



HUALAPAI TRIBE
Hualapai Indian Reservation

Public Services

P. O. Box 179
Peach Springs, Arizona 86434
Phone (928) 769-2216
FAX (928) 769-2343

**REQUEST FOR QUOTES
FOR
COMMUNITY WATER AND WASTEWATER
SERVICE FOR FAYEANNE CROOK & MARY
MANAKAJA HOMESITE'S PH 20-F68;
WA 17-21**

Original Issue Date: August 2021 (Crook Site)
Re-Issue Date: April 2022 (Manakaja and Crook Site)

The Hualapai Indian Tribe (Tribe), through the Tribal Council and the Public Services Department, seeks quotes from qualified contractors to install water and wastewater service lines to a residential home on the Hualapai Indian Reservation (Reservation) in Buck and Doe, Arizona.

Scope of Work

The Contractor shall install individual services for two homes. FayeAnne Crook shall have installed 209 feet of one and one half inch water service line with appurtenances and 154 feet of sewer service line as shown on the construction drawings with estimated quantities on the bid schedule. Mary Manakaja shall have installed 609 feet of one and one half inch water service line with appurtenances and 133 feet of sewer service line, 1000 gallon septic tank with 352 feet drainfield. Please see the attached contract and appendices.

Requests for Information

Questions concerning this Request for Quotes may be submitted in writing as a Request for Information (RFI). Submissions will be made via e-mail. Please send RFIs to the attention of Philip Wisely, Public Services Director, at Philip.Wisely@Hualapai-nsn.gov.

Other Information

Prior to start of the work, the successful firm must possess a Tribal Permit, the permit will be obtained from the Game and Fish Department. All sub-contractors and service providers must also possess a Tribal Permit. The successful firm must also complete and submit a Compliance Plan under the Tribe's Tribal Employment Rights Office (TERO) to assure that qualified Tribal members are given opportunities to perform work as employees of the firm or team.

Contact Information

Permits	TERO Compliance Plans
Winkie Crook, Game and Fish Director PO Box 249 Peach Springs, AZ 86434 928-769-2227 Winkie.Crook@Hualapai-nsn.gov	Bobby Havatone, TERO PO Box 179 Peach Springs, AZ 86434 928-769-2216 Bobby.Havatone@Hualapai-nsn.gov

Project Coordinator	Indian Health Service
Philip Wisely, Public Services Director PO Box 179 Peach Springs, AZ 928-769-2216 Philip.Wisely@Hualapai-nsn.gov	Marcus Felter, Environmental Engineer 1553 West Todd Dr., Suite 104 Tempe, AZ 85283 480-466-7829 Marcus.Felter@ihs.gov

APPENDICES

Appendix A – Contract

Appendix B – Bid Schedule

Appendix C – General Conditions

Appendix D – Supplementary Conditions

Appendix E – Labor Provisions

Appendix F – Technical Provisions (Specifications)

Appendix G – Construction Drawing

APPENDIX A

**HUALAPAI TRIBAL NATION
PROFESSIONAL SERVICE CONTRACT**

This Contract is made between the Hualapai Tribe, Public Services Department, Peach Springs, AZ 86434 (the "Tribe"), and, _____, an independent contractor, whose address is _____.(Tax ID. No.)_____. (the "Contractor"). The Tribe agrees to contract for the service of Contractor and Contractor agrees to provide services, under the terms and conditions of this Contract.

1. Description of Services:

Contractor shall provide the following services to the Tribe:

Refer to bid schedule.

2. Deliverables:

In addition to the work described in the Statement of Work, Attachment A, Contractor shall submit to the Tribe the following reports or other work products:

Draft Safety Plan

Final Safety Plan

3. Payment for Services.

In full consideration of the personal services to be provided under this Contract, the Tribe agrees to pay Contractor as follows:

the fixed sum of \$_____ for the services described in Attachment A, Statement of Work, or; in (monthly) progress payments based on **invoice. Not to exceed \$_____.**

at the rate of _____ \$ per hour, up to maximum of \$_____ per day, for services described in Attachment 1, Statement of Work, but not to exceed the sum of \$_____ for all work under this Contract unless authorized in writing by the Tribe's_____.

As a precondition to receipt of any payments under this Contract, Contractor must provide the Tribe with invoices detailing all work performed under this Contract since the previous invoice. Such invoices shall include a detailed description of services provided in the time period since the last invoice was submitted. Invoices shall be submitted to the Tribe: bi-weekly, or monthly, or upon completion of the Contract: Contractor will be paid monthly according to monthly invoices submitted for payment. **Contract not to exceed \$_____.**

Payment for approved invoices will be made within Thirty (30) days of receipt of such invoices by The Accounting Department of the Tribe. Final billing must be received within thirty (30) days of the completion or termination of this Contract.

Contractor further agrees that final payment for his services will be made after a review of the work performed is completed by the Tribes Principal Contacts. If the work is found to be unsatisfactory, the Tribe reserves the right to withhold final payment indefinitely until all deficiencies are corrected.

4. Period of Performance.

Performance on this project shall start no later than 10 days from the issuance of a Notice to Proceed and shall end no later than 45 days after the Notice, unless terminated earlier as provided in this Contract. This period of performance may be extended only by the written agreement of the Tribe and the Contractor.

Contractor agrees that he is solely responsible for beginning and completing this Contract by the dates specified in this Contract.

Contractor agrees that he shall be responsible for any costs to the Tribe associated with not completing this Contract by the scheduled ending date, unless unforeseen circumstances beyond control was caused by the management of the Tribe.

5. Principal Contacts.

All notices under this Contract shall be sent to the following designated Principal Contacts under this Contract. The Tribe may change its Principal Contacts at any time by written notification.

Tribe's principal contact:

Contracting Officer Mr. Philip G. Wisely, P.E.
Director,
Hualapai Public Services Department

Compliance Officer Ms. Salena Siyuja
Hualapai Grants and Contracts Department

Contractor's principal contact: _____
Representative

Contractor and his work shall be monitored by the **Public Services Department**, to determine whether the Contractor is in compliance with this Contract.

6. Independent Contractor.

It is understood and agreed that Contractor is an independent contractor with respect to all work to be performed under this Contract, and that Contractor is not an agent or employee of the Tribe. It is further understood and agreed that Contractor is not authorized to act on behalf of the Tribe, and that actions of Contractor are not actions of the Tribe.

Contractor will be responsible for providing all tools and equipment necessary to perform the tasks associated with this contract.

Contractor will be responsible for paying all employees or subcontractors he hires to perform any of the work under this Contract. Contractor's employees and subcontractors are not the employees of the Tribe. Contractor is solely responsible for paying his employees and subcontractors and for any obligation to payor withhold any federal, state, tribal, or local taxed on the amounts Contractor pays to his employees and subcontractors.

Contractor will be responsible for payment of all applicable federal, state, tribal and local taxed, and/or special levies required under unemployment insurance, social security, income tax, and/or other laws, with respect to Contractor's performance of his obligations and receipt of payment under

this Contract. The Tribe will not withhold any taxes payable by the Contractor on the amounts paid to Contractor under this Contract.

Contractor and the Tribe shall each retain its right to conduct its own separate business affairs, provided that such affairs do not interfere with the parties' obligations under this Contract.

7. Representations and Warranties of Contractor.

Contractor represents and warrants to the Tribe that he is not subject to any obligations, contracts, or restrictions that would prevent him from entering into or carrying out the provisions of this Contract. Contractor further represents and warrants that he has all of the qualifications, education, experience and skills required to complete the work intended to be completed under this Contract. If Contractor is not so qualified, his lack of qualification is grounds for immediate termination of this Contract by the Tribe without liability. Contractor shall devote his best efforts to carry out the work required by this Contract in accordance with the standard of care, skill and diligence normally adhered to by a person in this field providing similar services.

8. Termination.

This Contract may be terminated by either party at any time without cause by giving thirty (30) days advance written notice of such termination to the other party. Contractor shall only be paid for work performed and reasonably billed for prior to the effective date of termination except as may be stipulated in Attachment 1. Contractor's obligations under Articles 9 through 11 shall survive, and shall not be affected by, termination of this Contract.

9. Indemnification.

Contractor shall be responsible for any wrongful or negligent acts or omissions performed by him, his employees or his subcontractors associated with his performance under this Contract and agrees to indemnify and hold the Tribe harmless from any liability or damage to person or property that arises from or is related to any such act or omission, including any attorney fees that may be incurred.

10. Confidentiality.

Contractor acknowledges that all information related to Contractor's work under this Contract, including all findings, reports, and other information either provided directly or indirectly by the Tribe in connection with the Contract or developed, compiled or created by Contractor in performing his services under this Contract, and all improvements made or conceived by Contractor under this Contract, is confidential and proprietary information owned by, and of great value to, the Tribe. Accordingly, Contractor agrees not to disclose any such confidential information to any person without the prior, written authorization of the Chairman of the Hualapai Tribe.

Regardless of how or when this Contract is terminated, within five (5) working days of completion of the work under this Contract, Contractor shall deliver to the Tribe all copies (including those on computer disk or other electronic medium) of all documents, drawings, specifications, and other materials or information which were furnished directly or indirectly by the Tribe to Contractor in connection with this Contract or which were prepared or acquired by Contractor in performance of services under this Contract.

Contractor shall not use any of the proprietary information described in this paragraph for anyone other than the Tribe's benefit.

11. Intellectual Property.

The title to all work completed by Contractor under or associated with this Contract shall be in the Tribe. Contractor will promptly disclose to the Tribe all inventions, improvements, designs, publications and ideas made or conceived by Contractor in the course of or associated with providing services under this Contract, regardless of whether Contractor develops those inventions, improvements, designs, publications or ideas after the termination on this Contract. Contractor agrees to assign to the Tribe all right and title to all such inventions, improvement, designs, publications and ideas, and all copyrights, patents, and royalties associated with or derived from such ideas.

12. Amendment.

This Contract may be amended only by a written document signed by the Contracting Officer, the Grants and Contracts Compliance Officer to the Tribe and by the Contractor, and approved by the Chairman or Vice Chairman of the Tribe.

13. Assignment.

All rights and obligations under this Contract are personal to Contractor, and Contractor may not assign this Contract, or any rights or obligations hereunder, to any person. Any such attempted assignment shall be void.

14. Governing Law.

This Contract shall be governed by the laws and ordinances of the Hualapai Tribe. All claims arising under or related to this Contract shall be brought to the Contract Officer, Grants & Contract Officer then to the Hualapai Tribal Court.

CONTRACTOR:

By _____
Authorized Officer

HUALAPAI TRIBE:

By: _____
Public Services Department Contract Officer

By: _____
Grants and Contracts Compliance Officer

By: _____
Chairman or Vice Chairman

Program to be charged: _____

Contract/Grant No.: _____

Line Item/ Account # : _____

APPENDIX B

BID

Proposal of _____
(hereinafter called "BIDDER") organized and existing under the laws of the State of _____ doing
business as _____
(a corporation, a partnership, an individual, etc.) to the Hualapai Tribe (hereinafter called "Owner").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of the **Community Water and Wastewater Service for Fayeane Crook & Mary Manakaja Homesite PH 20-F68 WA 17-21** in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated in the Bid Schedule.

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

BIDDER hereby agrees to commence WORK under this contract as specified in the NOTICE TO PROCEED and to fully complete the PROJECT within 45 consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of **\$250** for each consecutive calendar day thereafter as provided in Section 3 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

BID SCHEDULE

All bidders must bid for all line items, sections and schedules. Lengths and quantities are estimates. It is recommended that the Bidder verify/estimate by conducting a site visit.

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

Item	Description	Est Qty	Unit	Unit Cost	Total Cost
1	Mobilization/Demobilization	1	LS		
	Schedule A –Fayeanne Crook Site				
2	Water Service Line – 1-1/2 Inch DR 11 PE	209	LF		
3	Water Service Line Connection	1	EA		
4	Water Meter, PRV, and Box Combination	1	EA		
5	Sewer Service Line – 4 Inch SDR 35 PVC	154	LF		
6	Cleanouts – Two Way	2	EA		
	Schedule B – Mary Manakaja Site				
7	Water Service Line – 1 1/2 Inch DR 11 PE	609	LF		
8	Water Service Line Connection	1	EA		
9	Water Meter, PRV, and Box Combination	1	EA		
10	Sewer Service Line – 4 Inch SDR 35 PVC	133	LF		
11	Cleanouts – Two Way	1	EA		
12	Septic Tank – 1000 Gallon Concrete	1	EA		
13	Distribution Box	1	EA		
14	Chamber Drainfield	352	LF		
15	Open Cut Roadway Crossing	14	LF		
16	Septic Tank Riser	4	VF		
17	Safety Screen	2	EA		
18	Distribution Box Risers	5	VF		
				Subtotal	
				TERO 3%	
				TOTAL	

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

Note: Bidders claiming Indian Preference must attach a properly completed "Indian Owned Economic Enterprise Qualification Statement" to this bid. Failure to submit this form will void the Bidder's claim for Indian Preference. The "Indian Enterprise Qualification Statement" may be obtained from Philip Wisely; Phone (928) 769-2216.

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

Submitted by Bidder:

Signature

Title

Firm

Mailing Address

License Number (if applicable)

City, State, Zip Code

Date

Telephone Number

Federal Employer ID Number

FAX Number

(SEAL if BID is by a corporation)

Attest _____

APPENDIX C

GENERAL PROVISIONS

- | | |
|--|--|
| 01. Definitions | 26. Protection of Existing Vegetation, Structures, Equipment, Utilities and Improvements |
| 02. Terminology | 27. Operations and Storage Areas |
| 03. Contract Time and Liquidated Damages | 28. Accident Prevention and Safety Program |
| 04. Amending and Supplementing Contract Documents | 29. Temporary Sanitary Facilities |
| 05. Drawings and Specifications | 30. Supervision by Contractor |
| 06. Equal Employment Opportunity | 31. Subcontracting |
| 07. Clean Air and Water | 32. Cleanup and Finish Grading |
| 08. Cultural Resources | 33. Guaranty |
| 09. Land and Rights of Way | 34. Indemnification |
| 10. Site Investigation and Conditions Affecting the Work | 35. Separate Contracts |
| 11. Differing Site Conditions | 36. Suspension of Work, Termination and Delay |
| 12. Underground Facilities | 37. Inspection and Testing |
| 13. Hazardous Environmental Conditions at Site | 38. Correction of Defective Work |
| 14. Insurance | 39. Changes in the Work |
| 15. Contract Security | 40. Changes in Contract Price |
| 16. Progress Schedules and Requirements for Compliance | 41. Use and Possession Prior to Completion |
| 17. Reports and Records | 42. Substantial Completion |
| 18. Submittals | 43. Variation in Estimated Quantities |
| 19. Materials, Services and Facilities | 44. Payments to Contractor |
| 20. Buy American Act | 45. Assignments |
| 21. Substitutions | 46. Acceptance of Final Payment as Release |
| 22. Patents | 47. Engineer's Role and Authority |
| 23. Surveys, Permits and Regulations | 48. Resolution of Disputes |
| 24. Laws and Regulations Affecting Work | |
| 25. Taxes | |

1. DEFINITIONS

- 1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:
- 1.2 ADDENDA - Written or graphic instruments issued prior to the execution of the AGREEMENT which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications or corrections.
- 1.3 AGREEMENT - The written instrument which is evidence of the AGREEMENT between the OWNER and CONTRACTOR covering the WORK.
- 1.4 ASBESTOS - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
- 1.5 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.
- 1.6 BIDDER - Any person, firm or corporation submitting a BID for the WORK.
- ~~1.7 BONDS - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.~~
- 1.8 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.
- 1.9 CLAIM - A demand or assertion by the OWNER or CONTRACTOR seeking an adjustment of CONTRACT PRICE or CONTRACT TIMES, or both, or other relief with respect to the terms of the CONTRACT. A demand for money or services by a third party is not a CLAIM.
- 1.10 CONTRACT - The entire and integrated written AGREEMENT between the OWNER and CONTRACTOR concerning the WORK, including all Contract Documents as defined in the Agreement, these General Provisions and the Supplementary Conditions. The CONTRACT supersedes prior negotiations, representations, or agreements, whether written or oral.
- 1.11 CONTRACT DOCUMENTS - The CONTRACT DOCUMENTS establish the rights and obligations of the parties and include the AGREEMENT, ADDENDA (which pertain to the Contract Documents), CONTRACTOR's BID (including documentation accompanying the BID and any post bid documentation submitted prior to the NOTICE OF AWARD) when attached as an exhibit to the AGREEMENT, the NOTICE TO PROCEED, ~~the BONDS~~, these GENERAL CONDITIONS, the SUPPLEMENTARY CONDITIONS, the SPECIFICATIONS and the DRAWINGS as the same are more specifically identified in the AGREEMENT, together with all WRITTEN AMENDMENTS, CHANGE ORDERS, WORK CHANGE DIRECTIVES, FIELD ORDERS, and OWNER's written interpretations, and clarifications issued on or after the Effective Date of the Agreement. Approved submittals and the reports and drawings of subsurface and physical conditions are not Contract documents. Only printed or hard copies of the items listed in this paragraph are CONTRACT DOCUMENTS. Files in electronic media format of

- text, data, graphics, and the like that may be furnished by the OWNER to the CONTRACTOR are not CONTRACT DOCUMENTS.
- 1.12 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.
 - 1.13 CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.
 - 1.14 CONTRACTING OFFICER - The person with the OWNER organization who is authorized to administer the contract for the OWNER.
 - 1.15 CONTRACTING OFFICER'S REPRESENTATIVE - The representative of the CONTRACTING OFFICER authorized to deal with the CONTRACTOR at the site, to administer the technical aspects of the CONTRACT, and to assure compliance with the drawings and specifications.
 - 1.16 CONTRACTOR - The person, firm or corporation with whom the OWNER has executed the AGREEMENT.
 - 1.17 CULTURAL RESOURCES - Buildings, archaeological sites, districts and objects of national, State or local significance on or eligible for, inclusion in the National Register of Historic Places.
 - 1.18 DRAWINGS - The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.
 - 1.19 EFFECTIVE DATE OF THE AGREEMENT - The date indicated in the AGREEMENT on which it becomes effective, but if no such date is indicated, it means the date on which the AGREEMENT is signed and delivered by the last of the two parties to sign and deliver.
 - 1.20 ENGINEER - The person or entity named as such in the CONTRACT DOCUMENTS.
 - 1.21 FIELD ORDER - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the OWNER to the CONTRACTOR during construction.
 - 1.22 HAZARDOUS ENVIRONMENTAL CONDITION - The presence at the SITE of ASBESTOS, PCBs, PETROLEUM, HAZARDOUS WASTE, or RADIOACTIVE MATERIAL in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the WORK.
 - 1.23 HAZARDOUS WASTE - The term HAZARDOUS WASTE shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
 - 1.24 NOTICE OF AWARD - The WRITTEN NOTICE by the OWNER to the apparent successful BIDDER stating that upon timely compliance by the apparent successful BIDDER with the conditions precedent listed therein, the OWNER will sign and deliver the AGREEMENT.
 - 1.25 NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.
 - 1.26 OWNER - A public or quasi-public body or authority, Tribe, corporation, association, partnership, or individual for whom the WORK is to be performed.
 - 1.27 PARTIAL UTILIZATION - Use by OWNER of a substantially completed part of the WORK for the purpose for which it is intended (or a related purpose) prior to SUBSTANTIAL COMPLETION of all the WORK.
 - 1.28 PCBs - Polychlorinated biphenyls.
 - 1.29 PETROLEUM - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel, oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
 - 1.30 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.
 - 1.31 RADIOACTIVE MATERIAL - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
 - 1.32 SITE - Lands or areas indicated in the CONTRACT DOCUMENTS as being furnished by the OWNER upon which the WORK is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by the OWNER which are designated for the use of the CONTRACTOR.
 - 1.33 SUBMITTALS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.
 - 1.34 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship; synonymous with TECHNICAL PROVISIONS.

