible for re-seeding or repairing erosion damage on the mound as necessary until a complete vegetation cover is achieved.

O. Filter Fabric: Filter fabric shall be installed in accordance with chamber manufacturer's recommendations. Filter fabric shall be installed directly on top of (draped over) the chambers prior to initial backfill. Use soil to hold the filter fabric in place and then backfill in accordance with the specifications.

P. Observation Ports: Observation ports shall be constructed of solid four (4) inch PVC pipe and shall installed as shown on the plans.

1. If chambers are used, the pipe shall be installed through the knockout ports on the chambers using couplings to keep the pipe from dropping into the chamber and preventing the removal of the pipe.

2. The riser shall extend between 18 inches and 24 inches above ground surface.

3. PVC slip-on gasketed caps shall be installed on each riser as shown in the detail.

4. Observation pipe and caps shall be painted with two (2) coats of epoxy green spray paint for UV protection.

Q. Inspection: The installed sewage disposal system shall be inspected by the Owner or Owner's Representative. Pressure test for leaks before backfilling and before connecting to the home sewer drain in the presence of the Owner or Owner's Representative. All connections and joints shall be visually inspected by the Owner or Owner's Representative to evaluate system pressure conditions. Contractor shall contact the operating utility prior to obtaining water from the public water system. If any leaks occur, the Contractor shall make all necessary repairs to the installed single residence effluent lift station system, at the Contractor's expense.

1. The Contractor shall provide the Owner or Owner's Representative with a minimum of 24 hour notice on the need for inspection prior to final backfill.

2. The sewer service lines, septic tank, and mound shall remain uncovered until inspected and approved

by the Owner or his/her representative.

3. Backfill prior to such approval will be cause for rejection of the construction for payment until disputed sections are uncovered for inspection purposes.

4. All such re-excavation shall be at the sole expense of the Contractor.

R. Electrical System Inspection: Conduct an electrical system test in the presence of the Owner or Owner's Representative. Proper electrical operation of the system shall be visually verified by the Owner or Owner's Representative.

1. Test the floats by activating the ON, OFF and ALARM floats. Test the Alarm system.

2. Use the push-to-test alarm button. Verify operation of the red alarm light and horn/buzzer.

3. Test the horn silence switch by switching from the "Normal" to the "Silence" position and thus silencing the audible alarm. Verify that the red alarm light remains energized. Verify alarm condition continues until switching back to the "Normal" position.

S. Septic Tank Abandonment: Old, unused, or deteriorated septic tanks that have been determined by the Owner or Owner's Representative to be disconnected and abandoned, shall be abandoned according to the following method:

1. The tank(s) shall have the liquid and solids/sludge pumped by a septic pump truck so that the tank is left empty. The removed materials shall be disposed of properly according to state and federal requirements.

2. Remove and dispose of tank cover, risers, inspection pipes and any tank interior pumps as directed by the Owner's Representative. The interior pipes and plumbing may be left in the tank for abandonment.

3. The tank shall then be crushed in place and filled with its own crushed debris. Contractor shall ensure that the bottom of the tank is breached to prevent the holding of any liquid.

4. The crushed tank shall then be backfilled with suitable, compactable, soil material, to fill the voids left by the tank.

5. The backfilled soil shall be properly compacted to prevent subsidence and to bring the backfilled area to the same level as the surrounding grade.

T. Mound Abandonment: Mound piping shall be abandoned by removing the observations pipes to a minimum of 12-inches below grade and filling the pipe and hole with suitable, compactible soil material. The remaining chambers and components of the system shall be abandoned in place. Mound piping must be cut and capped to prevent flow out of the field once it is abandoned.

TP - 13.05 RECORD DRAWINGS:

Record drawings shall be furnished per the requirements in TP 01.

TP - 13.06 WATER AND SEWER CROSSINGS:

Water and sewer crossings must meet the requirements in TP 01.

