

Construction Bid Documents & Specifications

**Washington City
Grapevine Transmission Line
Foundation Bid Package**

July 2025



**Intermountain Consumer
Professional Engineers, Inc.
1145 East South Union Avenue
Midvale, Utah 84047
(801) 255-1111**

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VOLUME I
BIDDING DOCUMENTS

BIDDING DOCUMENTS INDEX

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INVITATION TO BID

SECTION 00020

Bids for furnishing all labor, equipment, materials and services required for the performance of the Work specified in the Washington City (“CITY”) (“OWNER”) project documents, entitled Grapevine Transmission Line Project, must be emailed to tpentz@washingtongcity.org, Washington City at 111 North 100 East, Washington, Utah 84780. They will be received up to and before 3:00 p.m. on August 29, 2025.

Only those Bids submitted by Bidders pre-qualified by the OWNER shall be considered.

The proposed Work is general described as follows:

Washington City Grapevine Transmission Line Project: Bid - Foundation Construction. The project includes the installation of seven concrete Transmission Line Foundations.

A **mandatory** pre-bid meeting will be held on August 14, 2025, at 11:00 a.m. The pre-bid meeting will be held at the City Offices (Council Chamber) located at 111 North 100 East, Washington, Utah 84780. Each attendee is to bring their own PPE as we plan to visit the Transmission Line site.

The Owner anticipates that an award will be made by September 12, 2025. Foundation construction is to be completed by November 21, 2025. Early completion is acceptable.

Copies of the Bid Documents are available from Intermountain Consumer Professional Engineers, Inc., (“ENGINEER”) 1145 East South Union Avenue, Midvale, Utah 84047, phone 801-255-1111.

Bidders must be licensed contractors in the State of Utah. The Bidder and Bidder’s subcontractors shall provide evidence of licensure with the Bid.

Bids will be received on a lump sum basis, including allowances and unit price adjustments as described in the Bid Documents.

The CONTRACTOR will be required to furnish a Construction Performance Bond and a Construction Payment Bond as security for the faithful performance and the payment of all bills and obligations arising from the performance of the Contract. The CONTRACTOR will also be required to furnish a Guaranty Bond upon Substantial Completion of the Work guaranteeing all Work performed.

CONTRACTOR and all Subcontractors will be required to provide insurance as set forth in the Bid Documents.

OWNER reserves the right to reject any or all Bids, including without limitation the right to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and to reject the Bid or any Bidder if OWNER believes that it would not be in the best interest of OWNER to make an award to that Bidder. OWNER also reserves the right to waive informalities. Bids will be evaluated as prescribed in OWNER’s Procedure for Award of Construction Contracts for the Project.

END OF SECTION 00020

INSTRUCTIONS TO BIDDERS

SECTION 00100

1. DEFINED TERMS. Terms used in these Instructions to Bidders shall have the meanings assigned to them in the General Conditions, Specifications and Drawings.

1.1 Additional Terms. Additional terms, not defined in the General Conditions, are defined as follows:

Bidder - The person, firm, or corporation submitting a Bid for the Work to be performed.

Successful Bidder - The best bidder as evaluated by the OWNER pursuant to the OWNER's Procedure for Award of Construction Contracts for the Project as published in the OWNER's Bidding Documents and to whom the OWNER makes an award on the basis thereof.

1.2 Bidding Documents. Bidding Documents shall include the following:

Volume I - Bidding Documents

Invitation to Bid
Instructions to Bidders
Procedures for Award of Construction Contract
Bid Form
Qualification Statement
Subcontractor Information
Proposed Equipment and Material Data
Bid Bond

Volume II - Contract Forms and General Conditions

Agreement
Certificate of Insurance
General Conditions

Volume III - Specifications

General Requirements
Technical Specifications
Equipment & Materials Specifications

Volume IV - Drawings

Addenda

Issued prior to receipt of Bids

2. COPIES OF BIDDING DOCUMENTS. Bidding Documents may be obtained from the ENGINEER as stated in the Invitation to Bid.

Complete sets of Bidding Documents must be used in preparing Bids. Neither the OWNER nor ENGINEER assumes any responsibility for errors or misrepresentations resulting from the use of incomplete sets of Bidding Documents.

The OWNER and ENGINEER, in providing Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

3. **QUALIFICATION OF BIDDERS.** The OWNER has selected pre-qualified construction contractors for the construction of electrical Transmission Line facilities. OWNER will consider Bids pursuant to the selection methodology set forth in Procedures for Award of Construction Contracts (Section 00200).

4. **UTAH LICENSE REQUIREMENTS.** Bidder must be appropriately licensed in the State of Utah. In addition, prior to applying for a license, a corporation must be registered with the Utah Secretary of State. In the event of joint ventures, each venture partner must be licensed, and unless each joint venturer has an unlimited license, the joint venture must have an additional license for acting in the capacity of such joint venture. The Bidder and Bidder's subcontractors shall provide evidence of licensure with the Bid.

The Contract may be awarded to another Bidder if the person to whom the Bid was awarded is not licensed or if the amount of the Bid exceeds the limits of the Bidder's license. If, for any reason, the person to whom the Bid is awarded does not execute the Contract, the OWNER reserves the right to award or re-award the Contract without re-bidding. The OWNER reserves the right, without liability to the OWNER, to cancel the award, or any proposal, at any time before the execution of the Contract by all parties.

5. **EXAMINATION OF CONTRACT DOCUMENTS AND SITE.** It is the responsibility of each Bidder, before submitting a Bid, to: (a) thoroughly examine the Contract Documents and all requirements therein; (b) visit the Site to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work; (c) consider federal, state, and local laws and regulations that may affect cost, progress, performance, or furnishing of the Work; (d) study and carefully correlate Bidder's observations with the Contract Documents; and (e) promptly notify the ENGINEER of all conflicts, errors, or discrepancies discovered by Bidder in the Contract Documents. Submission of a Bid shall be conclusive evidence that the Bidder has complied with the requirements of the preceding sentence.

5.1 **Subsurface Conditions and Physical Conditions.** Reference is made to the General Conditions for identification of, and the extent to which Bidder is entitled to rely on, the following:

Reports of explorations and test of subsurface conditions at the Site which have been utilized by ENGINEER in preparation of the Contract Documents.

Drawings of physical conditions in or relating to existing surface and subsurface conditions (except underground facilities) which are at or contiguous to the Site that have been utilized by ENGINEER in preparation of the Contract Documents.

Copies of such reports and drawings will be made available by the ENGINEER to Bidders who request such subsurface information and sign a receipt therefor. Such reports and drawings do not form a part of this or any Contract Document issued by the OWNER or ENGINEER. Subsurface information issued by ENGINEER shall be returned by unsuccessful Bidders within thirty (30) days after Notice of Award.

5.2 **Limited Reliance by Bidders on Subsurface Data Provided.** Bidders are warned that the information contained in the Contract Documents relating to subsurface conditions may not be indicative of actual subsurface conditions that may be encountered while performing the Work. The OWNER does not warrant and hereby disclaims responsibility for the accuracy of this information except factual technical data derived from direct observation, examination or testing of physical samples or specimens with descriptions or measurements of such samples and specimens derived from direct examination or testing by persons acting on behalf of the OWNER.

5.3 **Underground Facilities.** Information and data reflected in the Contract Documents with respect to underground facilities at or contiguous to the Site are based upon information and data furnished to OWNER and ENGINEER by owners of such underground facilities or others, and OWNER and ENGINEER disclaim responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in these Contract Documents.

5.4 **Additional Information.** Before submitting a Bid, each Bidder shall at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional

information and data which pertain to the physical conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise which may affect cost, progress, performance, or furnishing of the work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

On request 48 hours in advance, the OWNER will seek to provide each Bidder access to property on which the Work is to be performed, under such terms of permission as OWNER may then prescribe, as each Bidder deems necessary for submission of a Bid.

5.5 Easements. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by CONTRACTOR in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by CONTRACTOR.

5.6 Bidder's Representation. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement concerning examination of the Contract Documents and the Site, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

6. INTERPRETATIONS AND ADDENDA. All questions about the meaning or intent of the Bidding Documents and the Contract Documents shall be submitted to ENGINEER in writing. Interpretations or clarifications considered necessary by ENGINEER in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by ENGINEER as having received the Bidding Documents. **Questions received less than 5 days prior to the date for opening of Bids may not be answered.** Only answers issued by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7. MANDATORY PREBID CONFERENCE. A mandatory pre-bid conference will be held at 11:00 a.m., local time, on August 14, 2025. Attendance is mandatory for prospective Bidders bidding as prime contractors. Pre-bid conference will be held at the following location:

Washington City Offices
111 North 100 East
Washington, Utah 84780
rhansen@washingtontcity.org

8. BIDDING DOCUMENTS.

8.1 Bid Form. The Bid Form is bound in the Bidding Documents and shall not be removed there from. The Bid must be completed in ink.

8.1.1 Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officer accompanied by evidence of authority to sign for the corporation). Bids by partnerships must be executed in the partnership name and signed by a partner. Bids by joint ventures shall be signed by each participant in the joint venture or by a representative of the joint venture accompanied by evidence of authority to sign for the joint venture.

8.1.2 The names of all persons signing shall be legibly printed below their signatures. A Bid by a person who affixes to his signature the word "president", "secretary", "agent", or other designation without disclosing his principal may be held to be the Bid of the individual signing. When requested by the OWNER, evidence of the authority of the person signing shall be furnished.

8.1.3 All blanks in the Bid Form shall be filled. A Bid price shall be indicated for each Bid item, allowance item, and adjustment unit price listed therein. The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers and dates of which shall be filled in on the Bid Form.

8.1.4 No alteration in Bids, or in the printed forms therefore, by erasures, interpolations, or otherwise will be acceptable.

8.2 Bid Pricing. The lump sum amount shall be based on the Work as indicated on the Drawings and as specified. The evaluated price and Award Contract Price will equal the Total Extended Price. The Contract Price subject to the Extended Price limitations, will be adjusted according to final delivered and installed construction units quantities. The adjustment unit prices in the Bid will apply to such final quantities.

8.3 Subcontractors, Suppliers, and Others.

8.3.1 Each Bidder shall provide, on the form bound in the Bidding Documents entitled “Subcontractor Information”, the name of each Subcontractor who will provide labor for the portion of the Work indicated, the percentage of the Total Bid anticipated to be paid each Subcontractor, and the Utah license number of each Subcontractor named.

8.3.2 The Bidder shall provide an experience statement of Subcontractor(s) with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, supplier, person or organization.

8.3.3 If the OWNER, after due investigation, has reasonable objection to any proposed Subcontractor, supplier, or other person or organization, the OWNER may, before the Notice of Award is given, request the apparent Successful Bidder to submit an acceptable substitute without an increase in the Bid. If the apparent Successful Bidder declines to make any such substitution, the OWNER may award the Contract to the next best Bidder, in the OWNER’s judgment, that proposes to use acceptable Subcontractors, suppliers, and other persons and organizations. Declining to make requested substitutions will not constitute grounds for sacrificing the Bid Security of any Bidder. Any Subcontractor, supplier, or other person or organization listed and to whom the OWNER does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to the OWNER, subject to revocation as provided in paragraph 6.8.1 of the General Conditions.

8.3.4 A Contractor whose Bid is accepted shall not substitute any person for a Subcontractor who is named in the Bid unless:

- (i) The OWNER objects to the Subcontractor, requests in writing a change in the Subcontractor and pays any increase in cost resulting from the change; or
- (ii) The substitution is approved by the OWNER and:
 - (1) The Subcontractor, after having a reasonable opportunity, fails or refuses to execute a written subcontract which was offered to the Subcontractor with the same terms that all other Subcontractors on the Project were offered;
 - (2) The named Subcontractor files bankruptcy or becomes insolvent; or
 - (3) The named Subcontractor fails or refuses to perform his subcontract within a reasonable time or is unable to furnish a performance bond and payment bond.

A CONTRACTOR whose Bid is accepted shall not contract with any Subcontractor not listed in its Subcontractor Information forms to perform the Work indicated, without the written approval of the OWNER.

8.4 Bid Preference. In accordance with the Procedure for Award of Construction Contracts for the Project (Section 00200), the OWNER shall award the Contract to the qualified Bidder who submits the best Bid. In accordance with OWNER’s Procedure for Award of Construction Contract (Section 00200), the OWNER shall award the Contract to the qualified CONTRACTOR who submits the best Bid.

9. SUBMISSION OF BIDS. Bids shall be submitted at the time and place indicated in the Invitation to Bid, or at the modified time and place indicated by Addendum. Bids shall be enclosed in the envelope provided with the Bidding Documents and sealed.

The Bidder shall submit one (1) duplicate copy of the bound Volume I, Bidding Documents, and other documents, as required, in an envelope marked "Washington City – Grapevine Transmission Line Project - Bidding Documents".

Volumes II, III, and IV, of the Bidding Documents are not to be submitted with the Bid.

Bid envelope and Bid Documents shall be marked with the name and address of the Bidder.

Email Bids are acceptable. If the Bid is sent through the mail or other delivery system, the sealed Bid envelope shall be enclosed in a separate envelope with the notation "Washington City - Grapevine Transmission Line Project" on the face and addressed to:

Washington City
ATTN: Tara Pentz
111 North 100 East
Washington, Utah 84780
tpentz@washingtontcity.org

Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids. Note, next day delivery to Washington is not always reliable, bidders to plan accordingly. Bids received after the time and date identified in the Invitation to Bid shall be returned unopened.

No Bidder may submit more than one Bid. Multiple Bids under different names will not be accepted from one firm or association. Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids and prequalification documents. Bids received after the time and date identified in the Invitation to Bid shall be returned unopened.

10. MODIFICATION AND WITHDRAWAL OF BIDS. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids. After the Bid opening, Bids may not be modified for any reason.

If, within 48 hours after Bids are opened, any Bidder files a duly signed, written notice with OWNER and promptly thereafter demonstrates to the reasonable satisfaction of OWNER that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid and the Bid Security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

11. BIDS TO REMAIN SUBJECT TO ACCEPTANCE. All Bids shall remain subject to acceptance for the number of days set forth in the Bid Form, but the OWNER may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

12. OPENING OF BIDS. At the location, date, and time indicated in the Invitation to Bid, the OWNER will publicly open the Bids. Pursuant to OWNER's Procedure for Award of Construction Contracts (Section 00200), the OWNER and ENGINEER shall consider the Bids.

The OWNER may conduct such investigations as the OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to OWNER's satisfaction within the prescribed time.

The initial Work Plan submitted with the Bids will be reviewed by the OWNER and ENGINEER to determine the Bidder's comprehension of the Work and the Bidder's experience and expertise in the construction of electrical Transmission Line facilities. The methods described in Work Plan will also be reviewed for conformance with the Specifications.

The OWNER and ENGINEER may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Contract Documents.

The OWNER and ENGINEER also may consider the technical proposal of the Bidder, including the operating costs, maintenance requirements, performance data, and guarantees of items of materials and equipment proposed for incorporation in the Work when such data are required.

The OWNER and ENGINEER will then determine the best bid of the prequalified Bidders pursuant to the Procedure for Award of Construction Contracts adopted for the Project.

13. AWARD OF CONTRACT. Pursuant to the OWNER's Procedure for Award of Construction Contract, the OWNER reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder if the OWNER believes that it would not be in the best interest of the OWNER to make an award to that Bidder. The OWNER also reserves the right to waive informalities.

14. SUBSTITUTE OR "OR-EQUAL" ITEMS. The procedure for submission of any application for review of substitute or "or-equal" items by CONTRACTOR and consideration by ENGINEER is set forth in Paragraph 6.7 of the General Conditions. The Contract, if awarded, will be on the basis of materials and equipment indicated on the Drawings or specified in the Specifications. Application for review of substitute or "or-equal" materials or equipment will not be considered by ENGINEER until after the effective date of the Agreement. Proposed substitute and "or-equal" items will be considered.

15. SIGNING OF AGREEMENT. When OWNER issues a Notice of Award to the Successful Bidder, the ENGINEER will issue two (2) unbound conformed copies of Volume II of the Bidding Documents to the successful Bidder. Within the number of days set forth in the Bid Form, the Successful Bidder shall sign all copies of the Agreement, leaving the dates blank, insert the required Bonds and power of attorney in the appropriate places and deliver all copies of Volume II to the OWNER. OWNER will, thereafter, execute all copies of the Agreement and other Contract Documents submitted by CONTRACTOR (Successful Bidder) and shall insert the date of contract on the Agreement, Bonds, and power of attorney. OWNER will provide the executed Contract Documents for binding and distribution. Distribution of executed copies shall be as stipulated in the Contract Documents. Executed Contract Documents will be accompanied by a complete set of the Drawings, with appropriate identification. If the Successful Bidder fails to comply with the requirements of this section, the OWNER may nullify its award of the Contract and thereafter accept the Bid of another Bidder.

16. PERMITS. The Bid Price shall not include the cost of all required permits or the cost of all measures required to comply with all permit requirements. Permits have been or will be obtained by OWNER, as indicated in the General Requirements.

17. TAXES. All taxes that are lawfully assessed against the OWNER or CONTRACTOR in connection with the Work shall be paid by CONTRACTOR. The Bid Price shall include all such taxes.

18. CONTRACT SECURITY. The CONTRACTOR's Performance and Payment Bonds shall be delivered to the OWNER with the executed Agreement.

19. RETAINAGE. Provisions concerning retainage are set forth in the General Conditions.

20. WORK PLAN. Bidder shall submit a full description of its initial Work Plan with the Bid. If any method does not meet the requirements of this Specification, the Bid may be held to be unresponsive and may be rejected. Descriptions of proposed methods shall be complete and detailed enough to demonstrate full conformance with the Specifications. The methods described in the Work Plan shall not be modified during construction except as authorized by OWNER.

21. EXTENDED WORK WEEK. OWNER may require a mandatory 6 day workweek as directed by the OWNER for work activities which are on the critical path of job completion.

22. COMMUNICATIONS. Prior to opening Bids, all communications relative to the Work shall be directed to the ENGINEER via email. The ENGINEER will review communications and issue Addenda if appropriate. The ENGINEER will not provide any formal interpretation of the Bidding Documents other than via addenda. Address communications to:

ICPE
ATTN: Matt Levorsen, P.E.
1145 East South Union Avenue
Midvale, UT 84047
Matt.Levorsen@icpeinc.com

And

Washington City
ATTN: Rick Hansen
111 North 100 East
Washington, Utah 84780
rhansen@washingtontcity.org

23. SCHEDULE MILESTONE. Schedule milestones are required by Article 13.10 of the General Conditions (Section 00700).

24. GUARANTY BOND. The CONTRACTOR will be required to submit a Guaranty Bond, in the amount of five percent (5%) of the final Contract Price, after completion of the Project which warrants the Work for a period of one year after final acceptance of the Work. The cost of this Guaranty Bond shall be included in the CONTRACTOR's Bid.

END OF SECTION 00100

PROCEDURE FOR AWARD OF CONSTRUCTION CONTRACT

SECTION 00200

1. Washington City intends to utilize the following procedures for award of the construction contract for construction of its Grapevine Transmission Line Project.
2. The phrase “construct . . . any facility for . . . power, including . . . a facility for the . . . transformation of electricity” shall include the installation, of below ground, of a) electrical equipment including power circuit breakers, Transmission Line steel, building and all related components; b) cabling and all associated components; and d) all other components and equipment necessary to construct and complete an operational and fully functioning electrical Transmission Line.
3. Upon receipt of bids, the OWNER and ENGINEER shall consider the bids. The OWNER or ENGINEER may meet with any bidder in order to ensure that the OWNER understands each bid.
4. The OWNER or ENGINEER shall recommend the best bid to the OWNER for consideration. The best bid shall be that bid which, in the opinion of the OWNER:
 - a. proposes the construction of the Project, or any part thereof, in a manner which meets the design specifications provided by the OWNER and the contract requirements provided by the bid specifications;
 - b. proposes the construction of the Project, or any part thereof, in a timely manner so as to ensure the completion of the Project.
 - c. proposes contract prices, either in lump sum or per item as specified in the OWNER’s design specifications, which are competitively priced in the market place;
 - d. provides the most certain and stable quality assurance;
 - e. provides the most substantial fiscal accountability and performance guarantee in the event of the construction contractor’s failure to perform as contracted;
 - f. demonstrates the construction contractor’s general ability to provide substantial post-construction support to the OWNER in the operation of its electrical Transmission Line facilities;
 - g. demonstrates that the construction contractor is experienced in constructing electrical Transmission Line facilities of the nature intended to be constructed by the OWNER.
 - h. demonstrates that the construction contractor is knowledgeable about the engineering, manufacture, assembly, testing and shipping or other ancillary services related to the delivery of major electrical equipment;
 - i. demonstrates that the construction contractor has experience in the construction of electrical Transmission Line facilities in climatological, topographic and geological situations similar to those within which the OWNER intends to construct electric Transmission Line facilities (at grade, above or below ground as the case may be);
 - j. demonstrates that the construction contractor’s subcontractors, suppliers, and other persons and organizations proposed for various portions of the work are qualified and experienced;
 - k. demonstrates that the construction contractor has satisfied other owners with the quality and timeliness of its work.

None of the above-listed criteria shall be an exclusive determinant of the best bid. The lowest bid shall be the best bid when all non-cost criteria are equal.

5. Any or all of the bids received may be rejected if the OWNER if it is determined that:
 - a. the bidder is not responsive or responsible;

- b. the apparent quality of the services, materials, equipment or labor offered does not conform to the approved plan or specifications; or
- c. the OWNER's interest would be served by such a rejection.

6. Any contract for the construction of electrical Transmission Line facilities shall require that the contractor provide a) a performance bond in an amount of 100% of the contract amount, conditioned upon the faithful performance of the contract in accordance with its terms and exclusively for the protection of the OWNER; and b) a payment bond in an amount not less than 100% of the contract amount, for the protection of claimants supplying labor or materials to the contractor or to any of his subcontractors, in the construction of electrical Transmission Line facilities for the OWNER. The performance bond and payment bond shall be issued by a surety company authorized to do business in the State of Utah.

END OF SECTION 00200

BID FORM

SECTION 00350

PROJECT IDENTIFICATION:

WASHINGTON CITY
GRAPEVINE TRANSMISSION LINE – FOUNDATION CONSTRUCTION

THIS BID IS SUBMITTED BY:

_____ (Bidder)
_____ (Bidder Address)

THIS BID IS SUBMITTED TO:

Washington City
Tara Pentz
111 North 100 East
Washington, Utah 84780
tpentz@washingtontcity.org

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents within the specified time and for the amount indicated in the Bid and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Invitation to Bid and the Instructions to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for 60 days after the day of Bid opening. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Bidding Documents within 10 days after the date of OWNER's Notice of Award.
3. In submitting this Bid, Bidder represents that:
 - (a) Bidder has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

| | | |
|-----------|-------------|-------|
| No. _____ | Dated _____ | _____ |
| No. _____ | Dated _____ | _____ |
| No. _____ | Dated _____ | _____ |
| No. _____ | Dated _____ | _____ |
 - (b) Bidder has visited the Site and become familiar with and satisfied itself as to the general local, Site, and labor and working conditions that may affect cost, progress, performance, and furnishing of the Work.

- (c) Bidder is familiar with, has satisfied itself as to all, and agrees to comply with Federal, state, and local Laws and Regulations and Permits that may affect cost, progress, performance, and furnishing of the Work
- (d) Bidder is aware of the general nature of Work to be performed by OWNER and others at the Site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.
- (e) Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- (f) Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
- (g) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm, or corporation and is not submitted in conformity with any agreement or rules of any group, associated, organization, or corporation, Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm, or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other bidder or over OWNER.
- (h) Bidder is aware of the warranty provisions of the Contract and will guaranty the Work, if awarded the Contract, for the time required in the Contract Documents.
- (i) Bidder is familiar with and has satisfied itself as to licensing requirements and Bidder licensing limits in accordance with the State of Utah regulatory requirements.
- (j) Bidder hereby acknowledges that the Work Plan submittals are enclosed with this Bid (Volume I) as described herein.

4. CONTRACT UNITS AND PRICES

Scope of Work. The work covered by this Proposal embraces the complete construction of the Grapevine Transmission Line Project, tested and ready to energize and operate as shown by the Construction Drawings and Specifications and as indicated in the Acceptance of the Owner. All material furnished by the Bidder shall be new and in conformance with the Specifications for Construction. All construction work shall be done in a thorough and workmanlike manner in accordance with the Plans, Specifications for Construction, and Construction Drawings. Changes from these documents shall not be permitted except upon the written permission of the Owner.

Materials. It is the intent of these specifications that only such materials and equipment that are acceptable to the Owner and the Engineer shall be used. Manufacturer and catalog numbers of acceptable equipment are included in the plans and specifications. Any other materials must be approved by the Owner and Engineer in writing prior to bid opening.

Drawings. The Drawings and Specifications collectively, show the specifications of the material and equipment shown thereon, and include schedules of conduit, cable and other items not readily ascertained from the drawings. Such schedules show the quantities, sizes, types, and other pertinent information; methods of installation and construction details are indicated clearly. The drawings and specifications are made a part of these contract Specifications.

Description of Construction Units. To aid in identification of the work and in the pricing of the work, the construction is divided into various groups of construction units. Each Construction Unit consists of a complete installation of the designated portion of the Transmission Line and line work as specified on the drawings together with connections to associated equipment. Each construction unit represents all labor and material including necessary accessories completely installed and tested in satisfactory operation. Full identification of each Construction Unit and all necessary specifications of the installation shall be shown on the drawings.

The Bidder shall have the cost for the complete construction of the Transmission Line and line work distributed among the appropriate listed Construction Units. Should some item of work required for the complete construction of the Transmission Line be apparently omitted from the Construction Units, the Bidder shall notify the Owner prior to submittal of Proposal for clarification. Without such notification, such apparently omitted work required for the complete construction of the Transmission Line shall be taken as included within the nearest appropriate Unit.

Each Construction Unit shall be designated by the letter of the Group to which it belongs and identifying number. The bid sheet shall be prepared for the project and shall contain all unit prices for Construction Units contained in the project. It is intended that in all cases the "Name and Description of Construction Unit" column of the Bid Sheets shall contain sufficient information to identify the Construction Unit.

Additional description to one or more of the Groups may be provided by the Engineer if deemed necessary to clarify the intent of these Specifications for Construction. However, such requests must be made at least five (5) working days prior to the bid due date.

It is noted that the quantities shown are estimates only. The Contractor is responsible to verify all quantities and for their own take-offs of the required work and materials.

CONSTRUCTION UNITS

Group F. Foundations. A Construction Unit consists of concrete foundations as specified in the drawings.

Group W. General Project Costs. These construction units are for overall project costs and management and include the following items:

- Bonding Costs. This unit includes the costs associated with obtaining the required bonds as outlined in these specifications.
- Mobilization/Demobilization Costs: This unit includes the costs to mobilize and demobilize equipment and personnel to the site for the project.
- Landscape Restoration: This unit includes the cost for any damage associated with the foundation installation. It is anticipated that poles 10, 12 & 14 will need some restoration work.
- Stormwater Pollution Prevention Plan (SWPPP): This unit cost is to implement and maintain the required permits and preventative measures as required by the SWPPP.
- Project Management: Provide costs for project management including schedule development and tracking, work plan development and tracking, coordination of sub-contractors and project close out. Items to be included, but not limited to are:
 - Safety Plan, Meetings & Enforcement
 - Construction sequencing, scheduling and methods
 - Construction Progress Meetings & Inspections

WASHINGTON CITY GRAPEVINE TRANSMISION LINE – BID; FOUNDATION CONSTRUCTION

| UNIT NO. | NAME AND DESCRIPTION OF CONSTRUCTION UNIT | NO. OF UNITS | UNIT PRICE | | | EXTENDED PRICE LABOR AND MATERIAL |
|------------------|---|--------------|------------|-------------------------------|---------------------------|-----------------------------------|
| | | | LABOR | CONTRACTOR FURNISHED MATERIAL | TOTAL LABOR AND MATERIALS | |
| <u>GROUP F</u> | <u>FOUNDATIONS</u> | | | | | |
| F1 | Pole #5 | 1 | | | | |
| F2 | Pole #7 | 1 | | | | |
| F3 | Pole #10 | 1 | | | | |
| F4 | Pole #11 | 1 | | | | |
| F5 | Pole #12 | 1 | | | | |
| F6 | Pole #14 | 1 | | | | |
| F7 | Pole #15 | 1 | | | | |
| | | 1 | | | | |
| TOTAL GROUP F | | | | | | |
| <u>GROUP W</u> | <u>OTHER</u> | | | | | |
| W1 | BONDING | LOT | | | | |
| W2 | PROJECT MANAGEMENT | LOT | | | | |
| W3 | LANDSCAPE RESTORATION | LOT | | | | |
| W4 | STORM WATERPOLLUTION PREVENTION PLAN | LOT | | | | |
| W5 | MOBILIZATION/DEMOBILIZATION | LOT | | | | |
| TOTAL GROUP W | | | | | | |
| TOTAL ALL GROUPS | | | | | | |

BID SUMMARY

| | LABOR (\$) | MATERIALS (\$) | TOTAL LABOR AND MATERIALS (\$) |
|--------------------------------|-------------------|-----------------------|---|
| Group F: Foundations | _____ | _____ | _____ |
| Group W: General Project Costs | _____ | _____ | _____ |

- | | |
|--|--------------------|
| 1. TOTAL BASE BID | _____ |
| 2. Value of Owner Furnished Materials (OFM) | \$40,581.15 |
| 3. TOTAL VALUE OF CONTRACTOR'S BOND BASE BID | _____ |

5. UNIT COST VALUES

- (a) The following is a list of several “unit cost” items for which a bid is required. These unit costs will be used if the quantities required for a given item differ from what is indicated on the bid documents or if unforeseen conditions are encountered during construction requiring additional work or a reduction in work to be performed. (Changes could be additive or subtractive to the Total Base Bid.) All labor, material, and associated overheads and profits needed for the installation of a given unit must be included in the construction unit costs provided.

| UNIT ID | UNIT | DESCRIPTION | COST | |
|---------|-----------------|---|-----------|-----------|
| | | | QTY < 250 | QTY > 250 |
| 1) | YD ³ | 1 cubic yard of installed concrete (to include <u>all</u> costs including excavation) | | NA |
| 2) | HR | Excavation crew rate | | NA |
| | | | | |

6. Bidder agrees that the Work will be substantially completed by the dates or durations listed and completed and ready for final payment in accordance with Paragraph 13.10 of the General Conditions.