- 1.35 SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.
- 1.36 SUBSTANTIAL COMPLETION - The time at which the WORK (or a specified part thereof) has progressed to the point where, in the opinion of the OWNER, the WORK (or a specified part thereof) is sufficiently complete, in accordance with the CONTRACT DOCUMENTS, so that the WORK (or specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the WORK refer to SUBSTANTIAL COMPLETION thereof.
- 1.37 SUPPLEMENTARY CONDITIONS - That part of the CONTRACT DOCUMENTS which amends or supplements these GENERAL CONDITIONS.
- 1.38 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.
- 1.39 TRIBE - The Indian tribe which has jurisdiction on the Indian Reservation on or near which the WORK will be performed.
- 1.40 UNDERGROUND FACILITIES - All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, or other liquids or chemicals, or traffic or other control systems.
- 1.41 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS and all materials and equipment incorporated or to be incorporated in the PROJECT.
- 1.42 WORK CHANGE DIRECTIVE - A written statement to the CONTRACTOR issued on or after the EFFECTIVE DATE of the AGREEMENT and signed by the OWNER, ordering an addition, deletion, or revision in the WORK, or responding to differing or unforeseen subsurface or physical conditions under which WORK is to be performed or to emergencies. A WORK CHANGE DIRECTIVE will not change the CONTRACT PRICE or the CONTRACT TIMES but is evidence that the parties expect that the change ordered or documented by a WORK CHANGE DIRECTIVE will be incorporated in a subsequently issued CHANGE ORDER following negotiations by the parties as to its effect, if any, on the CONTRACT PRICE or CONTRACT TIMES.
- 1.43 WRITTEN AMENDMENT - A written statement modifying the CONTRACT DOCUMENTS, signed by the OWNER and the CONTRACTOR on or after the EFFECTIVE DATE of the AGREEMENT and normally dealing with the non-engineering or non-technical rather than strictly construction-related aspects of the CONTRACT DOCUMENTS.
- 1.44 WRITTEN NOTICE - Any notice to any party of the AGREEMENT relative to any part of this AGREEMENT in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. TERMINOLOGY

- 2.1 Intent of Certain Terms or Adjectives
- 2.1.1 Whenever in the CONTRACT DOCUMENTS the terms "as allowed", "as approved," or terms of like effect or import are used, or the adjectives, "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the WORK, it is intended that such action or determination will be solely to evaluate, and make recommendations to the owner, in general, the completed WORK for compliance with the requirements of and information in the CONTRACT DOCUMENTS and conformance with the design concept of the completed PROJECT as a functioning whole as shown or indicated in the CONTRACT DOCUMENTS (unless there is a specific statement indicating otherwise).
- 2.2 The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.
- 2.3 Defective
- 2.3.1 The word "defective", when modifying the word "WORK," refers to WORK that is unsatisfactory, faulty, or deficient in that it does not conform to the CONTRACT DOCUMENTS or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to OWNER'S final payment.
- 2.4 Furnish, Install, Perform, Provide
- 2.4.1 The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the SITE (or some other specified location) ready for use or installation and in usable or operable condition.
- 2.4.2 The word "install", when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
- 2.4.3 The words "perform" or "provide", when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

2.4.4 When "furnish", "install," "perform", or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, "provide" is implied.

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

3. CONTRACT TIME AND LIQUIDATED DAMAGES

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

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

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

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

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

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

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

4. AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS

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

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

5. DRAWINGS AND SPECIFICATIONS

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

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

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

6. EQUAL EMPLOYMENT OPPORTUNITY

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

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

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

- 6.1.3 The CONTRACTOR agrees to post in conspicuous places available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
- 6.1.4 The CONTRACTOR shall, in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants shall receive consideration for employment without regard to race, color, religion, sex, or national origin.
- 6.1.5 The CONTRACTOR shall send, to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representative of the CONTRACTOR's commitment under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.
- 6.1.6 The CONTRACTOR shall comply with all provisions of Executive Order No. 11246, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor.
- 6.1.7 The CONTRACTOR shall furnish all information required by Executive Order No. 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. Standard Form 100 (EEO - 1), or any successor form, is the prescribed form to be filed within 30 days following the award, unless filed within 12 months preceding the date of award.
- 6.1.8 The CONTRACTOR shall permit access to its books, records, and accounts by the OWNER or the Office of Federal Contract Programs (OFCCP) for the purposes of investigation to ascertain compliance with the applicable rules, regulations, and orders.
- 6.1.9 If the OFCCP determines that the CONTRACTOR is not in compliance with this clause or any rules, regulations, and orders of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the CONTRACTOR may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order No. 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the CONTRACTOR as provided in Executive Order No. 11246, as amended, the rules, regulations, or orders of the Secretary of Labor, or as otherwise provided by law.
- 6.1.10 The CONTRACTOR shall include the terms and conditions of this clause in every SUBCONTRACT or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order No. 11246, as amended, so that such provisions will be binding upon each SUBCONTRACTOR or vendor.
- 6.1.11 The CONTRACTOR shall take such action with respect to any SUBCONTRACT or purchase order as the OWNER may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the CONTRACTOR becomes involved in, or is threatened with litigation with a SUBCONTRACTOR or vendor as a result of such direction by the OWNER, the CONTRACTOR may request the OWNER and the United States to enter into such litigation to protect the interests of the United States.
- 6.1.12 Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60 - 1.1

7. CLEAN AIR AND WATER

- 7.1 The CONTRACTOR agrees:
 - 7.1.1 To comply with all the requirements of section 114 of the Clean Air Act (42 U.S.C. 7414) and section 308 of the Clean Water Act (33 U.S.C. 1318) relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Clean Air Act and the Clean Water Act, and all regulations and guidelines issued to implement those acts before the award of this contract.
 - 7.1.2 That no portion of the WORK required by this prime contract will be performed in a facility listed on the Environmental Protection Agency List of Violating Facilities on the date when this contract was awarded unless and until the EPA eliminates the name of the facility from the listing.
 - 7.1.3 To use best efforts to comply with clean air standards and clean water standards at the facility in which the contract is being performed.
 - 7.1.4 To insert the substance of this clause into any nonexempt SUBCONTRACT, including this subparagraph 7.1.4.

8. CULTURAL RESOURCES

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

9. LAND AND RIGHTS-OF-WAY

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

- 9.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.
- 9.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

10. SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

- 10.1 The CONTRACTOR will take steps necessary to ascertain the nature and location of the WORK, and investigate the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The CONTRACTOR also will observe and determine the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the OWNER, as well as from the drawings and specifications made a part of this CONTRACT. Any failure of the CONTRACTOR to take the actions described and acknowledged in this paragraph will not relieve the CONTRACTOR from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the WORK without additional expense to the OWNER.
- 10.2 The OWNER assumes no responsibility for any conclusions or interpretations made by the CONTRACTOR based on the information made available by the OWNER. The OWNER does not assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its representatives before the execution of this CONTRACT, unless that understanding or representation is expressly stated in this CONTRACT.

11. DIFFERING SITE CONDITIONS

- 11.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:
- 11.1.1 Subsurface or latent physical conditions at the SITE differing materially from those indicated in the CONTRACT DOCUMENTS; or
- 11.1.2 Unknown physical conditions at the SITE, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.
- 11.2 CONTRACTOR shall not be entitled to any adjustment in the CONTRACT PRICE or CONTRACT TIMES if:
- 11.2.1 CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of CONTRACT PRICE and CONTRACT TIMES by the submission of a BID or becoming bound under a negotiated CONTRACT; or
- 11.2.2 the existence of such a condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the SITE and contiguous areas required by the bidding requirements of CONTRACT DOCUMENTS to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or
- 11.2.3 CONTRACTOR failed to give the written notice as required by paragraph 11.1.
- 11.3 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any CLAIM of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such CLAIMS asserted before the date of final payment.

12. UNDERGROUND FACILITIES

- 12.1 Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing UNDERGROUND FACILITIES at or contiguous to the SITE is based on information and data furnished to OWNER or ENGINEER by the owners of such UNDERGROUND FACILITIES, including OWNER, or by others. Unless it is otherwise expressly provided in the SUPPLEMENTARY CONDITIONS:
- 12.1.1 OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and
- 12.1.2 The cost of all of the following will be included in the CONTRACT PRICE, and CONTRACTOR shall have full responsibility for:
- a. reviewing and checking all such information and data.
 - b. locating all UNDERGROUND FACILITIES shown or indicated in the CONTRACT DOCUMENTS,

- c. coordination of the WORK with the OWNERS of such UNDERGROUND FACILITIES, including OWNER, during construction and
- d. the safety and protection of all such UNDERGROUND FACILITIES and repairing any damage thereto resulting from the WORK.

12.2 Not Shown or Indicated

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

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

13. HAZARDOUS ENVIRONMENTAL CONDITION AT SITE

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

14. INSURANCE

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

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

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

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

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

15. CONTRACT SECURITY

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

until the new surety or sureties shall have furnished an acceptable BOND to the OWNER. The performance BOND shall remain in full force and effect through the guarantee period.

16. PROGRESS SCHEDULES AND REQUIREMENTS FOR COMPLIANCE

- 16.1 The CONTRACTOR shall within 10 days of receipt of NOTICE TO PROCEED, submit to the OWNER for approval a practicable schedule, showing the order in which the CONTRACTOR proposes to carry on the WORK, the dates on which he will start the major items of work (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule shall be prepared on the form entitled "Contract Progress Schedule", a copy of which is included in the CONTRACT. No progress payment shall be made to the CONTRACTOR until acceptable schedules are submitted to the OWNER.
- 16.2 If, in the opinion of the OWNER, the CONTRACTOR falls behind the progress schedule, the CONTRACTOR shall take such steps as may be necessary to assure performance within the allowable TIME FOR COMPLETION. The CONTRACTOR may propose for approval by the OWNER measures such as increasing number of workers, number of shifts, or overtime operations, days of work, or the amount of construction plant, or all of them. The OWNER may require the CONTRACTOR to submit for approval such supplementary schedule or schedules necessary to demonstrate that the WORK shall be performed within the allowable CONTRACT TIME, all without additional cost to the OWNER.
- 16.3 Failure of the CONTRACTOR to comply with the requirements of this provision shall be grounds for determination that the CONTRACTOR is not prosecuting the work with such diligence as will insure completion within the specified CONTRACT TIME. Upon such determination the OWNER may terminate the CONTRACTOR's right to proceed with the WORK, or any separable part thereof in accordance with Section 36 entitled "Suspension of Work, Termination and Delay".

17. REPORTS AND RECORDS

- 17.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.
- 17.2 The CONTRACTOR shall keep all records related to the CONTRACT for a minimum of three years after acceptance of the completed work.

18. SUBMITTALS

- 18.1 The CONTRACTOR shall provide SUBMITTALS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The OWNER shall promptly review all SUBMITTALS. The OWNER'S approval of any SUBMITTALS shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SUBMITTAL which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.
- 18.2 When submitted for the OWNER'S review, SUBMITTALS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SUBMITTALS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.
- 18.3 Portions of the WORK requiring a SUBMITTAL or sample submission shall not begin until the SUBMITTAL or submission has been approved by the OWNER. A copy of each approved SUBMITTAL and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the OWNER.
- 18.4 Submittal Procedures
 - 18.4.1 At the time of each SUBMITTAL, CONTRACTOR shall give OWNER specific written notice of such variations, if any, that the SUBMITTAL submitted may have from the requirements of the CONTRACT DOCUMENTS, such notice to be in a written communication separate from the SUBMITTAL; and in addition, shall cause a specific notation to be made on each SUBMITTAL submitted to OWNER for review and approval of each such variation.
 - 18.4.2 OWNER's review and approval of SUBMITTALS shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the CONTRACT DOCUMENTS unless CONTRACTOR has in writing called OWNER's attention to each such variation at the time of each SUBMITTAL as required by paragraph 18.4.1 and OWNER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the SUBMITTAL approval.

19. MATERIALS, SERVICES AND FACILITIES

- 19.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.
- 19.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.
- 19.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

- 19.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the OWNER.
- 19.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

20. BUY AMERICAN ACT

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

21. SUBSTITUTIONS

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

22. PATENTS

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

23. SURVEYS, PERMITS, REGULATIONS

- 23.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.
- 23.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.
- 23.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise specified in the CONTRACT DOCUMENTS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the OWNER in writing, and any necessary changes shall be adjusted as provided in Section 39 - "CHANGES IN THE WORK".

24. LAWS AND REGULATIONS AFFECTING WORK

- 24.1 The CONTRACTOR shall at all times observe and comply with Federal, State, City, County and Tribal laws, ordinances and regulations which in any manner affect the conduct of the WORK; and all such orders and decrees as exist at the present and which may be enacted later by legislative bodies or tribunals having legal jurisdiction or authority over the WORK. No pleas of misunderstanding or ignorance thereof will be considered. The CONTRACTOR shall be wholly responsible for any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree.
- 24.2 Changes in Tribal Laws or Regulations effected subsequent to the time of opening of BIDS (or, on the EFFECTIVE DATE of the AGREEMENT if there were no BIDS) having an effect on the cost or time of performance of the WORK may be subject of an adjustment in CONTRACT PRICE or CONTRACT TIME.

25. TAXES

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

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

- 26.1 The CONTRACTOR shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the WORK SITE, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The CONTRACTOR shall remove trees only when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the CONTRACTOR shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the OWNER.
- 26.2 The CONTRACTOR shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the CONTRACTOR. The existence and location of utilities are not guaranteed by the OWNER and shall be investigated and verified in the field by the CONTRACTOR before commencing construction activities in any particular area. The CONTRACTOR shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the CONTRACTOR fails or refuses to repair the damage promptly, the OWNER may have the necessary work performed and charge the cost to the CONTRACTOR.

27. OPERATIONS AND STORAGE AREAS

- 27.1 The CONTRACTOR shall confine all operations (including storage of materials) to areas authorized or approved by the OWNER. The CONTRACTOR shall hold and save the OWNER and its representatives, free and harmless from liability of any nature occasioned by the CONTRACTOR's performance.
- 27.2 Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the CONTRACTOR only with the approval of the OWNER and shall be built with labor and materials furnished by the CONTRACTOR without expense to the OWNER. The temporary buildings and utilities shall remain the property of the CONTRACTOR and shall be removed by the CONTRACTOR at its expense upon completion of the work. Only with the written consent of the OWNER may the buildings and utilities be abandoned and not removed.
- 27.3 The CONTRACTOR shall use only established roadways, or use temporary roadways constructed by the CONTRACTOR when and as authorized by the OWNER. In such case, the CONTRACTOR shall minimize disruption and delays to traffic in the affected areas. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the CONTRACTOR shall protect them from damage. The CONTRACTOR shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

28. ACCIDENT PREVENTION AND SAFETY PROGRAM

- 28.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby.
- 28.2 The CONTRACTOR shall be solely and completely responsible for conditions of the job site, including safety of all persons, including employees, and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable Federal, Tribal, State, County, and local laws, ordinances, codes, the requirements set forth below, and any regulations that may be detailed in other parts of these documents. Where any of these are in conflict, the more stringent requirement shall be followed. The CONTRACTOR's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth herein.
- 28.3 The OWNER or his Representative will notify the CONTRACTOR of any observed non-compliance with the foregoing provisions and the action to be taken. The CONTRACTOR shall, upon receipt of such notice, immediately take corrective action. If the CONTRACTOR fails or refuses to comply promptly, the OWNER may issue an order stopping all or part of the WORK until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of claims for extension of time, or for excess costs or damages by the CONTRACTOR.
- 28.4 The CONTRACTOR shall develop and maintain for the duration of this CONTRACT, a safety program that will effectively incorporate and implement all required safety provisions. The CONTRACTOR shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program.
- 28.5 The CONTRACTOR as a part of his safety program, shall maintain at his office or other well-known place at the jobsite, safety equipment applicable to the WORK as prescribed by the aforementioned authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons who may be injured on the jobsite.
- 28.6 If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the OWNER and the ENGINEER. In addition, the CONTRACTOR must promptly report in writing to appropriate authorities and the OWNER's representative all accidents whatsoever arising out of, or in connection with, the performance of the WORK whether on, or adjacent to, the site, giving full details and statements of witnesses. If a claim is made by anyone

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

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

29. TEMPORARY SANITARY FACILITIES

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

30. SUPERVISION BY CONTRACTOR

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

31. SUBCONTRACTING

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

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

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

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

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

32. CLEANUP AND FINISH GRADING

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

33. GUARANTY

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

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

33.1.2 normal wear and tear under normal usage.

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

33.2.1 observations by ENGINEER;

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

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

- 33.2.4 use or occupancy of the WORK or any part thereof by the OWNER;
- 33.2.5 any acceptance by the OWNER or any failure to do so;
- 33.2.6 any review and approval of a SUBMITTAL or the issuance of a notice of acceptability by the OWNER;
- 33.2.7 any inspection, test or approval by others; or
- 33.2.8 any correction of defective WORK by the OWNER.

34. INDEMNIFICATION

- 34.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.
- 34.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.
- 34.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or recommended approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

35. SEPARATE CONTRACTS

- 35.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the OWNER any defects in such WORK that render it unsuitable for such proper execution and results.
- 35.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.
- 35.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefore as provided in Sections 39 and 40.

36. SUSPENSION OF WORK, TERMINATION AND DELAY

- 36.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.
- 36.2 If the CONTRACTOR is adjudged as bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the OWNER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT, and of all construction materials thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be incorporated in a CHANGE ORDER.