TP - 13.07 MEASUREMENT AND PAYMENT:

All measurements and payments will be based on completed and accepted work performed in strict accordance with the drawings and specifications and the respective prices and payment shall constitute full compensation for all work complete, including incidentals. No separate payment will be made for testing, excavation, trenching and backfilling or for other items of work covered under this section of the specifications and all such costs

pertinent to these items shall be included in the applicable unit prices.

A. Sewer Service Line: PVC sewer service line shall be measured in linear feet along the centerline of the pipe, including fittings. Payment for sewer service lines 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 excavation, bedding, stabilization material, connections to the septic/pump tank, cleanouts, fittings, trench backfilling, record drawings, and final clean-up.

B. Cleanout: Payment for the two way cleanout shall be at the contract unit price shown in the Bid Schedule, and shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for complete installation; including, excavation, connections to the sewer service line, house plumbing, record drawings, and final clean-up.

C. Septic Tank: Payment for the septic tank shall be at the contract unit price shown on the Bid Schedule, and shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for complete installation; including excavation, record drawings, and final clean-up. Payment shall be compensation for all materials and labor required to furnish and install the septic tank including the effluent filter.

D. Pump Tank: Payment for the pump tank shall be at the contract unit price shown on the Bid Schedule, and shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for complete installation; including excavation, record drawings, and final clean-up. Payment shall be compensation for all materials and labor required to furnish and install the pump tank.

E. Septic/Pump Tank Risers: Payment for septic/pump tank manhole risers shall be at the unit price shown on the Bid Schedule, and based on actual feet (measured vertically) installed including one septic/pump tank cover for each riser. Payment shall be full compensation for all materials, labor, and equipment required for a complete installation. No separate payment for the cover shall be made.

F. Riser Safety Screen: Payment for septic/pump tank riser safety screens shall be at the unit price shown on the Bid Schedule. Payment shall be full compensation for all materials, labor, and equipment required for a complete installation.

G. Effluent Pump with Controls: Each effluent pump shall be counted and paid for at its respective unit price in the Bid Schedule. Payment shall be full compensation for all materials, labor and incidentals required to furnish and install the pump and controls including the concrete blocks/pump stand, pull chain, float switches, HOA switch, alarm, control enclosure box, above ground electrical wiring and conduit, 4x4 treated post, anchoring control box, all electrical connections to circuits and controls, effluent discharge piping, check valve(s), union, ball valve and wye fitting inside the effluent pump tank/lift station.

H. Electrical Cable: Buried electrical cable shall be paid on the basis of feet installed at the unit price in the Bid Schedule. Payment shall be full compensation for all labor, equipment, excavation, and materials including electrical cable, conduit and adapters necessary to install the electrical cables.

I. Effluent Force Line: The effluent force line shall be measured in linear feet along the center line of the pipe, and payment shall be at the unit price on the Bid Schedule. Payment shall be full compensation for all pipe, fittings, excavation, labor, and backfilling required to place the pipe.

J. Mound Material (clean sand, fill and topsoil): The clean sand, fill and topsoil shall be paid for at the lump sum as specified in the Bid Schedule. Payment shall be full compensation for all excavation, labor, and equipment required to place the mound material.

K. Manifold Pipe: The manifold pipe shall be measured in linear feet along the center line of the pipe, and payment shall be at the unit price on the Bid Schedule. Payment shall be full compensation for all pipe, fittings, excavation, labor, and backfilling required to place the pipe.

L. Perforated Pipe: The perforated pipe shall be measured in linear feet along the center line of the pipe. Payment shall be made at the unit price on the Bid Schedule and shall be full compensation for all excavation, labor, back-fill, gravel, fittings and perforated pipe and synthetic material.

M. Distribution Media:

1. Drainfield Gravel: The drainfield gravel for the mound shall be paid for at the lump sum or per cubic yard price as specified in the Bid Schedule. Payment shall be full compensation for all plant, labor and material to place the gravel.