7. Communications concerning this Bid shall be sent to Bidder at the following address, telephone and fax number.

Phone No. _____

Fax No. _____

Utah Contractor’s License Number _____

License Expiration Date _____

License Limit _____

If a Corporation

By _____
 (Corporation Name)

By _____
 (Signature of Authorized Person)

 (Title)

Business address _____

State of Incorporation _____

If a Joint Venture

By _____

(Joint Venture Name)

By _____

(Signature of Authorized Person)

(Title)

Business address _____

Submitted On _____ 20

,

END OF SECTION 00350

QUALIFICATION STATEMENT

SECTION 00450

PART 1 - GENERAL

1.1. SUMMARY:

- A. This Section provides information on Bidder's organization, condition, experience, qualifications and references. This information may be used in the consideration of the Bids.

1.2. QUALIFICATION STATEMENT:

A. Bidder Identification:

Company Name: _____

Company Address: _____

Utah Contractor's License No. and Classification: _____

Principal Party for this Proposal (signature): _____

Name (printed): _____

Title: _____

Phone: _____ Fax: _____

B. Company Background:

Main Office Location: _____

Years in this business: _____

How long under the present ownership and control? _____

Type of Organization: _____

If the bid is not submitted as a sole bidder, Identify any joint venture partner, etc. as:

C. Pending Legal Action:

Do you have any pending legal action by any customer or supplier which could affect the financial stability of your organization? _____. If yes, state details:

D. Supervision and Workmen Qualifications:

1. State the name of the Bidder's field assigned principal: _____

2. Enclose resume of the above principal which is identified as: _____

3. How many key personnel from your home office or full-time employees do you plan to assign to this Project? _____

What is their craft or expertise? _____

4. What is your anticipated manpower loading for this project: _____

E. Equipment:

Provide list of major equipment that you propose to use in the construction of this project which is identified as: _____

Does your organization own or lease this equipment? _____

Identify general locale and present use of the equipment and time period to mobilize such equipment to the Project after Notice to Proceed?

F. References:

Provide three independent project references which can attest to your satisfactory performance of completed projects as listed above under Item E:

Project: _____

Short Description: _____

Reference Name: _____

Reference's Responsibility on this Project: _____

Reference's Phone Number: _____

Project: _____

Short Description: _____

Reference Name: _____

Reference's Responsibility on this Project: _____

Reference's Phone Number: _____

Project: _____

Short Description: _____

Reference Name: _____

Reference's Responsibility on this Project: _____

Reference's Phone Number: _____

G. Work Plan:

After review of the Contract Documents including Summary of Work, Volume III, and review of responses to addenda (if any), please submit a narrative work plan describing how your organization would plan to perform this project's work including field and office quality assurance. This work plan is identified as: ____

H. Constructability:

Can your organization perform the tasks required to meet the milestone schedule dates within the technical and general requirements of the project? _____

If not, state particular concern: _____

I. Personal Presentation:

Upon invitation, would your firm make a one hour presentation to the Owner's staff and the Engineer at the project site? _____

J. Post Construction Support:

During the warranty period, name the nearest facility from which you plan to provide such corrective services? _____

K. Does your organizations have capability to provide scheduled maintenance if requested by separate agreement?

END OF SECTION 00450

SUBCONTRACTOR INFORMATION

SECTION 00451

PART 1 - GENERAL

1.1. SUMMARY:

- A. This Section provides information about subcontractors the Bidder proposes to utilize for a portion of the Work. This information may be used in the consideration of the Bids. Add extra sheets if additional subcontractors are proposed.

1.2. SUBCONTRACTOR INFORMATION:

- A. Proposed Testing Laboratory (Concrete Tests, etc.): _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Percent of Bid Amount: _____ Utah License No. _____

- B. Proposed Layout Surveyor: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Percent of Bid Amount: _____ Utah License No. _____

- C. Proposed Foundation Subcontractor: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Percent of Bid Amount: _____ Utah License No. _____

- D. Proposed Site Crushed Rock Surface Subcontractor: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Percent of Bid Amount: _____ Utah License No. _____

- E. Proposed Concrete Supply Subcontractor: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Percent of Bid Amount: _____ Utah License No. _____

- F. Proposed Drilled Shaft Subcontractor: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Does this subcontractor have a minimum of three years experience in drill shaft construction including experience with similar subsurface materials, shaft sizes and special techniques as required? _____

Provide a list of three similar projects completed in the last three years. This list is enclosed and identified as: _____

Percent of Bid Amount: _____ Utah License No. _____

G. Proposed Heavy Equipment Hauler Subcontractor: _____

Subcontractor's Heavy Hauling Rig - Capacity & Description: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Does this Subcontractor have sufficient insurance to handle major equipment? _____

Percent of Bid Amount: _____ Utah License No. _____

H. Proposed Testing Subcontractor: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Percent of Bid Amount: _____ Utah License No. _____

I. Other Proposed Subcontractor: _____

Subcontractor's Location: _____

Has your organization used the services of this subcontractor before? _____

Percent of Bid Amount: _____ Utah License No. _____

END OF SECTION 00451

BID BOND

SECTION 00453

1. KNOW ALL MEN that we,

,
as Principal, and _____
as Surety, are held and firmly bound unto Washington City, 111 North 100 East, Washington, Utah 84780 hereafter called the "Owner") in the penal sum of ten percent (10%) of the amount of the bid referred to in paragraph 2 below, but not to exceed _____ dollars (\$_____), as hereinafter set forth and for the payment of which sum well and truly to be made we bind ourselves, our executors, administrators, successors and assigns, jointly and severally, by these presents;

2. WHEREAS, the Principal has submitted a bid to the Owner for the construction of the Electric System Upgrade Project.

3. NOW, THEREFORE, the condition of this obligation is such that if the Owner shall accept the bid of the Principal, and

(a) the Principal shall execute such contract documents, if any, as may be required by the terms of the bid and give such Contractor's Bond or Bonds for the performance of the contract and for the prompt payment of labor and material furnished for the Project as may be specified in the bid, or

(b) in the event of the failure of the Principal to execute such contract documents, if any, and give such Contractor's Bond or Bonds, if the Principal shall pay to the Owner the difference, not to exceed the penal sum hereof, between the amount specified in the bid and such larger amount for which the Owner may in good faith contract with another party to construct the Project, then this obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the undersigned have caused this instrument to be executed and their respective corporate seals to be affixed and attested by their authorized representatives this day of __, 20 ____

Principal (Seal)

Attest:

By _____

Secretary

Title

Principal (Seal)

Attest:

By _____

Secretary

Title

END OF SECTION 00453

VOLUME II

CONTRACT FORMS AND GENERAL CONDITIONS

BIDDING DOCUMENTS INDEX

| <u>DOCUMENT/ DIVISION</u> | <u>DESCRIPTION</u> | <u>PAGE NUMBER</u> |
|-------------------------------|--------------------------|------------------------|
| 00500 | AGREEMENT | 1 |
| 00610 | PERFORMANCE BOND | 2 |
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AGREEMENT

SECTION 00500

THIS AGREEMENT is made and entered into by and between Washington City hereinafter referred to as the "OWNER", and "CONTRACTOR". Both the OWNER and the CONTRACTOR are collectively referred to as the "PARTIES".

WITNESSETH: That the PARTIES do mutually agree as follows:

1. The OWNER has awarded the CONTRACTOR the contract for:

GRAPEVINE TRANSMISSION LINE PROJECT

for the agreed upon CONTRACT AMOUNT OF: \$ _____

2. The CONTRACTOR shall perform and complete in a good and workmanlike manner all of the Work as defined in the Contract Documents and to furnish all materials and all the tools and labor necessary to properly perform and complete the Work ready for use in strict accordance with the Contract Documents and the attached bonds, which are hereby declared and accepted as essential parts of this Agreement and to accept the Contract Price as defined in the Contract Document as full compensation therefore.
3. The OWNER shall pay CONTRACTOR the Contract Price in full compensation for CONTRACTOR's full performance in the manner and upon the conditions set forth in the Contract Documents.
4. The Contract Documents, which comprise the entire agreement between the OWNER and the CONTRACTOR for the performance of the Work, consist of everything included in Volumes I, II, III, IV and Addendum #1. The CONTRACTOR hereby certifies that the CONTRACTOR has read and understands every provision contained in the Contract Documents. CONTRACTOR shall be bound and shall comply with each and every term, condition and covenant set forth in the Contract Documents.

IN WITNESS WHEREOF, the CONTRACTOR and the OWNER have signed three original versions of this Agreement. One counterpart has been retained by the OWNER, one counterpart has been delivered to the Engineer and one counterpart has been delivered to the CONTRACTOR.

ATTEST:

By: _____

By: _____

Title: _____

Title: _____

ATTEST:

Washington City

By: _____

By: _____

Title: _____

Title: _____

END OF SECTION 00500

PERFORMANCE BOND

SECTION 00610

Any regular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR:

SURETY (Name and Principal Place of Business):

OWNER:

Washington City
111 North 100 East
Washington, Utah 84780

CONTRACT

Date: _____

Amount: _____

Description:

Washington City
Grapevine Transmission Line Project
Washington, Utah

BOND

Date:

Modification to this Bond Form:

CONTRACTOR AS PRINCIPAL

Company:

Signature:

Name and Title:

Attest:

Name and Title:

SURETY:

Company: _____ (Corp. Seal)

Signature: _____

Name and Title: _____

Attest: _____

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Contract, which is incorporated herein by reference.
2. If the Contractor performs the Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.
3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:
 - 3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below, that the Owner is considering declaring the Contractor in default and has requested and attempted to arrange a conference with the Contractor and Surety, to be held not later than fifteen (15) days after receipt of such notice, to discuss methods of performing the Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and
 - 3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1: and
 - 3.3 The Owner has agreed to pay the balance of the Contract Price to the Surety in accordance with the terms of the Contract or to a contractor selected to perform the Contract in accordance with the terms of the Contract with the Owner.
4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 4.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Contract; or
 - 4.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with a performance bond executed by a qualified Surety equivalent to the bond issued on the Contract, and paid to the Owner the amount of damages as described in Paragraph 6 of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's Default; or
 - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefore to the Owner; or
 2. Deny liability in whole or in part and notify the Owner citing the reasons therefore.
5. If the Surety does not proceed as provided in Paragraph 4, with reasonable promptness, the Surety shall be deemed to be in default on this bond fifteen (15) days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner returns the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.
6. After the Owner has terminated the Contractor's right to complete the Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2 or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Contract and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to the mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:
 - 6.1 The responsibilities of the Contractor for correction of defective work and completion of the Contract.

- 6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the action or failure to act of the Surety under paragraph 4; and
- 6.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or nonperformance of the Contractor.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators or successors.
8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.
9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work is performed under the Contract and shall be initiated within two years after Contractor's Default, or within two years after the Contractor ceased working, or within two years after the Surety refuses or fails to perform its obligation under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum of limitation available to sureties as a defense in the jurisdiction of the court shall be applicable.
10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the work is performed any provision of this bond conflicting with such statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
12. Definitions.
- 12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Contract after all proper adjustments have been made, including allowances to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.
- 12.2 Contract: The agreement between the Owner and the Contractor identified on the signature page including all the Contract documents and changes thereto.
- 12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor or to perform in complete or comply with the other terms thereof.

END OF SECTION 00610

PAYMENT BOND

SECTION 00620

Any regular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR:

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

Washington City
111 North 100 East
Washington, Utah 84780

CONTRACT

Date: _____

Amount: _____

Description (Name and Location):

Washington City
Grapevine Transmission Line Project
Washington, Utah

BOND

Date:

Modification to this Bond Form:

CONTRACTOR AS PRINCIPAL

SURETY (Name and Principal Place of Business):

Company: _____(Corp. Seal)

Company: _____(Corp. Seal)

Signature:

Signature: _____

Name and Title:

Name and Title: _____

Attest:

Attest: _____

Name and Title:

Name and Title: _____

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner solely for the protection of claimants supplying labor or materials to the Contractor or to any of its subcontractors, for use in the performance of the Construction Contract, which is incorporated herein by reference.
2. With respect to the Owner, this obligation shall be null and void if the Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies and holds harmless the Owner from all claims, demands, liens or suits by any person or entity who furnished labor, materials, or equipment for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have direct contract with the Contractor:
 1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from the Contractor, or not received within thirty (30) days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above thirty (30) days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.
5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.
6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
 - 6.1 Send an answer to the Claimant, with a copy to the Owner, within forty-five (45) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2 Pay or arrange for payment of any undisputed amounts.
7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
10. The Surety hereby waives notice of any change, including changes in time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
11. No suit or action shall be commenced by Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave notice required by Subparagraph 5.1 or Clause 4.2 (iii), or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the work is performed, any provision of this Bond conflicting with such statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.
15. Definitions.
 - 15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include, without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.
 - 15.2 Contract or Construction Contract: The agreement between the Owner and the Contractor identified on the signature page including all the Contract documents and changes thereto.
 - 15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor or to perform in complete or comply with the other terms thereof.

END OF SECTION 00620

GUARANTY BOND

SECTION 00635

GUARANTEE for _____

We hereby guarantee that all work performed for the Contract Documents entitled: Washington City – Grapevine Transmission Line Project, which we have constructed, has been completed in accordance with the Contract Documents that the Work as constructed will fulfill the requirements of the guaranties included in the Contract Documents. We agree to repair or replace any or all of our Work together with any other adjacent work which may be damaged in so doing, that may prove to be defective in workmanship or material within a period of one year after the substantial completion of the Work without any expense whatsoever to Washington City, ordinary wear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above-mentioned conditions within ten (10) calendar days after being notified in writing by the Washington City, we collectively or separately, do hereby authorize the Washington City to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefore upon demand. When correction Work is started, it shall be carried through to completion.

DATE: _____
Date of Substantial Completion

AMOUNT: _____
(5% Final Contract Price)

(SEAL AND NOTARIAL ACKNOWLEDGMENT OF SURETY)

| | |
|---------------------------------------|--------------------------|
| | _____ (CONTRACTOR) |
| Countersigned Resident Agent in Utah: | BY: _____ (Signature) |
| _____ (Agent) | _____ (Surety) |
| By: _____ (Signature) | By: _____ (Signature) |
| Address: _____ _____ | Address: _____ _____ |
| Phone No. _____ | Phone No. _____ |

END OF SECTION 00635

CERTIFICATE OF INSURANCE

SECTION 00636

GENERAL CONDITIONS

SECTION 00700

ARTICLE 1 - DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms shall have the following meanings, both in the singular and the plural:

- 1.1 Addenda--Written or graphic instruments issued by the ENGINEER prior to the opening of Bids which clarify, correct or change the Bidding Documents.
- 1.2 Agreement--The written contract between OWNER and CONTRACTOR covering the Work to be performed, which together with other Contract Documents constitute the legal relationship between the parties.
- 1.3 Application for Payment--The form acceptable to ENGINEER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- 1.4 As Indicated--“As indicated” refers to references in the Drawings.
- 1.5 As Specified- “As specified” refers to references in the other Contract Documents.
- 1.6 Bid--The formal offer or proposal of the Bidder submitted on the prescribed Bid Form together with the required Bid security and all information submitted with the Bid that pertains to performance of the Work.
- 1.7 Bidder - The person, firm, or corporation submitting a Bid for the Work to be performed.
- 1.8 Bonds--Performance Bonds and other instruments of security.
- 1.9 Change Order--A document signed by OWNER, CONTRACTOR and ENGINEER authorizing an addition, deletion or revision in the Work and, if warranted, an adjustment in the Contract Price or the Contract Times issued on or after the Effective Date of the Agreement.
- 1.10 Construction Site, Project Site, Site--Lands or other areas designated in the Contract Documents as being furnished by the OWNER for the performance of the construction, storage or access.
- 1.11 Contract Documents--All of the documents contained in Volumes I, II,III and IV and any addenda thereto, of the Washington City Grapevine Transmission Line Project.
- 1.12 Contract Price--The monies payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents and subject to all adjustments made in accordance with the Contract Documents, including but not limited to any amendments hereto (subject to the provisions of paragraph 10.9 in the case of Unit Price Work) and the assessment of liquidated damages.
- 1.13 Contract Times--The number of days or the dates stated in the General Requirements to: (i) achieve Substantial Completion; (ii) to achieve final completion, and (iii) achieve any interim milestones.
- 1.14 CONTRACTOR--The person, firm or corporation with whom OWNER has entered into the Agreement.
- 1.15 Day--A calendar day of twenty-four hours measured from midnight to the next midnight.

- 1.16 Defective--An adjective which 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 requirement of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion).
- 1.17 Drawings--The drawings which show the scope, extent and character of the Work to be furnished and performed by CONTRACTOR and which have been prepared by the ENGINEER and are referred to in the Contract Documents. Shop Drawings are not Drawings as so defined.
- 1.18 Effective Date of the Agreement--The date the Contract is executed by the OWNER.
- 1.19 ENGINEER--Intermountain Consumer Professional Engineers, Inc., or its duly authorized representatives. ENGINEER's address is:
- 1145 East South Union Avenue
Midvale, Utah 84047
- 1.20 CONSTRUCTION REPRESENTATIVE - Intermountain Consumer Professional Engineers, Inc. or its duly authorized representatives. CONSTRUCTION REPRESENTATIVE's address is:
- 1145 East South Union Avenue
Midvale, Utah 84047
- 1.21 Equipment --Products with operational or nonoperational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items), excluding machinery and equipment used for preparation, fabrication, conveying and erection of the Work.
- 1.22 Field Order--A written order issued by ENGINEER which orders minor changes in the Work in accordance with Section 9.5 but which does not involve a change in the Contract Price or the Contract Times.
- 1.23 Final Acceptance--The date that OWNER accepts the Work and authorizes Final Payment.
- 1.24 Furnish, Install and Provide- pay for, deliver to site, unload and uncrate, assemble, place in position, install, adjust, clean and otherwise make Materials and Equipment fit for their intended use.
- 1.25 General Requirements--Project Specifications (Volume III).
- 1.26 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.
- 1.27 Indemnities and Insureds—Washington City, ICPE and their respective members, directors, officers and employees.
- 1.28 Laws and Regulations; Laws or Regulations--Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction over the Agreement.
- 1.29 Liens--Liens, charges, security interests or encumbrances on Project funds, real property or personal property.
- 1.30 Materials -- Products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form a part of the Work, excluding machinery and equipment used for preparation, fabrication, conveying and erection of the Work.

- 1.31 Milestone--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
- 1.32 Notice of Award--The written notice by the OWNER to the apparent successful Bidder stating that upon compliance by the apparent successful Bidder with the conditions.
- 1.33 Notice to Proceed--The written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the Contract Documents.
- 1.34 OWNER – Washington City (“Washington” or the “City”) or its duly authorized representative.
- 1.35 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.
- 1.36 PCBs--Polychlorinated biphenyls.
- 1.37 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 wastes and crude oils.
- 1.38 Products – Purchased items for incorporation into the Work, regardless of whether specifically purchased for the project or taken from CONTRACTOR's stock of previously purchased products, excluding machinery and equipment used for preparation, fabrication, conveying and erection of the Work.
- 1.39 Project--The total construction of the Work to be provided under the Contract Documents, which may be the whole, or a part, as indicated elsewhere in the Contract Documents.
- 1.40 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.
- 1.41 Reference Drawings--Drawings not specifically prepared for this Contract, but which contain information pertinent to the Work.
- 1.42 Resident Project Representative--The authorized representative of ENGINEER who is assigned to the Project Site or any part thereof.
- 1.43 Samples--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
- 1.44 Shop Drawings--All diagrams, detail design calculations, fabrication, installation, and erection drawings, lists, graphs, catalog sheets, data sheets, and similar items, illustrations, schedules and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.
- 1.45 Specifications--Those portions of the Contract Documents consisting of written technical descriptions of the Work, and materials, equipment, construction systems, standards, workmanship, and certain administrative details applicable thereto.
- 1.46 Subcontractor--An individual, firm or corporation having a direct contract with CONTRACTOR or with another Subcontractor for the performance of a part of the Work at the Site.
- 1.47 Submittals--All Shop Drawings, product data, Samples, reports, and records which are prepared by CONTRACTOR, a Subcontractor, manufacturer, or Supplier, and submitted by CONTRACTOR to

ENGINEER as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe proper installation, operation and maintenance, or technical properties.

- 1.48 Substantial Completion--The status of the Work (or a specified part thereof) when it has progressed to the point where, in the opinion of ENGINEER as evidenced by his definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be used for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment as evidenced by ENGINEER's written recommendation for final payment. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof. To be considered substantially complete, all electrical power, controls, and instrumentation facilities must be operational and ready for OWNER's continuous use as intended.
- 1.49 Successful Bidder - The best bidder as evaluated by the OWNER pursuant to the OWNER's Procedure for Award of Construction Contracts for the Washington City – Grapevine Transmission Line Project as published in the OWNER's Bidding Documents and to whom the OWNER makes an award on the basis thereof.
- 1.50 Superintendent--The CONTRACTOR's representative at the Site with authority to act on behalf of CONTRACTOR.
- 1.51 Supplier--A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct contract with CONTRACTOR or with a Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or a Subcontractor.
- 1.52 Underground Facilities--All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and encasements containing such facilities, which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquids, petroleum products, telephone or other communications, cable television, sewage, drainage removal, control systems, or water.
- 1.53 Unit Price Work--Work to be paid for on the basis of unit prices.
- 1.54 Work--The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.
- 1.55 Work Change Directive--A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement, signed by OWNER's Director or his designee and recommended by ENGINEER, ordering an addition, deletion or change in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive may not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed 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.
- 1.56 Work Day--Any day the CONTRACTOR is performing Work under the Agreement.
- 1.57 Written Amendment--A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement.

ARTICLE 2 - PRELIMINARY MATTERS, CONTRACT TIMES

- 2.1 Copies of Documents. OWNER shall furnish to CONTRACTOR copies of the Contract Documents as stated in the General Requirements.

- 2.2 Commencement of Contract Times, Notice to Proceed. After receipt of all executable agreements, bonds, certificates of insurance and Letters of Assent required hereunder, the OWNER will issue a Notice to Proceed. The Contract Times will commence to run on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty (30) days after the Effective Date of the Agreement.
- 2.3 Commencement of Work. CONTRACTOR shall begin to perform the Work on the day indicated in the Notice to Proceed, but no Work shall be done at the Site prior to the date on which the Contract Times commence to run.
- 2.4 Completion of Work. CONTRACTOR shall complete all required Work within the times specified in Section 13.10.
- 2.5 CONTRACTOR's Preconstruction Responsibilities. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to CONSTRUCTION MANAGER any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby.
- 2.6 Certificates of Insurance. Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in Article 5 of the General Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with the Contract Documents.
- 2.7 Preconstruction Conference: Within ten (10) days after the Effective Date of the Agreement, but prior to the commencement of Work at the Site, a preconstruction conference shall be held. The purpose of the preconstruction conference shall be to designate responsible personnel, discuss contract requirements and procedures, and establish a working relationship. Matters requiring coordination shall be discussed and procedures for handling such matters established. The conference attendees, location and agenda are set forth in the General Requirements. CONTRACTOR shall bring to the conference:
- 2.7.1 An estimated construction progress schedule indicating the starting and completion dates of the various stages of the Work.
 - 2.7.2 A preliminary procurement schedule.
 - 2.7.3 A preliminary schedule of Submittal submissions.
 - 2.7.4 A list of all permits and licenses the CONTRACTOR shall obtain indicating the agency granting the permit, the expected date of submittal for the permit, and the date by which the permit must be received.

ARTICLE 3 - CONTRACT DOCUMENTS.

- 3.1 Integration. The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents shall be construed in accordance with the laws of the State of Utah.
- 3.1.1 It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. All Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage, as being required to produce the intended result, will be furnished and performed by the CONTRACTOR at the CONTRACTOR's sole expense whether or not specifically called for.

- 3.1.2 When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning.
 - 3.1.3 Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual, or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their consultants, agents, or employees from those set forth in the Contract Documents.
 - 3.1.4 In case of any conflict between manufacturers' data and the Contract Documents, the Contract Documents will take precedence unless the manufacturer's data conforms to data submitted with the Bid with a statement that the Bid is conditioned upon furnishing the Equipment and Materials defined in the manufacturers' data submitted therewith.
 - 3.1.5 Applicable codes and standards referenced in these Contract Documents establish minimum requirements for Equipment, Materials, and Work and are superseded by more stringent requirements of Contract Documents when and where they occur.
 - 3.1.6 The Specifications are separated into Divisions and Sections for convenience in defining the Work. Contract Drawings are separated according to engineering disciplines and other classifications. This sectionalizing and the arrangement of Contract Drawings shall not control the CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
 - 3.1.7 If, during the performance of the Work, CONTRACTOR finds a conflict, error, or discrepancy in the Contract Documents, CONTRACTOR shall report to same ENGINEER in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from ENGINEER; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.
- 3.2 Amending Contract Documents. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof only by formal Written Amendment or Change Order.
- 3.3 Supplementing Contract Documents. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, only by Field Order or ENGINEER's written interpretation or clarification.
- 3.4 Ownership of Contract Documents, Drawings and Specifications. CONTRACTOR and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, and (ii) shall not reuse any of such Drawings, Specifications, other documents or copies on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

ARTICLE 4 - AVAILABILITY OF LANDS, SUBSURFACE AND PHYSICAL CONDITIONS, REFERENCE POINTS

- 4.1 Availability of Lands. The lands and rights-of-way that will be provided by OWNER for the facilities to be constructed are identified in the Contract Documents. CONTRACTOR shall make his own arrangements and pay all expenses for additional Work area required by him outside the limits of land and right-of-way provided by the OWNER. CONTRACTOR shall confine his operations to the construction limits identified. Any Work performed in public rights-of-way, in addition to conforming to the Contract

Documents, shall be done in accordance with the requirements of the permit issued by the public agency in whose right-of-way the Work is located.

4.2 Subsurface and Physical Conditions.

4.2.1 Reports and Drawings: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site and those drawings of physical conditions in or relating to existing surface or subsurface conditions at or contiguous to the Site have been utilized by the ENGINEER solely for design purposes in preparing the Contract Documents and may not be relied upon by CONTRACTOR in its performance of the Contract. The information contained in those documents may not be indicative of actual subsurface conditions that may be encountered and the OWNER does not warrant and hereby disclaims responsibility for the accuracy of that information. CONTRACTOR must conduct, and has conducted, its own pre-Bid inspection in order to thoroughly familiarize itself with conditions at the Site. The determination of the actual character of subsurface material is the CONTRACTOR's sole responsibility and no claims for changes of any kind, for differing site conditions will be entertained by the OWNER.

4.2.2 Limited Reliance by CONTRACTOR on Technical Data. The reports, tests and drawings referred to in paragraph 4.2.1 were generated to aid the ENGINEER in assessing the suitability of facility locations, to compare the relative advantages of alternative design approaches, to develop structural requirements, and for other related design purposes. Such documents contain two types of information: Type A) factual technical data derived from direct observation, examination or testing of physical samples or specimens with descriptions or measurements of such samples and specimens derived from direct examination or testing by persons acting on behalf of the OWNER; and Type B) interpretations, interpolations, extrapolations, conclusions, or opinions made or derived from available evidence, including Type A data. The OWNER accepts responsibility only for the accuracy of Type A data but hereby warns the CONTRACTOR that such data does not purport to represent and may not be indicative of all subsurface conditions that may be encountered by the CONTRACTOR. The OWNER does not warrant and hereby disclaims all responsibility for Type B data and all other information other than the accuracy of Type A data, and all such information is to be used by CONTRACTOR at CONTRACTOR's sole risk. The obligation is upon the CONTRACTOR, before making its Bid, to make its own investigation as to all subsurface conditions and make its own interpretation of the character and condition of the materials which will be encountered. To this end the CONTRACTOR may excavate test holes as it deems necessary. The CONTRACTOR may not rely upon or make any claim against OWNER, ENGINEER, or any of their consultants with respect to:

- 4.2.2.1 the completeness of geotechnical information;
- 4.2.2.2 the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto;
- 4.2.2.3 any interpretations, interpolations, extrapolations, conclusions, or opinions made or derived from any evidence by any person; and
- 4.2.2.4 any Type B information.