- 36.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.
- 36.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR, the OWNER may without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the CONTRACT. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit. The reasonable profit shall be calculated in accordance with the provisions of Part 49 of the Federal Acquisition Regulation which are in effect on the date of this contract.
- 36.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to make recommendation on any request for payment within twenty (20) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the OWNER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to make recommendation on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days WRITTEN NOTICE to the OWNER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.
- 36.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

37. INSPECTION AND TESTING

- 37.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.
- 37.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.
- 37.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.
- 37.4 If the CONTRACT DOCUMENTS, Laws or Regulations of any public body having jurisdiction require any WORK (or part thereof) specifically be inspected, tested, or approved by an employee or other representative of such public body, the CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals pay all costs in connection therewith, and furnish the OWNER with required certificates of inspection or approval.
- 37.5 Inspections, tests or approvals by the OWNER or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.
- 37.6 The OWNER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.
- 37.7 If any WORK is covered contrary to the written instructions of the OWNER it must, if requested by the OWNER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.
- 37.8 If the OWNER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the OWNER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the OWNER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

38. CORRECTION OF DEFECTIVE WORK

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

- 38.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.
- 38.3 If within one year after the date of SUBSTANTIAL COMPLETION any WORK is found to be defective, or if the repair of any damages to the land or areas made available for the CONTRACTOR'S use by OWNER or permitted by Laws and Regulations is found to be defective, the CONTRACTOR shall promptly, without cost to the OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective WORK or, if the defective WORK has been rejected by the OWNER, remove it from the PROJECT and replace it with WORK that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other WORK, to the work of others or other land or areas resulting therefrom. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the OWNER may have the defective WORK corrected or repaired or may have their rejected WORK removed and replaced, and all costs will be paid by the CONTRACTOR.
- 38.4 Where defective WORK (and damage to other WORK resulting therefrom) has been corrected or removed and replaced under this paragraph 38, the correction period hereunder with respect to such WORK will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- 38.5 CONTRACTOR'S obligations under this paragraph 38 are in addition to any other obligation or warranty. The provisions of this paragraph 38 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

39. CHANGES IN THE WORK

- 39.1 Without invalidating the AGREEMENT and without notice to any surety, the OWNER may, at any time or from time to time, order additions, deletions, or revisions in the WORK by a WRITTEN AMENDMENT, a CHANGE ORDER, or a WORK CHANGE DIRECTIVE. Upon receipt of any such document, the CONTRACTOR shall promptly proceed with the WORK involved which will be performed under the applicable conditions of the CONTRACT DOCUMENTS (except as otherwise specifically provided).
- 39.2 The OWNER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the OWNER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the OWNER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.
- 39.3 If the OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the CONTRACT PRICE or CONTRACT TIME, or both, that should be allowed as a result of a WORK CHANGE DIRECTIVE, a Claim may be made therefore as provided in Section 48.

40. CHANGES IN CONTRACT PRICE

- 40.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:
- 40.1.1 Unit prices previously approved.
- 40.1.2 An agreed lump sum.
- 40.1.3 The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

41. USE AND POSSESSION PRIOR TO COMPLETION

- 41.1 The OWNER shall have the right to take possession of or use any completed or partially completed part of the WORK. Before taking possession of or using any work, the OWNER shall furnish the CONTRACTOR a list of items of WORK remaining to be performed or corrected on those portions of the work that the OWNER intends to take possession of or use. However, failure of the OWNER to list any item of work shall not relieve the CONTRACTOR of responsibility for complying with the terms of the CONTRACT. The OWNER's possession or use shall not be deemed an acceptance of any work under the CONTRACT.
- 41.2 While the OWNER has such possession or use, the CONTRACTOR shall be relieved of the responsibility for the loss of or damage to the WORK resulting directly from the OWNER'S possession or use. If prior possession or use by the OWNER delays the progress of the WORK or causes additional expense to the Contractor, an adjustment shall be made in the CONTRACT PRICE, the CONTRACT TIME or both, and the CONTRACT shall be modified in writing accordingly.

42. SUBSTANTIAL COMPLETION

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

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

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

43. VARIATION IN ESTIMATED QUANTITIES

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

44. PAYMENTS TO CONTRACTOR

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

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

The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. If the OWNER, at any time after fifty (50) percent of the WORK has been completed, finds that satisfactory progress is being made, the OWNER may reduce retainage to five (5%) percent on the current and remaining estimates. When the WORK is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages less authorized deductions.

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

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

- 44.5 If the OWNER fails to disapprove and return a partial payment estimate, or to approve and make payment to the CONTRACTOR within thirty (30) days after receipt of a recommendation by the ENGINEER, in addition to other remedies available to the

CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

45. ASSIGNMENTS

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

46. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

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

47. ENGINEER'S ROLE AND AUTHORITY

- 47.1 The ENGINEER shall act as the OWNER'S consultant during the construction period. He shall make recommendations to the OWNER on questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall assist the OWNER to interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and notify the OWNER if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.
- 47.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.
- 47.3 Neither the ENGINEER nor the OWNER will be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.
- 47.4 The ENGINEER does not have authority to obligate the OWNER to changes in the terms of the CONTRACT, or to give direction to the CONTRACTOR on behalf of the OWNER.

48. RESOLUTION OF DISPUTES

- 48.1 A good faith effort shall be made by all parties to the CONTRACT to resolve any claims or disputes prior to going to Arbitration.
- 48.2 All claims, disputes and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof which cannot be resolved by the CONTRACT parties, except for claims which have been waived by the making and acceptance of final payment as provided by Section 46, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.
- 48.3 Notice of the demand for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and with the American Arbitration Association. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.
- 48.4 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

APPENDIX D

SUPPLEMENTARY CONDITIONS

1. GENERAL SCOPE OF WORK

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

2. PRE-BID CONFERENCE

A Pre-Bid Conference is not necessary and therefore is not required. The CONTRACTOR will have access to the project site prior to bidding for the verification of conditions, or quantities, they may do so by contacting the OWNER. Any questions regarding the bid or bid documents should be addressed to the ENGINEER.

All explanations, suggestions, interpretations, clarifications, and changes made are not considered official and will not be enforceable or binding unless and until set forth in an Amendment to the solicitation or Request for Information (RFI) response.

3. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK

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

4. DAYS OF WORK AND HOURS OF WORK

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

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

5. LIQUIDATED DAMAGES

Liquidated Damages will be assessed in the amount of \$ **250** for each calendar day of delay beyond the Time For Completion stated in the Contract, or any extension thereof that may be granted pursuant to the terms of the Contract, until the work is determined by the Owner to be substantially complete.

6. PRE-CONSTRUCTION CONFERENCE AND PROJECT MEETINGS

Prior to commencing work on this contract, the Contractor shall be required to participate in a pre-construction conference with the Owner, Engineer, and other representatives designated by the Owner. The

purpose of this conference will be to discuss the authorities, duties, and responsibilities of parties involved and to plan operating procedures mutually satisfactory to those involved. It will also present an opportunity to resolve any questions regarding performance under the contract which have not been previously resolved.

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

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

7. UTILITIES

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

8. WARRANTIES

Unless otherwise indicated, the Contractor shall warrant all materials provided and work performed under this contract for a period of no less than one year from the date of final acceptance. The Contractor shall replace promptly and at his or her own expense any materials and workmanship which fails during this warranty period.

9. FINAL INSPECTION

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

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

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

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

10. ORDER OF PRECEDENCE

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

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

- B. Written bidding instructions.
- C. Supplementary Conditions.
- D. General Provisions.
- E. Submittals.
- F. Technical Provisions.
- G. Drawings.

11. INDIAN PREFERENCE

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

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

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

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

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

As used in this clause:

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

"Indian Tribe" means an Indian Tribe, pueblo, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant

to the Alaska Native Claims Settlement Act (85 Stat. 688; 43 U.S.C. 1601) which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

"Tribal Organization" shall be as defined in Section 4© of the Indian Self-Determination and Education Assistance Act (P.L. 93-638); that is: "the recognized governing body of any Indian Tribe; any legally established organization of Indians which is controlled, sanctioned or chartered by such governing body or which is democratically elected by the adult members of the Indian community to be served by such organization and which includes the maximum participation of Indians in all phases of its activities."

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

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

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

12. INDIAN PREFERENCE PROGRAM

Upon Notice of Award and prior to Notice to Proceed, the contractor will be required to submit a plan for the maximum utilization of Indian and Alaskan Native workers. Notice to Proceed will not be issued until the Owner has received and approved this plan.

For information on Indian Employment, bidders are advised to contact the Tribal TERO Officer;
Phone (760) 858-1116.

13. PROTECTION OF WORK

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

14. CONTRACT DOCUMENTS

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

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

15. RECORD DRAWINGS

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

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

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

- A. The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.
- B. The location and dimensions of any changes from the contract drawings.
- C. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabrication, erection, installation plans, and placing details, pipe sized, insulation materials, dimensions of equipment foundations, etc.
- D. All changes or modifications which result from the final inspection.
- E. All information as required in the technical provisions.
- F. Drawings showing one line diagrams with all conduit and wire sizes shown of the distribution systems, motor control centers, corrected wiring diagrams, equipment and conduit plans.
- G. Schematic (Elementary) Diagrams: This shall include, but not be limited to, complete schematics including items furnished by others for the following:
 - i. Motor Control Circuits for Starters furnished under this Contract.

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

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

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

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

16. ADDENDA AND INTERPRETATIONS

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

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

17. CONTRACTOR LICENSING

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

18. SUBMITTALS

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

Submittals are required:

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

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

Submittals may be drawings, sketches, manufacturer's literature, catalog descriptions, or other descriptions in sufficient detail to allow a decision. In addition, if the information supplied shows more than one model or style of equipment or material, the Contractor shall annotate the particular equipment or material he is submitting for approval. The information submitted for approval shall clearly show that the applicable sections of the specifications have been met. A transmittal letter shall accompany information submitted for approval. Items requiring approval must be approved by

the Engineer in writing prior to installation. The Contractor shall also give the name, address, and phone number of the firm from which the Contractor purchased the subject items. The Contractor shall also give the name, address, and phone number of the firm, which provides service, spare or additional parts for the subject items. The submittal will indicate the amount to be added to or deducted from the bid price should the submittal be accepted.

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

~~19. OPERATION AND MAINTENANCE MANUALS~~

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

- ~~A. Identification on the front cover stating the general nature of manual.~~
- ~~B. Neatly typewritten index near the front of the manual.~~
- ~~C. Complete instructions regarding operation, maintenance, and troubleshooting of all equipment involved. Material list of components with manufacturers' bulletins and list of replacement parts, their part numbers, current costs, and name and address of nearest vendor of the parts and equipment.~~
- ~~D. Operating Procedures: Include start up, break in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.~~
- ~~E. Maintenance Requirements: Include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.~~
- ~~F. Physical wiring diagram of all control system devices, accessory equipment, and the physical location of each wire between connection terminals on these devices.~~
- ~~G. Electrical schematic (ladder) diagram of the control system showing all circuits and control components in symbolic form using standard symbols. The diagram shall include a legend which explains all symbols.~~
- ~~H. Outline dimension and general physical arrangement drawings of each enclosure and panel board.~~
- ~~I. Copy of all guarantees and warranties issued.~~
- ~~J. Copy of approved shop drawings, with all data concerning all changes made during construction.~~

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

20. DISCOVERY OF ARCHEOLOGICAL OR HISTORICAL PROPERTIES

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

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

21. SAFETY REQUIREMENTS

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

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

All work within the right-of-way of a street, road, highway, sidewalk, trail, or other public thoroughfare, or work which requires encroachment into the right-of-way of a public thoroughfare, shall incorporate adequate signs, barricades, warning lights, and flagmen to ensure the protection of the work, protection of the employees, and the safety of the public. All open construction, obstructions, or other hazards left in place at the end of a work session shall be barricaded and marked by yellow warning lights, which shall be kept burning from sunset to sunrise. All signs, barricades, warning lights, and other traffic control devices, and all traffic control activities shall be in accordance with the most recent edition of the Federal Highway Administration "Manual On Uniform Traffic Control Devices" (ANSI D6.1), OSHA regulations, and the requirements of the transportation department which owns or maintains the thoroughfare.

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

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

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

22. STANDARD SPECIFICATIONS

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

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

23. NOTIFICATION REQUIREMENTS

It shall be the Contractor's responsibility to notify all utility companies involved whenever a utility line is to be cut, tapped, moved, or in any way disturbed from its original placement. Sufficient notice shall be given to the utility company so that its users can be informed of any disruption of service. Such notice must be given no less than 24 hours in advance.

APPENDIX E

LABOR PROVISIONS

1. DAVIS-BACON ACT

- (a) All laborers and mechanics employed or working upon the site of the WORK will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the CONTRACTOR and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions or paragraph (d) of this clause also, regular contributions made or costs incurred for more than a weekly period (but not less than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the determination for classification of work actually performed without regard to skill, except as provided in the clause entitled "Apprentices" and "Trainees." Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the CONTRACTOR and its subcontractors at the site of the WORK in a prominent and accessible place where it can be easily seen by the workers.
- (b) (1) The OWNER shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The OWNER shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met.
- (i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
 - (ii) The Classification is utilized in the area by the construction industry; and
 - (iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (2) If the CONTRACTOR and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the OWNER agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the OWNER to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator or an approved authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the OWNER or will notify the OWNER within a 30-day period of that additional time is necessary.
- (3) In the event the CONTRACTOR, the laborers or mechanics to be employed in the classification or their representatives, and the OWNER do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the OWNER shall refer the questions, including the views of all interested parties and the recommendation of the OWNER, to the Administrator of the Wage and Hour Division for determination. The Administrator or an authorized representative, will issue a determination within 30 days of receipt and so advise the OWNER or will notify the OWNER within the 30-day period that additional time is necessary.
- (4) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (b)(2) or (b)(3) of this clause, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the CONTRACTOR shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (d) If the CONTRACTOR does not make payments to a trustee or other third person, the CONTRACTOR may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, that the Secretary of Labor has found, upon the written request of the

CONTRACTOR, that applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the CONTRACTOR to set aside in a separate account assets for the meeting of obligations under the plan or program.

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

- (a) Overtime requirements: No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics (See Federal Acquisition Regulation 22.300) shall require or permit any such laborer or mechanic in any workweek in which individual is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (b) Violation, liability for unpaid wages, liquidated damages: In the event of any violation of the provisions set forth in paragraph (a) of this clause, the CONTRACTOR and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, employed in violation of the provisions set forth in paragraph (a) of this clause, in the sum of \$10 for each calendar day for which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the provisions set forth in paragraph (a) of this clause.
- (c) Withholding for unpaid wages and liquidated damages: The Contracting officer shall upon his or her own action or written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the CONTRACTOR or subcontractor under any such contract or any other Contract with the same Prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in paragraph (b) of this clause.
- (d) Payrolls and basic records:
- (1) The CONTRACTOR or subcontractor shall maintain payrolls and basic payroll records during the course of contract work and shall preserve them for a period of 3 years from the completion of the contract for all laborers and mechanics working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Nothing in this paragraph shall require the duplication of records required to be maintained for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act.
- (2) The records to be maintained under paragraph (d)(1) of this clause shall be made available by the CONTRACTOR or subcontractor for inspection, copying, or transcription by authorized representatives of the OWNER or the Department of Labor. The CONTRACTOR or subcontractor shall permit such representatives to interview employees during working hours on the job.
- (e) Subcontracts: The CONTRACTOR or subcontractor shall insert in any subcontracts the provisions set forth in paragraphs (a) through (d) of this clause and also a clause requiring the subcontractors to include these provisions any lower tier subcontracts. The Prime CONTRACTOR shall be responsible for compliance by any subcontractor or lower tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.

3. APPRENTICES AND TRAINEES

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

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

- (b) Trainees: Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employee and Training Administration withdraws approval of a training program, the CONTRACTOR will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (c) Equal Employment Opportunity: The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

4. PAYROLLS AND BASIC RECORDS

- (a) Payrolls and basic records relating thereto shall be maintained by the CONTRACTOR during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the WORK. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates or wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deduction made and actual wages paid. Whenever the Secretary of Labor has found under paragraph (d) of the clause entitled "Davis-Bacon Act" that the wages of any Laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the CONTRACTOR shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (b) (1) The CONTRACTOR shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the OWNER. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause. The information may be submitted in any form desired. Optional Form WH-347 Federal stock number 029-005-00014-1 is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance" signed by the CONTRACTOR or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following
 - (i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause entitled "Payrolls and Basic Records" and that such information is correct and complete.
 - (ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deduction as set forth in Regulations, 29 CFR Part 3 and
 - (iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

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

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

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

5. COMPLIANCE WITH COPELAND ACT REQUIREMENTS

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

6. WITHHOLDING OF FUNDS

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

7. SUBCONTRACTS (LABOR STANDARDS)

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

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

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

8. CONTRACT TERMINATION: DEBARMENT

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

9. DISPUTES CONCERNING LABOR STANDARDS

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

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

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

11. CERTIFICATION OF ELIGIBILITY

- (a) By entering into this contract, the CONTRACTOR certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government assisted contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government assisted contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

APPENDIX F

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 plant, 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 a competent person provided by the Contractor for evidence of hazardous conditions. Prior to the start of construction, the Contractor shall provide the Owner a list of scheduled inspections when required. A record of these daily 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.

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:

- A. All heavy construction machinery, such as trenching machines, bulldozers, and backhoes, must be equipped with a roll bar meeting the requirements of the above referenced regulation.
- B. Safety helmets shall be worn by all personnel working on the site.
- C. Safety shoes or boots will be worn by all personnel working on the site.
- D. When appropriate, proper eye protection will be worn by all personnel working on the site.
- E. When appropriate, proper gloves will be used by personnel working on the site.
- F. When appropriate, proper safety vest will be worn by all personnel working on the site.

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-03 U.S. Customary Units – Section 614" 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 insure 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 insure 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, not shown on the drawings and to confirm the exact locations of those existing utilities shown on the drawings. 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 or 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.
 - 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 designate water, and green designates sewer. Spacing between tracer wire access points shall be indicated on the plans or as specified by 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 inch from the marker top as shown on details. The 6 inch tape shall be 3M High Density Yellow Pressure Sensitive or approved equal.
 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. 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 concrete in 12 inch diameter holes and depth of bollard 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.

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 drawings 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 Tribal 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 the price.

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. The Contractor shall also 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. 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-inches trench width, regardless of the actual trench width and depth excavated. For structures, the rock shall be profiled 12-inches outside the perimeter of the structure and computed based on a product of the profile of the rock and an assumed 24-inches outside the structure's perimeter and 6-inches below the structure's footing. The rock volume will be computed as the product of the profiled rock area, as measured 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 by one of the following methods:

- a. Excavating and exposing the rock profile for measurement. 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. 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 structure. Loose rock shall not be used for backfill. Loose rock excavation shall be measured in cubic yards, including the total volume of only those rocks or boulders that are individually over one (1) cubic yard in volume.

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, and etcetera) 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.

All water removed from trenches shall be conveyed to natural drainage channels, storm sewers, or proper reservoirs as approved by 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-01.08.G.

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 vertical clearance of at least 18 inches between the bottom of the sewer line and the top of the water line shall be maintained. The water line shall be the normal water distribution pipe as specified on the construction drawings, with a 20 foot pipe section centered on the sewer crossing. 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-01.08.G.

- 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-01.08.G, shall be required where a water line is placed within ten (10) feet and within three (3) feet vertical above a pressurized sewer line.

Extra protection, as described in section TP-01.08.G, 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-01.08.G.

- 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-01.08.G.