2. Manufactured Chambers: Payment for chamber shall be made on a linear foot basis measured to the nearest foot and includes costs for the installation of manufactured chambers, stainless steel straps, end pieces, filter fabric (if required), and all required piping and fittings. Compensation shall include all labor, equipment, materials, and incidentals required for complete installation; including excavation, backfilling, record drawings, and final clean-up.

3. Mound Incidentals: All other incidental items not specifically covered in the other pay items shall be paid for on a lump sum basis per mound installation. These items include plowing of the original topsoil, removing excessive vegetation, seeding, protective cover for seeding, and the observation pipes. Payment shall be full compensation for all plant, labor, and material to complete all incidental items as specified.

N. Septic Tank Abandonment: Payment for abandonment of the existing septic tank shall be at the contract unit price measured each and shall be full compensation for pumping and crushing the existing concrete tank, backfilling the void left by the tank, and compacting the soil to prevent subsidence and to bring it to the same level as the surrounding grade.

O. Mound Abandonment: Payment for abandonment of the existing mound shall be at the contract unit price measured each and shall be full compensation for removing the observation pipes below grade, backfilling the void left by the pipes, and compacting the soil to prevent subsidence and to bring it to the same level as the surrounding grade.

SUBMITTAL REVIEW FORM, SECTION 13 –
INDIVIDUAL PRESSURIZED DOSED SEWAGE DISPOSAL SYSTEM

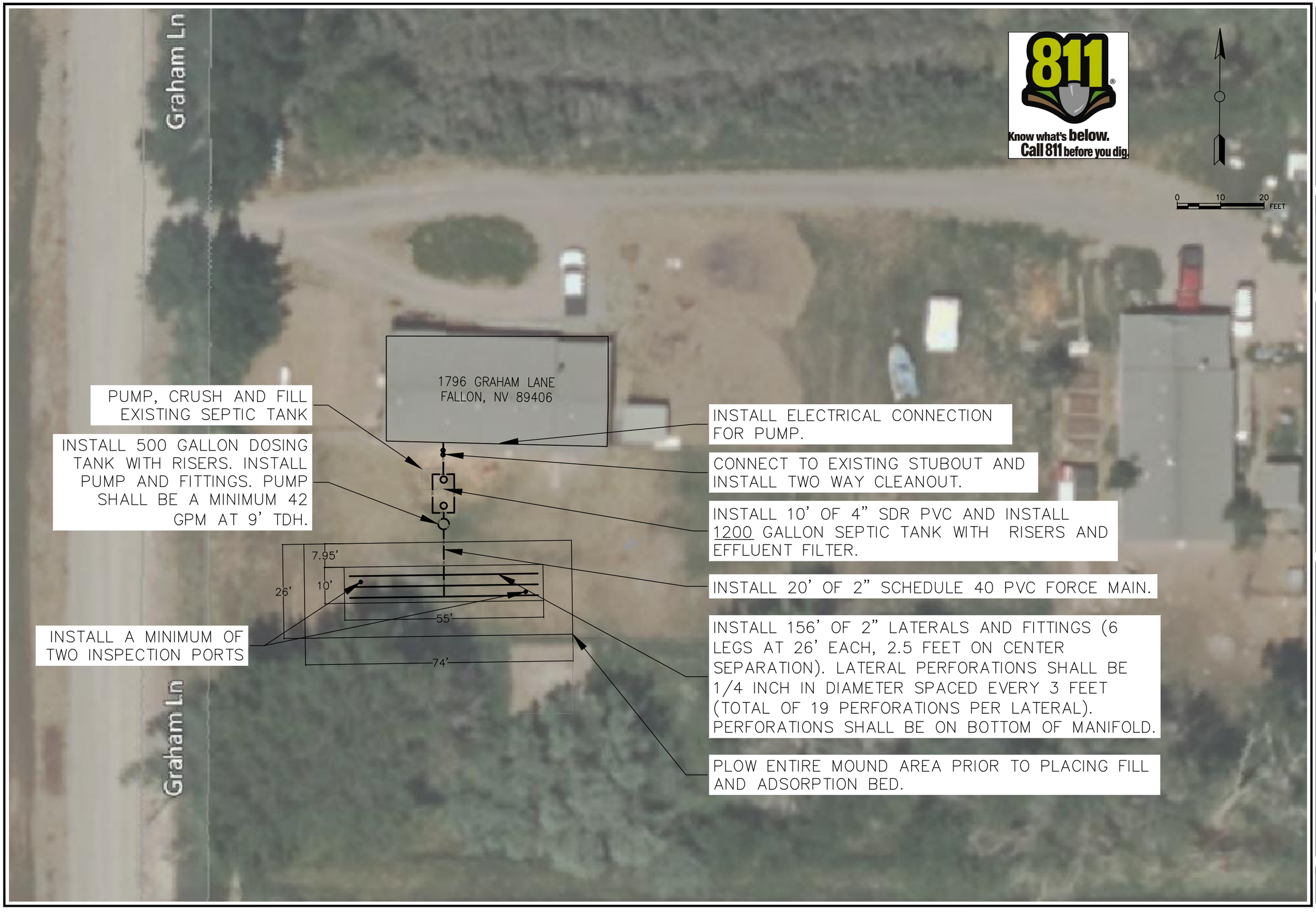
	Date	Initials	Submittal No.	
Received by ENGINEER:			Project No.	
Received by OWNER:			Contract No.	