4.3 Physical Conditions--Underground Facilities:

4.3.1 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 the underground facilities or by others.

- 4.3.1.1 OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any Underground Facilities Information;
- 4.3.1.2 The cost of all of the following will be included in the Contract Price and CONTRACTOR shall have full responsibility for (i) reviewing and checking all

Underground Facilities Information, (ii) locating all underground facilities shown or indicated in the Contract Documents, (iii) coordination of the Work with the owners of underground facilities during construction, and (iv) the safety and protection of all underground facilities and repairing any damage thereto resulting from the Work.

- 4.3.2 Not Shown or Indicated: If an underground facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated 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 as required by subsection 6.23), identify the Owner of the underground facility and give written notice to the OWNER and ENGINEER. ENGINEER shall 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 of the underground facility. If OWNER concludes that a change in the Work is required, a Work Change Directive or a Change Order shall be issued. CONTRACTOR shall be responsible for the safety and protection of the underground facility. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, to the extent that any delay or increase in cost to the CONTRACTOR is attributable to the existence of any underground facility that was not shown or indicated 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. If OWNER and CONTRACTOR are unable to agree on entitlement to or the amount or length of any adjustment in Contract Price or Contract Times, CONTRACTOR may make a claim therefor. However, OWNER, ENGINEER and their consultants shall not be liable to CONTRACTOR for any claims, costs, losses or damages incurred or sustained by CONTRACTOR on or in connection with any other project or anticipated project.
- 4.3.2.1 Generally, service connections are not indicated on the Drawings. Prior to commencing any Work at the Project Site, CONTRACTOR shall be responsible for locating existing underground installations at or contiguous to the Project Site, in advance of excavating or trenching, by contacting all local utilities and by prospecting.
- 4.3.2.2 All information relative to underground facilities shall be recorded and incorporated into the record documents required by subsection 6.19.
- 4.3.2.3 CONTRACTOR shall be responsible for any unauthorized interruption in the operation of underground facilities as a result of CONTRACTOR's operations. Unless the owner of the damaged facility elects to perform the repair and restoration work, CONTRACTOR shall repair and fully restore any damaged underground facility to a condition at least equal to that which existed prior to the time of damage. All repair and restoration work shall be performed to the satisfaction of the facility's owner and ENGINEER.
- 4.3.2.4 CONTRACTOR shall arrange for any inspection of repaired or reconditioned utility facilities required by authorities having jurisdiction. All inspection fees shall be paid by CONTRACTOR. If the facility's owner elects to perform the repair and restoration work, CONTRACTOR shall render all assistance required. CONTRACTOR shall be responsible for all just and reasonable expenses incurred by the facility's owner for such work.
- 4.4 Reference Points. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall endeavor to protect all reference points and shall report to the ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for all costs associated with the accurate replacement or relocation of such reference points by professionally qualified personnel.
- 4.5 Hazardous Material and Waste. CONTRACTOR shall perform and complete all requirements included in the Contract Documents, regardless if shown or not, for compliance with all Environmental Protection Agency, Department of Transportation, Occupational Safety and Health Administration, Federal Energy

Regulatory Commission and any other Federal, State, or local statutes, laws and regulations governing the handling, use, storage, conveyance, spill, release, clean-up or disposal of hazardous materials, petroleum products, solid or hazardous wastes. Where no specific regulations exist, all chemical, hazardous, and petroleum product piping and storage in underground locations shall be installed with double containment piping and tanks, or in separate concrete trenches and vaults, or with an approved lining which cannot be penetrated by the chemicals, unless waived in writing by the OWNER.

- 4.5.1 OWNER shall not be responsible for any asbestos, PCBs, petroleum, hazardous waste or radioactive material brought to the Site by CONTRACTOR, Subcontractor, Suppliers or anyone else for whom CONTRACTOR is responsible.
- 4.5.2 If the CONTRACTOR encounters any asbestos, PCB's, petroleum, hazardous waste or radioactive materials, the CONTRACTOR shall immediately: (i) stop all Work in connection with the hazardous condition and in any area affected thereby (except in an emergency as required by subsection 6.23), and (ii) notify OWNER and ENGINEER (and thereafter confirm such notice in writing). CONTRACTOR shall not be required to resume Work in connection with a hazardous condition or in any area affected by a hazardous condition until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR special written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (ii) specifying any special conditions under which Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of a Work stoppage or special conditions under which Work is agreed by CONTRACTOR to be resumed, either party may make a claim therefor.
- 4.5.3 If after receipt of special written notice referred to in subsection 4.5.2, CONTRACTOR does not agree to resume Work based on a reasonable belief that it is unsafe to do so, or does not agree to resume Work under such special conditions, then OWNER may order such portion of the Work that is in connection with the hazardous condition or in the affected area to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to the entitlement to, amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting a portion of the Work, then either party may make a claim therefor. OWNER may otherwise perform the Work.

ARTICLE 5 - INSURANCE, BONDS AND INDEMNIFICATION

- 5.1 General. The CONTRACTOR shall not commence any Work under this Contract until it obtains, at its own expense, all insurance and surety bonds as required in this section. The types of surety bonds and insurance to be obtained are Performance, Payment and Guaranty, and Workers' Compensation, Employers' Liability, Automobile Liability, Commercial General Liability, and Property Insurance, as outlined in the following portions of this section. The Workers' Compensation, Employers' Liability and Automobile Liability shall be maintained in force for the full period of this Contract or until the OWNER has finally accepted the Work, whichever occurs later. The Commercial General Liability policy shall be maintained in force for the full period of the Contract and for three years following final acceptance of the Work performance under this Contract by the OWNER.
- 5.2 Generally Accepted Professional Practices. The Services provided and/or procured, and/or Work performed by the CONTRACTOR shall be in accordance with generally accepted applicable professional practices and principles, except where a higher standard is called for by this Contract. These insurance, bond and indemnification provisions are in addition to and cumulative to any other right of indemnification or contribution, which the OWNER may have in law, in equity, or otherwise and shall survive the completion of the Project.
- 5.3 Indemnification. CONTRACTOR indemnifies and saves harmless and defends Indemnities against any and all claims, liability, loss, damage, cost, expense, award, fine or judgment (including attorneys' fees and costs) arising out of or resulting from CONTRACTOR's conduct or Work including (without limitation) such claims, liability, loss, damage, cost, expense, award, fine or judgments which are attributable to or arising by reason of death or bodily injury of persons, injury or damage to property, defects in

workmanship or materials, or design defects caused or resulting from the CONTRACTOR's acts or omissions, except to the extent those losses are solely caused by the Indemnities. In claims against any person or entity indemnified under this section by an employee of CONTRACTOR, anyone directly or indirectly employed by the CONTRACTOR or anyone for whose acts CONTRACTOR may be liable, the indemnification obligation under this section shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for CONTRACTOR's workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. It is the CONTRACTOR's sole responsibility to ascertain that the insurance requirements of this Contract are fulfilled. In the event that they are not, the CONTRACTOR shall not be relieved of his duty to perform, indemnify, defend and hold harmless the Indemnities nor shall the OWNER or the Indemnities be liable to the CONTRACTOR or any others in the event the CONTRACTOR's insurance, as accepted by the OWNER, fails to meet the full requirements herein.

- 5.4 Performance, Payment and Guaranty Bonds. CONTRACTOR shall furnish with the executed Agreement, a Performance and Payment Bond, in an amount equal to the Contract Price, as security for faithful performance and payment of all CONTRACTOR's obligations under the contract documents. The CONTRACTOR shall also furnish a Guaranty Bond in the amount of 5 percent (5%) of the final Contract Price at contract closeout which shall remain in effect for one year after Substantial Completion of the work. The CONTRACTOR shall use the Performance Bond forms contained in the Contract Documents. All bonds shall be executed by sureties included in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in Circular 570 by the Audit Staff Bureau of Government Financial Operations, U.S. Treasury Department". All Bonds signed by an agent must be accompanied by a certified copy of agent's authority to act. Only surety companies authorized to do business in, and having an agent for service of process in the State of Utah will be acceptable. If the Surety on any Bonds furnished by the CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of the preceding paragraph, CONTRACTOR shall within 10 days thereafter substitute another Bond and Surety, both of which must be acceptable to the OWNER.
- 5.5 CONTRACTOR's Responsibility. Nothing contained in these insurance requirements shall be construed as limiting the extent of the CONTRACTOR's total responsibility for payment of claims arising in whole or in part from the actions of a third party when such actions might be taken as a result of the CONTRACTOR's operations under this contract.
- 5.6 Industrial Insurance. CONTRACTOR shall procure, and maintain such insurance and see that its subcontractors (if any) purchase and maintain such insurance as required under Utah Industrial Insurance Act, for all of its employees working on the Project as described in this Contract.
- 5.7 Employee Protection in Lieu of Industrial Insurance. In the event any class of employees engaged in any work on the Project relative to this Contract is not protected under the Utah Industrial Insurance Act, then the CONTRACTOR shall provide to the OWNER adequate insurance coverage in a form and by an insurance carrier satisfactory to the OWNER for the protection of such employees.
- 5.8 Employer's Liability Insurance. CONTRACTOR shall procure and obtain Employers' Liability Insurance with limits as set forth in subsection 5.11.
- 5.9 Automobile Liability Insurance. CONTRACTOR shall procure and maintain automobile liability insurance limits as set forth in subsection 5.11 written on a combined single limit basis for bodily injury and property damage including all owned, leased, hired or non-owned motorized vehicles and apparatus and shall specifically indicate "any auto" on the Certificate.
- 5.10 Commercial General Liability Insurance. CONTRACTOR shall procure and maintain commercial general liability insurance coverage. The coverage under this policy shall include, but not be limited to, commercial general liability, completed operations liability, protective liability, blanket contractual liability, products liability and broad form property damage. The Commercial General Liability Insurance policy shall be

written for limits as set forth in subsection 5.11. The amount of coverage, as a combined single limit, shall apply to bodily injury, sickness, disease or death, personal injury, damage to or destruction of the property of persons which may occur directly or indirectly out of or arise out of or in connection with the activities under this Agreement and for the defense of claims arising therefrom.

5.11 The amount of insurance required to be carried by CONTRACTOR and each Subcontractor is as follows:

5.11.1 EMPLOYERS' LIABILITY insurance providing limits of liability in the following amount:

| | | |
|---------------------------|-------------|---------------|
| Bodily Injury by Accident | \$1,000,000 | each incident |
| Bodily Injury by Disease | \$1,000,000 | policy limit |
| Bodily Injury by Disease | \$1,000,000 | each employee |

5.11.2 COMMERCIAL GENERAL LIABILITY insurance, and if necessary, COMMERCIAL UMBRELLA LIABILITY insurance providing limits of liability in the following amounts with aggregate applying separately on a "per project" basis:

| | |
|--|-------------|
| General Aggregate: | \$5,000,000 |
| Product/Completed operations Aggregate | \$5,000,000 |
| Personnel & Advertising Injury Limit: | \$5,000,000 |
| Per Occurrence | \$5,000,000 |
| Fire Legal Liability | \$1,000,000 |

5.11.3 Automobile Liability.....\$2,000,000 per occurrence

5.11.4 Workers' Compensation.....Statutory

5.12 Transit Insurance: Transit Insurance shall be furnished by CONTRACTOR to insure and protect CONTRACTOR and OWNER from all risks of physical loss or damage to Equipment and Materials, not otherwise covered under other policies, during transit from point of origin to the Site of installation or erection.

5.12.1 Transit Insurance shall be written on an All-Risk basis with additional coverage applicable to the circumstances which may occur in the particular Work included in this Contract.

5.12.2 Transit Insurance shall be in an amount not less than 100% of the manufactured or fabricated value of items exposed to risk in transit at any one time.

5.13 Additional Insured. By endorsement (I.S.O. Form "B:CG2010" or its equivalent), the OWNER, the CONSTRUCTION MANAGER, and the ENGINEER, shall be included as an additional insured under the Automobile Liability and Commercial General Liability insurance policies as to bodily injury, sickness, disease or death, personal injury, damage to or destruction of the property of persons which may arise directly or indirectly out of or in connection with activities under this Contract. The CONTRACTOR's insurance shall be primary with respect to the additional insureds; and insurance coverage maintained by the OWNER shall be in excess of the CONTRACTOR's insurance and be non-contributing,

5.14 Endorsements. The additional insured, as included by the endorsements, shall read as follows: Washington City, and Intermountain Consumer Professional Engineers, Inc., including their directors, officers and employees, individually and collectively.

5.15 Waiver of Subrogation. By endorsement (I.S.O. Form #CG 24 04 11 85 or its equivalent), the CONTRACTOR's insurance carriers (except from Utah Workers' Compensation) shall waive their rights of recovery against the OWNER, CONSTRUCTION MANAGER, and ENGINEER and other additional insured as defined in paragraph 5.14, and their successors or assigns including their directors, officers and employees individually and collectively.

5.16 Primary Insurance. In the event of any claim by a third party for loss, the insurance policies of the CONTRACTOR shall be primary insurance. Any of the OWNER's and ENGINEER's insurance shall

stand in an unbroken chain of coverage in excess of the CONTRACTOR's scheduled underlying primary coverage.

- 5.17 Evidence of Insurance Required. At the time of executing this Contract and before commencement of the Work, the CONTRACTOR and Subcontractors shall have delivered to the OWNER Certificates of Insurance that attest to the fact that the CONTRACTOR and Subcontractors have obtained the insurance as required in the insurance section of this Contract.
- 5.18 OWNER's Satisfaction with Form and Content. The Certificate of Insurance and related endorsements must be satisfactory to the OWNER as to form and content and must comply with all insurance requirements as set forth herein or the certificate and endorsement may be rejected; and thereby, at the option of the OWNER, rendering this Contract cancelable.
- 5.19 Endorsements. All endorsements are to be dated, reflect the name of the insurance company, the type of insurance and policy number, be executed by a duly authorized representative of the insurance company and be attached to the certificate.
- 5.20 CONTRACTOR's Name. The full legal operating names of CONTRACTOR and insurance carrier shall be properly shown where applicable.
- 5.21 Separate or Cumulative Coverage. By endorsement (I.S.O Form #CG 25 01 11 85 or its equivalent), the limits of Commercial General Liability Insurance as required in this Agreement shall apply separately to this Project and shall not be reduced by other claims unless the insurance carrier has provided an endorsement agreeing, during the term of the Agreement, to immediately notify the OWNER each time the Commercial General Liability limits have been impaired by more than ten percent (10%), either cumulatively or severally, of the limits indicated on the certificate.
- 5.22 OWNER's Right to Obtain Insurance. If the CONTRACTOR fails to procure and/or maintain insurance set forth herein, in addition to other rights or remedies, OWNER shall have the right, if the OWNER so chooses, to procure and/or maintain the said insurance for and in the name of the CONTRACTOR with the OWNER as co-insured and CONTRACTOR shall pay the cost thereof and shall furnish all necessary information to make effective and/or maintain such insurance. In the event CONTRACTOR fails to pay cost, OWNER hereby has the right to set off any sums from the compensation set forth in this Agreement and directly pay for such coverage.
- 5.23 Utah-Based Insurance Providers. The insurance and bonds specified in this section of the Contract will be written with property and casualty insurance companies admitted to do business in Utah and rated A- or better and Class VIII or higher of financial size category in the current issue of Best's Key Rating Guide.
- 5.24 Utah Agent. The evidence of insurance coverage and all endorsements, if written by an agent outside the State of Utah, shall be countersigned by a Utah Resident Agent.
- 5.25 Cost of Claims. The cost of any claims under any policy(ies) with deductibles and/or self-insured retentions (except the Builders' Risk Insurance) shall be the sole responsibility of the CONTRACTOR.
- 5.26 Deductibles. With respect to any and all insurance required under this Section of the Agreement, the deductible shall not exceed \$50,000.00, without the prior written approval of the OWNER.
- 5.27 Deductibles and/or Self-Insured Retentions. Deductible and/or self-insured retentions, if any, will be typed on the Certificate of Insurance.
- 5.28 Notice of Cancellation. The Certificate of Insurance will provide for 30 day written notice of cancellation, or nonrenewal or any material change in the coverage for all insurance policies required in this contract other than Utah State Workers' Compensation insurance.

- 5.29 Renewal Certificates. Renewal certificates and related endorsements will be provided to the OWNER not later than 15 calendar days prior to the expiration date of the then current coverage.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

- 6.1 Supervision and Superintendence. CONTRACTOR shall supervise, inspect and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in a safe manner and in accordance with the Contract Documents. 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 others in the design or selection of a specific means, method, technique, sequence, or procedure of construction indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.
- 6.2 CONTRACTOR's Superintendent. CONTRACTOR shall keep on the Work at all times during its progress a competent resident Superintendent. All communications given to the Superintendent shall be as binding on CONTRACTOR. Whenever the Superintendent is not present at any particular Work Site he shall designate a person in charge (Acting Superintendent). Any information given by the ENGINEER to the Acting Superintendent shall be as binding as if given to the Superintendent.
- 6.3 Labor, Materials, Equipment and Working Hours. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, provide and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the Site shall be performed during the standard work day and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER's written consent given after prior written notice to ENGINEER. Written notice of CONTRACTOR's request to work overtime, on Saturdays, Sundays or any legal holiday must be received by ENGINEER 48 hours in advance.
- 6.4 Materials, Equipment, Etc. Unless otherwise specified in Volume III, Section 1, General Requirements, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.
- 6.5 Quality of Materials and Equipment. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents. When the quality of a material, process, or article is not specifically set forth in the Contract Documents, the best available quality of the materials, process, or article shall be provided.
- 6.5.1 CONTRACTOR shall check and verify all dimensions and conditions in the field continuously during construction. CONTRACTOR shall be solely responsible for any inaccuracies built into the Work due to CONTRACTOR's (including Subcontractor's) failure to comply with this requirement. CONTRACTOR shall inspect related and appurtenant Work and report in writing to the ENGINEER any conditions which will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all Site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the CONTRACTOR solely and entirely at CONTRACTOR's expense.
- 6.5.2 All work performed by the CONTRACTOR and Subcontractors shall be inspected by the CONTRACTOR and nonconforming Work and any safety hazards in the work area shall be noted and promptly corrected. The Work shall be conducted under the general observation of the

ENGINEER and is subject to inspection by representatives of the OWNER to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. The ENGINEER or any inspector(s) shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated. The presence of the ENGINEER or any inspector(s), however, shall not relieve the CONTRACTOR of the responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is the responsibility of the CONTRACTOR. No act or omission on the part of the ENGINEER or any inspector(s) shall be construed as relieving CONTRACTOR of this responsibility. Inspection of Work later determined to be nonconforming shall not be cause or excuse for acceptance of the nonconforming Work. The OWNER may accept nonconforming Work if the CONTRACTOR offers compensation acceptable to OWNER and it is in the OWNER's best interest as determined by the OWNER.

- 6.5.3 All materials and articles furnished by the CONTRACTOR or Subcontractors shall be subject to rigid documented inspection, by qualified personnel, and no materials or articles shall be used in the Work until they have been inspected and accepted by the CONTRACTOR and the ENGINEER or other designated representative. CONTRACTOR shall receive, maintain and catalog any material safety data sheet (MSDS) provided in connection with any materials or articles used in the Work. No Work shall be backfilled, buried, cast in concrete, covered, or otherwise hidden until it has been inspected. Any Work covered in the absence of inspection shall be subject to being uncovered. Where uninspected Work cannot be easily uncovered, such as in concrete cast over reinforcing steel, all such Work shall be subject to demolition, removal, and reconstruction under proper inspection.
- 6.5.4 All materials and articles furnished to the CONTRACTOR by the OWNER shall be subject to rigid inspection by CONTRACTOR before being used or placed by CONTRACTOR. CONTRACTOR shall inform ENGINEER, in writing, of the results of said inspections within one working day after completion of inspection. In the event CONTRACTOR believes any material or articles provided by OWNER to be of insufficient quality for use in the Work, CONTRACTOR shall immediately notify ENGINEER.
- 6.5.5 The ENGINEER or designated representative, acting for the OWNER, shall have the right at all times and places to reject any articles, materials or work to be furnished hereunder which, in any respect, fail to meet the requirements of the Contract Documents, regardless of whether the defects in such articles materials are detected at the point of manufacture or after completion of the Work at the Site.
- 6.5.5.1 If the ENGINEER or designated representative, through an oversight or otherwise, has accepted materials or Work which are defective or in any way contrary to the Contract Documents, such materials, no matter in what stage or condition of manufacture, delivery, or erection, may be rejected. CONTRACTOR shall promptly remove or replace rejected articles or materials from the Site of the Work after notification of rejection. All costs of removal and replacement of rejected articles or materials, as specified therein, shall be borne by the CONTRACTOR. Failure to promptly remove and replace rejected Work shall be considered a breach of this contract and the OWNER may, after 7 days notice, terminate the CONTRACTOR's right to proceed with the affected Work and remove and replace the Work and issue a backcharge to cover the cost of the Work.
- 6.5.5.2 During unfavorable weather, wet ground, or other unsuitable construction conditions, CONTRACTOR shall confine his operations to Work which will not be affected adversely by such conditions. No portion of the Work shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by CONTRACTOR to perform the Work in a proper and satisfactory manner.
- 6.6 Adjusting Progress Schedule. CONTRACTOR shall submit to CONSTRUCTION MANAGER for acceptance proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto. Proposed

adjustments in the progress schedule that would change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of subsection 11.1. Such adjustments may only be made by a Change Order or Work Change Directive.

- 6.6.1 If the CONTRACTOR is more than 10% behind schedule based on the remaining duration on the approved Project Schedule, OWNER may deduct from the CONTRACTOR's progress payment a sum equal to the liquidated damages of the next milestone (shown in Article 13) for the number of days CONTRACTOR is behind schedule. OWNER may withhold additional sums from the CONTRACTOR's progress payment if OWNER determines the Work cannot be completed for the unpaid balance of the Contract Price.
 - 6.6.2 In the event that the CONTRACTOR works overtime, weekends or holidays to regain the schedule, all OWNER'S additional or premium costs resulting from inspection, construction management or resident engineering resulting from such overtime, weekend or holiday work shall be identified to the CONTRACTOR and the Contract Price reduced by a like amount via Change Order.
 - 6.6.3 CONTRACTOR's employee responsible for scheduling and coordinating Work at the Site shall attend all meetings convened by the OWNER or CONSTRUCTION MANAGER for the purpose of scheduling the Work at the Construction Site.
- 6.7 Substitutes or "Or-Equal" Items. Whenever Equipment or Materials are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, Equipment or Materials of other Suppliers may be accepted by ENGINEER if sufficient information is submitted by CONTRACTOR to allow ENGINEER to determine that the Equipment or Material proposed is equivalent or equal to that named. Proposed substitutions shall be made one week prior to the bid opening to allow for proper approvals.
- 6.7.1 If CONTRACTOR wishes to furnish or use a substitute item of Equipment or Material, CONTRACTOR shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified, and be suited to the same use as that specified. The application shall state i) that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR's achievement of Substantial Completion on time; ii) whether acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project); and iii) whether incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified shall be identified in the application and available maintenance, repair, and replacement service for the substitute shall be indicated. The application shall also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR's expense additional data about the proposed substitute.
 - 6.7.2 If a specific means, method, technique, sequence, or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or use a substitute means, method, sequence, technique, or procedure of construction acceptable to ENGINEER, if CONTRACTOR submits sufficient information to allow ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided for substitute Equipment and Material
 - 6.7.3 ENGINEER shall be allowed a reasonable time within which to evaluate each proposed substitute. ENGINEER shall be the sole judge of acceptability, and no substitute will be ordered, installed, or used without ENGINEER's prior written acceptance which shall be evidenced by either a Change Order or an approved Submittal. OWNER may require CONTRACTOR to furnish at

- CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.
- 6.7.4 ENGINEER shall record the time required by ENGINEER and ENGINEER's Consultants in evaluating substitute(s) proposed or submitted by CONTRACTOR pursuant to paragraphs 6.7.1 and 6.7.2 and in making changes in the Contract Documents (or in the provisions of any other direct Contract with OWNER for Work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.
- 6.8 Subcontractors, Suppliers and Others. CONTRACTOR shall perform with his own organization work amounting to not less than 51 percent of the combined value of all items of the Work covered by the Contract.
- 6.8.1 CONTRACTOR shall report to OWNER the name and address of each Subcontractor whom he engages for Work on the Project within 10 days after the Subcontractor commences Work on the Contract.
- 6.8.2 CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization, whether initially or as a substitute, against whom OWNER may have reasonable objection.
- 6.8.3 Particular consideration shall be given to the qualifications of each Subcontractor proposed on the Subcontractors Information list (Volume I). The use of Subcontractors listed by Bidder and accepted by OWNER prior to the Notice of Award will be required in the performance of the Work.
- 6.8.4 No acceptance by OWNER of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER to reject defective Work.
- 6.9 CONTRACTOR's Responsibilities Regarding Subcontractors and Supplies. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions.
- 6.9.1 Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier or other person or organization any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.
- 6.9.2 CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR. CONTRACTOR shall require all Subcontractors, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with ENGINEER through CONTRACTOR.
- 6.10 Specifications and Drawings. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- 6.11 Written Agreements with Subcontractors. All Work performed for CONTRACTOR by a Subcontractor or Supplier shall be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER, and contains provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, their Consultants and all other additional insured for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and insurance applicable to the Work. If the insurers on any

such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR shall obtain the same.

- 6.12 Patent Fees and Royalties. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and, if to the actual knowledge of OWNER or ENGINEER, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall defend, indemnify and hold harmless Indemnittees, and anyone directly or indirectly employed by Indemnittees, from and against all claims, costs, losses and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents. CONTRACTOR does' further agree to indemnify indemnittees against any suit or claim brought or instituted, whether or not such suit or claim be rightfully or wrongfully brought or instituted, and in any case, Indemnittees shall be at liberty to employ attorneys of their own selection to appear and defend the suit(s) on Indemnittees' behalf at the sole expense of the CONTRACTOR.
- 6.13 Permits. CONTRACTOR shall at CONTRACTOR's sole cost and expense obtain and pay for all construction permits and licenses specified in Division 1, General Requirements, and ensure that the list of all permits known to be required in performance of the Work has been listed there. The CONTRACTOR shall be responsible to assure this list is complete and to obtain other permits which are required but not listed. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the execution of the Work which are applicable at the time of opening of Bids. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.
- 6.14 Laws and Regulations.
- 6.14.1 CONTRACTOR and its officers, employees, agents, contractors, licensees or invitees shall comply, at the CONTRACTOR's sole cost and expense and at all times, with all applicable laws, ordinances, statutes, rules, acts or regulations in effect or that become in effect during the time work is performed under this Contract.
- 6.14.2 CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performing the Work and shall cause all his agents, employees, Subcontractors, and Suppliers to observe and comply with all existing and future laws, ordinances, and regulations. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.
- 6.14.3 If CONTRACTOR knows or has reason to know that CONTRACTOR's performance of the Work is contrary to Laws or Regulations, CONTRACTOR shall bear all claims costs, losses and damages arising therefrom.
- 6.14.4 Utah Industrial Insurance Act. CONTRACTOR shall comply with all applicable requirements of "Utah Industrial Insurance Act."
- 6.14.5 Unemployment Compensation Act. CONTRACTOR shall comply with all applicable requirements of "Unemployment Compensation Law".
- 6.14.6 Overhead Electrical Lines: The CONTRACTOR shall comply with all legal code requirements pertaining to activities to be performed near overhead electrical lines. Any liability or penalty incurred for violating the above referenced laws shall be borne strictly by the CONTRACTOR and the CONTRACTOR shall indemnify, defend and hold the OWNER, CONSTRUCTION MANAGER, and ENGINEER harmless from any such liability or penalty.
- 6.14.7 Occupational Diseases. CONTRACTOR shall carry adequate coverage for Occupational Diseases.