- E. Separation between Water Lines and Components of the Sewage Disposal System: Water lines shall not be installed within ten (10) feet of a septic tank, within 25 feet of a septic drainfield, or 50 feet from an outhouse. Also, waterlines shall not be installed within 100 feet of the perimeter fence of an individual lagoon, or within 500 feet of the perimeter fence of a 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 or the water and 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.

TP - 01.11 BACKFILLING:

Trenches shall not be backfilled until the Owner or Owner's Representative has inspected and approved the pipe installation and jointing as being in compliance with the requirements of plans and specifications.

- 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 to at least 90% of the reference density for this material as described herein. Soil 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-01.11 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-01.11. 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 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 centerline), and initial backfill material (extending from pipe 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.
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. If over-excavation is required, bedding material is to be compacted to 90% of the maximum dry density as determined by the Standard Proctor density test (ASTM D-6938). Haunching material shall be placed by hand and worked under the pipe haunch to provide adequate side support for the pipe.

Haunching and initial backfill material shall be compacted to 90% of the maximum dry density as determined by the Standard Proctor density test (ASTM D-6938). Care shall be taken to ensure that the pipe is not supported by the bells of the pipes.

2. Haunching: Haunching is the material from the bottom of the pipe to the center line 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 90% of the maximum dry density as defined in TP 1.10. Placement and compaction of the haunching shall be achieved so as to avoid damage to or displacement of the pipe.
3. Initial Backfill: Initial backfill is the material from the spring 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 90% of the maximum dry density as defined in section TP-1.10. 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.
4. Final Backfill: Final backfill shall not be placed until the embedment material is placed and compacted to 85% of the maximum dry density as defined in section TP-1.10, 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 the Compaction Requirements, Methods, and Testing section.
5. 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 consist of one sack of cement to one cubic yard of concrete sand 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.
6. 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.
7. 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:

- E. 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.

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)

- F. 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 Modified Proctor Tests with 5 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.

- G. 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 tamp, roller, hydrohammer, or other device which will obtain the specified density without injury to the pipe or related structures.
- H. 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.
- I. The Contractor will perform at least one (1) compaction test at each Type I or II location as defined in TP-1.10. One compaction tests will be performed on each at a minimum of five hundred (500) and a maximum of one-thousand (1,000) linear feet of trench at Type II or III locations as defined in TP-1.10. A 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 regrading 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 to a 3-inch depth to make the crossing level with the existing roadway. Cold mix is not permitted.
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. 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, for the life of the project. 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 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 - 01.21 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.

TP - 01.22 AS-BUILT 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 revisions changes ("red-lines") of the construction drawings in sufficient detail to be accepted by the Owner or Owner's Representative for as-built 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, hydrants, connections to other lines, bends, marker posts, manholes, fence corners, inspection ports, water and sewer tapping points, cleanouts, 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 as-built drawings may be contained in the Supplemental Technical Provisions.

The recording of the as-built drawings 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. As-built drawings shall be submitted by the Final Inspection and before final payment can be made..

TP - 01.23 MEASUREMENT AND PAYMENT:

- A. General: 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.
- B. 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.
- C. 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 solid rock excavations.
- 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 for the life of the project, 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. As-built Drawing: The as-built drawing shall be submitted with or prior to submitting the final invoice and shall be reviewed and approved prior to making the final payment. Payment for this item shall be merged into the other pay items.

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

DATE INITIALS Submittal No. _____

Received by ENGINEER: _____ Project No. _____

Received by OWNER: _____ Contract No. _____

TP	Specification	Description (Indicate Type, Model No., Manufacturer, etc.)	Action By Owner
1.02	Safety Plan, including 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)		
1.09	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	Baseline testing location plan		
1.12	Modified Proctor Testing		
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 05 – WATER SERVICE LINES

TP-05.01 SCOPE:

Furnish all labor, materials, equipment, and incidentals as required, and perform all operations in connection with the complete installation of water service lines, in strict accordance with the applicable drawings and these Technical Provisions. All permits, permissions, or other authorizations required by the tribal or municipal utility authority for tapping and connection are the responsibility and to the cost of the Contractor.

TP-05.02 GENERAL:

New service lines will be identified on the drawings. Water service lines shall be installed as shown on the detail drawing and connected to the existing building water service line stub-out within five (5) feet of the building. Contractor shall verify the location, size, and type of service line stub-out. Service line staking and staking for new water main tap and meter box shall be performed by the Contractor and approved by the Owner or Owner's Representative. Locating existing lines and valves shall be the responsibility of the Contractor in coordination with a representative from the operating utility. Existing water 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. Trench excavation and backfilling operations shall be performed as specified in Technical Provision 01 (TP-01).

Contractor shall contact each resident or business to verify the time that water 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.

TP-05.03 WATER SERVICE LINE MATERIALS:

- A. Polyethylene (PE) Pipe: All polyethylene (PE) pipe and fittings furnished under this specification shall be NSF and AWWA approved for potable water service line, shall conform to ASTM D3035 (Controlled Outside Diameter), shall conform to all applicable provisions and requirements of the latest revision of AWWA C901-08 and, by inclusion, all appropriate standards referenced therein. PE pipe must be 200 psi minimum pressure rated, Iron Pipe Size (IPS) DR-11 PE4710 or equal and shall have a Plastic Pipe Institute (PPI) recommended long term Hydrostatic Design Stress (HDS) of at least 1,000 psi at a temperature of 73°F (23°C).
- B. PE Pipe Fittings: Brass fittings for the PE pipe shall be designed to prevent collapsing and pullout. Fittings shall use a compression ring, or pack joint, with stainless steel stiffeners, to make a watertight connection. Fittings shall not contain lead and shall be Mueller Insta-tite, Ford (Ultra-tite, Pack Joint, or Grip Joint), or equal as approved by the Owner or Owner's Representative.
- C. PVC Pipe and Fittings (2-inch): PVC pipe shall be SDR 21 (200 psi). Each joint of pipe shall carry the NSF seal of approval for pipes for potable water. Pipe shall conform to ASTM D-2241 and ASTM D-1784. Rubber coupling rings shall conform to ASTM D-1869.
- D. Service Saddles: Water service saddles or clamps, shall be of stainless steel, bronze, or brass construction and of a design that will prevent collapsing of the PVC main line. Service saddles or clamps shall comply with the latest versions of AWWA C605 and C800. Saddles shall be Mueller BR 2 S (for all types of water mains) or BR 2 B (not allowed for PVC mains) Series double strap type, Mueller SS Series stainless steel service saddles (for all types of water mains), Ford FS202 Series double strap type (for all types of water mains), Ford FS303 Series stainless steel service saddles (for all types of water mains), or approved equal, for the size of pipe tapped. Threads shall be IPT.

- E. Corporation Stops: Corporation stops shall be brass with IPT inlet and an Insta-tite, Grip Joint, Ultra-tite, or Pack Joint outlet. Corporation stops shall be lead free and be equal to Mueller H-15028 or Ford FB1000-4 per the latest version of AWWA C800.
- F. Curb Stops and Boxes: Curb stops shall be brass, Mueller Mark II Oriseal or Ford ball valve curb stop or approved equal. Curb stops shall have IPS to PE Insta-tite (Mueller), Ultra-tite (Ford), Pack Joint (Ford), or Grip Joint (Ford) end connections, a solid tee head roadway, and quarter turn stops. Curb stop valves must comply with AWWA C800 (latest version). Boxes shall be 1-1/4-inch diameter Arch Pattern in cast iron, Mueller, Ford, or approved equal. They shall have a 48-inch minimum box extension length with a 40-inch stationary rod and a one piece locking top.
- G. Water Meter and Box Combination:
1. Coppersetter: Ford 70 Series lead-free coppersetter with cartridge style dual check valve and angle ball valve stop; 5/8-inch by 3/4-inch or approved equal shall be utilized. Adequate brace bars to support the meter in a horizontal position in a rigid manner shall be provided. Where an Individual PRV is required, a Ford 72 Series Tandem lead-free coppersetter with cartridge style dual check valve and angle ball valve stop; 5/8-inch by 3/4-inch or approved equal shall be installed.
 2. Individual Pressure Reducing Valve (PRV): If required, or as shown on the drawings, PRVs shall be lead-free and NSF-certified. Individual PRVs shall be Zurn-Wilkins Model NR3XL or approved equal. The PRV shall only be installed if indicated on the plans.
 3. Water Meter: The water meter shall be a sealed register magnetic drive water meter with nutating disc, positive displacement, magnetic, or ultrasonic lead-free meter. The meter shall be Badgermeter Model 25, Sensus iPerl, Neptune T10 series, Kamstrup Ultrasonic water meter, or equal as indicated on the project drawings and as approved by Owner and noted on the bid schedule.
 4. Meter Box: Boxes in traffic areas shall be wire reinforced concrete with steel diamond plate or cast iron covers with interlocked sections. Boxes and covers in non-traffic areas shall be wire reinforced concrete. All sections of all boxes shall be nested or otherwise interlocked to prevent lateral movement. Sufficient sections shall be installed to provide a walled enclosure for a minimum depth of 6 inches below the angle valve. Minimum cover opening dimensions shall be 9-inches by 14-inches. Pea gravel or 3/4 inch crushed rock shall be placed inside the meter can below the water meter to a minimum depth of three (3) inches as shown on the drawings. The meter box shall be installed on bricks or masonry block on top of the prepared subsurface.
- H. Tracer Wire, Tracer Wire Access Point, and Warning Tape: Shall be installed per the requirements of TP-01.

TP-05.04 SERVICE SADDLE AND CORPORATION STOP INSTALLATION:

A water service saddle shall be installed at the water main with a corporation stop. Each connection to a water main shall be live tapped through the corporation stop with an approved tapping machine, unless otherwise approved by the Owner or Owner's Representative in writing. Dry taps are only permitted during new water main installation, prior to disinfection.

TP-05.05 SERVICE LINE INSTALLATION:

Water service lines shall be installed per ASTM D2774 (PE) or AWWA C605-05 (PVC). PE pipe shall be installed with sufficient slack for thermal expansion and contraction. All water service lines shall have a minimum cover of 36 inches, or as directed by the Owner or Owner's Representative. The water meter and box shall be installed as shown on the standard detail.

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. Install Tracer Wire and Warning Tape along the water service lines from the water main to the meter box and to the building, or as shown on the drawings.

TP-05.06 METER BOX INSTALLATION:

The meter box shall be installed on top of a gravel base and bricks or masonry blocks as indicated in the Detail. The meter box shall be set 1/2 inch above the finished grade of the site or adjacent pavement surface. The meter box shall be supported during backfill to ensure final setting of the meter box is plumb.

TP-05.07 AS-BUILT DRAWING:

The requirements of Technical Provision 01 must be met. Failure to properly identify these items will result in the Contractor having to uncover pipe at Contractor's expense to verify their location. The as-builts shall become the property of the Owner after contract completion.

TP-05.08 TESTING AND FLUSHING:

Water service lines and joints shall be tested by applying mainline pressure to the service line before backfilling. No visible leakage will be allowed. After installation, the water service line, meter, and valves shall be thoroughly flushed for a minimum of 15 minutes. Flushing shall be completed prior to connecting to the house or existing service line. If a restricted flow, or leak, is observed, the Contractor shall correct the identified problem prior to backfilling.

TP-05.09 WATER SERVICE AND SEWER CROSSINGS:

Where water and sewer lines cross, the requirements of TP-01 must be met.

TP-05.10 MEASUREMENT AND PAYMENT:

- A. Water Service Lines: Water service lines shall be measured in linear feet along the centerline of the pipe. Payment for the water service lines shall be at the contract unit price shown on the bid schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, bedding, stabilization material, pipe installation, backfilling, compaction, seeding, disinfection, hydrostatic testing, and final cleanup.
- B. Service Line Connection: Cost for the water service line connection shall include the water main tap, water service saddle, and corporation stop. Each water service line connection shall be measured such that a water main tap and connection to the corresponding building stub-out or plugged line as required shall be counted as a total of one each. Payment for these connections shall be at the contract unit price shown on the bid schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, water main tap, saddle, corporation stop, building stub-out connection or line termination and plugging, applicable tapping fees, backfilling, compaction, and final cleanup.
- C. Curb Stops: Curb stops shall be measured as each. Payment for the curb stops shall be at the contract unit price shown on the bid schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, curb stop, curb box and stationary rod, fittings, backfilling, compaction, and final cleanup.
- D. Water Meter and Box Combination: Water meter and box shall be measured as each. Payment for the water meter and box shall be at the contract unit price shown on the bid schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, copper-setter, water meter, water meter box with lid, fittings, backfilling, compaction, and final cleanup.

- E. Water Meter, PRV, and Box Combination: Water meter, pressure reducing valve (PRV) and box shall be measured as each. Payment for the water meter, PRV, and box shall be at the contract unit price shown on the bid schedule, which shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for a complete installation, including excavation, copper-setter, water meter, PRV, water meter can with frost-proof cover, fittings, backfilling, compaction, and final cleanup.

**SUBMITTAL REVIEW FORM
SECTION 05 – 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
05.03	PE Pipe		
05.03	PE Pipe Fittings		
05.03	PVC Pipe & Fittings		
05.03	Service Saddles		
05.03	Corporation Stops		
05.03	Curb Stops & Boxes		
05.03	Coppersetter		
05.03	Pressure Reducing Valve		
05.03	Water Meter		
05.03	Meter Box with Cover		

Signature

Date

CONTRACTOR:

OWNER APPROVAL:

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. All pipes and joints shall be approved by the Owner or Owner's Representative prior to backfilling. The work will not be accepted until satisfactory backfilling, compaction 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.

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. Only rigid couplers will be allowed, such as PVC fittings, shielded Fernco's (for mismatched pipe materials), or approved equal. Non-rigid couplers will not be allowed.
- C. 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.
- D. 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 Sewers, a neoprene rubber boot with stainless steel bands shall be used.

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.
 - 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) 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.
- 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 service lines are continuous with no joints until the 10 foot separation requirement is met.

TP - 07.06 AS-BUILT 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 as-builts 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 Line: 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, as-builts, 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, as-built 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
ROADWAY, RAILROAD, AND SPECIAL UTILITY CROSSINGS

TP - 11.01 SCOPE OF WORK:

Specifications included herein are intended to support requirements of the Special Provisions and Section 01 of these Technical Provisions where road, railroad, and special utility crossings are necessary for the installation of sanitation facilities under this contract.

Construction shall comply in all respects to the requirements of any permit incorporated into this contract. Copies of applicable permits obtained by the Owner shall be included in the Appendix to these Technical Provisions. The contractor shall meet all requirements and conditions of these permits with respect to materials, equipment, notification and timing. At least two days notice shall be given to the Owner or Owner's Representative and permit grantor before work is done on any crossing. Any permits not previously obtained by the Owner shall be the responsibility of the Contractor.

Requirements of the permit or permits shall control if contradictions exist between Technical Provisions and such permits. 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-03 U.S. Customary Units – Section 614". At least two (2) weeks prior to performing the crossing, the contractor shall submit a traffic control plan showing how they intend to safely control traffic in the area of the crossing for review and approval by the project engineer. For road crossings, the Contractor shall have at least one lane open to traffic at all times unless otherwise required by traffic control plan.

The work to be completed under these Technical Provisions includes the furnishing of all labor, materials, transportation, tools, supplies and appurtenances necessary to complete the crossings in accordance with the indicated requirements.

TP - 11.02 ROADWAY CROSSINGS:

Where so indicated on the drawings, main pipeline crossings of highways, railroads, canals, and other structures shall be made by installation of a steel pipe casing under the structure as shown on the plans. The casing pipe shall be installed where indicated on the plans and at the locations designated by the Owner. Casing pipe 8-inches in diameter and larger shall be Grade A steel pipe with a minimum wall thickness of 0.375 inches and shall meet ASTM A-53 or ASTM A-120 (Welded and Seamless Steel Pipe).

The casing pipe for water service lines and sewer service lines shall be standard weight galvanized steel pipe conforming to ASTM A-120 (Welded and Seamless Steel Pipe). Crossings for water service lines and water mains shall be a minimum of four (4) feet below the surface of the roadway and two (2) feet below other structures and canal inverts unless otherwise shown on the plans.

The method of installing the carrier pipe within the steel casing shall be approved by the Owner. Pipe within casings shall be installed in the encasement pipe as shown on the plans providing suitable spacers that will prevent disturbance of the assembled joints. The casing spacers shall be installed per manufacturer's specifications. Casing spacers shall be boltless and non-metallic as manufactured by GPT or approved equal. After the carrier pipe is installed in the casing and tested, both ends of the encasement shall be sealed to prevent the entrance of foreign objects into the casing. Seal shall be Link-Seal as manufactured by GPT or approved equal. All water and sewer lines installed within the casing pipe shall be installed with mechanical restrained joints on every pipe joint within the casing pipe.

A. Open Cut Crossings:

1. Unpaved Roads: Excavation and backfilling of unpaved roads shall be done in accordance to Technical Provision Section 01.

2. Paved Roads: Excavation and backfilling of paved roads shall be done in accordance to Technical Provision Section 01. If an open cut crossing is required to be backfilled using lean concrete backfill, the concrete fill shall contain 50 pounds of cement per cubic yard.

B. Bored Road Crossing: Where only bored road crossing shall be permitted as indicated on the plans, the Contractor shall furnish all equipment, material, and labor required to complete the installation. Boring methods which involve jetting or washing techniques are not allowed. Alternate methods of road boring must be approved in writing by the applicable permit granting authority or right-of-way authority and the Owner or Owner’s Representative. The use of water under pressure jetting or puddling shall not be permitted to facilitate boring, pushing, or jacking operations.

Alignment of the borehole shall be such that all grades and alignment of the pipeline to be encased as shown on the plans are maintained. Failure to maintain such grades and alignment will result in rejection of the crossing for payment. Such operations shall be scheduled so that it may be completed from start to finish without delay and in accordance with appropriate permits and the standards.

When the casing pipe is to be installed by boring, the casing shall be kept on line and grade by suitable guide rails in the approach pit. The deviation from line and grade of the casing pipe shall provide installation of the carrier pipe within the following allowances:

Lines	Horizontal Deviation	Vertical Deviation
Water Line	1.0 ft per 100 feet (1.0%)	1.0 ft per 100 ft (1.0%)
Sewer Line	1.0 ft per 100 feet (1.0%)	0.1 ft per 50 ft (0.2%)

Deviations will be determined from the line and grade approved by the Owner. The casing pipe for all crossings shall be installed in a manner that will allow for the installation of the carrier pipe in a straight line without contacting the walls of the casing. Casings for the carrier pipe shall be installed prior to the installation of pipe within 100 feet of the crossing for the main or service line under construction.

If excessive voids or too large a bored hole is produced during casing or pipeline installations, or if it is necessary to abandon a bored or tunneled hole, prompt remedial action shall be taken by the Contractor. All voids or abandoned holes caused by boring or jacking are to be filled by pressure grouting. The grout material shall be as specified by the permit granting authority or right-of-way authority and approved by the Owner or Owner’s Representative. The hole diameter shall not exceed the outside diameter of the casing pipe (including coating) by more than two (2) inches on casings with an inside diameter greater than twelve (12) inches.