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
13.03A 13.03M 13.03N 13.03P	PVC Sewer Pipe Manifold Pipe Perforated Pipe Observation Pipe		
13.03B	Cleanout, Fittings, Cap, Foam, Wire Mesh, Concrete		
13.03C 13.03E	Septic/Pump Tank		
13.03D	Effluent Filter		
13.03F	Septic/Pump Tank Risers, Safety Screen, Cover		
13.03G 13.03H 13.03I	Effluent Pump/Controls & Electrical Wiring		
13.03J	Effluent Discharge Line		
13.03L	Effluent Force Line		
13.03K	Check Valve/Ball Valve		
13.03P	Mound Material and Sieve Analysis		
13.03O	Perforated Pipe Distribution Media		
13.03Q	Filter Fabric		

13.03S	Paint		
13.03T	Pipe Hangers		
13.03U	Expanding Foam		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

CONSTRUCTION DRAWINGS



DATE	REVISIONS	INIT.

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THE FALLON PAIUTE-SHOSHONE TRIBE

CHURCHILL COUNTY, NEVADA

J. DOWNS PROPOSED MOUND SEPTIC SYSTEM
PH22-F90-G

DRAWN BY: S.L. DATE: 10/24
CHECKED BY: DATE:
APPROVED BY: DATE:

FILE NAME: K BOWEN - MOUND SYSTEM
RN NUMBER: RN32-24
PROJ ENG: SOPHIA LOPEZ

SITE PLAN

SHEET 1 OF 4

DATE	REVISIONS	INT.

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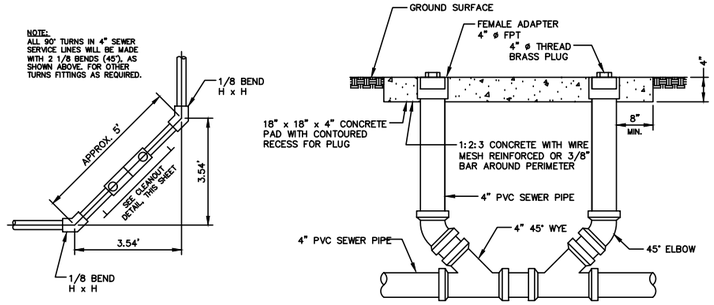
THE FALLON PAIUTE-SHOSHONE TRIBE
CHURCHILL COUNTY, NEVADA
JOAN DOWNS PROPOSED MOUND SEPTIC SYSTEM
###