- 6.14.8 Occupational Safety and Health. CONTRACTOR shall comply with all applicable requirements pertaining to Occupational Safety and Health.
- 6.14.8.1 Time Extension. If the work temporarily suspended is on the "critical path," the total number of days which the suspension is in effect shall be added to the number of allowable contract days. If a portion of work at the time of such suspension is not on the "critical path," but subsequently becomes work on the critical path, the allowable Contract Time will be computed from the date such work is classified as on the critical path.
- 6.14.8.2 Additional Compensation. If, as a result of a suspension of the Work, CONTRACTOR sustains a loss which could not otherwise have been avoided by his reassignment of employees, equipment or materials to other Work within the Project which has not been suspended, OWNER shall pay CONTRACTOR an amount as determined by OWNER to be fair and reasonable compensation for CONTRACTOR's actual loss in accordance with the following:
- Idle Time of Equipment. Compensation for equipment idle time will be determined on a force account (time and materials) basis and shall include the cost of extra moving of equipment and rental loss. CONTRACTOR shall make a concerted effort to minimize idle time and equipment moves. Idle time of equipment will only include payment of the equipment without operator except during the time an operator is required to move the equipment.
- Idle Time of Labor. Compensation for idle time of workers will be determined by ENGINEER based on actual idle or show-up time.
- Increased Costs of Labor and Materials. Increased costs of labor and materials will be compensated only to the extent such increase was in fact caused by the suspension, as determined by ENGINEER.
- Compensation for actual loss due to idle time of either equipment or labor shall not include markup for profit.
- The days for which compensation will be paid shall be full or partial calendar days, excluding Saturdays, Sundays, and legal holidays, during the existence of such delay.
- 6.15 Taxes. CONTRACTOR shall include in the Bid prices and pay all sales, consumer, use and other similar taxes required to be paid or withheld by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.
- 6.16 Interference with Adjacent Work, Use of Premises. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.
- 6.16.1 CONTRACTOR shall assume full responsibility for any damage to any land or area, or to the owner or occupant thereof or of any adjacent land or areas, resulting from the performance of the Work. Should any claim be made by the owner or occupant of any adjacent land because of the performance of the Work, CONTRACTOR shall promptly settle with the other party by negotiation or otherwise resolve the claim by negotiation or other dispute resolution proceeding or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify, defend and hold Indemnities harmless from and against all claims, costs, losses and damages arising out of or resulting from any claim or action, legal or equitable, brought by any owner or occupant of adjacent land against Indemnities to the extent caused by or based upon CONTRACTOR's performance of the Work.

- 6.16.2 CONTRACTOR shall cooperate fully with all utility work forces, other contractors of the OWNER, and work forces of other public or private agencies engaged in any type of work that may interfere with the progress of the CONTRACTOR's Work. The CONTRACTOR shall schedule the Work so as to minimize any interference with these work forces and entities, including those discussed in the General Requirements, Volume III, of these specifications.
- 6.16.3 Nothing in the Contract shall be interpreted as granting to the CONTRACTOR exclusive occupancy of the Site of the project. The CONTRACTOR must ascertain to his own satisfaction the scope of the project and the nature of any other contracts that have been or may be awarded by the OWNER in the construction of this and adjoining projects to the end that the CONTRACTOR may perform this Contract in the light of such other contracts, if any.
- 6.16.4 CONTRACTOR shall not cause any unnecessary hindrance or delay to any other CONTRACTOR working on the project. If the performance of any contract for the project is likely to be interfered with by the simultaneous performance of some other contract or contracts, the OWNER or ENGINEER shall decide which CONTRACTOR shall cease Work temporarily and which CONTRACTOR shall continue or whether the Work under the contracts can be coordinated so that the CONTRACTORS may proceed simultaneously. On all questions concerning conflicting interest of CONTRACTORS performing related Work, the decision of the OWNER or ENGINEER shall be binding upon all CONTRACTORS concerned and the OWNER or ENGINEER and their consultants shall not be responsible for any damages suffered or extra costs incurred by the CONTRACTOR resulting directly or indirectly from the award or performance or attempted performance of any other contract or contracts on the project or caused by a decision or omission of the OWNER or ENGINEER respecting the order of precedence in the performance of the contracts.
- 6.16.5 If through acts of neglect on the part of the CONTRACTOR, any other CONTRACTOR or Subcontractor shall suffer loss or damage on the Work, the CONTRACTOR agrees to settle with such other CONTRACTOR or Subcontractor by agreement or arbitration, if possible. If such other CONTRACTOR or Subcontractor shall assert any claim against the OWNER, the ENGINEER, or their consultants on account of any damage alleged to have been so sustained, the OWNER or ENGINEER shall notify the CONTRACTOR who shall hold harmless, indemnify and defend the OWNER, the District, the ENGINEER, and their consultants, and each of their officers, employees, and agents against any such claim, including attorneys' fees and any other costs incurred by the indemnified parties relative to any such claim.
- 6.17 Waste Materials and Rubbish Control. During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. Disposal of all rubbish and surplus materials shall be off the Site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction. CONTRACTOR shall leave the Site clean and ready for occupancy by OWNER upon Substantial Completion of the Work.
- 6.18 Excessive Loads. CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.
- 6.19 Record Documents. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Test Records, Field Orders, Requests for Information (RFI's), and all other written interpretations and clarifications in good order and annotated to show all changes made during construction. These record documents together with all final samples and a counterpart of all approved Submittals will be available to ENGINEER for reference. Records shall be protected from deterioration, damage or destruction and maintained in a manner that provides for immediate retrieval. Upon completion of the Work, all record documents, samples and Shop Drawings shall be delivered to OWNER. Receipt and acceptance of record documents will be a prerequisite for final payment to CONTRACTOR.

- 6.20 Safety and Protection. CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall give notices, erect and maintain all safeguards and comply with all laws, ordinances, regulations, codes and lawful orders of any public agency.
- 6.20.1 CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection and training to prevent damage, injury or loss to:
- 6.20.1.1 all persons on the Work Site or anyone who may be affected by the Work;
 - 6.20.1.2 all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site;
 - 6.20.1.3 other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction; and
 - 6.20.1.4 other property and people at the Site or in proximity thereto which or who foreseeably may be injured by activities on Site.
- 6.20.2 All damage, injury or loss to any property referred to in paragraph 6.20.1.2, 6.20.1.3, or 6.20.1.4 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or their Consultants or anyone employed by any of them or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier or other person or organization directly or indirectly employed by any of them).
- 6.20.3 CONTRACTOR's duties and responsibilities for safety and protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER in accordance with subsection 13.7 that the Work is acceptable.
- 6.20.4 CONTRACTOR shall make reasonable efforts to detect and abate any violations of safety standards of which it is aware and to which its employees are exposed, despite the fact that CONTRACTOR did not commit the violation.
- 6.20.5 CONTRACTOR shall designate a qualified and experienced safety representative, meeting the definition of OSHA competent person, at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs. The Safety Representative shall have the ability to recognize hazards and the authority to take corrective action.
- 6.21 Safety Program. Within 30 days of OWNER's Notice to Proceed, CONTRACTOR shall demonstrate compliance action with the requirements of Utah Occupational Safety and Health Administration requirements and all other applicable local, state and federal requirements by submitting a copy of all safety plans, programs and permits to the ENGINEER. Such plans and permits shall include but is not limited to:
- 6.21.1 Safe Work Plan (job task analysis)
 - 6.21.2 Emergency Plan.
 - 6.21.3 Rigging and Hoisting Plans.
 - 6.21.4 Excavation and Trenching Plans.
 - 6.21.5 Respiratory Protection Program.
 - 6.21.6 Fire Protection Plan.
 - 6.21.7 CONTRACTOR's Safety Plan and Hazard Communication Program.
- 6.21.7.1 Hazard Communication Programs. CONTRACTOR shall be responsible for coordinating any exchange or provision of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

- 6.21.7.2 CONTRACTOR shall, upon completion of the Project, forward all material safety data sheets to the Engineer. A material safety data sheet shall be provided for any materials to which the Laws and Regulations may apply.
- 6.22 Site Security. CONTRACTOR shall provide Site security as specified in the General Requirements.
- 6.23 Emergencies. In emergencies or imminent danger situations affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR, without special instruction or authorization from OWNER or ENGINEER, shall act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR experiences any accident or injury or believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If OWNER determines that a change in the Contract Documents is required because the action taken by CONTRACTOR was required by an emergency not caused by the CONTRACTOR or its subcontractors, the OWNER shall issue a Work Change Directive or Change Order.
- 6.24 Submittals. Procedures for processing submittals are provided in Volume III - Specifications.
- 6.24.1 After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, CONTRACTOR shall submit to ENGINEER for review and acceptance in accordance with the accepted schedule of submissions, copies of Submittals which will bear the required information that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission. All submissions shall be identified as ENGINEER may require. The data shown on Submittals shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to enable ENGINEER to review the information as required.
- 6.24.2 Before submission of each Submittal, CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each Submittal with other Submittals and with the requirements of the Work and the Contract Documents.
- 6.24.3 At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of each variation that the Submittal may have from the requirements of the Contract Documents, and in addition, shall cause a specific notation to be made on each Submittal submitted to ENGINEER for review and approval of each such variation.
- 6.24.4 ENGINEER shall review Submittals with reasonable promptness, but ENGINEER's review and acceptance will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences, or procedures of construction (except where a specific means, method, technique, sequence, or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such shall not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by ENGINEER, and shall return the required number of corrected copies of Submittals and resubmit as required for review and acceptance. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous Submittals.
- 6.24.5 ENGINEER's review and acceptance of Submittals shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission and ENGINEER has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Submittal. Nor shall any acceptance by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Submittals.
- 6.24.6 Where a Submittal is required by the Specifications, any related Work performed prior to ENGINEER's review and acceptance of the pertinent submission shall be the sole expense and responsibility of CONTRACTOR.

- 6.25 Continuing the Work. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as OWNER and CONTRACTOR may otherwise agree in writing.
- 6.26 CONTRACTOR's Liability; Indemnification. To the full extent permitted by law, CONTRACTOR shall at all times indemnify and keep indemnified Indemnities and hold and save Indemnities harmless from and against any and all liability for damages, claims, judgments, losses, fines, penalties, charges and expenses of whatever kind or nature, including but not limited to all professional and attorneys' fees and costs, which Indemnities shall or may at any time sustain or incur by reason of or in consequence of the acts or omissions in the performance of the Work under this Agreement by the CONTRACTOR, anyone directly or indirectly employed by CONTRACTOR or anyone for whose acts CONTRACTOR may be liable, including CONTRACTOR's use of design guidelines, technical specifications, standard details, and Project criteria provided by the Indemnities, except to the extent those claims, losses, fines, penalties or expenses are solely caused by the Indemnities. CONTRACTOR shall pay over, reimburse and make good Indemnities, all monies which Indemnities shall pay or cause to be paid, or become liable to pay, by reason of the foregoing circumstance. CONTRACTOR does further agree to indemnify Indemnities against any suit or claim brought or instituted against Indemnities by any person or entity and concerning any damages or injuries sustained or incurred as a result of CONTRACTOR's acts or omissions in performance of its Work under this Agreement whether such suit or claim be rightfully or wrongfully brought or instituted, and in any such case Indemnities shall be at liberty to employ attorneys of their own selection to appear and defend the suit or suits in Indemnities' behalf at the expense of the CONTRACTOR. This provision applies whether or not it is caused in part by an act or omission (active, passive, or comparative negligence included), or any party indemnified hereunder, but not from the sole negligence of a party indemnified thereunder.
- 6.27 No Limits on Indemnification. In any and all claims brought against Indemnities by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.26 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.
- 6.28 Exception to Indemnification. The obligations of CONTRACTOR under paragraph 6.26 shall not extend to the liability of Indemnities caused primarily by negligent preparation of maps, drawings, surveys, designs or specifications upon which is placed the applicable state-authorized design professional seal of OWNER's ENGINEER or ENGINEER's Consultant's officers, directors, partners, employees or agents.
- 6.29 Survival of Obligations. All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations of CONTRACTOR indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Agreement.
- 6.30 The CONTRACTOR and all its Subcontractors shall comply with all terms and conditions of the Substance Abuse Prevention Procedures attached hereto, together with any and all amendments now existing or which are later made hereto.

ARTICLE 7 - THE "WORK"

- 7.1 The Work to be performed under this Contract shall consist of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all Work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all Work, materials, and services not expressly indicated or called for in the Contract

Documents which may be necessary for the complete, safe and proper construction of the Work in good faith shall be provided by the CONTRACTOR as though originally so indicated at no increase in cost to OWNER.

- 7.2 The CONTRACTOR shall schedule and perform the Work in such a manner as to result in the least possible disruption to the public's use of roadways, driveways, and utilities. Utilities shall include but not be limited to water, sewerage, drainage structures, ditches and canals, gas, electric, cable television, and telephone. The approximate location of utilities shall be provided by ENGINEER on plan and profile sheets therefore. Such approximate locations are guaranteed for neither accuracy or completeness. The CONTRACTOR shall incorporate as-built locations on the reproducible record plans, in red ink, showing proper location on each sheet where these utilities are located.
- 7.3 Related Work at Site. OWNER may perform other work related to the Project at the Site by OWNER's own forces, or let other direct contracts therefore which shall contain General Conditions similar to these, or have other work performed by utility owners. In addition to the Work under this Contract, OWNER has awarded, or will award, separate contracts for other work related to the Project to be performed at the Site.
- 7.4 Project Site. CONTRACTOR's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices. OWNER may utilize all or part of the project site during the entire period of construction for the conduct of the OWNER's normal operations. CONTRACTOR shall cooperate and coordinate with the ENGINEER to facilitate the OWNER's operations and to minimize interference with the CONTRACTOR's operations.
- 7.5 Safe Access. CONTRACTOR shall afford each other contractor who is a party to another direct contract with the OWNER and each utility owner proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly connect and coordinate the Work with other contractors as appropriate. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering the other contractor's work and will only cut or alter the other contractor's work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in direct contracts between OWNER and such utility owners and other contractors.
- 7.6 Notice of Delays by Others. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects or deficiencies in such other work that render part of the CONTRACTOR's Work unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure so to report shall constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent or nonapparent defects and deficiencies in such other work.
- 7.7 Coordination. In addition to overseeing the execution of this Contract, the CONSTRUCTION MANAGER shall also be responsible for overseeing related Work at the Site under other OWNER contracts. CONTRACTOR shall coordinate directly with other contractors that have been issued Notice to Proceed by OWNER when developing CONTRACTOR's initial schedule submittal. CONTRACTOR's schedule shall reflect this coordination to eliminate conflicts with all other contractors. CONTRACTOR shall coordinate directly with ENGINEER and any other contractors to schedule day-to-day access to the site as necessary. ENGINEER shall make final determination regarding schedule adjustments if necessary to avoid schedule conflicts between contractors.
- 7.8 Interference With Work On Utilities: CONTRACTOR shall cooperate and coordinate fully with all utility forces of the OWNER engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the Work, and shall schedule the Work so as to minimize interference with

said relocation, altering, or other rearranging of facilities. CONTRACTOR shall review with the various utility companies the construction methods, safety procedures and Work to be done in the vicinity of utilities. When temporary relocation of utilities is necessary, sufficient advance notice shall be given by the CONTRACTOR to the utility involved. Utilities and other concerned agencies shall be contacted at least 7 days prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines. The CONTRACTOR shall submit the findings of a utility investigation to the ENGINEER.

- 7.9 Notice to Owners of Adjacent Properties: CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the Work may affect them. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, CONTRACTOR shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, shall include appropriate information concerning the interruption and instructions on how to limit any resulting inconvenience.
- 7.10 Time Limitations. Time limitations required by OWNER shall be for the benefit of OWNER and contractors under other contracts who have entered into such contracts with OWNER in reliance on the time limitations set forth in these Contract Documents. Any claim by a contractor for damages due to delay or damage to the Work or the property of a contractor by another contractor shall be asserted against that contractor.
- 7.11 Lines and Grades; Survey Data. All Work shall be done to the lines, grades, and elevations shown on the Drawings. CONTRACTOR shall establish basic horizontal and vertical control points and shall use these points as datum for the Work. Any additional survey, layout, or measurement Work needed for proper construction of the Work shall be performed by CONTRACTOR as a part of the Work at no additional cost to the OWNER. CONTRACTOR shall employ experienced instrument personnel, competent assistants, and such instruments, tools, stakes, and other materials required to complete the survey, layout, and measurement Work. In addition, CONTRACTOR shall furnish, without charge, competent personnel from its force and such tools, stakes, and other materials as ENGINEER may require in establishing or designating control points or in checking survey, layout, and measurement of Work performed by CONTRACTOR. CONTRACTOR shall keep ENGINEER informed, a reasonable time in advance, of the times and places at which CONTRACTOR wishes to do Work, so that horizontal and vertical control points may be established and any checking deemed necessary by ENGINEER may be done with minimum delay to CONTRACTOR. CONTRACTOR shall remove and reconstruct Work which is improperly located. The CONTRACTOR shall make available for examination throughout the construction period all field books, notes, and other data developed by CONTRACTOR in performing the surveys required by the Work and shall submit all such data to ENGINEER with documentation required for final acceptance of the Work.

ARTICLE 8 - ENGINEER'S STATUS DURING CONSTRUCTION

- 8.1 OWNER's Representative. ENGINEER shall be OWNER's representative during the construction of the Project.
- 8.2 Visits to Site. ENGINEER shall make visits to the Site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine if the Work is proceeding in accordance with the Contract Documents. On the basis of such visits and through on-Site observations as an experienced and qualified design professional, ENGINEER shall keep OWNER informed of the progress of the Work and guard OWNER against defects and deficiencies in the Work.
- 8.3 Project Representation. ENGINEER shall furnish a PROJECT REPRESENTATIVE to assist ENGINEER in observing the performance of the Work.
- 8.3.1 Communications pertaining to Submittals, written interpretations, and Change Orders shall be directed to ENGINEER at his home office with copies to PROJECT REPRESENTATIVE.

- 8.3.2 Communications pertaining to day-to-day operations at the Site shall be directed to PROJECT REPRESENTATIVE.
- 8.3.3 The PROJECT REPRESENTATIVE and his assistants shall conduct observations of the Work in progress to assist ENGINEER in determining that the Work is proceeding in accordance with the Contract Documents.
- 8.3.4 The PROJECT REPRESENTATIVE shall not have authority to permit any deviation from the Contract Documents, except with concurrence of the ENGINEER.
- 8.3.5 The PROJECT REPRESENTATIVE shall be authorized, subject to review by the ENGINEER, to disapprove or reject any defective workmanship, Equipment, or Material.
- 8.4 Clarifications and Interpretations. ENGINEER shall issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of drawings or otherwise) as ENGINEER may determine necessary. Such clarifications shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification or interpretation justifies an increase in the Contract Price or an extension of the Contract Times and the parties are unable to agree on the amount or extent thereof, CONTRACTOR may make a claim therefore.
- 8.5 Authorized Variations in Work. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and shall be binding on OWNER and CONTRACTOR, who shall perform the Work involved promptly.
- 8.6 Rejecting Defective Work. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, and will also have authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- 8.7 Determination for Unit Prices. ENGINEER shall determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER shall review with CONTRACTOR, ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decisions thereon shall be final and binding upon OWNER and CONTRACTOR, unless, within ten days after the date of any such decision, either OWNER or CONTRACTOR delivers to the other party to the Agreement and to ENGINEER written notice of intention to appeal from such a decision.
- 8.8 Decisions on Claims and Disputes.
- 8.8.1 ENGINEER shall be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes, and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 10 and 11 in respect of changes in the Contract Price or Contract Times shall be referred initially to ENGINEER in writing with a request for a written decision in accordance with this paragraph, which ENGINEER shall render within a reasonable time. Written notice of each such claim, dispute, and other matter shall be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than 30 days) after the occurrence of the event giving rise thereto, and written supporting data shall be submitted to ENGINEER and the other party within 60 days after such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim.
- 8.8.2 When functioning as interpreter of the requirements of the Contract Document and judge of the acceptability of the Work, ENGINEER will not show partiality to OWNER or CONTRACTOR. The rendering of a decision by ENGINEER with respect to any such claim, dispute, or other matter shall be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute, or other matter.

ARTICLE 9 - CHANGES IN THE WORK

- 9.1 OWNER's Order to Change Work. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work within the scope of this Agreement. Such additions, deletions or revisions shall be authorized by a Written Amendment, Field Order, Change Order or Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which shall be performed under the conditions of the Contract Documents, unless otherwise specifically provided.
- 9.2 Claim Based on Change Order. If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an adjustment in the Contract Price or an adjustment of the Contract Times, that should be allowed as a result of a Work Change Directive, a claim may be made therefore.
- 9.3 Limitation on increase in Contract Price or Contract Times. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents as amended, modified or supplemented, or to perform the Work in a safe manner, except in the case of an emergency or in the case of uncovering Work.
- 9.4 Execution of Change Orders. OWNER and CONTRACTOR shall execute appropriate Change Orders covering:
- 9.4.1 changes in the Work which are (i) ordered by OWNER, (ii) required because of acceptance of defective Work or correcting defective Work, or (iii) are otherwise agreed to by the parties;
 - 9.4.2 changes in the Contract Price or Contract Times which are agreed to by the OWNER and CONTRACTOR; and
 - 9.4.3 changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER; provided that in lieu of executing any such Change Order an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations but during any such appeal CONTRACTOR shall carry on the Work and adhere to the progress schedule.
- 9.5 In the event that OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an adjustment in the Contract Price or Contract Time without causing delay, in, or disruption of the CONTRACTOR's schedule for completion of the Project; or increase in the cost for rework; the OWNER's Director is authorized to issue a "Work Change Directive" for the addition, deletion or change to proceed on an extra work basis, subject to the submittal of daily reports of all labor, equipment, materials and supplies utilized while performing extra Work to be completed and agreed upon by the CONTRACTOR and the OWNER's Director.
- 9.6 Notice of Change Orders to Surety. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including but not limited to Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice shall be CONTRACTOR's responsibility and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 10 - CHANGE OF CONTRACT PRICE

- 10.1 Total Compensation. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities, and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in Contract Price.
- 10.2 Change of Contract Price. The Contract Price may only be changed by a Written Amendment or a Change Order. Any claim for an adjustment in the Contract Price shall be based on written notice delivered by the

party making the claim to the other party and to the ENGINEER promptly (but in no event later than ten days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within thirty days after the occurrence of the event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the adjustment claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. The ENGINEER shall review and render a decision on all claims for adjustment in the Contract Price.

10.3 Determination of Value of Work Covered by Change Order. The value of any Work covered by a Change Order or of any claim for an adjustment in the Contract Price shall be determined in one of the following ways:

10.3.1 where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraphs 10.9.1 through 10.9.3 inclusive).

10.3.2 by mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 10.6.2.1).

10.3.3 on the basis of the Cost of the Work (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraphs 10.6 and 10.7).

10.4 Cost of the Work. The term "Cost of the Work" means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as may otherwise be agreed in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in subsection 10.5:

10.4.1 Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but shall not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.

10.4.2 Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds, and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

10.4.3 Payments made by CONTRACTOR to the Subcontractors for Work performed or furnished by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER who shall then determine, with the advice of ENGINEER, which bids, if any, will be accepted. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work shall be determined in the same manner as CONTRACTOR's Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

10.4.4 Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

10.4.5 Supplemental costs including the following:

- 10.4.5.1 Necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.
- 10.4.5.2 Costs, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work; and the cost less market value of such items used but not consumed and which remain the property of CONTRACTOR.
- 10.4.5.3 Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER; and the costs of transportation, loading, unloading, installation, dismantling, and removal thereof all in accordance with terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
- 10.4.5.4 Sales, consumer, use or similar taxes related to the Work, as imposed by Laws and Regulations and for which CONTRACTOR is liable.
- 10.4.5.5 Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- 10.4.5.6 Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance, or otherwise, sustained by CONTRACTOR in connection with the performance and furnishing of the Work, provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in subsection 10.6.2.
- 10.4.5.7 The cost of utilities, fuel and sanitary facilities at the Site.
- 10.4.5.8 Expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage and similar petty cash items in connection with the Work.
- 10.4.5.9 Cost of premiums for additional Bonds and insurance required because of changes in the Work.

10.5 Exclusions from Cost of the Work. The term "Cost of the Work" shall not include any of the following:

- 10.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR whether at the Site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in subsection 10.4.1 or specifically covered by subsection 10.4.4 all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
- 10.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.
- 10.5.3 Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
- 10.5.4 Cost of premiums for all bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same, except for the cost of premiums covered by subsection 10.4.5.9.
- 10.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

- 10.6 CONTRACTOR's Fee. The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:
- 10.6.1 a mutually acceptable fixed fee; or if none can be agreed upon,
 - 10.6.2 a fee based on the following percentages of the various portions of the Cost of the Work:
 - 10.6.2.1 for costs incurred under subsections 10.4.1 and 10.4.2, the CONTRACTOR's total mark up fee shall be 15 percent including both profit and overhead;
 - 10.6.2.2 for costs incurred under subsection 10.4.3, the CONTRACTOR's fee shall be 5 percent; and if a subcontract is on the basis of Cost of the Work plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be 15 percent;
 - 10.6.2.3 no fee shall be payable on the basis of costs itemized under subsections 10.4.4, 10.4.5 and 10.5;
 - 10.6.2.4 the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost shall be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee in an amount equal to five percent of such net decrease; and
 - 10.6.2.5 when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with subsections 10.6.2.1 through 10.6.2.4, inclusive.
- 10.7 Records Supporting Cost Items. Whenever the cost of any Work is to be determined pursuant to subsections 10.4 and 10.5, CONTRACTOR shall establish and maintain records thereof in accordance with generally accepted accounting practices and shall submit an itemized cost breakdown together with supporting data to the ENGINEER. OWNER may audit CONTRACTOR's records related to such costs during customary business hours.
- 10.8 Allowances. It is understood that the CONTRACTOR has included in the Contract Price all allowances named in the Contract Documents, and shall cause the Work to be done by such suppliers or Subcontractors and for such sums within the limit of the allowances as may be acceptable to ENGINEER on behalf of OWNER. Prior to final payment, an appropriate Change Order shall be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted. The CONTRACTOR agrees that the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of equipment and materials required by the allowances to be delivered to the Site, labor, installation costs, and all applicable taxes. The CONTRACTOR further agrees that all overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and that no demand for additional payment on account of any thereof will be valid.
- 10.9 Unit Price Work.
- 10.9.1 Where the Contract Documents provide that part of the Work is to be Unit Price Work, the Contract Price shall initially be deemed to include, for all Unit Price Work, an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the quantity of each item as indicated in the Contract Documents. The quantities of items of Unit Price Work are expected maximums and are provided for the purpose of determining the maximum, not to exceed, Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR shall be made by ENGINEER.
 - 10.9.2 Each unit price shall be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.
 - 10.9.3 Where the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Contract Documents and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result

thereof, but the parties are unable to agree as to the amount of any such increase, CONTRACTOR may make a claim for an increase in the Contract Price.

ARTICLE 11 - CHANGE OF CONTRACT TIMES

- 11.1 Contract Time. The Contract Times (or Milestones) may only be changed by a Written Amendment, or Change Order. Any claim for an adjustment of the Contract Times (or Milestones) shall be based on Work that affects the Critical Path only and a written notice delivered by the party making the claim to the other party and to CONSTRUCTION MANAGER promptly (but in no event later than ten days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within thirty days after such occurrence (unless CONSTRUCTION MANAGER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. CONTRACTOR shall demonstrate the requested Contract Time change through schedule submittals if so requested by the CONSTRUCTION MANAGER. The CONSTRUCTION MANAGER shall review and recommend a decision to OWNER on all claims for adjustment in the Contract Times (or Milestones). Any change to the Contract Times agreed to by OWNER shall be incorporated in a Change Order or Written Amendment.
- 11.2 Extension for Delays Beyond CONTRACTOR's Control. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) may be extended in an amount equal to time lost due to such delay if a claim is made therefore as provided in subsection 11.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work, or to fires, floods, epidemics, abnormal weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

ARTICLE 12 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

- 12.1 Warranty and Guarantee. CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects of which OWNER or ENGINEER is aware shall be provided to CONTRACTOR. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article.
- 12.1.1 No provision in the Contract Documents nor any specified guarantee time limit shall be held to limit CONTRACTOR's liability for defects.
- 12.1.2 All Equipment and Materials furnished by CONTRACTOR for the Work shall carry a written guarantee from the manufacturer or Supplier of such items when called for in the Specifications. Written guarantees shall be submitted to ENGINEER with other Submittals. ENGINEER shall transmit such guarantees to OWNER for review.
- 12.2 Access to the Work. ENGINEER and ENGINEER's representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests shall be permitted access to the Work for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.
- 12.3 Tests and Inspections. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals.
- 12.3.1 CONTRACTOR shall be responsible for and shall pay all costs in connection with any inspection or testing required in connection with OWNER's or ENGINEER's acceptance of a Supplier of

- Materials or Equipment proposed to be incorporated in the Work, or of Materials or Equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work.
- 12.3.2 If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested, or approved, CONTRACTOR shall assume full responsibility therefore, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection, testing, or approval.
- 12.3.3 The cost of all inspections, tests, and approvals in addition to the above which are required by the Contract Documents shall be paid by OWNER, unless otherwise specified.
- 12.3.4 All inspections, tests, or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to OWNER and CONTRACTOR, or by ENGINEER if so specified.
- 12.3.5 If any Work, including the work of others, that is to be inspected, tested, or approved is covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation. Such uncovering shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.
- 12.3.6 Neither observations by ENGINEER nor inspections, tests, or approvals by others shall relieve CONTRACTOR from CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.
- 12.4 Defective Work. The term "defective" is used in these documents to describe Work that is unsatisfactory, faulty, not in conformance with the requirements of the Contract Documents, or not meeting the requirements of any inspection, test, approval, or acceptance required by Law or the Contract Documents.
- 12.4.1 Any defective Work may be disapproved or rejected by ENGINEER at any time before final acceptance even though it may have been overlooked and included in a previous Application for Payment.
- 12.4.2 ENGINEER shall provide CONTRACTOR prompt notice of defects as they become evident.
- 12.5 Uncovering Work. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall bear all direct, indirect, and consequential costs of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals); and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefore. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefore.
- 12.6 OWNER May Stop The Work. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.
- 12.7 Correction or Removal of Defective Work. If required by ENGINEER, CONTRACTOR shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, remove it from the Site and replace it with nondefective Work. CONTRACTOR shall bear all direct, indirect, and consequential costs of such correction or removal

(including but not limited to fees and charges of engineers, architects, attorneys, and other professionals) made necessary thereby.