TP - 11.03 ROADWAY RESTORATION:

Road restoration shall be done in accordance with Section 01 of these Technical Provisions.

TP - 11.04 BARRICADES, GUARDS AND SAFETY PROVISIONS:

The Contractor shall be responsible for erecting and maintaining adequate barricades, construction signs, torches, red lanterns, flagmen, and guards, as required, during the progress of the construction work and until it is safe to resume use of the roadway. Rules and regulations of the permit granting authority or right-of-way authority regarding safety provisions shall be observed. All work within the right-of-way of roads shall be performed in accordance with the latest edition of the Manual on Uniformed Traffic Control Devices (MUTCD). Work within right-of-ways and traffic control plans shall comply with all applicable provisions of Section 01 of the Technical Provisions in addition to those indicated under provisions of this Section.

TP - 11.05 RAILROAD AND SPECIAL UTILITY CROSSINGS:

Railroads and other specialized utility crossings shall comply with all requirements of the permits indicated.

Pipeline alignment and grades shall be maintained as shown on the plans. The Contractor shall be responsible for compliance with all requirements of special crossing permits applicable to this project. Copies of such permits shall be included in the Appendix of these specifications. If no special crossing permits are appended, and such crossings are indicated on the plans, crossings will comply with all applicable provisions of Section 01 of these Technical Provisions in addition to those indicated under other provisions of this Section. At least two (2) days of notice shall be given to the Owner or Owner's Representative and right-of-way authority or permit granting authority before work is done on any crossing.

TP - 11.06 CLEANUP:

Upon completion of the work, the entire site shall be cleared of all debris, and the ground surface shall be finished to smooth and uniform slopes. Cleanup shall be considered an incidental item and no additional payment shall be made for it. All of the right-of-way area and structures shall be left in a condition at least equal to their condition prior to construction.

TP - 11.07 MEASUREMENT AND PAYMENT:

Payment for bored roadway, open cut roadway, railroad or special utility crossings shall be measured in linear feet along the centerline of the casing. Payment shall be full compensation for all materials, equipment, labor, and incidentals for a complete installation including, but not limited to, boring, asphalt cutting, excavation, encasement and carrier pipe, carrier pipe connection fittings and joint restraints, blocking/casing spacers, backfilling, paved and gravel roadway restoration, barricades, guards and safety provisions, traffic control plan, cleanup, and record drawings. Such payment shall also be full compensation for all required certificates of insurance, development of approved traffic control plans and implementation of traffic control.

SUBMITTAL REVIEW FORM

SECTION 11 – ROADWAY, RAILROAD, AND SPECIAL UTILITY CROSSINGS

	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
11.01	Permits		
11.02	Boring Method		
11.02	Casing		
11.02	Casing Spacers		
11.02	Casing Seal		

	Signature	Date
CONTRACTOR:		
OWNER APPROVAL:		

TECHNICAL PROVISIONS

SECTION 12 - NON-AGGREGATE SEWAGE DISPOSAL SYSTEMS

TP - 12.01 SCOPE:

The work covered by these specifications includes the furnishing of all labor, tools, equipment, material, and performing all operations necessary to construct non-aggregate type individual sewage disposal facilities (septic tank & chambered drainfield systems) at the indicated homesite and as shown in the site plan. This work includes connection to building drain, service cleanouts, septic tank, distribution box, drainfield chambers, abandonment of existing septic tank(s), fittings, and appurtenances in accordance with these specification and applicable plans.

TP - 12.02 GENERAL:

The individual sewage disposal systems and related facilities shall be constructed at the locations and of the sizes shown on the site drawings. Field changes in location and orientation may be required as directed by the Owner or Owner's Representative at the time of construction, but shall not alter the total area of drainfield required. Excavation, trenching, backfilling, compaction, and any needed dewatering shall be completed in accordance with Technical Provision 01 (TP-01), unless specifically altered under other requirements of this specification section.

Pipe joints and fitting installation shall be in accordance with the manufacturer's recommendations. All pipes and joints shall be approved by the Owner or Owner's Representative prior to backfilling. The work will not be accepted until satisfactory backfilling, compaction, 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 - 12.03 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.
 - 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. Only rigid couplers will be allowed, such as PVC fittings, shielded Fernco's or approved equal. Non-rigid couplers will not be allowed.
- 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. 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 fee 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.
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.
4. The dimensions of the septic tank shall be labeled on the detail or the design drawings. 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 or 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. If noted in the contract documents or 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 fee 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. Septic Tank Manhole Risers: Manhole 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 and to the outlet of the septic tank to access the effluent filter.
1. Risers shall be corrugated HDPE with a 24 inches HDPE UV protected heavy duty cover and stainless steel locking screws, or equal. Risers shall have a water tight connection to the tank.
 2. Risers shall have a printed warning label with information regarding the hazards present when entering a tank affixed by the Contractor. These labels may be supplied by the manufacturer and 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 (Kid Catcher) or approved equal. The Contractor shall provide one (1) extra Safety Screen to the Tribe for each septic tank installed.
 4. Where manhole risers are required to be more than 36-inches in height, the risers and manhole 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.
- F. Distribution Boxes: Distribution boxes and covers shall be constructed in general conformance with the configuration indicated in the detail drawings with discharge hole locations as required to maintain design elevations.
1. Boxes shall be fabricated from pre-cast concrete with a separate outlet for each drainfield lateral. Boxes shall have a minimum wall thickness of 1.5 inches and a 28 day compressive strength of 3,000 psi.
 2. Concrete boxes shall be manufactured by a fabricator routinely involved in construction of distribution boxes and shall contain sufficient interior steel reinforcing sufficient to facilitate hauling and handling stresses.
 3. Chipped and honey combed boxes shall not be approved.
 4. Boxes shall have at least the same amount of outlet openings as the number of laterals (rows) in the drainfield.
 5. Invert elevations of each outlet shall be equal to each other.
 6. All outlets shall be at a minimum 1.inch lower than the inlet.
 7. Each outlet shall be fitted with a speed leveler, as manufactured by Tuf-Tite or equal to facilitate equal distribution of effluent to each drainfield lateral.
- G. Distribution Box Risers: Distribution box risers shall be installed to provide access to the distribution box from the ground surface.
1. Risers shall be at least the same dimensions as the distribution box and shall be attached to the distribution box to provide a watertight connection.
 2. Risers shall be corrugated HDPE with a Polylok 24" HDPE heavy cover, part # 3008-HD, with stainless steel locking screws or approved equal. Or may 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.
 3. The distribution box cover shall have an effective locking device which meets the Owner or Owner's Representative's approval.

H. Manufactured Chambers:

1. Drainfield chamber sections shall be constructed of high strength polyethylene plastic.
2. Chambers shall be high capacity chambers equal to INFILTRATOR Quick4 Plus High Capacity Chambers (34 inches wide x 53 inches long x 14 inches high), ADS Arc 36 HC Chambers (34.5 inches wide x 63 inches long x 16 inches high), or approved equal.
3. A minimum loading rating of AASHTO H-10 shall be required for wheel load protection.

I. 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.

J. Pea Gravel: Pea gravel shall be clean washed pea gravel between 1/8" to 1/4" inches in diameter.

K. Gravel: Gravel for the base bedding of the septic tank and distribution box shall be clean, hard, durable and free of fines, coal, clay or other soft fragments and shall meet the approval of the Owner or Owner's Representative. Gravel shall vary in size from 3/4-inch to 1-1/2-inch.

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

TP - 12.04 INSTALLATION:

Verify that dimensions and elevations 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, distribution box, drainfield chambers, 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.
- 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% or 1/2-inch per foot.
- b) From the septic tank to the distribution box and the distribution box to the drainfield, the four (4) inch PVC pipe shall be laid at a minimum grade of 1% or 1/8-inch per foot).
- 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 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 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. All required fittings shall be in conformance with the provisions of TP-12.03. The detail drawing for this two-way cleanout is located in the TP-07 Details (Detail 7A).
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 95% Modified Proctor Density.
 - 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, riser, and etcetera, as approved by the Owner or 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 TP-02.
 - 3. Backfilling Tank:
 - a) Prior to backfilling, the tank elevation shall be checked at all corners to assure that placement is level and is set 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 24 inches of cover unless tank is designed for a deeper bury depth and approval is obtained from the Owner or Owner's Representative.
 - 4. Groundwater:
 - a) If groundwater is present, dewater in accordance with TP 01, as needed.
 - 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 effluent filter shall be installed on the septic tank outlet piping in a sanitary tee/baffle.
- 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 four (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 distribution box.
 3. Install filter handle and extend handle to within 12-inches of the top of the access riser for ease of accessibility.
- E. Septic Tank Risers: The Contractor shall install the approved covered risers for the inlet and outlet of the septic tank.
1. The top of the riser covers shall be set at least six (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 as manufactured by the Henry Group (formerly K.T. Snyder Company) or equal water-tight material and 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.
- F. Distribution Box: Distribution box shall be placed at the location indicated in the plans and detail drawings.
1. The box shall be set on a six (6) inch minimum bed of gravel to facilitate leveling the box.
 2. The distribution box shall be installed such that the inlet and outlet openings of the distribution box meet the required minimum of 1% slope between the septic tank and the drainfield.
 3. In some cases this will require the top of the distribution box to be buried below grade. If the top is buried below grade, install risers as stated in TP-12.04.G. Otherwise, the distribution box shall be installed such that the top of the distribution box is between one (1) and six (6) inches above finished grade.
 4. The distribution box shall be installed level to assure that equal distribution is provided to each drainfield lateral. Equal distribution shall be checked by the Contractor in the presence of the Owner's Representative by filling the box with water to indicate equal overflow to the drainfield.
 5. The speed levelers shall be adjusted as needed to obtain equal flow to each drainfield lateral. Any unused outlet openings shall be left sealed or shall be grouted as directed by the Owner's Representative.
- G. Distribution Box Riser: If the top of the distribution box is buried below grade, then distribution box risers (extension collars) shall be installed to provide an access cover to the buried distribution box.
1. The distribution box riser shall be connected to the top of the box with a Ram-Nek flexible gasket as manufactured by K.T. Snyder Company or equal and grouted to the top of the box to provide a water tight connection.
 2. The top of the riser shall be set between one (1) and six (3) inches above finished grade.
- H. Chamber Drainfield: Chamber drainfields shall be constructed in accordance with the detail and plans. The plans shall indicate the size and number of chambers required for the designed drainfield area.

1. Excavation:

- a) Trenches for installation of the chamber sections shall be excavated to the elevation, width, length and direction as indicated by plans and the Owner or Owner's Representative.
- b) Excavation shall not be allowed when the moisture content of the soil is greater than the plastic limit (when rolling a sample between the hands forms a wire) If the soil crumbles, then soil preparation may proceed. Excavation or construction shall not be allowed when the occurrence of rain, snow or frost is such that the quality of construction may be impaired.
- c) All smeared or compacted surfaces of the bottom or side walls shall be raked to a depth of three (3) inches.
- d) Loose material, including stones and debris shall be removed before the infiltration chambers are placed in the trench.
- e) Avoid walking in the excavated trench to prevent compaction and loss of soil structure.

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) End caps shall be installed at the end of each drainfield lateral as recommended by the chamber manufacturer.
- f) Each row of leaching chambers shall contain a splash plate on the native soil within the leaching chamber where the effluent pipe enters the 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 16 inches, or approved equal.
- g) Place filter fabric over the chambers prior to backfilling in accordance with TP-12.04.I.

3. Backfilling:

- a) Before backfilling, the system shall be inspected by the Owner or Owner's Representative.
- b) Backfill material shall be hand selected to be free of organic and other potentially clogging material and hand placed to a point three (3) inches above the highest chamber perforation.
- c) Place and pack down soil at chamber interlocking joints. Backfill to cover the louvers. Backfill shall be packed down by walking along the edges of the trench to assure structural support of the chambers.
- d) The remaining backfill material may be mechanically placed.
- e) A minimum cover of 12 inches is required or as recommended by the manufacturer.
- f) Trench backfill material shall be mounded six (6) inches above the natural ground surface to allow for settlement and to divert away runoff water.
- g) After the system is covered, the site should be seeded in accordance with TP-01 to prevent

erosion.

- I. 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 TP-12.04.H.
- J. Observation Pipe: Observation pipes shall be constructed of solid four (4) inch PVC pipe and shall be installed at the end of each chamber leg or as indicated on the plans.
 - 1. 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 threaded 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.
- K. Inspection: The installed sewage disposal system shall be inspected by the Owner or Owner's Representative in accordance with this TP-12.
 - 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 of the septic tank and drainfield installation.
 - 2. The sewer service lines, septic tank, distribution box and drainfield 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.
- L. 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 any interior pipes, plumbing, or pumps as directed by the Owner's Representative.
 - 3. Remove and dispose of concrete tank cover, risers and inspection pipes as directed by the Owner's Representative.
 - 4. The tank shall then be crushed in place and filled with its own crushed concrete debris.
 - 5. The crushed tank shall then be backfilled with suitable, compactable, soil material, to fill the void left by the tank.
 - 6. The backfilled soil shall be properly compacted to prevent subsidence and to bring the backfilled area to the same level as the surrounding grade.

TP - 12.05 AS-BUILT DRAWINGS:

As-built drawings shall be furnished for individual sewage disposal systems and shall include two swing ties from permanent structures or facilities to each of the following:

- A. Inspection/access ports on the septic tank (Risers)

- B. All cleanouts
- C. All bends and elbows
- D. Distribution box
- E. Location of the drainfield header and observation ports
- F. Abandoned septic tanks
- G. Intersections with other utilities

TP - 12.06 WATER AND SEWER CROSSINGS:

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

TP - 12.07 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 Lines: The solid gravity PVC pipe shall be measured in lineal feet along the centerline of the pipe including fittings. Payment shall be at the unit price. Payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required for complete installation, including excavation, bedding, backfill, compaction, pipe installation, fittings, all connections, as-built drawings, and final cleanup.
- B. Cleanouts: Payment for the two-way cleanouts shall be at the unit price as stated in the fee 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, as-built drawings, and final cleanup.
- C. Septic Tanks: Payment for septic tanks shall be at the unit price as stated on the fee schedule. Payment shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for complete installation; including excavation, setting, leveling, backfilling, effluent filter, as-built drawings, and final clean-up.
- D. Septic Tank Manhole Risers: Payment for septic tank manhole risers shall be at the unit price shown on the fee schedule, and based on actual feet (measure vertically) installed, including one septic tank cover for each riser. Payment shall be full compensation for all materials, labor, and equipment required for a complete installation including: the water tight connection to the septic tank, rope for the concrete tank lids/covers, backfilling, and compaction around the risers. No separate payment for the covers shall be made.
- E. Riser Safety Screens: Payment for septic/pump tank riser safety screens shall be at the unit price shown on the fee schedule. Payment shall be full compensation for all materials, labor, and equipment required for a complete installation.
- F. Distribution Boxes: Payment for distribution boxes shall be at the contract unit price shown on the fee schedule. Payment shall be full compensation for furnishing all labor, equipment, materials, and incidentals required for complete installation; including, excavation, connections to the sewer service line and drainfield piping, as-builts, and final clean-up.
- G. Distribution Box Risers: Payment for distribution box risers shall be at the unit price shown on the fee schedule, and based on actual feet (measure vertically) installed, including one distribution box cover for

each riser. Payment shall be full compensation for all materials, labor, equipment and incidentals required for a complete installation including: riser, cover, the water tight connection to the distribution box, backfilling, compaction, as-builts, and final clean up around the risers.

- H. Chamber Drainfields: Payment for chamber drainfields shall be made on a linear foot basis measured to the nearest foot and includes costs for the installation of manufactured chambers, end pieces, splash pads/solid blocks, filter fabric (if required), observation pipes with UV paint and all required piping and fittings. Compensation shall include all labor, equipment, materials, and incidentals required for complete installation; including excavation, backfilling, compaction, final grading, seeding, as-builts, and final clean-up.
- I. Water and Sewer Crossings - Sewer service lines: All costs associated with completion of water and sewer crossings shall be merged with other fee items and will not be considered a separate item for payment. No additional payment will be made for installation of ductile iron sewer pipe associated with water and sewer crossings.
- J. Septic Tank Abandonment: Payment for abandonment of the existing septic tank shall be at the contract unit price per job 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.

If the existing septic tank is any material other than concrete, the Contractor shall be paid at the contract unit price per job to pump and remove the existing septic tank. The Contractor shall be responsible for all costs associated with the removal, including, but not limited to transporting and disposing of the septic tank at a State licensed and approved waste disposal site located off the particular reservation where the work is to be performed. The payment shall also be full compensation for backfilling the void with soil from the designated area, and compaction to prevent subsidence and to bring it to the same level as the surrounding grade.