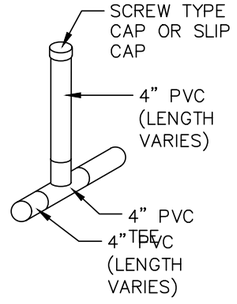
DRAWN BY: S.L. DATE: 3/24
CHECKED BY: DATE:
APPROVED BY: ### DATE: ###

FILE NAME: JOAN DOWNS - MOUND SYSTEM
RN NUMBER: ###
PROJ ENG: SOPHIA LOPEZ

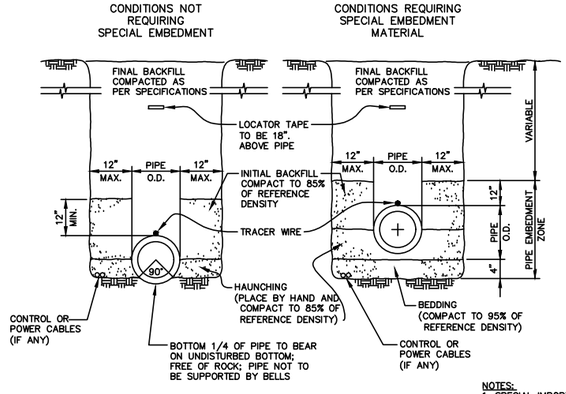
SITE PLAN
SHEET 2 OF 4



7A **SEWER SERVICE CLEANOUT**
Scale: N.T.S.

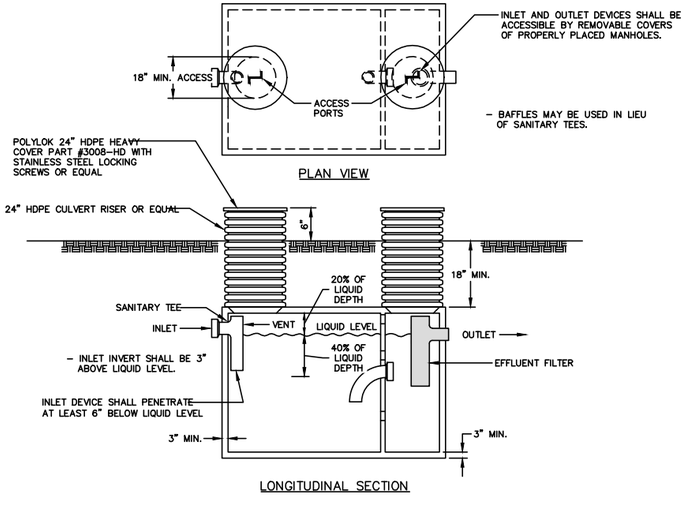


13B **AT-GRADE OBSERVATION PIPE**
Scale: N.T.S.

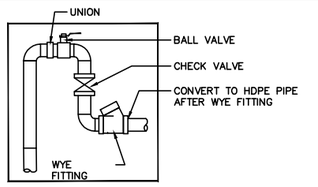


NOTES:
1. SPECIAL IMPORTED BEDDING AND HAUNCHING MATERIAL SHALL MEET THE CRITERIA OF THE UNIFIED SOILS CLASSIFICATION SYSTEM FOR GW, GP, SW OR SP SOILS.
2. ATTACH TRACER WIRE TO PIPE 3 TIMES PER 20' PIPE LENGTH, MINIMUM.

1A **TYPICAL TRENCH SECTIONS**
Scale: N.T.S.