- 12.8 One-Year Correction Period. Under the provisions of the Guaranty Bond furnished by CONTRACTOR at the completion of the Work, if within one year after the Date of Substantial Completion of the Project, any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions, either correct such defective Work, or, if it has been rejected by OWNER, remove it from the Site and replace it with nondefective Work. If 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, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect, and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals) will be paid by CONTRACTOR.
- 12.9 Acceptance of Defective Work. OWNER may, at its election, choose to accept defective Work instead of requiring correction or removal and replacement of defective Work. CONTRACTOR shall bear all direct, indirect, and consequential costs attributable to OWNER's evaluation of and determination whether to accept such defective Work (including but not be limited to fees and charges of engineers, architects, attorneys, and other professionals). If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents with respect to the Work. If OWNER's acceptance occurs after such recommendation, CONTRACTOR shall pay OWNER for OWNER's costs of evaluation and determination whether to accept the defective Work.
- 12.10 OWNER May Correct Defective Work. If CONTRACTOR fails within a reasonable time after written notice of ENGINEER to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by ENGINEER, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency.
- 12.10.1 To the extent necessary to complete corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work, and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site and incorporate in the Work all Equipment and Materials stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere.
- 12.10.2 All direct, indirect, and consequential costs of OWNER in exercising such rights and remedies shall be charged against CONTRACTOR and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents with respect to the Work. OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a claim therefore. Such direct, indirect, and consequential costs shall include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs, and all costs of repair and replacement of work of others destroyed or damaged by correction, removal, or replacement of CONTRACTOR's defective Work.
- 12.10.3 CONTRACTOR shall not be allowed an extension of the Contract Times because of any delay in performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

ARTICLE 13 - PAYMENTS TO CONTRACTOR AND COMPLETION

- 13.1 Applications for Progress Payment. Within fifteen days following the last day of each month, CONTRACTOR shall submit to ENGINEER for review an Application for Progress Payment filled out and signed by CONTRACTOR covering the Work completed during the preceding calendar month. The

Application for Progress Payment shall be accompanied by such supporting documentation as required by the Contract Documents.

- 13.1.1 If payment is requested on the basis of Equipment and Materials not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Progress Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the Equipment and Materials free and clear of all liens, charges, security interests, and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the Equipment and Materials are covered by appropriate property or Builder's Risk insurance and other arrangements to protect OWNER's interest therein, all of which shall be satisfactory to OWNER.
 - 13.1.2 Progress payments shall be in the amount of 90% of the amount of the Application for Progress Payment less the sum of all previous payments. When the amount retained by OWNER becomes equal to 5% of the Contract Price, the remaining progress payments shall be made in full, provided CONTRACTOR's performance is satisfactory in the opinions of OWNER.
 - 13.1.3 CONTRACTOR warrants and guarantees that title to all Work, Materials, and Equipment covered by any Application for Progress Payment, whether incorporated in the Project or not, shall pass to OWNER free and clear of all Liens no later than the time of OWNER's payment.
- 13.2 Review of Application for Progress Payment. ENGINEER shall, within five Work Days after receipt of each Application for Progress Payment, either recommend in writing that OWNER make the Progress Payment or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. OWNER shall pay the recommended amount within thirty (30) days after receipt of ENGINEER's recommendation for payment.
- 13.2.1 ENGINEER's recommendation of final payment shall constitute an additional representation by ENGINEER to OWNER that the conditions precedent to CONTRACTOR's entitlement to final payment have been fulfilled.
 - 13.2.2 ENGINEER shall refuse to recommend payment, either in whole or any part if:
 - 13.2.2.1 subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended;
 - 13.2.2.2 the Work is defective, or completed Work has been damaged requiring correction or replacement;
 - 13.2.2.3 written claims have been made against OWNER or Liens have been filed in connection with the Work;
 - 13.2.2.4 the Contract Price has been reduced by Written Amendment or Change Order;
 - 13.2.2.5 OWNER has been required to correct defective Work or complete Work;
 - 13.2.2.6 CONTRACTOR has failed to satisfactorily prosecute the Work in accordance with the Contract Documents; or
 - 13.2.2.7 CONTRACTOR has failed to make payment to Subcontractors, or for labor, Materials, or Equipment; or
 - 13.2.2.8 OWNER is entitled to terminate the Contract.
 - 13.2.3 OWNER may refuse to make payment of the full amount recommended by ENGINEER because claims have been made against OWNER on account of CONTRACTOR's performance the Work, because Liens have been filed in connection with the Work, or because there are other items entitling OWNER to a set-off against the amount recommended. OWNER shall give CONTRACTOR immediate written notice stating the reasons for such action.
 - 13.2.4 The OWNER shall authorize progress payments of the amount due under the Contract at the end of each calendar month, or as soon thereafter as practical, to the CONTRACTOR if the CONTRACTOR is satisfactorily performing the Contract and the OWNER has not been required to withhold payment to the CONTRACTOR.
 - 13.2.5 The CONTRACTOR shall disburse money paid to him, including any interest which he receives, to his Subcontractors and suppliers within 15 days after he receives the money, in direct

proportion to the subcontractor's and supplier's basis (including payments of interest on amounts withheld) in the total Contract between CONTRACTOR and OWNER.

- 13.3 Substantial Completion. When CONTRACTOR considers the entire Work ready for its intended use, CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER and OWNER do not consider the Work substantially complete, ENGINEER shall notify CONTRACTOR in writing giving his reasons therefore. If ENGINEER considers the Work substantially complete, ENGINEER shall prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the Date of Substantial Completion. ENGINEER shall attach thereto a tentative list of items to be completed or corrected before final payment.
- 13.3.1 OWNER shall, within fourteen days after receipt of the tentative certificate, advise ENGINEER of additional Work necessary in order that the Work be substantially complete. ENGINEER shall notify CONTRACTOR in writing of the additional Work necessary.
- 13.3.2 At the time of delivery of the tentative certificate of Substantial Completion, ENGINEER shall deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities, insurance, and warranties.
- 13.4 Partial Utilization. Use by OWNER of any finished part of the Work, which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and useable part of the Work that can be used by OWNER without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:
- 13.4.1 OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees, CONTRACTOR shall certify to OWNER and ENGINEER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion.
- 13.4.2 OWNER may at any time request CONTRACTOR in writing to permit OWNER to take over operation of any such part of the Work although it is not substantially complete. OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. ENGINEER shall list any additional work which shall be completed or corrected and deliver such list to OWNER and CONTRACTOR and shall recommend any division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance, warranties, and guarantees for that part of the Work. Prior to Substantial Completion of such part of the Work, OWNER shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.
- 13.5 Final Inspection. Upon written notice from CONTRACTOR that the Work or an agreed portion thereof is complete, ENGINEER and OWNER shall make a final inspection of the Work and shall notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

- 13.6 Final Application for Payment. After CONTRACTOR has completed all Work to the satisfaction of OWNER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents, and other documents - all as required by the Contract Documents, and after ENGINEER has indicated that the Work is acceptable, CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, except to the extent they have been previously delivered, together with complete and legally effective releases or waivers, satisfactory to OWNER, of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, Material, and Equipment for which a Lien could be filed, and that all payrolls, Equipment and Material bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.
- 13.7 Final Payment and Acceptance.
- 13.7.1 ENGINEER shall, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application to OWNER for payment, if, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation--all as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled. Thereupon, ENGINEER shall give written notice to OWNER that the Work is acceptable. The amount recommended for payment by ENGINEER shall be due and payable by OWNER to CONTRACTOR thirty days after ENGINEER's written notice to OWNER that the Work is acceptable and complete. If ENGINEER is not satisfied that the Work is acceptable and complete, ENGINEER shall return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application
- 13.7.2 If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. The written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.
- 13.8 CONTRACTOR's Continuing Obligation. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor any review and approval of a Submittal, nor the issuance of any notice of acceptability, nor any correction of defective Work by OWNER will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents.
- 13.9 Waiver of Claims. OWNER's making and CONTRACTOR's acceptance of final payment shall constitute a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from defective work appearing after final inspection, or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein. OWNER's making and CONTRACTOR's acceptance of final payment shall not constitute a waiver by OWNER of any rights in respect of CONTRACTOR's continuing obligations under the Contract Documents, nor a waiver of those claims previously made in writing and still unsettled.

13.10 Contract Times.

13.10.1 OWNER and CONTRACTOR recognize that time is of the essence for the performance of the CONTRACTOR's obligations pursuant to this Agreement, that Work under other contracts is dependent on timely and satisfactory completion of the Work.

13.10.2 Contract Times are as follows:

| <u>Milestone</u> | <u>Date</u> |
|-----------------------|-------------|
| Completion of Project | 11/21/2025 |

13.10.3 When CONTRACTOR is in default for nonperformance within the stipulated Contract Times including any intermediate Milestone Dates, ENGINEER shall notify CONTRACTOR in writing within 30 days after the Contract Times or intermediate Milestone Date.

ARTICLE 14 - SUSPENSION OF WORK AND TERMINATION

14.1 OWNER May Suspend Work. OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety (90) days by notice in writing to CONTRACTOR and ENGINEER which shall fix the date on which Work shall be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefore.

14.2 OWNER May Terminate. OWNER may terminate this Contract upon the occurrence of any one or more of the following events:

14.2.1 CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state Law in effect at such time relating to the bankruptcy or insolvency;

14.2.2 a petition is filed against CONTRACTOR under any chapter of the bankruptcy Code as now or hereafter in effect at the time of filing, or a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state Law in effect at the time relating to bankruptcy or insolvency;

14.2.3 CONTRACTOR makes a general assignment for the benefit of creditors;

14.2.4 a trustee, receiver, custodian, or agent of CONTRACTOR is appointed under applicable Law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR's creditors;

14.2.5 CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

14.2.6 CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable Equipment or Materials or failure to adhere to the progress schedule);

14.2.7 If CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction; or

14.2.8 CONTRACTOR violates any provisions of the Contract Documents in any substantial way.

14.3 OWNER may, after giving CONTRACTOR (and the surety, if there be one) seven days' written notice of OWNER's intention to terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all Equipment and Materials stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, 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, indirect, and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals, and court and arbitration costs), such excess will be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER shall be incorporated in a Change Order. When exercising any rights or remedies under this paragraph, OWNER shall not be required to obtain the lowest price for the Work performed.

- 14.4 Where CONTRACTOR's services have been terminated by OWNER, the termination shall not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due to CONTRACTOR by OWNER shall not release CONTRACTOR from liability.
- 14.5 OWNER may, without cause and without prejudice to any other right or remedy, upon seven days' written notice to CONTRACTOR, elect to abandon the Work and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which shall include, but not be limited to, direct, indirect, and consequential costs.
- 14.6 CONTRACTOR May Stop Work or Terminate. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety (90) days by OWNER or under an order of court or other public authority, or OWNER fails for 45 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven (7) days' written notice to OWNER and ENGINEER, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if OWNER has failed to make any payment when due, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

ARTICLE 15 - RESOLUTION OF DISPUTES

15.1 Arbitration.

- 15.1.1 All claims, disputes and other matters in question between OWNER and CONTRACTOR arising out of, or relating to the Contract Documents or the breach thereof, except for claims which have been waived by the making or acceptance of final payment, shall be decided by arbitration in accordance with the Uniform Arbitration Act of the State of Utah. Any dispute requiring arbitration shall be handled in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association.
- 15.1.2 No demand for arbitration of any such claim, dispute, or other matter, that involves any report, submittal or referral required by the Contract Documents to be made to the ENGINEER for review, approval or consideration, shall be made until the Engineer has reported in writing to the OWNER and CONTRACTOR regarding such review, approval or consideration. Nor shall such a demand be made later than thirty (30) days after such written report.
- 15.1.3 CONTRACTOR shall carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise agreed by CONTRACTOR and OWNER in writing.

ARTICLE 16 - MISCELLANEOUS

- 16.1 Giving Notice. Whenever any provision of the Contract Documents requires the giving of written notice the notice shall be dated and signed by the party giving such notice or his duly authorized representative. The notice shall be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if sent by fax (with oral verification of receipt followed by mailing of the original), or if delivered by overnight delivery, or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice. For the purposes of the various notice requirements contained in the Contract Documents, notice shall be

deemed given on the date it is personally delivered, one day after it is sent by overnight mail, three days after the date it is mailed, as evidenced by the postmark or if such notice is given by facsimile transmission, as provided herein, it shall be deemed served immediately upon receipt of transmission if transmitted during normal business hours or, if not transmitted during normal business hours, on the next business day following facsimile transmission.

- 16.2 Computation of Time. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the Law of the applicable jurisdiction, such day will be omitted from the computation.
- 16.3 Notice of Claims. Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission, or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.
- 16.4 Cumulative Remedies. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations particularly imposed upon CONTRACTOR by the Contract Documents and all of the rights and remedies available to OWNER and ENGINEER thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph shall be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply. All representations, warranties, and guarantees made in the Contract Documents shall survive final payment and termination or completion of the Agreement.
- 16.5 Governing Law and Venue. The Contract Documents shall be governed and interpreted in accordance with the laws of the State of Utah. CONTRACTOR hereby agrees and consents to the exclusive jurisdiction of the courts of the State of Utah, and that venue of any action brought hereunder shall be in Utah County, Utah.

END OF SECTION 00700

VOLUME III
SPECIFICATIONS

BIDDING DOCUMENTS INDEX

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DIVISION 1 - GENERAL REQUIREMENTS

PART 1 - GENERAL REQUIREMENTS

1.1 SUMMARY:

- A. This Section summarizes the Work of the Project as covered in detail in the complete Contract Documents.

1.2 PROJECT DESCRIPTION

A. Project Scope

- 1. The work required under this project will construct the new foundations associated with the Grapevine Transmission Line Project as detailed in the plans and specifications. Both Washington and Contractor furnished materials will be used on the project. The successful contractor will be required to perform and participate in all aspects of foundation construction process, such as material purchase, installation, testing, commissioning and landscape repair as outlined in the drawings and specifications. Close coordination between the Contractor, Washington, the Engineer and others (such as material suppliers, subcontractors,) will be required in order for the Project to be completed successfully and on schedule.

B. Project Description –The Grapevine Transmission Line is generally described below.

- 1. The Transmission line is new construction that will tie into existing facilities.
- 2. The concrete foundations will be constructed by this project as indicated in the drawings.
- 3. Pole Numbers from bore hole location drawing varies from final drawings and should be correlated accordingly.

1.3 WORK COVERED BY CONTRACT DOCUMENTS:

- A. This Contract is entitled “Washington City Grapevine Transmission Line Project.” The work required under this contract is indicated in the drawings and specifications.

B. The Transmission Lines is:

Grapevine Transmission Line
Along Park Way Street and I-15.
Washington, Utah 84780

C. The Project has critical schedule requirements which are briefly outlined below.

- 1. Project Sequencing Requirements: One of the primary goals and requirements of the project will be complete the project without any outages to Washington City customers. This will require the Contractor to carefully plan and coordinate with material suppliers and vendors as well as Washington and ICPE.
 - a. The transmission line steel structures and anchor bolts have been placed on order by Washington City. All transmission interconnects and transmission poles construction will be performed by Washington City. The contractor is responsible for transmission Line foundation installations and **all associated material** and equipment not provided by Washington.
 - b. A detailed schedule and work plan will be required to be submitted by the Contractor.

- c. Work on the project can start immediately after award.
 - 2. The Contractor will be required to arrange his work schedule to meet the critical project dates and requirements indicated.
 - 3. The above is a very simplified overview of the work required by the project. It is not intended to outline all of the requirements to complete the project. Work must be scheduled and coordinated with several parties throughout the course of the project. Careful planning and coordination with all parties involved will be required to complete the project properly and on time.
 - D. Project Schedule
 - 1. The successful Contractor will be responsible to develop a detailed project schedule that will meet the various requirements of the project.
 - 2. Completion of the project is to be on or before November 21, 2025
- 1.4 WORK BY OTHERS/OWNER AND OTHER ACTIVITIES
- A. Materials Under Other Contracts:
 - 1. Electrical equipment and materials that Washington City will provide, by other contracts, are briefly described below.
 - a. Transmission Line Steel Structures/Anchor Bolts
 - B. Work by OWNER:
 - 1. WASHINGTON will be performing the above grade work, transmission line interconnections, cable installation, and wiring for this project.
 - C. Work By Others:
 - 1. No work by others will be provided.
 - D. Other Activities:
 - 1. The Contractor is to coordinate additional laydown yard space for the project if required.
 - 2. Federal, state, and local regulations that affect this Contract are stated in the GENERAL CONDITIONS (Volume II) of the Contract Documents.
- 1.5 CONTRACTOR'S USE OF PREMISES:
- A. Limited Use:
 - 1. Limit use of the premises for storage and execution of the Work to allow for Work by other CONTRACTOR(s). Confine operations to areas within Contract limits indicated. Portions of the Site beyond areas in which construction operations are indicated are not to be disturbed.
 - 2. All work activity and material storage must be maintained within the project area.
 - 3. Coordinate with other separate CONTRACTORS, other parties, and OWNER to avoid interference of operations.
 - 4. Conduct operations as to ensure the least inconvenience to OWNER as indicated in the GENERAL CONDITIONS.
- 1.6 WORK SEQUENCE:

- A. General: Construction sequence shall be determined by CONTRACTOR subject to meeting critical milestone dates to allow coordination with others.
- B. Construct Work to provide the least possible interference to the activities of OWNER and others.
- C. Scheduled Events: Schedule the Work to conform to the events and dates as indicated within this Contract's activities.
- D. Substantially Completed Areas: OWNER intends to place in service, in accordance with the provisions for use of completed Work set forth in the GENERAL CONDITIONS, the following areas or facilities as soon as they are Substantially Complete and ready for their intended use.
 - 1. Project Completion December 19, 2025

1.7 OWNER FURNISHED MATERIALS:

- A. Materials furnished and paid for by OWNER are described in Section 01610 of Volume III, Division 1. All other materials not listed shall be the responsibility of the Contractor.
- B. OWNER's Responsibilities:
 - 1. Arrange for delivery of Compliance Drawings, manufacturer's instructions, and certificates to CONTRACTOR.
 - 2. Arrange and pay for Equipment delivery.
 - 3. Deliver Supplier's bill of materials to CONTRACTOR.
 - 4. Inspect deliveries jointly with CONTRACTOR.
 - 5. Submit claims for transportation damage.
 - 6. Arrange for replacement of damaged, defective, or missing items.
 - 7. Arrange for manufacturer's warranties, Bonds, Field Service, and inspections, as required.
- C. CONTRACTOR's Responsibilities:
 - 1. Be responsible for the cost of repair or replacement of the materials by Bonding and Insurance required in Volume II.
 - 2. Designate delivery date for Materials in the construction schedule.
 - 3. Review one set of Compliance submittals as furnished by the Engineer after review by the Engineer. Submit to Engineer with notification of any discrepancies or problems anticipated in the use of the Materials.
 - 4. Receive, handle, and unload Materials at the delivery point, including uncrating and storage.
 - 5. Promptly acknowledge receipt, inspect products jointly with Engineer; record shortages and damaged or defective items on Material Receiving Form as provided by the Engineer.
 - 6. Protect products from damage and exposure to elements.
 - 7. Transport materials already received by the OWNER from their current storage locations to the project site. All costs to be included in the bid.
 - 8. Assemble, install, connect, adjust, and furnish Materials as stipulated in the respective Sections of the Specifications, Volume III.
 - 9. Provide inspections.

1.8 COPIES OF DOCUMENTS:

- A. Furnished Copies: After execution of Agreement, CONTRACTOR will be provided at no cost, a maximum of two (2) sets of full-size Contract Drawings for the project including revised drawings (and schedules), and a maximum of two (2) sets of the Bid Documents in addition to those used in execution of the Agreement.

- B. Additional Copies: Additional copies of above documents will be supplied by Engineer upon request at \$500.00 per one set of Drawings and one set of Bid Documents.

1.9 DRAWING LIST INCLUDES:

- A. Contract drawings.
- B. Reference drawings.
- C. OWNER-furnished equipment and materials, Bills of Material.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 01110

DIVISION 1 – GENERAL REQUIREMENTS

PART 1 - SECTION 01140 - PERMITS AND ENVIRONMENTAL COMPLIANCE

1.1 SUMMARY:

- A. The Section includes the permits required to perform the Work under the Contract Documents.
- B. Related Work specified elsewhere:
 - 1. GENERAL CONDITIONS.

1.2 GENERAL:

- C. Completeness of the list of permits provided is not guaranteed by the Owner. Contractor shall be responsible for determining and verifying the extent of permits required.
- D. The Owner has obtained the permits specified below for Work on the Project.
- E. The Contractor shall obtain all permits, other than those obtained by the Owner, required for the execution of work in accordance with the Contract Documents. Copies of these permits will be provided to the Owner.
- F. The Contractor shall include in the Bid the cost of obtaining all necessary permits, including application fees and other costs, and the costs of complying with the conditions of all permits.

1.3 PERMITS TO BE OBTAINED BY CONTRACTOR:

- 1. As required

1.4 PERMITS TO BE OBTAINED BY OWNER:

- G. None

1.5 COMPLIANCE WITH PROJECT PERMITS:

- H. Contractor shall comply with all permits obtained by Owner.

PART 2 - PART 2 - PRODUCTS - Not Applicable

PART 3 - PART 3 - EXECUTION - Not Applicable

END OF SECTION 01140

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01320 – PROJECT MEETINGS, SCHEDULES, AND REPORTS

PART 1 - GENERAL

1.1 SUMMARY

A. Project Meetings:

1. Preconstruction conference.
2. Coordination schedules.
3. Progress meetings.
4. Coordination meetings.

B. Schedules and Reports:

1. Initial coordination submittals.
2. Construction progress schedule.
3. Procurement schedule.
4. Construction progress reports.

C. Related Work Specified Elsewhere:

1. For CPM Schedules: SECTION 01321.
2. For Submittal Requirements: SECTION 01330.

1.2 PROJECT MEETINGS

A. Preconstruction Conference:

1. The Engineer will administer a meeting within 7 days after the Effective Date of the Agreement, to review items stated in the following agenda and to establish a working understanding between the parties as to their relationships during conduct of the Work.
2. Preconstruction conference shall be attended by:
 - a. Contractor and his superintendent.
 - b. Engineer and Resident Project Representative.
 - c. Representative(s) of Owner.
 - d. At Owner's option, representatives of principal Subcontractors and Suppliers.
 - e. Other parties.
3. Agenda:
 - a. Construction schedules.
 - (1) Completion times.
 - (2) Liquidated damages.
 - b. Critical Work sequencing.
 - c. Designation of responsible personnel (including Designated Competent Person(s) and Contractor's Safety Representative).
 - d. Subcontracts.

- e. Project coordination.
 - f. Material and Equipment.
 - (1) Owner furnished.
 - (2) Contractor furnished.
 - (3) Storage Areas.
 - g. Placement of signs and posters.
 - h. Procedures and Processing of:
 - (1) Field decisions.
 - (2) Substitutions.
 - (3) Submittals.
 - (4) Change Orders.
 - (5) Applications for payment.
 - i. Procedures for testing.
 - j. Procedures for maintaining record documents.
 - k. Use of Premises:
 - (1) Work and storage areas.
 - (2) Owner's requirements.
 - l. Construction facilities, controls, and construction aids.
 - m. Temporary utilities.
 - n. Safety and first-aid.
 - o. Security.
 - p. Permits required for construction.
 - q. Education programs.
4. Location of Meeting: will be determined after project award and will be followed with a visit to the line site.
5. Reporting:
- a. Within 3 working days of the meeting, Engineer will prepare and distribute minutes of the meeting to Owner and Contractor.
 - b. Contractor shall provide copies to Subcontractors and major Suppliers.

B. Progress Meetings:

- 1. Engineer will schedule and administer a meeting a minimum of once each week and at other times as requested by the Engineer, Owner, or Contractor's Representatives of the Owner, Engineer, and Contractor shall be present at each meeting. With Engineer's concurrence, Contractor may request attendance by representatives of Subcontractors, Suppliers, or other entities concerned with current program or involved with planning, coordination, or performance of future activities. All participants in the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.
- 2. Contractor and each Subcontractor represented shall be prepared to discuss the current construction progress report and any anticipated future changes to the schedule. Each Subcontractor shall comment on the schedules of Contractor and other Subcontractors and advise if their current progress or anticipated activities are compatible with that Subcontractor's Work.
- 3. If one Subcontractor is delaying another, Contractor shall issue such directions as are necessary to resolve the situation and promote construction progress.

4. Agenda:

- a. Safety issues.
 - b. Review of construction progress since previous meeting.
 - c. Field observations, interface requirements, conflicts.
 - d. Defective workmanship.
 - e. Requests from Owner.
 - f. Problems which impede construction schedule.
 - g. Off-site fabrication.
 - h. Delivery schedules.
 - i. Submittal schedules and status.
 - j. Site utilization.
 - k. Temporary facilities and services.
 - l. Hours of Work.
 - m. Hazards and risks.
 - n. Housekeeping.
 - o. Quality and Work standards.
 - p. Change orders.
 - q. Documentation of information for payment request.
 - r. Corrective measures and procedures to regain construction schedule if necessary.
 - s. Revisions to construction schedule.
 - t. Review of proposed activities for succeeding Work period.
 - u. Review proposed Contract modifications for:
 - (1) Effect on construction schedule and on completion date.
 - (2) Effect on other contracts of the Project.
 - v. Other business.
5. Location of Meetings: At or near the project site or other location as mutually agreed to.
6. Reporting:
- a. Within 5 working days of each meeting, Engineer will prepare and distribute minutes of the meeting to Owner and Contractor.
 - b. Contractor shall distribute copies to principal Subcontractors and Suppliers.

C. Multiple Contract Coordination Meetings:

1. The Engineer may administer coordination meetings to be attended by Owner or his representative and prime contractors at the Site. Contractor shall participate in such conferences, accompanied by Subcontractors as requested by Construction Manager.
2. Agenda will be similar to that stated above for Progress Meetings.
3. Location of Meetings: At or near the project site or other location as mutually agreed to.

1.3 SCHEDULES AND REPORTS:

A. Initial Coordination Schedules:

1. Within 7 days after the Effective Date of Agreement, Contractor shall submit to Engineer for review and acceptance:
 - a. A preliminary construction progress schedule. The schedule shall show the Work in a horizontal bar chart or other graphic format, and indicate the times (number of days or dates) for starting and completing the various stages of the Work including any milestones specified in the Contract Documents.

- b. A preliminary procurement schedule of Equipment and Materials.
 - c. A preliminary schedule of Submittals, as stated in SECTION 01330.
2. Within 14 days of Notice of Award, submit preliminary network diagram in accordance with SECTION 01321, and include:
 - a. Preliminary cash requirement prediction.
 - b. Preliminary schedule of Submittals as described in SECTION 01330.
 - c. Preliminary procurement schedule of Equipment and Materials

B. Construction Progress Schedule:

1. After submittal of preliminary construction progress schedule as stated above, submit a detailed construction progress schedule within 7 days after the Effective Date of Agreement. Base the schedule on the preliminary construction progress schedule and incorporate review comments and other feedback. Submit 2 copies to Engineer for review and acceptance.
2. The schedule shall show the Work in a horizontal bar chart or other graphic format suitable for displaying scheduled and actual progress.
 - a. The schedule shall indicate phase of the Work; starting date, major milestones, and dates of Substantial Completion and final completion.
 - b. Breakdown Work phases into separate time bar for each significant construction activity entry, with dates Work is expected to begin and be completed. Within each time bar, indicate estimated completion percentage in 10% increments.
 - c. Scale and spacing shall allow room for notations and revisions.
 - d. Sheet Size: 11" x 17".
3. Provide sub-schedules to define in more detail critical portions of schedules, if requested.
4. Engineer will review and comment on construction progress schedule and, upon agreement between Engineer and Contractor on necessary changes:
 - a. Contractor shall print and distribute copies of the accepted schedule to Engineer. Contractor shall print additional copies for Subcontractors and other parties required to comply with scheduled dates, one copy to each party.
5. Revise the construction progress schedule after each meeting, event, or activity where revisions have been recognized and accepted in accordance with the GENERAL CONDITIONS.
6. Update and submit copies to Engineer of the revised schedule at least once each month to show actual progress compared to the originally accepted schedule and any proposed changes in the schedule of remaining Work. Include with construction progress report.
7. Critical Path Method (CPM) schedule development and updating shall be as specified in SECTION 01321.