SUBMITTAL REVIEW FORM, SECTION 12 – NON-AGGREGATE SEWAGE DISPOSAL SYSTEMS

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
12.03.A	PVC Sewer Pipe & Fittings		
12.03.B	Cleanout, Fittings, Cap, Foam, Mesh, Concrete		
12.03.C	Septic Tank		
12.03.D	Effluent Filter		
12.03.E	Septic Tank Manhole Riser, Safety Screen & Riser		
12.03.F 12.03.G	Distribution Box and Risers		
12.03.H	Drainfield Chambers		
12.03.I	Filter fabric (if required)		

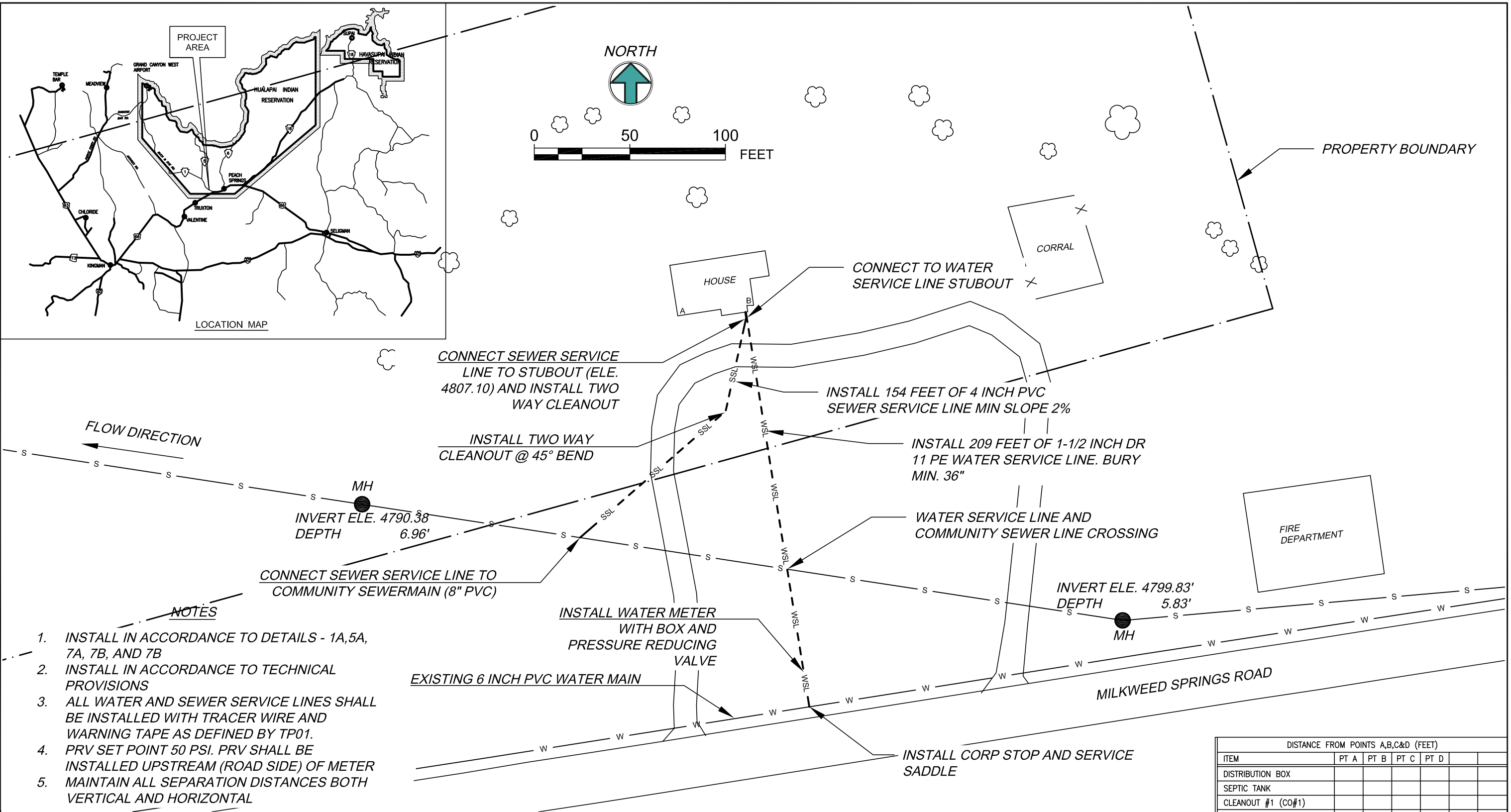
Signature

Date

CONTRACTOR:

OWNER APPROVAL:

APPENDIX G



NOTES

1. INSTALL IN ACCORDANCE TO DETAILS - 1A,5A, 7A, 7B, AND 7B
2. INSTALL IN ACCORDANCE TO TECHNICAL PROVISIONS
3. ALL WATER AND SEWER SERVICE LINES SHALL BE INSTALLED WITH TRACER WIRE AND WARNING TAPE AS DEFINED BY TP01.
4. PRV SET POINT 50 PSI. PRV SHALL BE INSTALLED UPSTREAM (ROAD SIDE) OF METER
5. MAINTAIN ALL SEPARATION DISTANCES BOTH VERTICAL AND HORIZONTAL

PHOENIX AREA INDIAN HEALTH SERVICE – SANITATION FACILITIES CONSTRUCTION

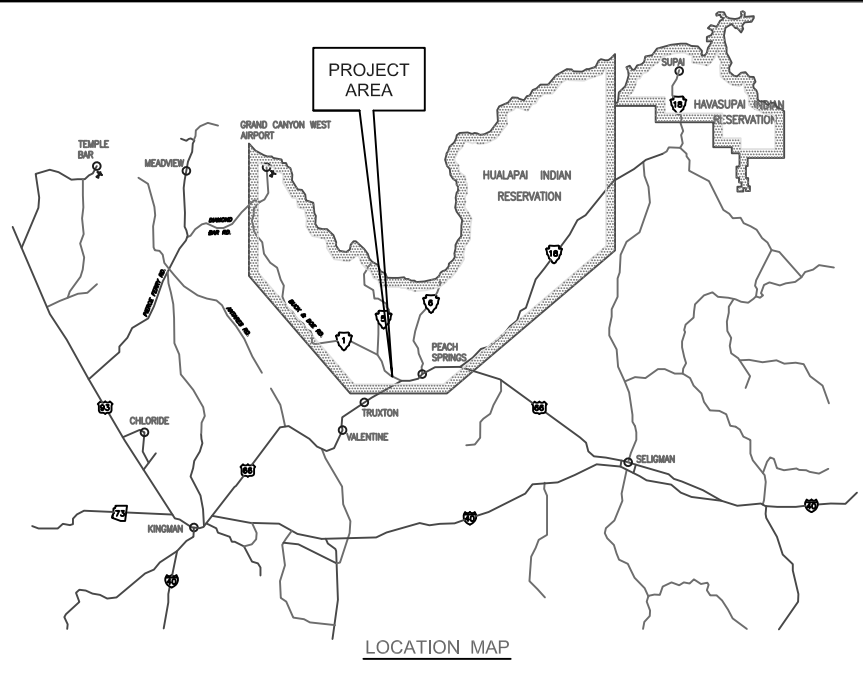
PROJECT NUMBER: PH 20-F68 WA 17-21	PROJECT ENGINEER/MANAGER: MF	WASTEWATER		WATER	
HOMEOWNER: FAYEANNE CROOK	DESIGN APPROVED BY: JK DATE: 08/2021	SEPTIC TANK SIZE: N/A	SERVICE LINE SIZE: 4"	SERVICE LINE SIZE: 1-1/2 INCH	
COMMUNITY: BUCK AND DOE	DRAWN BY: MF DATE: 08/2021	SEPTIC TANK MATERIAL:	MATERIAL: PVC	MATERIAL: PE	
DISTRICT: WADO	CHECKED BY: DATE:	FIELD AREA: N/A	TOTAL LENGTH: 154 FEET	TOTAL LENGTH: 209 FEET	
RESERVATION: HUALAPAI RESERVATION		SEEPAGE PITS-NO.:	AVERAGE DEPTH/PIT (FT):	CONTRACTOR:	
ADDRESS: 1400 MILKWEED SPRINGS RD		CONTRACTOR:		DATE INSTALLED:	
LATITUDE: 35°31'35.08"N	LONGITUDE: 113°28'14.95"W	DATE INSTALLED:			
TYPE OF HOUSE: FRAME	# BEDROOMS: 2	# PEOPLE: -			

ITEM	DISTANCE FROM POINTS A,B,C&D (FEET)			
	PT A	PT B	PT C	PT D
DISTRIBUTION BOX				
SEPTIC TANK				
CLEANOUT #1 (CO#1)				
INSPECTION PORT 1 (DF#1)				
INSPECTION PORT 2 (DF#2)				
INSPECTION PORT 3 (DF#3)				
WATER METER				
MISC #1:				
MISC #2:				
MISC #3:				



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WESTERN ARIZONA DISTRICT OFFICE
1553 WEST TODD DRIVE, SUITE 107
TEMPE, AZ 85283
(480) 592-0091



NOTES

1. INSTALL IN ACCORDANCE TO DETAILS - 1A, 5A, 7A, 11A, 12A, 12C AND 12D
2. INSTALL IN ACCORDANCE TO TECHNICAL PROVISIONS
3. ALL WATER AND SEWER SERVICE LINES SHALL BE INSTALLED WITH TRACER WIRE AND WARNING TAPE AS DEFINED BY THE TP01
4. PRV SET POINT 50 PSI. PRV SHALL BE INSTALLED UPSTREAM (ROAD SIDE) OF METER
5. CONTRACTOR SHALL NEATLY CLEAR AND GRUB SMALL SHRUBS, TREES AND DEBRIS WHERE THE SEPTIC SYSTEM (INCLUDING DRAINFIELD) WILL BE LOCATED (INCLUDING A 10' PERIMETER BEYOND THE SEPTIC SYSTEM). THIS WORK SHALL BE INCIDENTAL TO THE OVERALL COST OF THE JOB AND NO ADDITIONAL COMPENSATION WILL BE PAID FOR THIS WORK.

DRAINFIELD DESIGN

3-BEDROOM 2-BATHROOM HOME = 400gpd
SOIL ABSORPTION RATE = 0.40

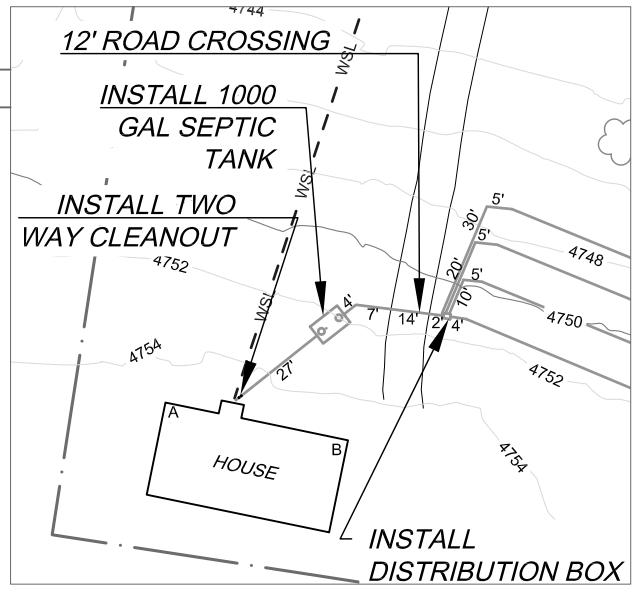
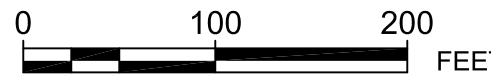
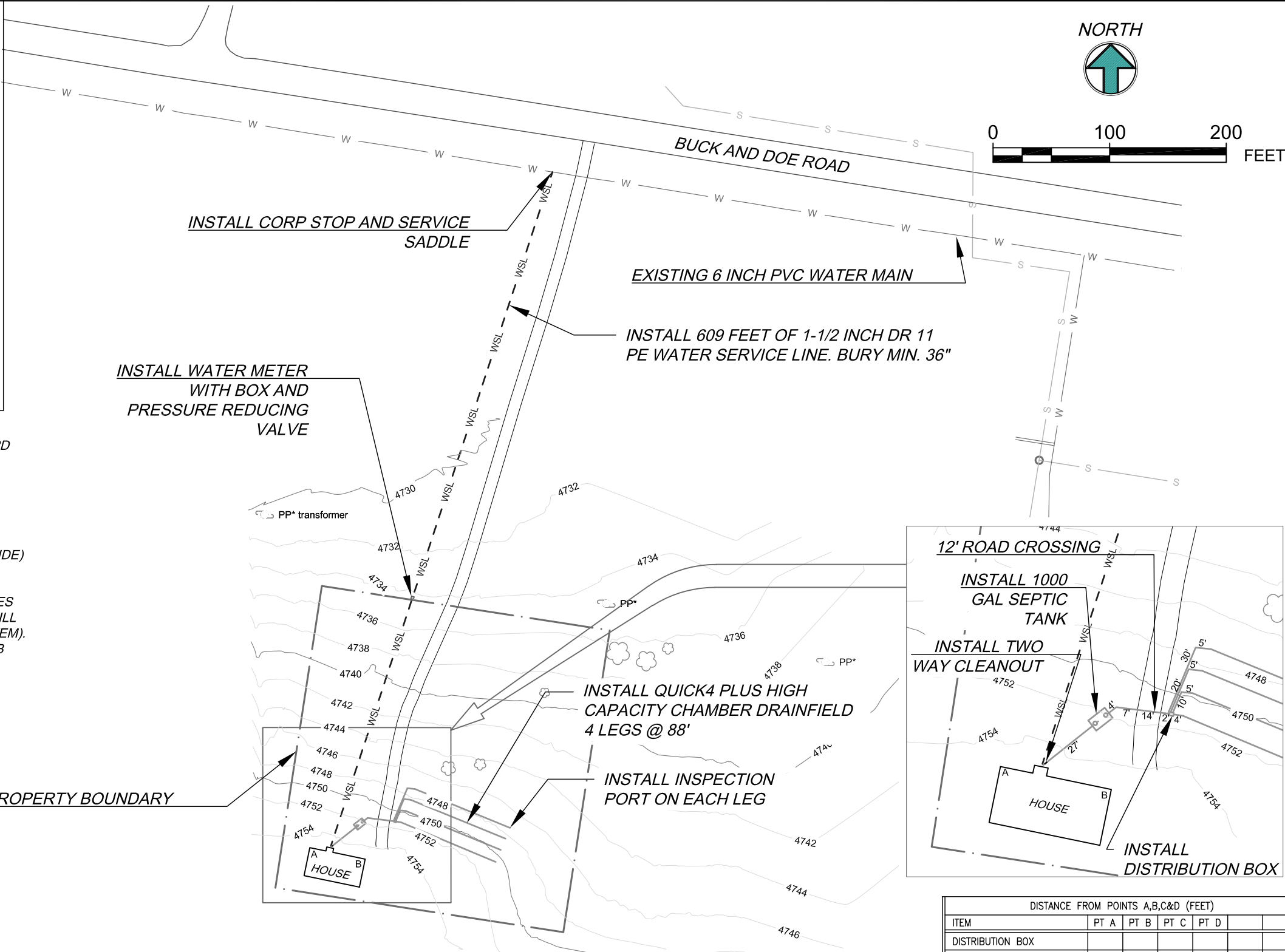
ABSORPTION AREA = 400/0.40 = 1,000 FT²

CHAMBER AREA = 34"X53"= 1,802 IN²
CHAMBER AREA = 1,802/144 IN² = 12.51 FT²

NUMBER CHAMBERS NEEDED = 1,000/12.51 = 79.94 ~ 80

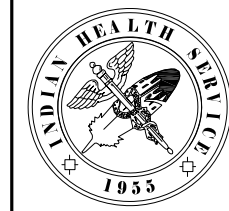
TOTAL LENGTH OF DRAINFIELD = 80 X 4.41 FEET = 352 FEET

4 DRAINFIELD LEGS AT 88 FEET
MINIMUM DEPTH 36"



ITEM	DISTANCE FROM POINTS A,B,C&D (FEET)			
	PT A	PT B	PT C	PT D
DISTRIBUTION BOX				
SEPTIC TANK				
CLEANOUT #1 (CO#1)				
INSPECTION PORT 1 (DF#1)				
INSPECTION PORT 2 (DF#2)				
INSPECTION PORT 3 (DF#3)				
WATER METER				
MISC #1:				
MISC #2:				
MISC #3:				

PHOENIX AREA INDIAN HEALTH SERVICE – SANITATION FACILITIES CONSTRUCTION



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PROJECT NUMBER: PH 20-F68 WA 17-21	PROJECT ENGINEER/MANAGER: MF
HOMEOWNER: MARY MANAKAJA	DESIGN APPROVED BY: JK DATE: 04/2022
COMMUNITY: BUCK AND DOE	DRAWN BY: MF DATE: 04/2022
DISTRICT: WADO	CHECKED BY: DATE:
RESERVATION: HUALAPAI RESERVATION	
ADDRESS: 1391 BUCK AND DOE ROAD	
LATITUDE: 35°31'29.96"N	LONGITUDE: 113°28'158.99"W METER NO.:
TYPE OF HOUSE: FRAME	# BEDROOMS: 3 # PEOPLE: -

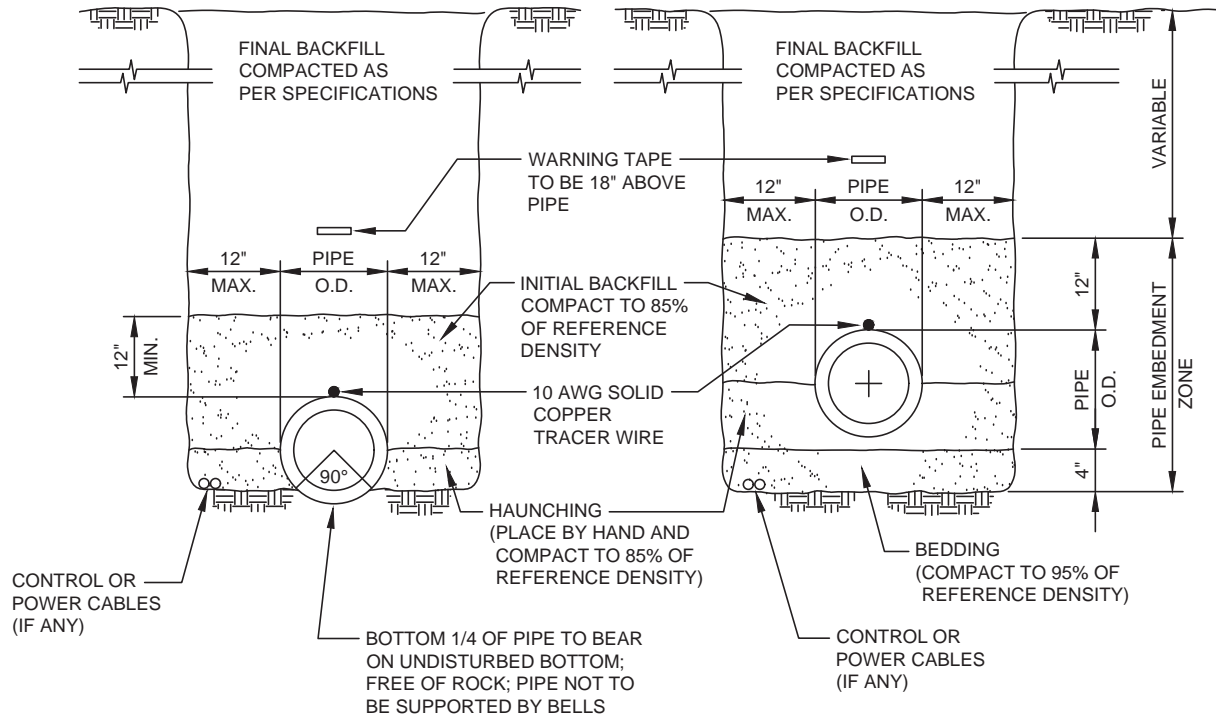
WASTEWATER		WATER	
SEPTIC TANK SIZE: 1000 GAL	SERVICE LINE SIZE: 4 INCH	SERVICE LINE SIZE: 1-1/2 INCH	
SEPTIC TANK MATERIAL: CONCRETE	MATERIAL: PVC	MATERIAL: PE	
FIELD AREA: N/A	TOTAL LENGTH: 133 FEET	TOTAL LENGTH: 609 FEET	
SEEPAGE PITS-NO.:	AVERAGE DEPTH/PIT (FT):	CONTRACTOR:	
DATE INSTALLED: -		DATE INSTALLED:	

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.

RARE CONDITIONS
NOT REQUIRING
SPECIAL EMBEDMENT

CONDITIONS REQUIRING
SPECIAL EMBEDMENT
MATERIAL



1A **TYPICAL TRENCH SECTIONS**
Scale: N.T.S.

DATE	REVISIONS	INITIALS
11-14	UPDATED	
03-18	REVISED	L.B.