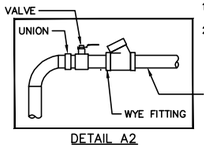


12A **TYPICAL TWO COMPARTMENT SEPTIC TANK**
Scale:NTS



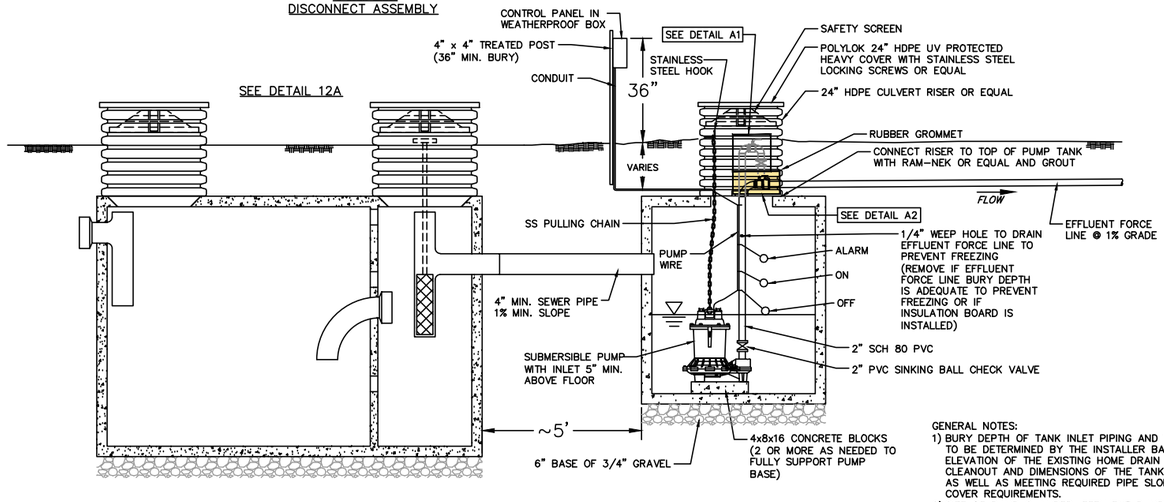
DETAIL A1
DISCONNECT ASSEMBLY

SAFETY SCREEN



DETAIL A2

DISCONNECT ASSEMBLY NOTES:
1) COMPONENTS IN DETAIL A1 AND A2 ARE TO BE WITHIN THE RISER.
2) DISCONNECT ASSEMBLY SHALL BE SET TO BE REACHED WITHIN 24" OF THE TOP OF THE RISER



GENERAL NOTES:
1) BURY DEPTH OF TANK INLET PIPING AND TANK FLOORS TO BE DETERMINED BY THE INSTALLER BASED ON THE ELEVATION OF THE EXISTING HOME DRAIN PIPING, 2-WAY CLEANOUT AND DIMENSIONS OF THE TANKS INSTALLED, AS WELL AS MEETING REQUIRED PIPE SLOPE AND TANK COVER REQUIREMENTS.
2) SIZE OF PUMP CHAMBER, EFFLUENT PUMP, PIPING AND FITTINGS TO BE SHOWN ON THE PLANS. FLOAT HEIGHTS (ELEVATIONS) TO BE SHOWN ON THE PLANS.
3) USE BOLLARDS AS NEEDED OR SHOWN ON THE PLANS TO PROTECT PUMP AND/OR CONTROL PANEL.
4) CONCRETE BLOCKS USED SHALL BE COMMON IN SIZE.