C. Construction Progress Schedule with Multiple Prime Contracts:

1. Contractor shall secure time commitments for performing critical construction activities from other prime contractors. Contractor shall prepare a construction schedule taking into account the required interfacing with work on other contracts. The schedule shall be a comprehensive, fully developed schedule. The schedule shall be based on the preliminary construction schedule.

D. Procurement Schedule:

1. After submittal of preliminary procurement schedule with the preliminary network diagram as stated above under "Initial Coordination Schedules," submit a detailed schedule for procurement of

- Equipment and Materials to be furnished by Contractor, Subcontractors, manufacturers, and Suppliers. Procurement schedule shall be an integral part of the CPM Schedule as specified in SECTION 01321.
2. Construction Manager will review and comment on the schedule for procurement, and upon agreement with Contractor concerning any necessary revisions, the schedule will be accepted.
 3. Procurement schedule shall coincide with the construction progress schedule and the Submittal schedule, and shall indicate the date each item will be needed at the Site and the time required for delivery after order is placed.
 4. Update the accepted schedule for procurement at least once each month to show the status of orders placed, Submittals, and delivery. Submit with the construction progress report.
 5. If requested by Engineer, submit copies of any purchase order placed by Contractor or Subcontractors.

E. Construction Progress Reports:

1. Submit a report on actual construction progress on a monthly basis. More frequent reports may be required should the Work fall behind the accepted schedule.
2. Construction progress reports shall consist of the revised construction progress schedule and a narrative report which shall include but not be limited to the following:
 - a. Comparison of actual progress to planned progress shown on originally accepted schedule.
 - b. Summary of activities completed since the previous construction progress report.
 - c. Identification of problem areas.
 - d. A description of current and anticipated delaying factors, if any.
 - e. Impact of possible delaying factors.
 - f. Proposed corrective actions.
3. Submit a construction progress report to Engineer with each application for partial payment. Work reported complete but not readily apparent to Engineer must be substantiated with supporting data when requested by Engineer.
4. If a schedule update reveals that, through no fault of Owner, the Work is likely to be completed later than the Contract completion date, Contractor shall establish a plan for making up lost time and submit to Owner and Engineer for review before implementing the plan. All actions necessary to get the Work back on schedule shall be at Contractor's expense.

F. Daily Force Report:

1. Submit to the Engineer a daily force report.
2. The report shall be delivered not later than 9:00 a.m. of the work day following the report date and include, but not be limited to, the following:
 - a. The day of week and date.
 - b. Contractor name.
 - c. Report number.
 - d. Summary of work in process (segregated by Contractor and Subcontractor).
 - e. Details of work accomplished including quantities of work installed.
 - f. Summary of equipment working and where working.
 - g. Summary of manpower by work element and Subcontractor.
 - h. Receipt of major equipment or materials.

G. Schedule of Values:

1. Use values as established in Bid. Price will be used as the Schedule of Values.

H. Special Reports:

1. When an event of an unusual and significant nature occurs at the site, prepare and submit a special report. List the chain of events, persons participating, response by Contractor's personnel, an evaluation of the results or effects, and similar pertinent information. Advise the Owner in advance when such events are known or predictable.
2. Submit original report to Owner and copy to Engineer.

PART 2 - PRODUCTS - Not applicable.

PART 3 - EXECUTION - Not applicable.

END OF SECTION 01320

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01321 – CPM SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes administrative and procedural requirements for the critical path method (CPM) of scheduling and reporting progress of the Work.

1. Refer to the General Conditions and the Agreement for definitions and specific dates of Contract Times.

1.2 DEFINITIONS

A. Critical Path Method (CPM): A method of planning and scheduling a construction project where activities are arranged based on activity relationships and duration of each activity; and network mathematical calculations determine when activities can be performed and the critical path of the Project.

B. Critical Path: The longest continuous chain of activities through the network schedule that established the minimum overall Contract duration from Notice to Proceed to Date of Substantial Completion.

C. Network Diagram: A graphic diagram of a network schedule, show the activities and activity relationships.

D. Activity: A separate and distinct part of a Contract that can be identified for planning, scheduling, monitoring, and controlling the construction Work. Activities included in a construction schedule consume time and resources. Duration of an activity shall not exceed the greater of 30 calendar days or 10% of the overall Contract duration.

1. Critical activities are activities on the critical path, and have zero or negative float.
2. Predecessor activity is an activity that may be started or completed before a following activity can be started or completed.
3. Successor activity is an activity which may start after commencement or completion of a previous activity.

E. Event: An event is the starting or ending point of an activity. An event has no duration.

F. Milestone: A key or critical point in time for reference or measurement. A milestone has no duration.

G. Float is the measure of leeway in activity performance.

1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of any of its successor activities.
2. Total float or “slack time” is the measure of leeway in starting or completing an activity without adversely affecting an intermediate deadline or the planned Contract completion date.
3. Negative float is the amount of time beyond the late completion date that an activity is actually completed.
4. Relative float is the current status of an activity in relation to the approved CPM schedule completion date.
5. Available float is the amount of time between early completion of a CPM activity and its scheduled completion date.

1.3 QUALITY ASSURANCE

A. Project Scheduler:

1. Provide the services of a Project Scheduler to provide planning, evaluating, and reporting by CPM scheduling techniques.
2. Scheduler shall have computer facilities that are capable of delivering detailed network and diagrams and reports upon request.

B. Program: Use a computer software program for network analysis that has been developed specifically to manage CPM construction schedules and is acceptable to Engineer.

1. Microsoft Projects

1.4 DELAYS AND TIME EXTENSIONS:

A. Float Time:

1. Positive float time shall be jointly owned by Owner and Contractor.
2. Positive float time expires as the work progresses.
3. Contractor shall not use artificial activity durations, preferential logic, or other devices for the purpose of sequestering float.

B. Time Extension: Time extensions will be administrated in accordance with the General Conditions. Time extensions will be considered only to the extent that time adjustments for the activity or activities exceed the float along the network paths involved.

1.5 PRELIMINARY NETWORK DIAGRAM:

A. Preliminary Meeting:

1. If requested by Owner and Engineer participate in a meeting with Project Scheduler to discuss the proposed schedule and the requirements of this Section prior to submittal of the preliminary network diagram and other preliminary schedules.

B. Preliminary Network Diagram: Submit a preliminary network diagram within 14 days of Notice of Award. The preliminary network diagram shall detail activities for the duration of construction after issuance of the Notice to Proceed.

1. Include each significant construction activity. Define the relationship between each activity in the network with other activities. Schedule each construction activity in proper sequence.
2. Indicate milestone dates and completion of the work on the date established for substantial completion, unless Owner agrees otherwise.

C. Schedule of Submittals: With submittal of the preliminary network diagram, include a schedule of Submittals required during the first 30 days of construction following issuance of Notice to Proceed. List those required to maintain orderly progress of the work and those required early because of long lead-time for manufacturer or fabrication.

D. Distribution: Contractor shall print and distribute copies of the preliminary network diagram and other specified preliminary schedules to Engineer. Contractor shall print additional copies for other parties involved in construction activities that are scheduled early.

1.6 CPM SCHEDULE:

- A. Prepare the construction progress schedule using the network analysis diagram system known as the critical path method (CPM).
 - 1. Follow the steps necessary to complete development of the network diagram in sufficient time to submit CPM Schedule so it can be accepted for use no later than 21 days after issuance of the Notice to Proceed.
 - 2. Establish procedures for monitoring and updating the CPM Schedule and for reporting progress.
 - 3. At the time the construction progress schedule is approved by the Owner, it becomes the “baseline” schedule which can be extended only by a Contract modification. The “current” progress schedule will be compared to the “baseline” schedule.

- B. CPM Schedule Preparation: Prepare a list of all activities involved in the Project. Include a list of activities required to complete the Work. Provide the best data available for generation of the network diagram and the CPM schedule.
 - 1. Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Assign each activity a number.
 - 2. Indicate estimated times for the following activities to be performed.
 - a. Preparation and processing of Submittals.
 - b. Purchase of Equipment and Materials.
 - c. Delivery.
 - d. Fabrication.
 - e. Installation.
 - f. Interfaces with Owner’s existing operations or other contractors.
 - g. Startup and testing operations.
 - 3. Treat each system or separate area as a separate numbered activity for principal elements of the Work.

- C. Processing: Enter prepared data on the processing system. Process data to produce output data or a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reprocess as often as necessary to fit the CPM schedule within the duration of the Contract from Notice to Proceed to the Date of Substantial Completion.

- D. Format: Display the full network on a single sheet of mylar or other reproducible media, of sufficient width to show data clearly for the entire Contract duration from Notice to Proceed to the Date of Substantial Completion.
 - 1. Mark the critical path. Locate the critical path near the center of the network; locate paths with the most float near the edges.
 - 2. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

- E. Initial Issue: Prepare the initial issue of the CPM schedule network diagram from a listing of straight “total float - early start” sort. Identify critical activities. Prepare tabulated reports in hardcopy and electronic (disc) formats to show the following:
 - 1. Contractor or Subcontractor and Work activity according to responsibility for each.
 - a. Assign responsibility codes to all parties responsible for accomplishment of an activity.

2. Number and description of the activity.
 - a. Assign numbering such that predecessor activity numbers are smaller numerically than successor activity numbers.
 3. Principal events of that activity.
 4. Immediate predecessor and successor activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in working days.
 8. Total float.
 9. Dollar value of activity (coordinated with the value summaries).
 - F. Value summaries: Prepare 2 cumulative value listings, sorted by finish dates.
 1. In subsequent updates of both listings, substitute actual finish dates for activities completed as of listing date.
 - G. Provide complete sets of network diagram(s), schedules, and tabulations to Engineer for CPM schedule initial issue and updates. Provide additional copies for principal Subcontractors and suppliers affected by the CPM schedule.
- 1.7 CPM SCHEDULE UPDATING:

- A. Update on monthly basis (or as required by the Engineer) to include, but not be limited to:
 1. Actual start and completion dates in direct comparison to scheduled dates.
 2. Percentage completion of unfinished activities.
 3. Incorporation of approved changes and time extensions.
 4. Narrative update identifying problems, proposed solutions, and known delays.
 5. Changes in the network diagram.
- B. Submit a line item summary listing of changes.
- C. Responsibility for Project Completion:
 1. If a schedule update reveals that through no fault of Owner, the work is behind schedule and is likely to be completed later than the current adjusted date of substantial completion Contractor shall:
 - a. Establish a plan for making up lost time and submit to Owner and Engineer for review within 5 working days of the schedule update.
 - b. Take into account comments by Owner or Engineer on the plan prior to implementation.
 - c. Implement the plan of action.
 2. All actions necessary to complete the Work within the Contract Times shall be at Contractor's expense.

1.8 REVIEW AND EVALUATION

- A. Contractor and major Subcontractors shall participate in a review and evaluation of proposed initial issue and updated network diagrams and calculations with Engineer and Owner.
 1. Revisions necessary as a result of joint reviews shall be resubmitted for approval by Engineer working days after the meeting.
 2. Allow 5 working days for Engineer review of revisions.

3. The approved schedule shall be the schedule used by Contractor for directing the work, reporting progress, and requesting payment.
 4. After CPM schedule approval, Contractor shall within 3 working days furnish copies of network and tabulations to Engineer, Owner, separate contractors, Subcontractors and Suppliers or fabricators, and others identified by Contractor with need-to-know schedule responsibility.
- B. The approved CPM schedule shall be have signed concurrence of all major Subcontractors and Suppliers. Major subcontracts are defined as having values equal to or exceeding 5% of the Contract value.
- C. Owner's review and approval of any schedule submittal or update shall not constitute a waiver of any requirement of the Contract Documents.

PART 2 - Not Applicable

PART 3 - Not Applicable

END OF SECTION 01321

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01330 – SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes definitions, descriptions, transmittal, and review of Submittals.
- B. Related Work Specified Elsewhere:
 - 1. Project Meetings, Schedules and Reports: SECTION 01320.
 - 2. CPM Schedules: SECTION 01321.
 - 3. Contract Closeout: SECTION 01780.

1.2 GENERAL INFORMATION:

- A. Definitions:
 - 1. Shop Drawings, product data, and Samples are Submittals prepared by Contractor, Subcontractor, manufacturer, or Supplier and submitted by Contractor to Engineer as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties.
 - a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
 - b. Product data includes standard printed information on materials, products and systems; not custom-prepared for this Project, other than the designation of selections from available choices.
 - c. Samples include both fabricated and unfabricated physical examples of materials, products, and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
 - 2. Informational Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings, product data, or Samples.
 - a. Technical reports include laboratory reports, tests, technical procedures, technical records, and Contractor's design analysis.
 - b. Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, Bonds, Project photographs, physical work records, statements of applicability, copies of industry standards, Project record data, security/protection/safety data, and similar type Submittals.
 - c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.
 - 3. Refer to ARTICLES 1.3 and 1.4 of this Section for detailed lists of documents and specific requirements.

B. Quality Requirements:

1. Submittals such as Shop Drawings and product data shall be of the quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings such as reproducibles shall be useable for further reproduction to yield legible hard copy.
2. Documents submitted to Engineer that do not conform to these requirements shall be subject to rejection by Engineer, and upon request by Engineer, Contractor shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Contractor's (or his Subcontractor's) failure to initially satisfy the legibility quality requirements will not relieve Contractor (or his Subcontractors) from meeting the required schedule for Submittal of Shop Drawings and product data.

C. Language and Dimensions:

1. All words and dimensional units shall be in the English language.
2. Metric dimensional unit equivalents may be stated in addition to the English units.

D. Submittal Completeness:

1. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable Engineer to review the information effectively.
2. Where standard drawings are furnished which cover a number of variations of the general class of Equipment, each such drawing shall be individually annotated to describe exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" is not an acceptable means of annotating Submittals. Such annotation shall also include proper identification of the Submittal permanently attached to the drawing.
3. Reproductions or copies of Contract Drawings or portions thereof will not be accepted as complete fabrication or erection drawings. Contractor may use a reproduction of Engineer prepared Contract Drawings for erection drawings such as to indicate information on erection or to identify detail drawing references. Where the drawings are revised to show this additional Contractor information, Engineer's title block is to be replaced with a Contractor's title block, and Engineer's professional seal will be removed from the drawing. The Contractor shall revise these erection drawings for subsequent Engineer revisions to the Contract Drawings.

1.3 COMPLIANCE SUBMITTALS:

A. Items shall include, but not be limited to, the following:

1. Manufacturer's specifications.
2. Catalogs, or parts thereof, of manufactured Equipment.
3. Shop fabrication and erection drawings.
4. General outline drawings of Equipment showing overall dimensions, location of major components, weights, and location of required building openings and floor plates.
5. Detailed Equipment installation drawings, showing foundation details, anchor bolt sizes and locations, baseplate sizes, location of Owner's connections; and all clearances required for erection, operation, and disassembly for maintenance.
6. Schematic diagrams for electrical items, showing external connections, terminal block numbers, internal wiring diagrams and one-line diagrams.
7. Bills of material and spare parts list.
8. Instruction books and operating manuals.
9. Material lists or schedules.
10. Performance tests on Equipment by manufacturers.
11. Concrete mix design information.
12. Samples and color charts.

13. All drawings, catalogs or parts thereof, manufacturer's specifications and data, samples, instructions, and other information specified or necessary:
 - a. For Engineer to determine that the Equipment and Materials conform with the design concept and comply with the intent of the Contract Documents.
 - b. For the proper erection, installation, operation and maintenance of the Equipment and Materials which Engineer will review for general content but not for substance.
 - c. For Engineer to determine what supports, anchorages, structural details, connections, and services are required for the Equipment and Materials, and the effects on contiguous or related structures and Equipment and Materials.

B. Schedule of Submittals:

1. Prepare for Engineer's concurrence, a schedule for submission of all Submittals specified or necessary for Engineer's approval of the use of Equipment and Materials proposed for incorporation in the Work or needed for proper installation, operation, or maintenance. Submit the schedule with the procurement schedule and construction progress schedule. Schedule submission of all Submittals to permit review, fabrication, and delivery in time so as to not cause a delay in the Work of Contractor or his Subcontractors or any other contractors as described herein.
2. In establishing schedule for Submittals, allow 10 days in Engineer's office for reviewing original Submittals and 5 days in Engineer's office for reviewing resubmittals.
3. The schedule shall indicate the anticipated dates of original submission for each item and Engineer's approval thereof, and shall be based upon at least one resubmission of each item.
4. Schedule all Submittals required prior to fabrication or manufacture for submission within 15 days of the Notice to Proceed. Schedule Submittals pertaining to storage, installation and operation at the Site for Engineer's approval prior to delivery of the Equipment and Materials.
5. Resubmit Submittals the number of times required for Engineer's "Submittal Approved." However, any need for resubmittals in excess of the number set forth in the accepted schedule, or any other delay in obtaining approval of Submittals, will not be grounds for extension of the Contract Times, provided Engineer completes his reviews within the times stated above.

C. Transmittal of Submittals:

1. All Submittals of Equipment and Materials furnished by Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor.
2. After checking and verifying all field measurements, transmit all Submittals to Engineer for approval as follows:
 - a. Affix a Submittal Information Block to all Submittals whether prepared by Contractor, Subcontractor, or Supplier. Affix transparent decal blocks on all Shop Drawings, and gummed paper-type blocks on all product data type Submittals. All Submittal Information Blocks needed for Project will be furnished to Contractor at no charge at the initial coordination conference. A copy of the Submittal Information Block is included as an appendix to this Section.
 - b. Identify each Submittal by Project name and number, Contract title and number, and the Specification Section and Article number marked thereon or in the letter of transmittal. Unidentifiable Submittals will be returned for proper identification.
 - c. Check and stamp Submittals of Subcontractors, Suppliers, and manufacturers with Contractor's approval prior to transmitting them to Engineer. Contractor's stamp of approval shall constitute a representation to Owner and Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or Contractor assumes full responsibility for doing so, and that Contractor has coordinated each Submittal with the requirements of the Work and the Contract Documents.
 - d. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from the requirements of the Contract Documents.
 - e. Make all modifications noted or indicated by Engineer and return revised prints, copies, or Samples until approved. Direct specific attention in writing, or on revised Submittals, to changes

other than the modifications called for by Engineer on previous Submittals. After Submittals have been approved, submit copies thereof for final distribution. Prints of approved drawings transmitted for final distribution will not be further reviewed and are not to be revised. If errors are discovered during manufacture or fabrication, correct the Submittal and resubmit for review.

- f. Following completion of the Work and prior to final payment, furnish record documents and approved Samples and Shop Drawings necessary to indicate "as constructed" conditions, including field modifications, in the number of copies specified. Furnish additional copies for insertion in Equipment instruction books and operating manuals as required. All such copies shall be clearly marked "PROJECT RECORD."
 - g. Work requiring a Submittal shall not be commenced or shipped until the Submittal has been stamped "Submittal Approved" or "Submittal Approved as Noted" by Engineer.
 - h. Keep a copy or sample of each Submittal in good order at the site.
3. Quantity Requirements:
- a. Except as otherwise specified, transmit all manufacturer's or fabricator's Shop Drawings in the quantity as follows:
 - (1) Initial Submittal: 3 copies to Engineer. One copy will be returned to Contractor.
 - (2) Resubmittals: One reproducible and 3 copies to Engineer. One copy will be returned to Contractor.
 - (3) Submittal for Final Distribution: 3 copies plus the number of copies required by Contractor to Engineer.
 - (4) As-Constructed Prints: 3 copies to Engineer.
 - b. Transmit Submittals of product data as follows:
 - (1) Initial Submittal: 3 copies to Engineer. One copy will be returned to Contractor.
 - (2) Resubmittals: 3 copies to Engineer. One copy will be returned to Contractor.
 - (3) Submittal for Final Distribution: 3 copies plus the number of copies required by Contractor, to Engineer.
 - c. Transmit Submittals of material Samples, color charts, and similar items as follows:
 - (1) Initial Submittal: 3 to Engineer.
 - (2) Resubmittal: 3 to Engineer.
 - (3) Upon approval, one sample will be returned to Contractor.
 - d. Transmit Submittals of Equipment instruction books and operating manuals as follows:
 - (1) Initial Submittal: 2 copies to Engineer. One copy will be returned to Contractor.
 - (2) Resubmittals: 2 copies to Engineer. One copy will be returned to Contractor.
 - (3) Submittal for Final Distribution: 3 copies to addresses as instructed later.
 - e. Transmit Submittals for Reference Only - 3 copies to Engineer.
 - f. Owner may copy and use for internal operations and staff training purposes any and all document Submittals required by this Contract and approved for final distribution, whether or not such documents are copyrighted, at no additional cost to Owner.

D. Engineer's Review:

1. Engineer will review and return Submittals to Contractor with appropriate notations. Instruction books and similar Submittals will be reviewed by Engineer for general content but not for detailed substance.

2. Engineer's approval of Submittals will not relieve Contractor from his responsibility as stated in the General Conditions.

E. Submittal Action Stamp:

1. Engineer's review action stamp, appropriately completed, will appear on all Submittals of Contractor when returned by Engineer. Review status designations listed on Engineer's action stamp are defined as follows:

A - SUBMITTAL APPROVED: Signifies Equipment or Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is approved for incorporation in the Work. Contractor is to proceed with fabrication or procurement of the items and with related Work. Copies of the Submittal are to be transmitted to Engineer for final distribution.

B - SUBMITTAL APPROVED AS NOTED (RESUBMIT): Signifies Equipment and Material represented by the Submittal conforms with the design concept and complies with the intent of the Contract Documents and is approved for incorporation in the Work in accordance with Engineer's notations. Contractor is to proceed with fabrication or procurement of the items and with related Work in accordance with Engineer's notations and is to submit a revised Submittal responsive to notations marked on the returned Submittal or written in the letter of transmittal.

C - SUBMITTAL RETURNED FOR REVISION (RESUBMIT): Signifies Equipment and Material represented by the Submittal appears to conform with the design concept and comply with the intent of the Contract Documents but information is either insufficient in detail or contains discrepancies which prevent Engineer from completing his review. Contractor is to resubmit revised information responsive to Engineer's annotations on the returned Submittal or written in the letter of transmittal. Fabrication or procurement of items represented by the Submittal and related Work is not to proceed until the Submittal is approved.

D - SUBMITTAL NOT APPROVED (SUBMIT ANEW): Signifies Equipment and Material represented by the Submittal does not conform with the design concept or comply with the intent of the Contract Documents and is disapproved for use in the Work. Contractor is to provide Submittals responsive to the Contract Documents.

E - PRELIMINARY SUBMITTAL: Signifies Submittals of such preliminary nature that a determination of conformance with the design concept or compliance with the intent of the Contract Documents must be deferred until additional information is furnished. Contractor is to submit such additional information to permit layout and related activities to proceed.

F - FOR REFERENCE, NO APPROVAL REQUIRED: Signifies Submittals which are for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, bulletins and similar data, all of which are useful to Engineer or Owner in design, operation, or maintenance, but which by their nature do not constitute a basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract Documents. Engineer reviews such Submittals for general content but not for substance.

G - DISTRIBUTION COPY (PREVIOUSLY APPROVED): Signifies Submittals which have been previously approved and are being distributed to Contractor, Owner, Resident Project Representative, and others for coordination and construction purposes.

1.4 INFORMATIONAL SUBMITTALS:

A. Informational Submittals are comprised of technical reports, administrative Submittals, and guarantees which relate to the Work, but do not require Engineer approval prior to proceeding with the Work. Informational Submittals include:

1. Welder qualification tests.
2. Welding procedure qualification tests.
3. Field test reports.
4. Concrete cylinder test reports.
5. Certification on Materials:
 - a. Cement tests.
6. Soil test reports.
7. Temperature records.
8. Shipping or packing lists.
9. Job progress schedules.
10. Equipment and Material delivery schedules.
11. Progress photographs.
12. Warranties and guarantees.

B. Transmittal of Informational Submittals:

1. All informational Submittals furnished by Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor unless otherwise specified.
 - a. Identify each informational Submittal by Project name and number, Contract title and number, and the Specification Section and Article number marked thereon or in the letter of transmittal. Unidentifiable Submittals will be returned for proper identification.
 - b. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from the requirements of the Contract Documents.
2. Quantity Requirements:
 - a. Technical reports and administrative Submittals except as otherwise specified:
 - (1) Engineer: Two copies.
 - b. Written Certificates and Guarantees:
 - (1) Engineer: 6 copies.
3. Test Reports:
 - a. Responsibilities of Contractor, Owner, and Engineer regarding tests and inspections of Equipment and Materials and completed Work are set forth elsewhere in these Contract Documents.
 - b. The party specified responsible for testing or inspection shall in each case, unless otherwise specified, arrange for the testing laboratory or reporting agency to distribute test reports as follows:
 - (1) Owner: Two copies.
 - (2) Engineer: One copy.
 - (3) Contractor: Two copies.
 - (4) Manufacturer or Supplier: One copy.

C. Engineer's Review:

1. Engineer will review informational Submittals for indications of Work or Material deficiencies.
2. Engineer will respond to Contractor on those informational Submittals which indicate Work or Material deficiency.

PART 2 - PART 2 - PRODUCTS - Not applicable.

PART 3 - PART 3 - EXECUTION - Not applicable.

PART 4 - APPENDIX - Not applicable

END OF SECTION 01330

DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01420 – DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Definitions:

1. Basic contract definitions used in the Contract Documents are defined in the GENERAL CONDITIONS (Volume II).
2. General Requirements are the provisions or requirements of DIVISION 1 Sections and which apply to the entire work of the Contract.
3. Additional definitions are supplied in the Specifications to clarify the scope and intent of the Specifications.

- B. Related Information Specified Elsewhere: Specification standards and associations applicable to the Work are specified in each Section.

1.2 SPECIFICATION FORMAT AND CONTENT EXPLANATIONS:

- A. Specification Format: The Specifications are organized into Divisions and Sections. Some portions may not fully comply and no particular significance will be attached to such compliance or noncompliance.

1. Divisions and Sections: For convenience, a basic unit of Specification text is a "Section," each unit of which is numbered and named. These are organized with related Sections, into "Divisions," which are recognized as the present industry consensus on uniform organization and sequencing of Specifications. The Section title is not intended to limit meaning or content of Section, nor to be fully descriptive of requirements specified therein, nor to be an integral part of text.
2. Section Numbering: Used for identification and to facilitate cross-references in Contract Documents. Sections are placed in numeric sequence; however, numbering sequence is not complete, and listing of Sections in Table of Contents at beginning of Contract Documents must be consulted to determine numbers and names of Specification Sections in these Contract Documents.
3. Page Numbering: Numbered independently for each Volume and Section. The Volume number, followed by the Section number, followed by page number is shown at the bottom of each page, to facilitate location of text.
4. Parts: Each Section of Specifications generally has been subdivided into three basic "parts" for uniformity and convenience (PART 1 - GENERAL, PART 2 - PRODUCTS, and PART 3 - EXECUTION). These "Parts" do not limit the meaning of text within. Some Sections may not contain all three "Parts" when not applicable, or may contain more than three "Parts" to add clarity to organization of Section.
5. Capitalization of Titles: Used strictly to assist reader of Specification in scanning text for key words in content. No emphasis on or relative importance is intended except where underscoring may be used in body of text to emphasize a duty, critical requirement, or similar situation.
6. Project Identification: Project identification is recorded at bottom of each page of Specifications to minimize possible misuse of Specifications, or confusion with other Project Specifications.