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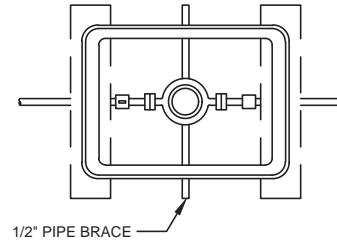
PAO REVISED DETAILS
WATER - SEWER - MISC DETAILS
TYPICAL TRENCH SECTIONS

DRAWN BY: ---- DATE: ----
CHECKED BY: ---- DATE: ----

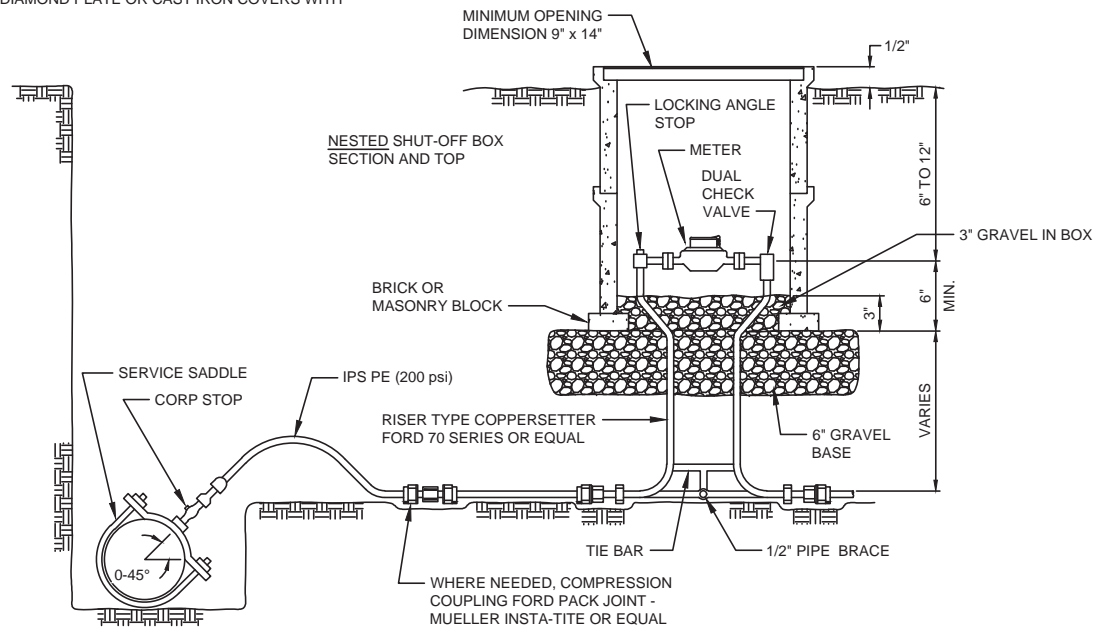
FILE NAME: REVISED MISC DRAWINGS
LAYOUT NAME: 1A
PROJ ENG: ----

NOTES:

- 1) MINIMUM HORIZONTAL DISTANCE BETWEEN WATER SERVICE LINE & SEWER SERVICE LINES SHALL BE 10 FEET.
- 2) WATER SERVICE LINE BURY SHALL BE A MINIMUM OF 36 INCHES.
- 3) POLYETHYLENE (PE) PIPE SHALL BE 1 INCH FOR SERVICE LINES LESS THAN 200 FEET & 1-1/2 INCHES FOR SERVICE LINES OVER 200 FEET AND LESS THAN 300 FEET.
- 4) WATER SERVICE LINES SHALL NOT EXTEND BEYOND 300 FEET. IF NEEDED, 2 INCH PE. LATERALS SHALL BE INSTALLED TO EXTEND WATER SERVICE TO INDIVIDUAL HOMES.
- 5) WATER METER BOX SHALL BE LOCATED AS DIRECTED BY OWNER.
- 6) WHERE APPLICABLE, EXISTING WATER SERVICE LINES SHALL BE CONNECTED TO NEW WATER MAIN LINES USING A NEW SERVICE SADDLE AND CORPORATION STOP.
- 7) TRACER WIRE AND WARNING TAPE SHALL BE INSTALLED ON ALL WATER SERVICE LINES FROM THE MAIN TO THE BUILDING.
- 8) ALL THREADED FITTINGS (CORPORATION STOP, PE CONNECTORS) FOR PE PIPE ARE TO BE IPS THREADS. OTHER THREADS NOT ALLOWED.
- 9) OUTLET TO COPPER SETTER SHALL HAVE A DUAL CHECK VALVE.
- 10) METER BOXES IN TRAFFIC AREAS SHALL BE WIRE REINFORCED CONCRETE WITH STEEL DIAMOND PLATE OR CAST IRON COVERS WITH INTERLOCK SECTIONS.



TOP VIEW



SECTION VIEW

5A WATER SERVICE LINE CONNECTION
Scale: NTS

DATE	REVISIONS	INITIALS
01-15	UPDATED	
06-18	REVISED	L.B.



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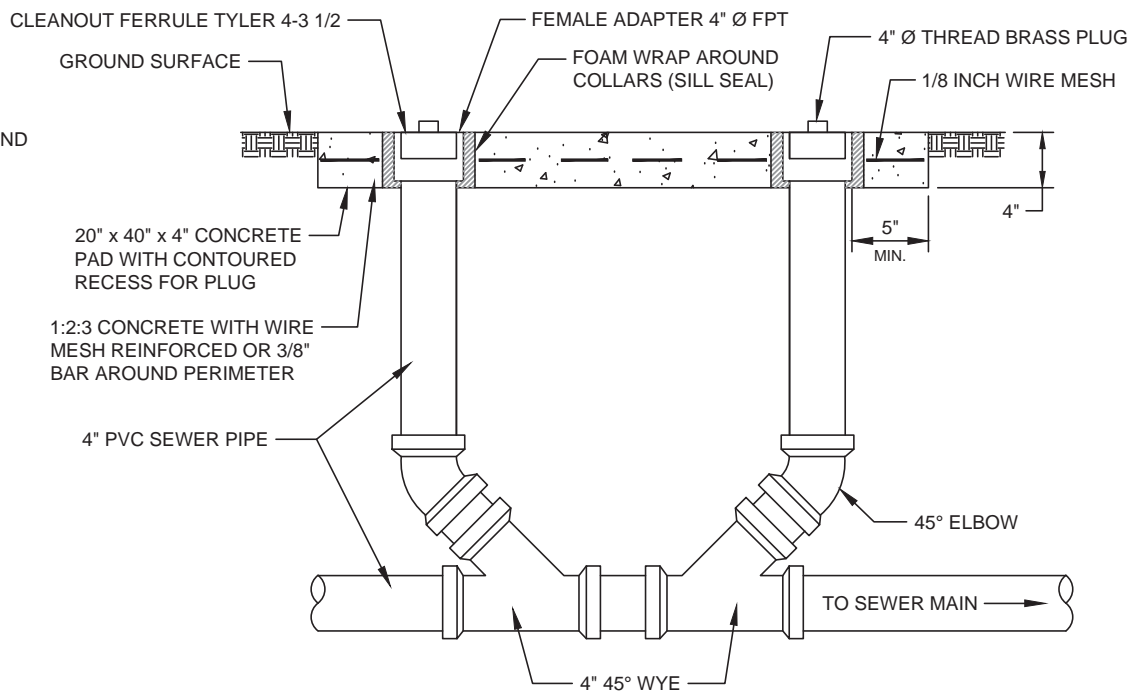
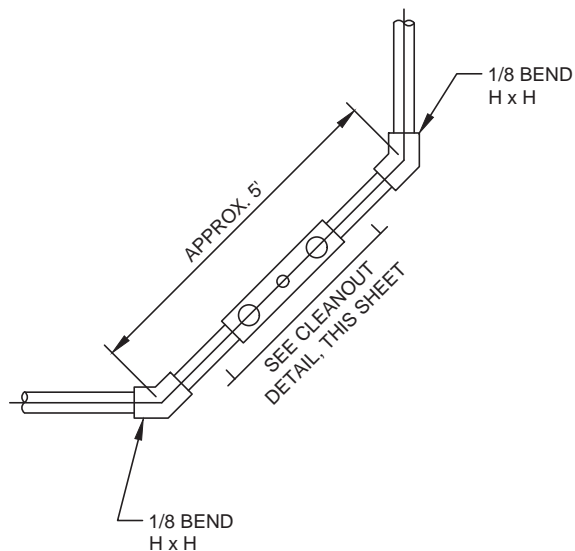
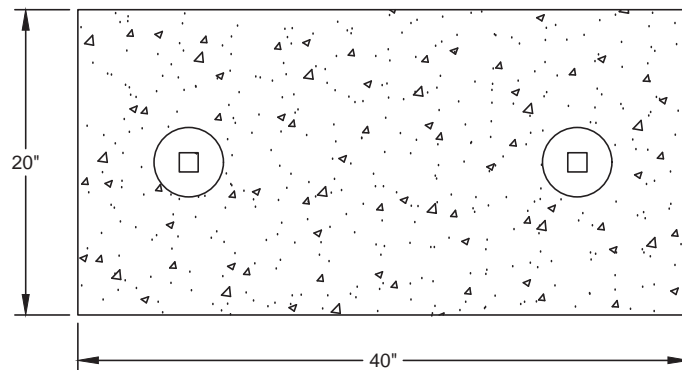
PAO REVISED DETAILS
WATER - SEWER - MISC DETAILS
WATER SERVICE LINE CONNECTION

DRAWN BY: ---- DATE: ----
CHECKED BY: ---- DATE: ----

FILE NAME: REVISED WATER DRAWINGS
LAYOUT NAME: 5A
PROJ ENG: ----

NOTES:

- 1) ALL 90° TURNS IN 4" SEWER SERVICE LINES WILL BE MADE WITH 2 1/8 BENDS (45°), AS SHOWN BELOW. FOR OTHER TURNS FITTINGS AS REQUIRED.
- 2) THE REQUIRED DISTANCE BETWEEN THE TWO-WAY CLEANOUT AND THE HOUSE SHALL BE WITHIN 10 FT. OF BUILDING OR AS SHOWN ON PLANS.



7A SEWER SERVICE CLEANOUT
Scale: N.T.S.

DATE	REVISIONS	INITIALS
11-14	UPDATED	
06-18	REVISED	LTS

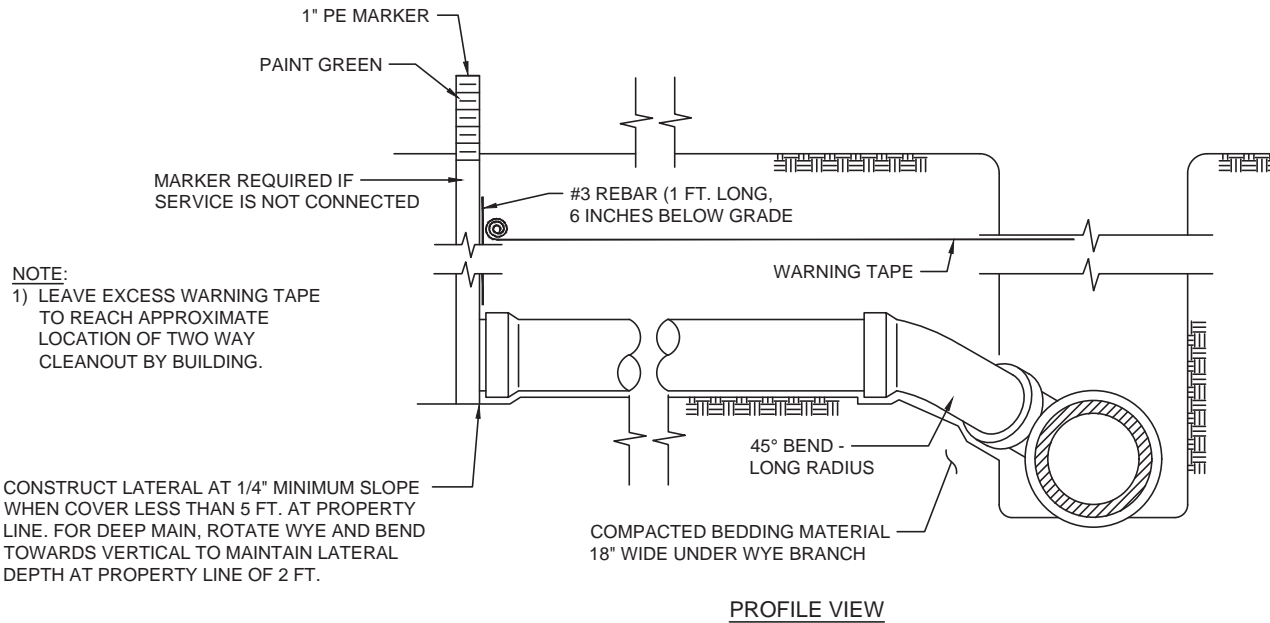
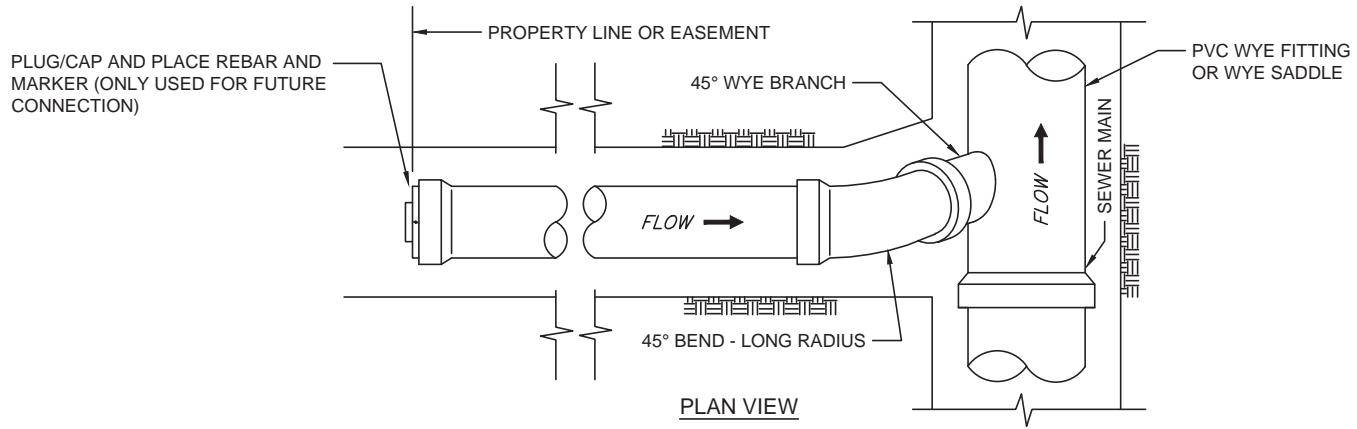


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PAO REVISED DETAILS
WATER - SEWER - MISC DETAILS
SEWER SERVICE CLEANOUT

DRAWN BY: ----	DATE: ----	FILE NAME: REVISED SEWER DRAWINGS
CHECKED BY: ----	DATE: ----	LAYOUT NAME: 7A
		PROJ ENG: ----



NOTE:
1) LEAVE EXCESS WARNING TAPE TO REACH APPROXIMATE LOCATION OF TWO WAY CLEANOUT BY BUILDING.

CONSTRUCT LATERAL AT 1/4" MINIMUM SLOPE WHEN COVER LESS THAN 5 FT. AT PROPERTY LINE. FOR DEEP MAIN, ROTATE WYE AND BEND TOWARDS VERTICAL TO MAINTAIN LATERAL DEPTH AT PROPERTY LINE OF 2 FT.

7B SEWER SERVICE WITHOUT CONNECTION
Scale: N.T.S.

DATE	REVISIONS	INITIALS
11-14	UPDATED	
06-18	REVISED	LTS

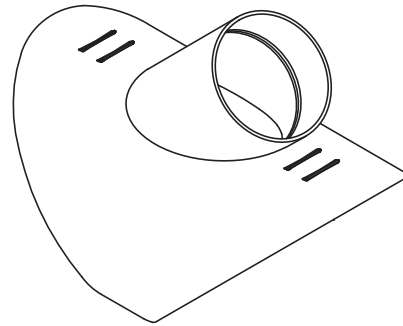


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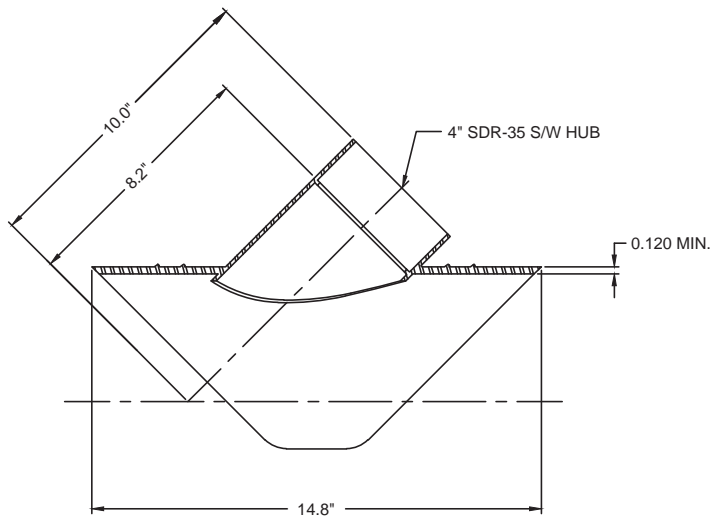
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PAO REVISED DETAILS
WATER - SEWER - MISC DETAILS
SEWER SERVICE WITHOUT CONNECTION

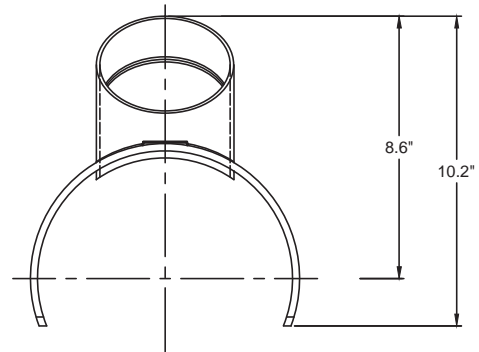
DRAWN BY: ----	DATE: ----	FILE NAME: REVISED SEWER DRAWINGS
CHECKED BY: ----	DATE: ----	LAYOUT NAME: 7B
		PROJ ENG: ----



ISO VIEW



PROFILE VIEW



END VIEW

7C

SEWER SERVICE SADDLE

Scale: N.T.S.