13A **MOUND SYSTEM PUMP TANK**
Scale:NTS

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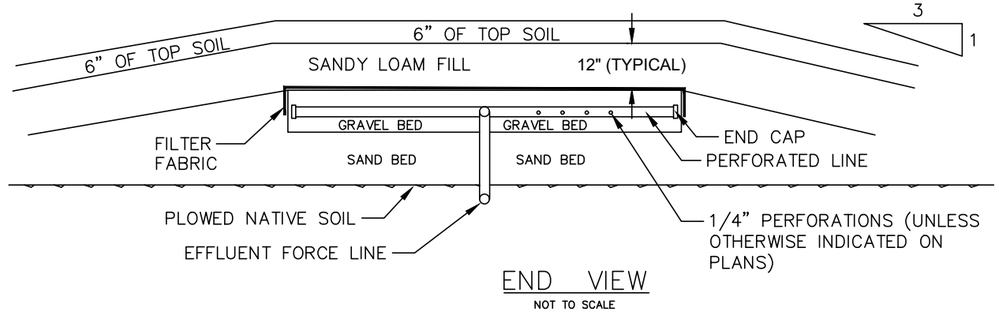
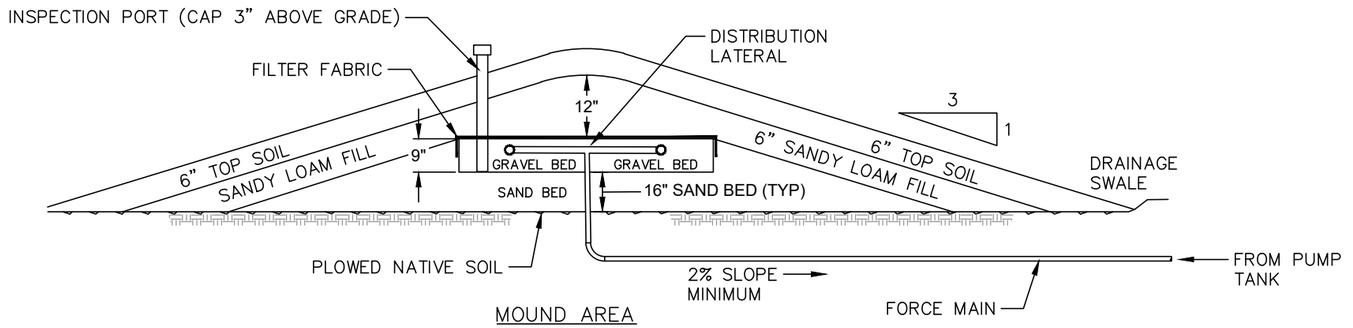
Details I
SHEET 3 OF 4

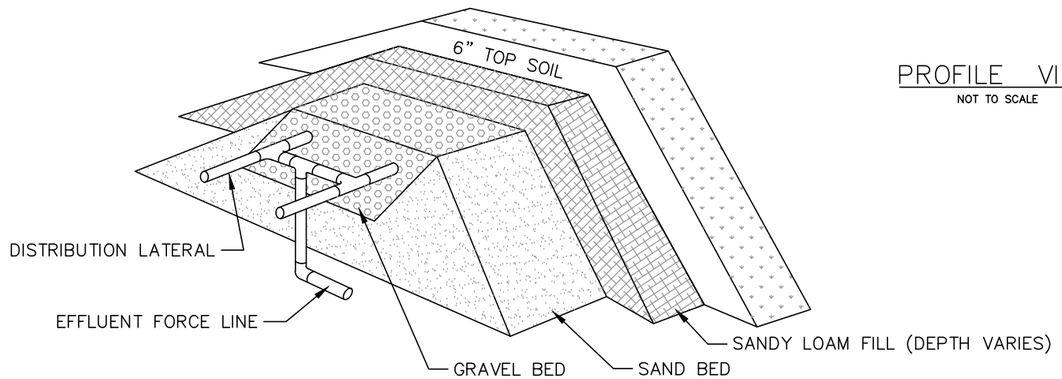
THE FOLLOWING ITEMS WILL BE CALLED OUT ON THE PLANS:
1. LATERAL DIAMETER
2. PERFORATION SPACING
3. PERFORATION SIZE (IF OTHER THAN 1/4")
4. FORCE MAIN DIAMETER



END VIEW
NOT TO SCALE



MOUND AREA



MOUND AREA – ISOMETRIC

PROFILE VIEW
NOT TO SCALE

13E **MOUND SYSTEM (DOUBLE LATERAL IN GRAVEL MEDIA) DETAIL**
Scale:NTS

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Details II
SHEET 4 OF 4