B. Specification Content:

1. This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

- a. Imperative Language: These Specifications are written in imperative and abbreviated form. This imperative language of the Specifications is directed at the Contractor, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall," "the Contractor shall," and "shall be," and similar mandatory phrases by inference in the same manner as they are applied to notes on the Drawings. The words "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, fulfill (perform) all indicated requirements whether stated imperatively or otherwise.
 - b. Specifying Methods: The techniques or methods of specifying requirements varies throughout text, and may include "prescriptive," "compliance with standards," "performance," "proprietary," or a combination of these. The method used for specifying one unit of Work has no bearing on requirements for another unit of Work.
 - c. Overlapping and Conflicting Requirements: Where compliance with two or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, notify Engineer for a decision as specified in GENERAL CONDITIONS.
 - d. Abbreviations: Throughout the Contract Documents are abbreviations implying words and meanings which shall be appropriately interpreted. Specific abbreviations have been established, principally for lengthy technical terminology and in conjunction with coordination of Specification requirements with notations on Drawings and in schedules. These are normally defined at first instance of use. Organizational and association names and titles of general standards are also abbreviated.
- C. Assignment of Specialists: In certain instances, Specification text requires that specific Work be assigned to specialists in the operations to be performed. These specialists must be engaged for performance of those units of Work and assignments are requirements over which Contractor has no choice or option. These assignments must not be confused with, and are not intended to interfere with, enforcement of building codes and similar regulations governing the Work, labor agreements, local trade and union jurisdictions and similar conventions. Nevertheless, final responsibility for fulfillment of Contract requirements remains with Contractor.

1.3 DRAWING SYMBOLS:

- A. Except as otherwise indicated, graphic symbols used on Drawings are those symbols recognized in the construction industry for purposes indicated. Refer instances of uncertainty to Engineer for clarification.

1.4 INDUSTRY STANDARDS:

- A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference and are stated in each section.
 - 1. Referenced standards, referenced directly in Contract Documents or by governing regulations, have precedence over non-referenced standards which are recognized in industry for applicability to the Work.
 - 2. Where compliance with an industry standard is required, standard in effect shall be as stated in GENERAL CONDITIONS.
 - 3. Where an applicable code or standard has been revised and reissued after the date of the Contract Documents and before performance of Work affected, the Owner, with recommendation by the Engineer, will decide whether to issue a Change Order to proceed with the updated standard.
 - 4. In every instance the quantity or quality level shown or specified shall be the minimum to be provided or performed. The actual installation may comply exactly, within specified tolerances, with the minimum quantity or quality specified, or it may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for the context of the requirements. Refer instances of uncertainty to the Engineer for a decision before proceeding.

5. Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

a. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

B. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision.

PART 2 - PRODUCTS - Not applicable.

PART 3 - EXECUTION - Not applicable.

END OF SECTION 01420

DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01520 – FIELD OFFICES AND SHEDS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary field offices and other structures required for office and storage space required by Contractor.
- B. Related Work Specified Elsewhere:
 - 1. Equipment and Materials: SECTION 01600.
 - 2. Temporary Utilities and Facilities: SECTION 01560.

PART 2 - PRODUCTS

2.1 FIELD OFFICES:

- A. General:
 - 1. Provide trailers, mobile buildings, or buildings constructed with floors raised aboveground, with steps, landings, and railings at entrance doors.
 - 2. Buildings shall be structurally sound, secure, and weathertight.
 - 3. Provide appropriate type fire extinguishers at each office and storage area.
 - 4. Maintain offices during progress of the Work.
 - 5. Install office spaces ready for occupancy 14 days after Notice to Proceed.
- B. Contractor's Office:
 - 1. Provide field office(s) for Contractor's superintendent(s) on the Site.
 - 2. It shall be of size required for general use, with lights, heat, cooling, furnishings, telephone service, and other necessary facilities and utilities required by Contractor's operations.

2.2 STORAGE SHEDS AND TRAILERS:

- A. On Site:
 - 1. Provide temporary buildings or trailers required for storage of Equipment and Materials installed under this Contract (and those furnished by Owner or others under separate contract).
 - 2. Provide ventilation and heating as required by Equipment and Material stored.
- B. Off Site:
 - 1. Advise Engineer of any arrangements made for storage of Equipment and Materials in a place other than Owner's Site. Furnish evidence of insurance coverage in conformance with the GENERAL CONDITIONS.

PART 3 - EXECUTION

3.1 LOCATION, INSTALLATION AND MAINTENANCE:

A. General:

1. Place temporary buildings, trailers and stored materials in locations acceptable to Owner or Engineer.
2. Install field offices and sheds to resist winds and elements of the locality where installed.
3. Remove when no longer needed at the Site or when Work is completed.
4. Keep approach walks free of dust and debris.
5. At completion of Work, remove temporary buildings and trailers, foundations (if any), utility services, and debris.
6. Prepare ground or paved areas as specified in applicable Sections.

END OF SECTION 01520

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01530 – TEMPORARY BARRIERS AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes General Requirements for:
 - 1. Safety and protection of Work.
 - 2. Safety and protection of existing property.
 - 3. Barriers.
 - 4. Security.
 - 5. Environmental controls.
 - 6. Access roads and parking areas.
 - 7. Traffic control and use of roadways.
- B. Related Work Specified Elsewhere:
 - 1. Temporary Utilities and Facilities: SECTION 01560.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION

3.1 SAFETY AND PROTECTION OF WORK AND PROPERTY:

- A. General:
 - 1. Provide for the safety and protection of the Work as set forth in GENERAL CONDITIONS. Provide protection at all times against wind, dust, or heat so as to maintain all Work and Equipment and Materials free from injury or damage. At the end of each day, all new Work likely to be damaged shall be appropriately protected.
 - 2. Notify Engineer immediately at any time operations are stopped due to conditions which make it impossible to continue operations safely or to obtain proper results.
- B. Property Other than Owners:
 - 1. Provide for the safety and protection of property as set forth in the GENERAL CONDITIONS. Report immediately to the owners thereof and promptly repair damage to existing facilities resulting from construction operations.
 - 2. The applicable requirements specified for protection of the Work shall also apply to the protection of existing property of others.
 - 3. Before acceptance of the Work by Owner, restore all property affected by Contractor's operations to the original or better condition.

3.2 BARRIERS:

A. General:

1. Furnish, install, and maintain suitable barriers as required to prevent public entry, protect the public, and to protect the Work, existing facilities, and wildlife from construction operations. Remove when no longer needed or at completion of Work.
2. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards or regulatory agencies.
3. Barriers shall be of a neat and reasonable uniform appearance, structurally adequate for the required purposes.
4. Maintain barriers in good repair and clean condition for adequate visibility.
5. Relocate barriers as required by progress of Work.
6. Repair damage caused by installation and restore area to original or better condition. Clean the area.

3.3 SECURITY:

A. Contractor shall initiate a security program at mobilization and maintain the security program throughout the construction period until Owner's occupancy.

B. Contractor shall be responsible for:

1. Protecting the interest of the Contractor and the Owner.
2. Keeping unauthorized personnel away from the construction area.

3.4 ENVIRONMENTAL CONTROLS:

A. Dust Control:

1. Contractor shall furnish all labor, equipment, and means required and shall carry out effective measures as required to comply with permits and wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the Engineer.
2. Contractor shall apply non-toxic soil stabilizers according to manufacturers' specifications to all inactive construction areas, or water at least twice daily, as needed to maintain adequate dust control.
3. Contractor shall enclose, cover, water (at least twice daily, or more frequently as needed), or apply non-toxic soil binders according to manufacturers' specifications on all exposed piles (i.e. gravel, sand, dirt) with a silt content of 5 percent or greater.
4. Contractor shall water active construction sites and unpaved roads at least twice daily, or more frequently as needed.
5. If Contractor cannot maintain effective dust control under windy conditions, the Contractor shall temporarily suspend all excavating and grading operations.
6. Contractor shall cover or maintain at least two feet of freeboard (minimum vertical distance between the top of the load and the top of the trailer) on all trucks hauling dirt, sand, soil, or other loose materials outside of the construction site.
7. When there is visible track-out from an unpaved road onto a paved public road, Contractor shall, as directed, install wheel washers where the vehicles exit and enter onto the paved roads, wash the undercarriage of trucks and any equipment leaving the Site on each trip, or sweep the paved street at the end of each shift with a Mobil Athey or similar water spray pick-up broom-type street sweeper. The Engineer will notify Contractor as to which measure to use to remove visible track-out.

8. The Contractor shall maintain a maximum speed limit of 15 miles per hour (mph) while on the Site and access roads. If watering of unpaved roads is not sufficient to control dust, the Contractor shall reduce vehicle speeds to 10 mph or less on unpaved roads.
 9. Contractor shall pave or seal construction roads which have traffic volumes for sustained periods of time of more than 50 daily trips by construction equipment, or 150 total daily trips for all vehicles, at least 100 feet onto the site from the main road.
- B. Air Quality Control: Contractor shall maintain all vehicles and equipment in proper tune, use Best Available Control Technology on construction equipment, including a timing retardation, use natural-gas powered construction equipment where possible, and encourage employee car-pooling.
- C. Noise Control:
1. Contractor shall comply with the hours of work as allowed by the local jurisdiction or land management agency.
 2. Noise limits on construction equipment will comply with the noise limits of the local jurisdiction or land management agency.
- D. Debris Control and Clean-Up:
1. Keep the premises free at all times from accumulations of debris, waste materials, and rubbish caused by construction operations and employees. Responsibilities shall include:
 - a. Adequate trash receptacles about the Site, emptied promptly when filled.
 - b. Periodic cleanup to avoid hazards or interference with operations at the Site and to maintain the Site in a reasonably neat condition.
 - c. The keeping of construction materials such as forms and scaffolding neatly stacked.
 2. Prohibit overloading of trucks to prevent spillages on access and haul routes. Provide periodic inspection of traffic areas to enforce requirements.
 3. Final cleanup is specified in SECTION 01780 - CONTRACT CLOSEOUT.
- E. Chemical Use and Pollution Control:
1. All chemicals used during project construction or furnished for project operation, whether soil sterilant, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.
 2. Herbicides shall not be used unless prior approval is obtained. If Contractor decides that herbicides are needed, the Contractor shall submit a written request specifying the type of herbicide to be used to the Engineer. The Engineer will notify the Contractor if approval has been obtained.
 3. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by the discharge of hazardous or toxic substances from construction operations.
 4. Provide equipment and personnel, perform emergency measures required to contain any spillages, and remove contaminated soils or liquids. Excavate and dispose of any contaminated earth off-Site in approved locations, and replace with suitable compacted fill and topsoil.
 5. Take special measures to prevent harmful substances from entering public waters, sanitary, or storm sewers.
- F. Rodent Control:
1. Provide rodent control as necessary to prevent infestation of construction or storage areas.
 2. Employ methods and use materials which will not adversely affect conditions at the Site or adjoining properties.

3. Should the use of rodenticides be considered necessary, submit an informational copy of the proposed program to Owner with a copy to Engineer. Clearly indicate:
 - a. The area or areas to be treated.
 - b. The rodenticides to be used, with a copy of the manufacturer's printed instructions.
 - c. The pollution preventive measures to be employed.
4. The use of any rodenticide shall be in accordance with the manufacturer's printed instructions and regulatory agencies.

3.5 ACCESS ROADS AND PARKING AREAS:

A. On-Site Roads:

1. Contractor will use existing access roads as indicated.
2. Contractor shall be responsible to construct and maintain any additional access roads required for its construction operations. Locations of additional roads are subject to approval by Engineer and agency having jurisdiction.
3. Contractor shall be responsible to provide safe, unobstructed, and adequate vehicular and pedestrian access along existing roads.

B. Parking Areas:

1. Contractor shall utilize designated parking areas in locations approved by the Owner.
2. Do not allow parking in areas used for construction traffic or equipment and material storage.
3. Do not allow heavy vehicles or construction equipment in parking areas.

C. Maintenance:

1. Contractor shall maintain access roads and parking areas and restore to original, better, or specified condition at completion of Work.
2. All temporary roads and parking areas shall be restored to their original condition, including drainage and placement of topsoil, native surface rock and boulders, at completion of Work.

3.6 USE OF ROADWAYS:

A. Contractor's Operations:

1. Contractor shall investigate the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the Work.
2. Contractor shall coordinate and pay for all agency, utility, or contractor services required for, or associated with, hauling on public or private roads.
3. All operations shall meet the approval of owners or agencies having jurisdiction.
4. Keep traffic areas as free as possible of excavated materials and maintain in a manner to eliminate dust, mud, and hazardous conditions.

B. Maintenance of Roadways:

1. Repair roads, walkways, and other traffic areas damaged by Contractor's activities.
2. All repairs shall meet the approval of owners or agencies having jurisdiction.

3.7 Contractor shall comply with all of the Owner's safety and security requirements at the project site.

END OF SECTION 01530

DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01560 – TEMPORARY UTILITIES AND FACILITIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements of a temporary nature not normally incorporated into final Work. It includes the following:
 - 1. Utility services.
 - 2. Construction and support facilities.
 - 3. Construction aids.
 - 4. Safety and health.
 - 5. Fire protection.

- B. Related Work Specified Elsewhere:
 - 1. Temporary Barriers and Controls: SECTION 01530.
 - 2. Field Offices and Sheds: SECTION 01520.
 - 3. Summary of Work: SECTION 01110.

1.2 REFERENCES:

- A. American National Standards Association (ANSI):
 - 1. A10 Series - Safety Requirements for Construction and Demolition.

- B. National Electrical Contractors Association (NECA):
 - 1. Electrical Design Library - Temporary Electrical Facilities.

- C. National Fire Protection Association (NFPA):
 - 1. 10 - Portable Fire Extinguishers.
 - 2. 70 - National Electrical Code.
 - 3. 241 - Safeguarding Construction, Alterations, and Demolition Operations.

- D. National Electrical Manufacturers Association (NEMA).

- E. Underwriters Laboratories (UL).

1.3 QUALITY ASSURANCE:

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
 - 1. Building Code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, Fire Department, and rescue squad rules.
 - 5. Environmental protection regulations.

B. Standards:

1. Comply with NFPA 10 and 241, and ANSI A10 Series standards "Temporary Electrical Facilities."
2. Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS:

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous, unsanitary conditions, or public nuisances to develop or persist on the Site.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT:

- A. Provide new or undamaged previously used materials and equipment in serviceable condition may be used. Provide materials and equipment suitable for the use intended, of capacity for required usage, and meeting applicable codes and standards.
- B. Water: Provide potable water approved by local health authorities.
- C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- E. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 TEMPORARY ELECTRICITY AND LIGHTING:

A. Service:

1. For each Site, arrange with the Owner and provide service required for power and lighting or furnish on-site generation with periods of operation as specified or required.
2. The electric service shall be of sufficient capacity and characteristics for the various construction tools, machinery, lights, heating and air conditioning, pumps, and other tools required by Contractor and his Subcontractors.

3. Provide weatherproof, grounded, power distribution system sufficient to accommodate construction operations requiring power, use of power tools, electrical heating, and lighting. Provide overload protection. Locate multiple outlets spaced so that entire area of construction can be reached by power tools on a single extension cord of 100-foot maximum length. Supply power for electric welding, if any, from either temporary power distribution system or by engine-driven, power-generator sets at Contractor's option.
4. Provide adequate artificial lighting for all areas of Work when natural light is not adequate for Work.
 - a. Sufficient light shall be provided for general construction areas, with additional sufficient lighting for specific tasks and to meet safety requirements.

3.2 TEMPORARY TELEPHONE SERVICE:

A. General:

1. Telephone service is not available at the site. The contractor shall use mobile telephone equipment.

3.3 TEMPORARY SANITARY FACILITIES:

A. Contractor-Furnished Facilities:

1. Furnish, install, and maintain temporary sanitary facilities for use through construction period. Remove on completion of Work.
2. Provide for all construction workers under this Contract and representatives at the Site.
3. Provide toilet facilities of the chemical-aerated recirculation or combustion type, properly vented, fully enclosed with a glass- fiber-reinforced polyester shell or similar nonabsorbent material, and conforming to Part 1926 of the OSHA Standards for Construction.
4. Establish a regular collection of all sanitary and organic wastes.

B. Use of Existing Facilities:

1. Existing restrooms facilities are not available at the project site.

3.4 TEMPORARY CONSTRUCTION AIDS:

A. General:

1. Provide construction aids and equipment required by personnel and to facilitate the execution of the Work; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other such facilities and equipment.
2. Materials may be new or used, must be suitable for the intended purpose, and meet the requirements of applicable codes, regulations, and standards.

3.5 TEMPORARY SAFETY AND HEALTH:

- #### A. General:
- Within 30 days of Notice to Proceed, Contractor shall develop safety and health programs for personnel at Project Site as specified in GENERAL CONDITIONS.

3.6 TEMPORARY FIRE PROTECTION:

A. General:

1. Within 7 days of Notice to Proceed, Contractor shall develop a fire prevention and protection program for all Work under this Contract.

2. The program shall comply with the applicable provisions for safety and protection as set forth in - GENERAL CONDITIONS and with applicable parts of the NFPA 10 and 241.
3. Locate fire extinguishers where convenient and effective for their intended purpose.
4. Store combustible materials in containers in fire-safe locations.
5. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for fighting fires.
6. Provide supervision of welding operations and similar sources of fire ignition.
7. Post warning and instructions at each extinguisher location, and instruct construction personnel on proper use of extinguishers and other available facilities at Project Site.
8. Prohibit smoking in hazardous fire exposure areas and in underground excavations. "No Smoking" signs shall be posted in these areas.

3.7 INSTALLATION AND REMOVAL:

- A. Relocation: Relocate construction aids as required by progress of construction, by storage, or Work requirements and to accommodate requirements of Owner and other Contractors at the Site.
- B. Removal: Remove temporary materials, equipment, and services when construction needs can be met and allowed by use of permanent construction, or at completion of the Project.
- C. Repair: Clean and repair damage caused by installation or by use of temporary facilities.
 1. Remove foundations and underground installations for construction aids.
 2. Grade the areas of the Site affected by temporary installations to required elevations and clean the area.

END OF SECTION 01560

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01580 – PROJECT IDENTIFICATION AND SIGNS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes basic requirements for temporary Project identification and informational signs required during construction.
- B. Related Work Specified Elsewhere:
 - 1. Submittals: SECTION 01330.

1.2 QUALITY ASSURANCE:

- A. Design sign and structure to withstand wind and environmental conditions of locality. Provide with finish adequate to withstand weathering, fading, chipping, and peeling for duration of construction.

PART 2 - PRODUCTS

2.1 INFORMATIONAL SIGNS:

- A. Construction:
 - 1. This includes signs for traffic, construction workers, and general public in regards to directions, warnings, hazards, locations of areas, facilities, equipment, and others of a similar nature.
 - 2. Provide signs of design, size, color, and lettering as required by regulatory agencies. Signs shall be painted metal, wood, plastic, or fiberglass and of materials suitable for the conditions in which they are placed, such as weathering and fading.
 - 3. Construct structure and framing of wood or metal, structurally adequate to resist design requirements of area of Project.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Project and Contractor Identification Sign:
 - 1. Install in appropriate location so as not to obstruct traffic, pedestrians, or construction operations.
 - 2. Erect on framing or foundation, and rigidly brace.
 - 3. Maintain sign in good repair, in a clean and neat condition.
 - 4. Remove upon completion of Project.
- B. Informational Signs:
 - 1. Install at appropriate locations and in sufficient quantities to assure visibility. Relocate as required by progress of Work.
 - 2. Maintain signs in good repair, in a neat, clean, readable condition.
 - 3. Remove all signs, framing, supports, and foundations upon completion of Project.

END OF SECTION 01580

DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01600 – EQUIPMENT AND MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements governing Contractor's selection of products for use in the Project.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. For the applicability of industry standards to products specified:
 - 2. For submittal of Contractor's construction progress schedule and the Submittal schedule: SECTIONS 01320 and 01330.

1.2 DEFINITIONS:

- A. Definitions used in this Article are not intended to change the meaning of other terms used in these Contract Documents, such as "specialties," "systems," "structures," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
 - 1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "Material," "Equipment," "system," and terms of similar intent.
 - a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
 - 2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 - 3. "Equipment" is a product with operational or nonoperational parts, whether motorized, or manually operated, that may require service connections, such as wiring or piping.

1.3 QUALITY ASSURANCE:

- A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
 - 1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete Project requirements in a timely manner, consult with Engineer to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.
 - 2. Where possible, provide products which match products already installed.

1.4 TRANSPORTATION AND SHIPMENT:

A. Shipment Preparation:

1. Contractor shall require manufacturers and Suppliers to prepare products for shipment in a manner to facilitate unloading and handling, and to protect against damage, deterioration, or unnecessary exposure to the elements in transit and storage. Provisions for protection shall include the following:
 - a. Crates or other suitable packaging materials.
 - b. Covers and other means to prevent corrosion, moisture damage, mechanical injury, and accumulation of dirt in motors, electrical equipment, and machinery.
 - c. Suitable rust-preventive compound on exposed machined surfaces and unpainted iron and steel.
 - d. Grease packing or oil lubrication in all bearings and similar items.
- B. Marking: Each product item shall be tagged or marked as identified in the delivery schedule or on Submittals. Complete packing lists and bills of material shall be included with each shipment. Each piece of every item need not be marked separately, provided that all pieces of each item are packed or bundled together and the packages or bundles are properly tagged or marked.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Schedule delivery to minimize long-term storage at the Site and to prevent overcrowding of construction spaces. Allow ample time to avoid delay of the Work.
2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to the Site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected. Inspect shipment to assure:
 - a. Product complies with requirements of Contract Documents and reviewed Submittals.
 - b. Quantities are correct.
 - c. Containers and packages are intact and labels are legible.
 - d. Products are properly protected and undamaged.
5. Store products at the Site in a manner that will facilitate inspection and measurement of quantity or counting of units. Mark deliveries of component parts of Equipment to identify the Equipment, to permit easy accumulation of parts, and to facilitate inspection and measurement of quantity or counting of units.
6. Store heavy Materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, and with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
8. Protect motors, electrical Equipment, plumbing fixtures, and machinery of all kinds against corrosion, moisture deteriorations, mechanical injury, and accumulation of dirt or other foreign matter.
9. Protect exposed machined surfaces and unpainted iron and steel as necessary with suitable rust-preventive compounds.
10. Protect bearings and similar items with grease packing or oil lubrication.
11. Handle and store steel plate, sheet metal, and similar items in a manner to prevent deformation.

B. Handling:

1. Provide equipment and personnel necessary, to unload and handle products, by methods to prevent damage or soiling to products, or packaging.
2. Handle by methods to prevent bending or oversteering. Where lifting points are designated, lift components only at those points.
3. Provide additional protection to surrounding surfaces as necessary to prevent damage.

C. Maintenance of Storage:

1. Inspect stored products on a scheduled basis.
2. Verify that storage facilities comply with manufacturer's product storage requirements, including environmental conditions continually maintained.
3. Verify that surfaces of products exposed to elements are not adversely affected; that any weathering of finishes is acceptable under requirements of Contract Documents.
4. For mechanical and electrical Equipment in long-term storage, provide manufacturer's service instructions to accompany each item, with notice of enclosed instructions on exterior of package. Service Equipment on a regularly scheduled basis.

D. Protection After Installation: Provide substantial coverings as necessary to protect installed products from damage from subsequent construction operations. Remove coverings when no longer needed or as specified.

1.6 PRODUCTS FURNISHED BY OWNER:

A. Refer to Section 01610 for detailed listing and requirements for Owner Furnished Materials.

B. Contractor to install Owner Furnished Materials as indicated in the project documents.

C. Receipt and Unloading:

1. Items furnished by Owner for installation under this Contract, unless otherwise indicated within this specification, will be delivered to the Site complete with packing lists and bills of material. Contractor shall furnish receipts to shipper upon delivery.
2. The Equipment contractor will provide duplicate bills of material to Resident Project Representative's office at the Site prior to the delivery of each shipment of Equipment and Material.
3. Contractor shall receive, check, unload, inventory, accept and store all Equipment and Materials delivered to the Site per proper notice and in accordance with manufacturer's instructions. He shall report any damage to Engineer prior to or during unloading, and advise Engineer of any shortage at time of delivery. Engineer will verify such reports and so notify the Equipment contractor.
4. Contractor shall be responsible for proper location of trucks for unloading and all demurrage charges and substantiated claims for damage to trucks resulting from unloading operations.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION:

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise specified or indicated, new at the time of installation.

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
2. Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Continued Availability: Where, because of the nature of its application, Owner is likely to need replacement parts or additional amounts of a product at a later date, either for maintenance and repair or replacement, provide standard products for which the manufacturer has published assurances that the products and its parts are likely to be available to Owner at a later date.
4. Conform to applicable Specifications, codes, standards, and regulatory agencies.
5. Comply with size, make, type, and quality specified, or as specifically approved in writing by Engineer.
6. Manufactured and Fabricated Products:
 - a. Design, fabricate, and assemble in accordance with the best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
 - c. Equipment and Materials shall be suitable for service conditions intended.
 - d. Equipment capacities, sizes, and dimensions indicated or specified shall be adhered to unless variations are specifically approved in writing by Engineer.
 - e. Provide labels and nameplates where required by regulatory agencies or to state identification and essential operating data.
7. Do not use products for any purpose other than that for which designed or are specified.
8. To the fullest extent possible, provide products of the same kind from a single source.
9. Where products are to match or replace existing materials installed, provide products of the same type and model presently installed.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS:

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place except as required for proper movement and performance, and accurately located and aligned with other Work.
 1. Obtain and distribute copies of manufacturer's printed instructions and recommendations if not a part of Submittals, containers, or packaging to parties involved in the installation, including a copy to Engineer.
 2. Maintain one complete set of instructions at the Site during installation and until completion.
 3. Handle, install, connect, clean, condition, and adjust products in accordance with such instructions and in conformance with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.
- B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01600

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01610 – OWNER FURNISHED EQUIPMENT AND MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. The equipment and materials described in this section will be furnished by WASHINGTON CITY (“OWNER”) under separate specifications for installation by the Contractor.
- B. The Owner furnished materials are presently on order. Anticipated deliveries are as noted in this section.
- C. The Contractor is responsible for the proper and successful installation of all materials in the project whether provided by the Owner or materials provided by the Contractor.
- D. The Contractor is solely responsible for the proper safeguarding, handling, transporting, and installation of these materials. The Bidder shall provide and include in the Bid Proposal any and all costs associated with receiving, storing, insuring against loss or damage, transporting, and handling the Owner Furnished Materials.
- E. The Contractor shall be responsible for the loss or damage to all materials and all equipment on the site that are required for his portion of the work until acceptance of the completed work by the Owner. Any lost or damaged equipment or material under the responsibilities of the Contractor shall be promptly replaced by the Contractor at his expense.
- F. Material and equipment shall be stored so as to ensure the preservation of their quality and fitness for the work. Material and equipment shall be stored on wooden platforms or other hard, clean surfaces, and also covered, if necessary.
- G. Except as indicated otherwise herein, all work, labor, and additional equipment required for complete erection of the equipment, including receiving from carriers, unloading, and storage prior to erection, shall be provided by the Contractor. So as not to impede construction due to shortage of miscellaneous materials, the Contractor will be responsible for obtaining minor materials due to shortfalls.
- H. Information describing equipment in this section will give only an approximate scope of the work and is not intended to be detailed itemization of all work to be done as a part of these specifications. To obtain complete information the manufacturers' drawings and other contract information must be examined. If necessary, supplemental information may be obtained from the manufacturer concerning the extent of field work required.
- I. Two copies of all available manufacturer's shop drawings will be furnished to the successful bidder.
- J. All spare parts and maintenance tools provided with equipment shall be delivered to the Owner as directed.
- K. All Owner furnished equipment and materials shall be installed by the Contractor in strict accordance with the manufacturer's installation instructions.
- L. All equipment delivered to the site awaiting installation shall be stored in a manner that will protect it from deteriorating effects of the elements and from physical damage.
- M. All equipment shall be adjusted and lubricated in accordance with the manufacturer's instructions, so that it is left in a satisfactory operating condition. Extreme care shall be exercised in handling porcelain parts to avoid chipping or breakage.

- N. The Contractor shall perform any drilling on equipment steel racks or supports, and attach all brackets, extensions, or switch clip angles necessary for securely mounting the equipment. All holes drilled or punched in steel shall be treated in accordance with Section 05200.
- O. Equipment shall be installed on the concrete footings with all items true, plumb, and level.
- P. All equipment shall be tested after installation and adjusted for proper operating action to the satisfaction of the Owner.
- Q. After the installation of all station equipment has been completed, the Contractor shall thoroughly clean all insulators and bushings to the satisfaction of the Owner.
- R. The following is a general description of the major Owner Furnished material types or groups that will be installed. A summary of the Owner furnished materials is found at the end of this section.

PART 2 - STEEL STRUCTURES

2.1 GENERAL

- A. The structural steel as required for this project will be Owner furnished.

2.2 DESCRIPTION

- A. Structural steel supplied by the Owner:
 - 1. (1) Lot Anchor Bolts, Nuts & Washers

2.3 DELIVERY

- A. The steel anchor bolts are anticipated to be delivered by August 15, 2025.

2.4 INSTALLATION

- A. The Contractor is responsible for installing the concrete foundations for all steel structures.

2.5 MANUFACTURER'S SERVICES

- A. NONE

2.6 FINAL INSPECTION

- A. The steel structures will be inspected for proper installation as required by the specifications.

PART 3 - MATERIALS RECEIPT

- 3.1 Not applicable.