DATE	REVISIONS	INITIALS
11-14	UPDATED	
05-18	REVISED	LTS



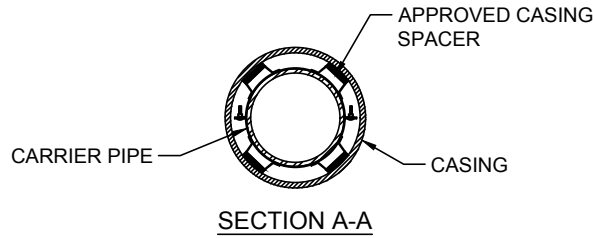
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PAO REVISED DETAILS
WATER - SEWER - MISC DETAILS
SEWER SERVICE SADDLE

DRAWN BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

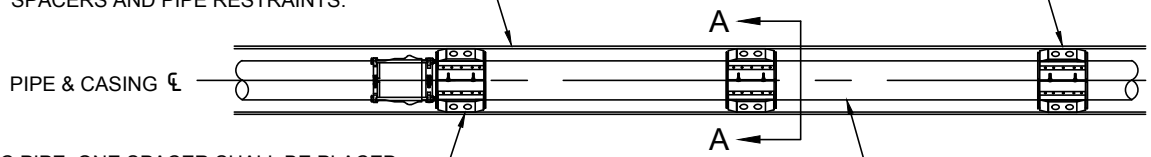
FILE NAME: REVISED SEWER DRAWINGS
LAYOUT NAME: 7C
PROJ ENG: _____



MINIMUM CASING PIPE DIAMETER REQUIREMENTS (UNLESS OTHERWISE INDICATED ON PLANS)	
CARRIER PIPE NOMINAL DIAMETER	MINIMUM NOMINAL CASING PIPE DIAMETER
4"	12"
6"	14"
8"	18"
10"	20"
12"	24"

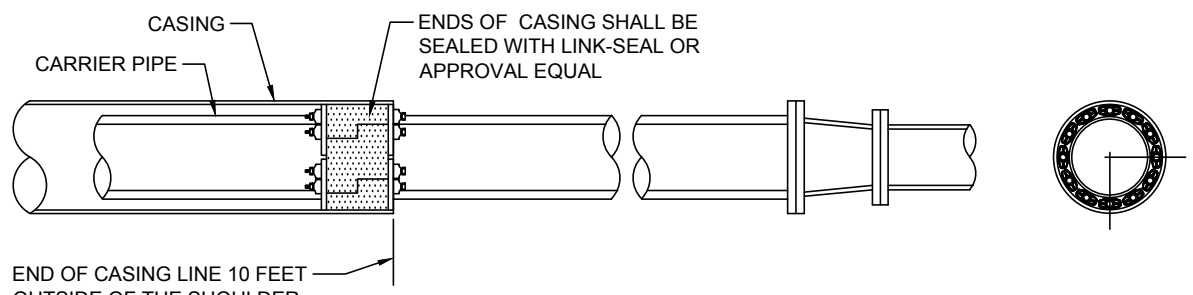
CASING PER UTILITY CROSSING PERMIT & PLAN SET. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL VERIFY THAT THE DIAMETER OF CASING IS ADEQUATE TO ACCOMMODATE CARRIER PIPE, SPACERS AND PIPE RESTRAINTS.

MAX. SEPARATION OF SPACERS VARIES BY MANUFACTURER. PROVIDE A MIN. OF 3 SPACERS PER 20' PIPE LENGTH



FOR PVC PIPE, ONE SPACER SHALL BE PLACED ON THE SPIGOT END OF EACH SEGMENT AT THE LINE MARKING THE LIMIT OF INSERTION INTO THE BELL. NOTE: JOINT RESTRAINTS ARE REQUIRED, ONE SPACER SHALL BE INSTALLED ADJACENT TO THE RESTRAINTS.

CARRIER PIPE AND MATERIAL AS SPECIFIED IN CONTRACT DOCUMENTS



END OF CASING LINE 10 FEET OUTSIDE OF THE SHOULDER LINES OR AS DIRECTED BY THE UTILITY CROSSING PERMIT

11A CASING DETAIL
Scale: NTS

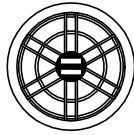
DATE	REVISIONS	INITIALS
12-14	UPDATED	
04-18	REVISED	DA



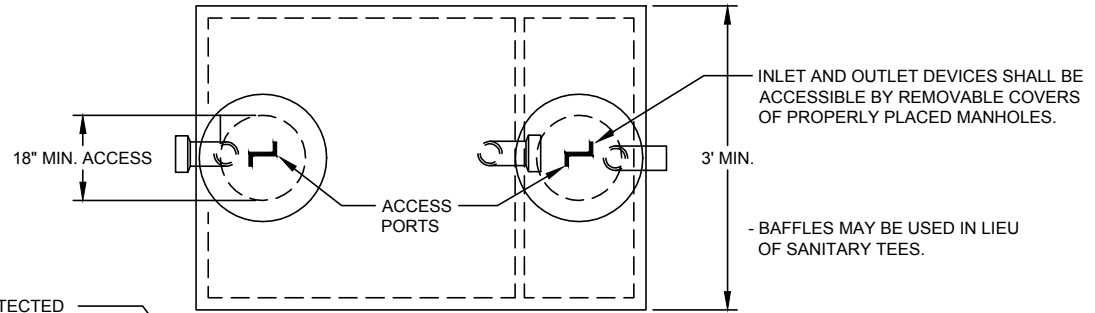
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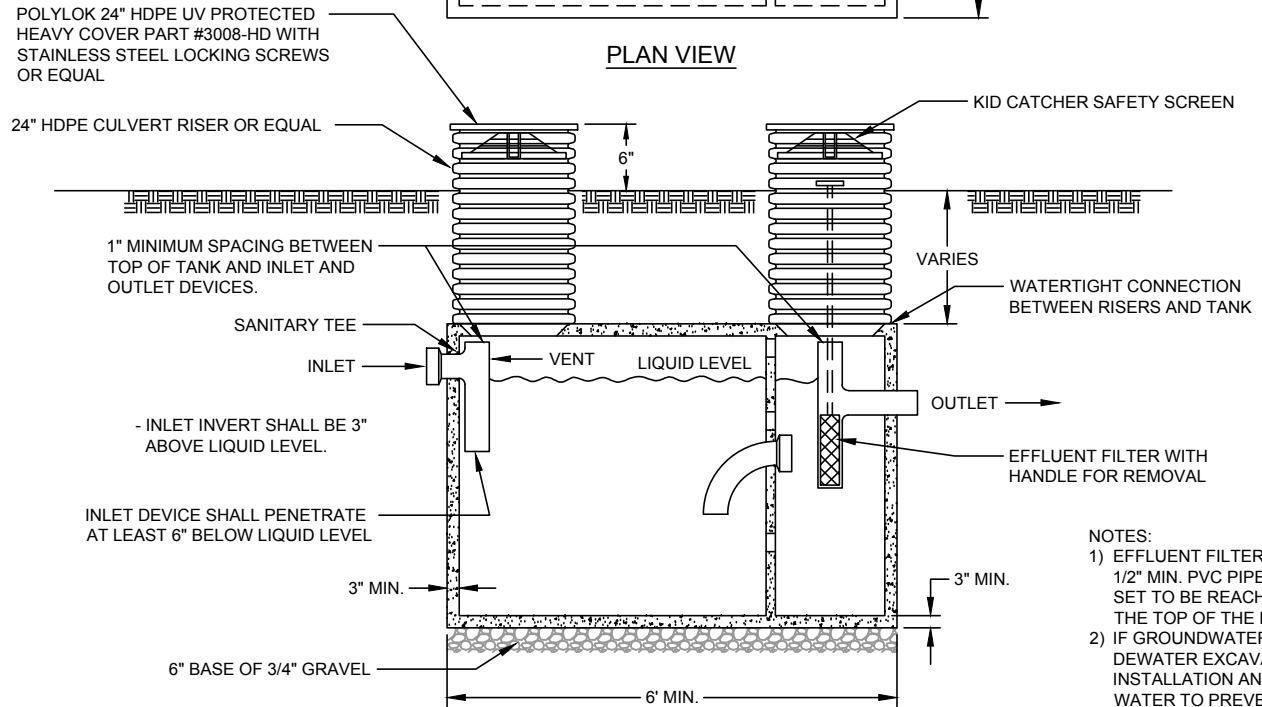
PAO REVISED DETAILS		
WATER - SEWER - MISC DETAILS CASING DETAIL		
DRAWN BY: ----	DATE: ----	FILE NAME: REVISED MISC DRAWINGS
CHECKED BY: ----	DATE: ----	LAYOUT NAME: 11A
		PROJ ENG: ----



KID CATCHER SAFETY SCREEN



PLAN VIEW



LONGITUDINAL SECTION

- NOTES:
- 1) EFFLUENT FILTER HANDLE SHALL BE 1/2" MIN. PVC PIPE, 12" LONG AND SET TO BE REACHED WITHIN 1' OF THE TOP OF THE RISER.
 - 2) IF GROUNDWATER IS PRESENT, DEWATER EXCAVATION FOR SAFE INSTALLATION AND FILL TANK WITH WATER TO PREVENT FLOTATION.

12A TYPICAL TWO COMPARTMENT CONCRETE SEPTIC TANK
Scale: NTS

DATE	REVISIONS	INITIALS
01-15	UPDATED	
06-18	REVISED	LTS

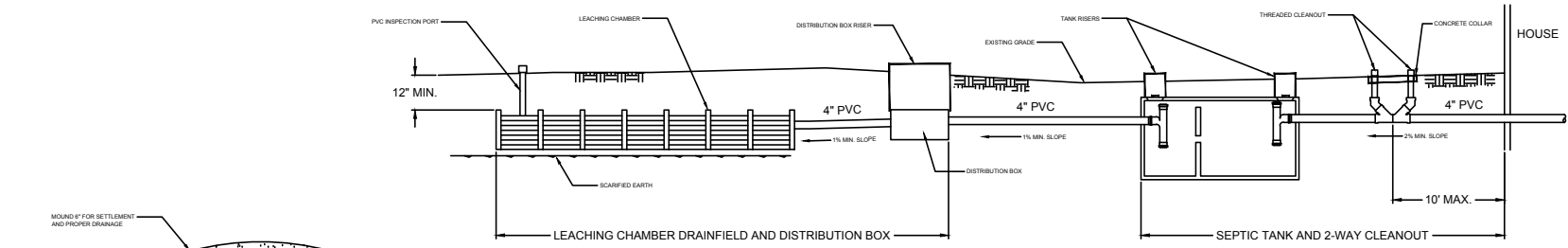


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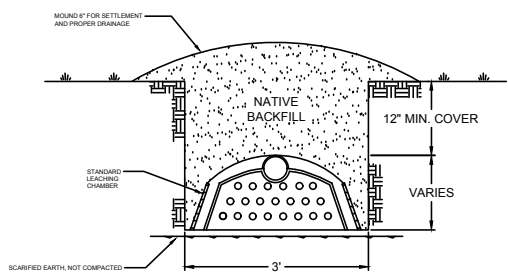
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PAO REVISED DETAILS
WATER - SEWER - MISC DETAILS
TYPICAL TWO COMPARTMENT SEPTIC TANK

DRAWN BY: ----	DATE: ----	FILE NAME: REVISED SEWER DRAWINGS
CHECKED BY: ----	DATE: ----	LAYOUT NAME: 12A
		PROJ ENG: ----

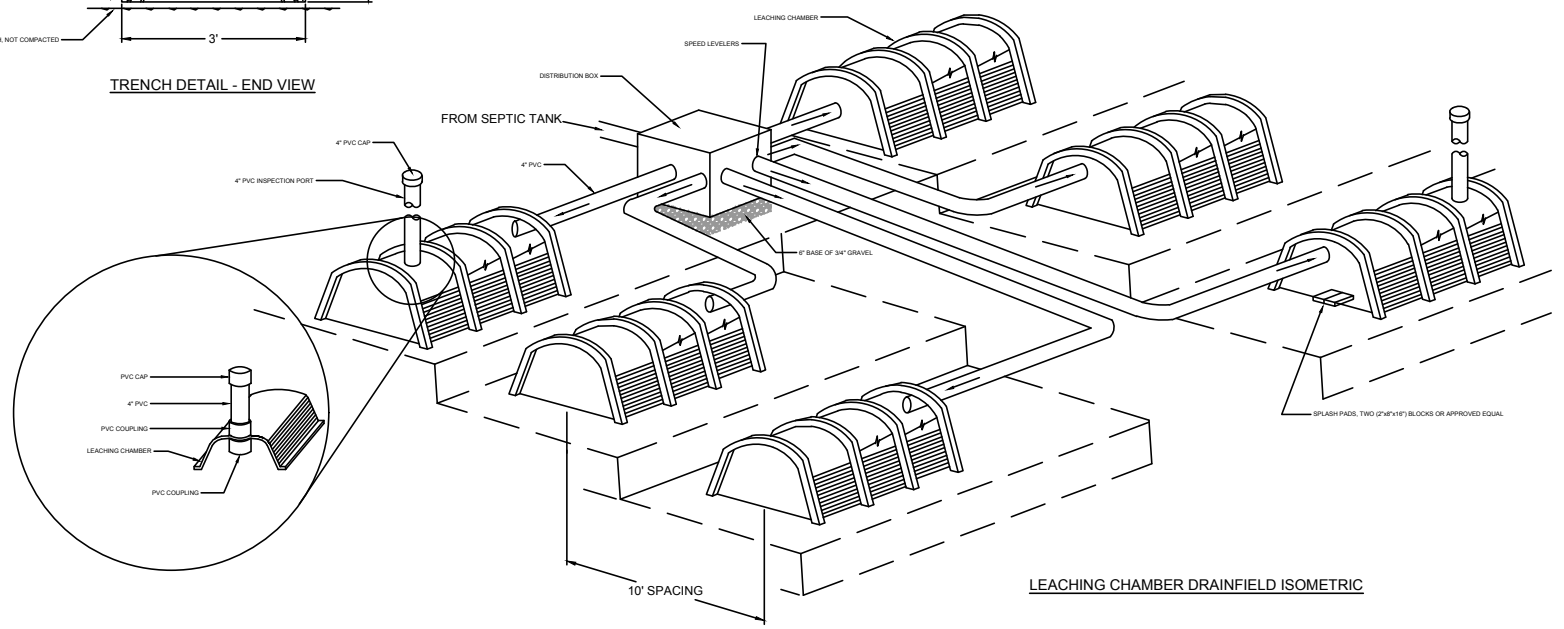


DRAINFIELD PROFILE VIEW



TRENCH DETAIL - END VIEW

- NOTES:
- 1) ACTUAL NUMBER OF LEACHING CHAMBER ROWS, AND THE LENGTH OF EACH ROW FOR SPECIFIC SITES WILL BE BASED ON CALCULATIONS EVALUATING HOME SIZE AND SOIL LOADING RATES AND SHALL BE IDENTIFIED ON THE PLANS.
 - 2) LOCATION OF INSPECTION PORTS WILL BE INDICATED ON SITE PLAN.



LEACHING CHAMBER DRAINFIELD ISOMETRIC

12C SEPTIC TANK & LEACHING CHAMBER DRAINFIELD (SLOPING SITE)
Scale: NTS

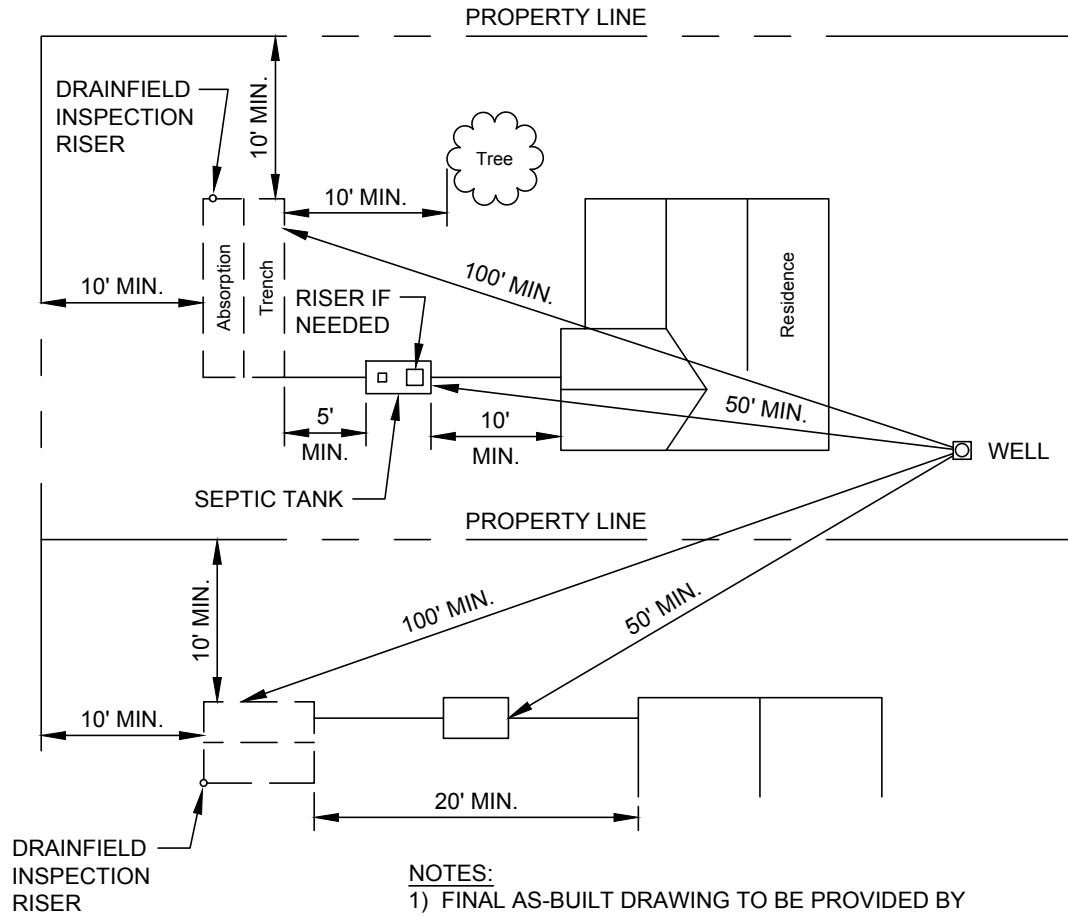
DATE	REVISIONS	INITIALS
12-14	UPDATED	
06-18	REVISED	LTS



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PAO REVISED DETAILS		
WATER - SEWER - MISC DETAILS		
SEPTIC TANK & LEACHING CHAMBER DRAINFIELD (SLOPING SITE)		
DRAWN BY: ----	DATE: ----	FILE NAME: REVISED SEWER DRAWINGS
CHECKED BY: ----	DATE: ----	LAYOUT NAME: 12C
		PROJ ENG: ----



- NOTES:**
- 1) FINAL AS-BUILT DRAWING TO BE PROVIDED BY CONTRACTOR SHOWING RELATIVE LOCATIONS OF ALL FEATURES REFERENCED TO HOUSE CORNERS.
 - 2) STREAM, LAKE OR WETLAND DISTANCES TO DRAINFIELD 100', TO SEPTIC TANK 50' AND TO PIPING 25'.

12D TYPICAL LOT PLAN
Scale: NTS

DATE	REVISIONS	INITIALS
11-14	UPDATED	
05-18	REVISED	LTS



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PAO REVISED DETAILS		
WATER - SEWER - MISC DETAILS TYPICAL LOT PLAN		
DRAWN BY: ----	DATE: ----	FILE NAME: REVISED SEWER DRAWINGS
CHECKED BY: ----	DATE: ----	LAYOUT NAME: 12D
		PROJ ENG: ----