END OF SECTION 01610

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01630 – CONTRACTOR FURNISHED EQUIPMENT AND MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. All the electrical equipment and materials not indicated to be furnished by the Owner in Section 01610 but necessary for project construction shall be furnished and installed by the Contractor.
- B. Contractor is to furnish type and kind of material as indicated in the drawing set and as provided for in these specifications. No substitutions are allowed unless approved in writing by the Owner or Owner's Engineer.
- C. The Contractor is responsible for all unlisted miscellaneous material necessary for project construction.

END OF SECTION 01630

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01631 – SUBSTITUTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. Related Work Specified Elsewhere:
 - 1. Requirements for submitting Contractor's Construction Schedule and the Submittal Schedule: SECTIONS 01320 and 01330.
 - 2. Requirements governing Contractor's selection of products: SECTION 01600.

1.2 DEFINITIONS:

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Changes in products, Materials, Equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
 - 1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to the Contract Documents requested by Owner or Engineer.
 - 3. Specified options of products and construction methods included in the Contract Documents.

1.3 SUBMITTALS:

- A. Substitution Request Submittal: Engineer will consider written requests for substitution if received within 10 days after Notice to Proceed. Requests received more than 10 days after commencement of the Work will be rejected.
 - 1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for Change Order proposals.
 - 2. Identify the Equipment or Material, the fabrication, or installation method to be replaced in each request. Include related Specification Section/Article and Drawing numbers.
 - 3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
 - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as performance, weight, size, durability, visual effect and available maintenance, repair, and replacement service.
 - c. Product data, including Drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.

- e. A statement indicating the substitution's effect on Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on the overall Contract Times.
 - f. Cost information, including a proposal of the net change, if any, in the Contract Price.
 - g. Whether or not incorporation or use of the substitute is subject to payment of any license fee or royalty.
 - h. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents, will perform adequately the functions and achieve the results called for by the general design, is similar in substance to that specified, and is suitable for same use as that indicated and specified.
 - i. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
4. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of the substitution within 1 week of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of an approved Submittal.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS:

- A. Conditions: Engineer will receive and consider Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by Engineer. If the following conditions are not satisfied, Engineer will return the requests without action except to record noncompliance with these requirements.
- 1. Revisions to the Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of the Contract Documents.
 - 3. The request is timely, fully documented, and properly submitted.
 - 4. The specified product or method of construction cannot be provided within the Contract Time. Engineer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 - 5. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.
 - 6. The requested substitution offers Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 - 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where Contractor certifies that the substitution will overcome the incompatibility.
 - 9. The specified product or method of construction cannot be coordinated with other materials and where Contractor certifies that the proposed substitution can be coordinated.
 - 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where Contractor certifies that the proposed substitution provides the required warranty.
 - 11. Where a proposed substitution involves more than one prime contractor, each contractor shall cooperate with the other contractors involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of products.
- B. The Contractor's submittal and Engineer's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION - Not Applicable

END OF SECTION 01631

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01750 - MANUFACTURER'S FIELD SERVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements of manufacturers for services to be performed at the Project Site in regards to erection, start-up, and testing of equipment.

1.2 SERVICES REQUIRED:

- A. Services with Equipment and Materials Furnished Under this Contract:
 - 1. Furnish the services of qualified field personnel from the manufacturers of suppliers of equipment furnished and installed under this Contracts, as required to perform all manufacturer's field services called for in the specifications. Field personnel shall be certified by the manufacturer of the specific product or system as having the necessary knowledge and experience to perform the required functions.
 - 2. Where such services is specified, Contractor shall not perform any work related to the installation or operation of equipment furnished and installed under this Contract without direct observation and guidance of the manufacturer's or supplier's field personnel unless Engineer concurs otherwise.
 - 3. The manufacturer's or supplier's field personnel shall perform the following:
 - a. Observed the erection, installation, start-up and testing of equipment.
 - b. Instruct and guide Contractor in proper procedures.
 - c. Supervise the initial start-up, operational check, and any required adjustments of equipment.
 - d. Instruct Owner's designated personnel in proper operation and maintenance of all equipment.
 - e. Furnish a written report (Service Time Report) to Engineer covering all Work done at least once each week and when work on each item of equipment or system is completed.
 - 4. All manufacturer's and supplier's field personnel shall advise Engineer of their arrival at the Site.

PART 2 - PRODUCTS: Specified in applicable sections.

PART 3 - EXECUTION

3.1 OPERATION AND TESTING

- A. Placing Equipment in Operation:
 - 1. Place all equipment installed under this Contract (and those furnished by Owner) into successful operation according to instructions of the supplier, manufacturer, or field representative, including making all required adjustments, tests, and operation checks.

B. Performance Tests:

- 1. Equipment Furnished Under this Contract:
 - a. Owner may conduct acceptance tests after installation to determine if the equipment installed as part of the work perform in accordance with contract documents (and as guaranteed). Final acceptance of equipment will be based on acceptable results of such tests.

- b. No tests will be conducted on equipment for which manufacturer's field service is specified unless manufacturer's field representative is present and declares in writing that the equipment is ready for such test.
- c. Contractor will be notified by Owner so that Owner can have a representative or manufacturer's representative present during any tests of equipment for which manufacturer's field service is not specified.
- d. The tests will be made as set forth in the contract documents unless the interested parties mutually agree upon some other manner of testing.

END OF SECTION 01750

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01780 – CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Instruction book and operating manual submittal.
 - 4. Submittal of warranties.
 - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections.
- C. Related Work Specified Elsewhere:
 - 1. Prerequisites to Substantial Completion and Final Acceptance: GENERAL CONDITIONS.
 - 2. Submittals: SECTION 01330.
 - 3. Manufacturer's Field Service: SECTION 01750.
 - 4. Warranties: SECTION 01785.

1.2 SUBSTANTIAL COMPLETION:

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the application for the last payment, show 100% completion for the portion of the Work claimed as completed.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship Bonds, maintenance agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases enabling Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Submit record drawings, instruction books and operating manuals, and similar final record information.
 - 6. Deliver tools, spare parts, extra stock, and similar items.
 - 7. Make final changeover of permanent locks and transmit keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete start-up testing of systems and instruction of Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the Site, along with mockups, construction tools, and similar elements.
 - 9. Complete final cleanup requirements, including touch-up painting.
 - 10. Touch up and otherwise repair and restore marred, exposed finishes.
 - 11. Restore disturbed areas to original condition including drainage and placement of topsoil, native surface rocks and boulders.
- B. Inspection Procedures: On receipt of a request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements. Engineer will prepare inspection or advise Contractor of construction that must be completed or corrected.

1. Engineer will repeat inspection when requested and assured by Contractor that the Work is Substantially Complete.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.3 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Price.
 3. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by Engineer.
 4. Submit consent of surety to final payment.
 5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 6. Submit a final liquidated damages settlement statement.
- B. Reinspection Procedure: Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to Engineer.
1. Upon completion of reinspection, Engineer will prepare a certificate of final acceptance. If the Work is incomplete, Engineer will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated.

1.4 RECORD DOCUMENT SUBMITTALS:

- A. General: Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
1. Record information concurrently with construction progress.
 2. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Mark each document "PROJECT RECORD" in neat, large, printed letters.
 3. Mark new information that is important to Owner but was not shown on Contract Drawings or Shop Drawings.
 4. Note related Change Order numbers where applicable.
 5. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
 6. Include the following:
 - a. Depths of various elements of foundation in relation to finish datum.
 - b. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

- c. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of construction.
 - d. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.
 - e. Field changes of dimension and detail.
 - f. Changes made by Change Order or other Modifications.
 - g. Details not on original Contract Drawings.
- C. Record Specifications: Maintain one complete copy of the Contract Documents including Addenda. Include with the Contract Documents one copy of other written construction documents, such as Change Orders and Modifications issued in printed form during construction.
- 1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
 - 2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
 - 3. Note related record drawing information and product data.
 - 4. Upon completion of the Work, submit record Specifications to Engineer for Owner's records.
 - 5. Include the following:
 - a. Manufacturer, trade name, catalog number, and Supplier of each product and item of Equipment actually installed, particularly optional and substitute items.
 - b. Changes made by Addendum, Change Order, or other Modifications.
 - c. Related Submittals.
- D. Record Product Data: Maintain one copy of each product data Submittal. Note related Change Orders and markup of record drawings and Specifications.
- 1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Site and from the manufacturer's installation instructions and recommendations.
 - 2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
 - 3. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records.
- E. Record Samples Submitted: Immediately prior to Substantial Completion, Contractor shall meet with Engineer and Owner's personnel at the Project Site to determine which Samples are to be transmitted to Owner for record purposes. Comply with Owner's instructions regarding packaging, identification, and delivery to Owner.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and Submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to Engineer for Owner's records.
- G. Instruction Books and Operating Manuals: Organize operation and maintenance data into suitable sets of manageable size as specified in SECTION 01330.
- H. Warranties and Bonds: Specified in Document 00700 - GENERAL CONDITIONS, SECTION 01330, and SECTION 01785.

1.5 SPARE PARTS:

A. Products Required:

1. Provide to Owner the quantities of products, spare parts, maintenance tools, and maintenance materials specified in individual Sections, in addition to that required for completion of Work.
2. Products shall be identical to those installed in the Work. Include quantities required from Supplier or manufacturer of original purchase to avoid variations in manufacture.

B. Storage, Maintenance:

1. Coordinate with Owner. Deliver and unload spare products to Owner at Project Site and obtain receipt prior to final payment.
2. For portions of Project accepted and occupied by Owner prior to Substantial Completion, deliver the applicable spare products to Owner at time of acceptance. Obtain receipt.
3. Maintain spare products in original containers with labels intact and legible, until delivery to Owner.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION.

3.1 FINAL CLEANING:

- A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in SECTION 01530.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Clean concrete floors to a "broom clean" condition.
 - d. Wipe surfaces of mechanical and electrical Equipment. Remove excess lubrication and other substances. Clean light fixtures and lamps.
 - e. Remove debris and surface dirt from limited-access spaces including roofs, trenches, equipment vaults, manholes, and similar spaces.
 - f. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.
 - g. Clean and polish plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
 - h. Clean light fixtures and lamps so as to function with full efficiency.
 2. Remove temporary structures, tools, equipment, supplies, and surplus materials.
 3. Remove temporary protection devices and facilities which were installed to protect previously completed Work.

4. Special Cleaning: Cleaning for specific units of Work is specified in applicable Sections of Specifications.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.
 1. Extra materials of value remaining after completion of associated Work become Owner's property. Dispose of these materials as directed by Owner.
- E. Repairs:
 1. Repair damaged protective coated surfaces.
 2. Repair roads, walks, fences, and other items damaged or deteriorated because of construction operations.
 3. Restore all ground areas affected by construction operations.

END OF SECTION 01780

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01785 - WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.
 - 1. Refer to the General Conditions for terms of the Contractor's Guaranty Bond and period for correction of the Work.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Procedures for submitting warranties: SECTION 01330.
 - 2. Contract closeout procedures: SECTION 01780.
 - 3. Specific requirements for warranties on products and installations specified to be warranted.
 - 4. Certifications and other commitments and agreements for continuing services to Owner: Specified throughout the Contract Documents.
 - 5. Guaranty Bond: SECTION 00635.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of the warranty on the work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturer's, and subcontractors required to countersign special warranties with Contractor.

1.2 DEFINITIONS

- A. Standard product warranties are preprinted written warranties published by individual manufacturer's for particular products and are specifically endorsed by manufacturer to Owner.
- B. Special warranties are written warranties required by or incorporated in the contract documents, either to extend time limits provided by standard warranties or to provide greater rights for Owner.

1.3 WARRANTY REQUIREMENTS:

- A. All equipment, materials and workmanship shall be warranted for a period of at least one (1) year after the date of energization.
- B. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure.
- C. Reinstatement of Warranty: When work is covered by a warranty has failed, and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- D. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of the Contract Documents. Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether Owner has benefitted from use of the work through a portion of its anticipated useful service life.

- E. Owner's Recourse: Expressed warranties made to Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, or remedies.
 - 1. Rejection of Warranties: Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the contract documents.
- F. Where the contract documents require a special warranty, or similar commitment on the work or part of the work, Owner reserves the right to refuse to accept the work, until Contractor presents evidence required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

- A. Submit written warranties to Engineer prior to the date certified for substantial completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the Date of Substantial Completion for the work, or a designated portion of the work, submit written warranties upon request of Engineer.
 - 1. When a designated portion of the work is completed and occupied or used by Owner, by separate agreement with Contractor during the construction period, submit properly executed warranties to Engineer within 15 days of completion of that designated portion of the work.
- B. When the contract documents require Contractor, or Contractor and a Subcontractor, Supplier, or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by required parties. Submit a draft to Owner, through Engineer, for approval prior to final execution.
- C. Form of Submittal: At final completion, compile 2 copies of each required warranty properly executed by Contractor, or by Contractor, Subcontractor, Supplier, or Manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the contract documents.
- D. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 ½ by 11 inch paper.
 - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the installer.
 - 2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," and required by SECTION 01330.
 - 3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS - Not applicable

PART 3 - EXECUTION - Not applicable

END OF SECTION 01785

DIVISION 2 – SITE WORK

SECTION 02380 - DRILLED PIER FOUNDATIONS

PART 1 - SCOPE

- 1.1 This specification covers the supply and installation of drilled pier foundations.

PART 2 - DEFINITIONS

- 2.1 Engineer: ICPE
- 2.2 Geotechnical Engineer: The specialized engineering firm retained by the owner or the engineer with responsibilities of inspection of all phases of drilled pier construction and testing and investigation of soil and pier performance.
- 2.3 Contractor: The organization contracted to perform the work governed by this specification. Contractor shall employ personnel experienced in the type of work to be performed, including anticipated subsurface conditions and special techniques which may be required.

PART 3 - REFERENCE CODES, SPECIFICATIONS AND STANDARDS.

The following codes, specifications and standards of the latest revision shall be considered as part of this specification.

- 3.1 Section 03301 – Concrete Foundations
- 3.2 American Concrete Institute, ACI 318 building code requirements for reinforced concrete.
- 3.3 ACI 301, specification for structural concrete for buildings.
- 3.4 ACI 304, recommended practice for measuring, mixing, transporting and placing concrete.
- 3.5 ACI 305, recommended practice for hot weather concreting.
- 3.6 ACI 306, recommended practice for cold weather concreting.
- 3.7 ACI 315, manual of standard practice for detailing reinforced concrete structures.
- 3.8 ACI 347, recommended practice for concrete formwork.
- 3.9 ACI 336, suggested design and construction procedures for pier foundations.
- 3.10 ACI 322, building code requirements for structural plain concrete.
- 3.11 American Society for testing and materials (ASTM)
- 3.12 American welding society D12.1 recommended practices for welding reinforcing steel, metal inserts, and connections in reinforced concrete construction.
- 3.13 Concrete reinforcing steel institute. (CRSI)

PART 4 - MATERIALS

4.1 GENERAL

- A. All Materials must meet the requirements outlined in Section 03301 – Concrete Foundations.

4.2 CEMENT

- A. Unless otherwise noted, all cement shall be Portland cement conforming to ASTM C 150, Type V. All cement supplied shall be from one manufacturer.

4.3 WATER

- A. Water used in mixing shall be clean and free of deleterious amounts of acids, alkalis, organic matter or other impurities which are injurious to concrete.

4.4 ADMIXTURES

- A. Chemical admixtures shall conform to "Chemical Admixtures for Concrete" (ASTM C 494) and shall not be used without prior written approval by the engineer.

4.5 AGGREGATE

- A. Fine aggregate shall conform to "Concrete Aggregates" (ASTM C 33)
- B. Coarse aggregate shall conform to "Concrete Aggregates" (ASTM C 33) one inch to No. 4 size.
- C. Aggregates for Type II or III cement shall be acid-resistant type silica rocks. Quartz, flintstone, etc., are preferred. No carbonate rocks such as limestone, calcite, dolomite, etc. shall be used.

4.6 REINFORCEMENT

- A. Deformed reinforcing steel bars conforming to ASTM A 615 grade 60 shall be used. Bars shall be tagged with mark number and size prior to shipment.

4.7 STEEL CASING

- A. Steel casings shall conform to ASTM A 252, grade 2, ASTM A 36, or ASTM A 444 corrugated steel.
- B. Vertical joints in non corrugated permanent casings shall be 100 percent penetration welds.
- C. Hardened steel teeth for seating into rock on permanent casings shall be face welded with AWS electrodes.

4.8 SAND-CEMENT GROUT

- A. A sand-cement grout shall be used for filling annular voids outside of permanent casings.

PART 5 - DRAWINGS AND SUBMITTALS

- 5.1 Unless noted otherwise, two copies of the following shall be submitted to the engineer for review and approval.

- 5.2 Design of concrete mixes in accordance with this specification and ACI 301 as applicable.

- 5.3 Reinforcing steel bending, location and detail drawings, final approved drawings shall also accompany the first shipment of reinforcing delivered to the site.
- 5.4 Certified mill test reports for reinforcing steel.
- 5.5 Detailed procedures for tremie concrete and/or casing removal, if any.
- 5.6 Report of actual location, alignment, elevations and dimensions of drilled piers.
- 5.7 Reports of actual material quantities for each pier.

PART 6 - EXECUTION

Prior to excavation contractor shall locate all existing underground utilities and construction in the field to determine any conflicts with the work. The engineer shall be notified of any conflicts and will specify solutions so that the work may proceed.

6.1 EXCAVATION

- A. Excavation of drilled piers may be performed by hand, auger drill, bucket drill, clamshell or any other type of or combination of equipment which will obtain the required results.
- B. Excavate drilled pier to dimensions and required elevations shown on contract drawings. If drawings call for an allowable service load bearing pressure, extend excavation to suitable material as instructed by the geotechnical engineer.
- C. Construction methods shall be used to insure that the pier is located properly, and is plumb within tolerances described below, the soil adjacent to the hole is not unduly disturbed and the hole is clean and of the specified dimension for its entire length.
- D. Contractor shall remove excavated material from site or as otherwise directed by the engineer.
- E. The completed hole shall have a flat, level bottom or if the excavation extends into sloping rock, the bottom may be stepped or leveled such that the final surfaces slope not more than 10 degrees. Where used, step heights shall not exceed one quarter of the width or diameter of the bearing surface.

6.2 REINFORCEMENT

- A. Reinforcement shall be clean and free of mud, oil, or other coatings which adversely affect bond.
- B. Reinforcement shall be placed in accordance with the contract documents, and be securely braced to retain its configuration and location throughout the placing of concrete and the extraction of the casing. If spacers are used which are capable of sliding on the casing, such elements shall be securely attached to the reinforcement.

6.3 CASING

- A. Provide steel casing for shaft excavation where required.
- B. Steel casings shall be of sufficient strength to withstand handling stresses, concrete pressure and surrounding earth or fluid pressures.
- C. Outside diameter of casing shall be of a minimum of the normal outside diameter of the drilled foundation shaft.

- D. Where a casing is required only for safety during inspection or workers safety during construction, the wall thickness shall be a minimum of ¼" thick steel shall be loose fitting and shall be removed from the hole when inspection is completed.
- E. Unless otherwise specified the casing may be removed or left in place at the contractors option. If casing is to be removed during or after concreting, special procedure for casing removal shall be followed.

6.4 CONCRETE

- A. Concrete shall be placed immediately after completion of the excavation and after the geotechnical engineer has verified allowable service load bearing capacity. Uncased or belled pier excavations shall not be left open overnight.
- B. Concrete may be placed by free fall through a hopper at center of pier or equivalent means such that the fall is down center of the shaft and concrete does not hit the sides or the reinforcing steel. The free fall of the concrete is limited to the requirements outlined in Section 03301 – Concrete Foundations, 4.6 Placing Concrete.
- C. Concrete shall be placed in one continuous pour whenever possible. If a construction joint is required, existing concrete shall be level, clean and roughened to an amplitude of one inch prior to continuation of concrete placement. If reinforcement is not continuous through the construction joint, reinforcement dowels and/or a shear key shall be provided when required by the engineer.
- D. Compaction of concrete shall be accomplished by vibrating the top 5 feet of concrete of each pour after casing has been removed or when casing is permanent.
- E. When casing is to be removed, the geotechnical engineer shall provide inspection during the casing removal and placement of concrete; withdraw the casing only as the shaft is being filled with concrete.
- F. When casing is removed, provide concrete with a slump of 5 inches or greater to prevent arching of concrete during removal of casing.
- G. During casing removal upward movement of the reinforcing steel shall not exceed 6 inches. Downward movement shall not exceed 6 inches per each 20 ft. of shaft length.
- H. When casing is left in place, fill annular void between casing and excavation with concrete or fluid grout.
- I. For placing concrete under water, use a tremie pipe, where permitted by the engineer. Prior to placing concrete the water level inside the excavation shall balance with water head outside. Sheet piling, casing or bentonite slurry shall be used to retain the sides of the excavation during concreting.

PART 7 - TESTING AND INSPECTION

- 7.1 For test cylinder testing requirements and frequency, see Section 03301-5.2.D.
- 7.2 Inspection of the drilled pier shall document the following construction tolerances.
 - A. Location of pier shall be within 1/24 of shaft diameter but not more than 3 inches.
 - B. Drilled pier shall not be out of plumb more than 1.5 percent of the pier length or 12.5 percent of the shaft diameter but no more than 15 inches.
 - C. Where rock penetration is required vertical tolerance may be increased to 2 percent of pier length.
 - D. For battered piers, pier axis shall be within 5 percent of the length from the specified inclination.

E. Concrete cutoff elevation shall be plus 1 inch minus 3 inches.

F. When drilling mud is used, concrete cutoff elevation of any different tolerance than 7.2 E shall be approved by the engineer.

7.3 Inspection of the bottom of pier excavation shall be the responsibility of the geotechnical engineer. Inspection from the surface shall be performed wherever practical.

END OF SECTION 02380

DIVISION 3 - CONCRETE

SECTION 03301 - CONCRETE FOUNDATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This specification covers the furnishing of all material, equipment, accessories, tools, services, transportation, labor, and supervision required for the supply and installation of cast in place concrete.

1.2 CONCRETE

- A. Unless otherwise indicated, concrete shall be normal weight (145 pcf) ready-mixed concrete, conforming to ASTM C94.

1.3 ITEMS INCLUDED

- A. This specification includes the following items:
 - 1. Concrete shown on the Drawings.
 - 2. Concrete for slabs on grade
 - 3. Reinforcement
 - 4. Formwork
 - 5. Embedded Items, including Anchor Bolts

1.4 COMPLIANCE SUBMITTALS

- A. Submit concrete mix design, including technical information for all ingredients, reinforcement and embedment shop drawings, accessories, technical data and any other submittals as specified in Division 01, Section 01330 and as requested by the Engineer.
- B. The concrete manufacturer shall certify that the concrete delivered conforms to the specification for Ready-Mixed Concrete ASTM C94.
- C. Information on materials to be used on the project that are in addition or as a substitute to materials indicated in this Specification are to be approved by the Engineer prior to their use.
- D. All ingredients and quantities in concrete mixes shall be listed in submittals with technical descriptions, test reports and MSDS sheets for all admixtures. Concrete shall not be placed until all concrete mix submittals are approved by the Engineer.
- E. A certificate of compliance with the requirements of the Specification shall be submitted by the aggregate supplier.

PART 2 - CODES AND STANDARDS

- 2.1 The following codes and standards of the latest revision shall be considered as part of this Specification:
 - A. American Concrete Institute, ACI 318, Building Code Requirements for Reinforced Concrete.
 - B. ACI 301, Specifications for Structural Concrete for Buildings.

- C. ACI 304, Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- D. ACI 305, Recommended Practice for Hot Weather Concreting.
- E. ACI 306, Recommended Practice for Cold Weather Concreting.
- F. ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures
- G. Detailing Manual and Commentary.
- H. ACI 318, Building Code Requirements for Structural Concrete and Commentary.
- I. ACI 347, Recommended Practice for Concrete Formwork.
- J. American Society for Testing and Materials (ASTM), as noted.
- K. American Welding Society D12.1, Recommended Practices for Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction.
- L. American Welding Society D1.4, Structural Welding Code - Reinforcing Steel.
- M. Concrete Reinforcing Steel Institute (CRSI), as noted.
- N. Uniform Building Code (UBC), 1997 Edition.
- O. National Electrical Safety Code (NESC), latest Edition.

PART 3 - MATERIALS

3.1 CEMENT

- A. Unless otherwise noted, all cement shall be Portland Cement conforming to ASTM C150, Type V cement. All cement supplied shall be of one manufacturer unless indicated otherwise on the Drawings or approved by the Engineer. All cement supplied shall be of one manufacturer.

3.2 WATER

- A. Water used in mixing shall be clean and free from deleterious amounts of acids, alkalis, organic matter, or other impurities likely to be injurious to concrete. Water shall contain less than 650 milligrams per liter of chlorides calculated as Cl and less than 1000 milligrams per liter of sulfates calculated as SO₄.

3.3 ADMIXTURES

- A. Chemical Admixtures shall conform to "Chemical Admixtures for Concrete" (ASTM C 494) and shall not be used unless prior approval in writing is obtained from the Construction Manager. Approved admixtures shall maintain or improve the strength and/or durability of concrete of the original design mix. Admixtures shall be used in strict accordance with the manufacturer's recommendations and shall be accompanied by the services of the qualified field representative of the manufacturer to supervise the use thereof. A certificate from an approved laboratory attesting that the admixture equals or exceeds ASTM C494, Type D will be required.
- B. Air Entraining Admixtures shall conform to "Specifications for Air-Entraining Admixtures for Concrete" (ASTM C 260). Air content shall be determined in accordance with ASTM C231. The agent and the cement proposed for use shall be selected well in advance of concrete placing. Approved air-entraining admixtures are as follows:

1. Darex AEA (Grace Construction Materials)
2. MB-VR (Master Builders Co.)
3. Sika AER (Sika Chemical Corp.)

C. The use of accelerators shall not be allowed unless approved by the Engineer.

D. Pozzolans

1. Fly Ash shall meet the requirements of ASTM C618, Class F or C, be from the same source for any individual structure and have the following properties:

| | <u>CLASS F</u> | <u>CLASS C</u> |
|---------------------|----------------|----------------|
| a. Loss of ignition | 3% Max. | 2% Max. |
| b. SO3 Content | 3% Max. | 4% Max. |
| c. Moisture Content | 1% Max. | 1% Max. |

2. Silica Fume (Microsilica): Meeting the requirements of ASTM C1240.

- a. Force 10,000 by Grace
- b. MCI 2001 or 2002 by Cortec

3.4 AGGREGATE

A. Aggregates shall conform to requirements of ACI 318, Section 3.3

B. Aggregates nonconforming to gradation requirements in this Specification but which produces concrete with the required strength and conforms to all other requirements of this Specification, as verified by testing or actual in service experience, may also be used. Where Type V cement is required, no carbonate rocks such as limestone, calcite, dolomite, magnetite, siderite, etc. shall be used. Coarse aggregate shall meet the requirements of ASTM C33. The Coarse aggregate shall be uniformly graded as follows:

| <u>SIEVE</u> | <u>PERCENT PASSING</u> |
|--------------|------------------------|
| 1 1/2 inch | 100 |
| One inch | 95-100 |
| 1/2 inch | 25-60 |
| No. 4 | 0-10 |
| No. 8 | 0-5 |

C. Fine aggregate shall meet the requirements of ASTM C33 and shall be uniformly graded as follows:

| <u>SIEVE</u> | <u>PERCENT PASSING</u> |
|--------------|------------------------|
| 3/8 inch | 100 |
| No. 4 | 80-100 |
| No. 8 | 80-100 |
| No. 16 | 50-80 |
| No. 30 | 25-60 |
| No. 50 | 10-30 |
| No. 100 | 2-10 |

3.5 CONCRETE DURABILITY AND QUALITY

A. All concrete shall meet the durability and quality requirements specified in ACI 318.

B. The 28 day compressive strength (f'c) of the concrete shall be not less than 4500 psi or as specified on the drawings.

- C. Method of proportioning shall be in accordance with ACI 211.1, "Recommended Practice for Selecting Proportions for Normal and Heavy Weight Concrete."
- D. The determination of the water-cement ratio to attain the required strength shall be in accordance with ACI 301, Method 2 (For combinations of materials previously evaluated or to be established by trial mixes), and with ACI 211.1. In addition, the maximum water-cement ratio (by weight) shall be 0.45 and the minimum cement content shall be 5-1/2 sacks per cubic yard.
- E. From the test results of the aforementioned procedures, a curve shall be plotted showing relationship between the water-cement ratio and compressive strength, and the maximum water-cement ratio to be used shall be the value shown by the curve to produce the strength a minimum of 25 percent greater than the strength specified.
- F. Calcium chloride, other salts and admixtures containing chlorides, or other salts, shall not be included in the concrete design mix..
- G. Concrete may contain a maximum of 15 percent pozzolans, by weight, as a substitute for cement in the mix.
- H. Unless otherwise noted or approved by the Engineer, all concrete shall be air-entrained. The air content shall be as follows:
 - 1. 6 to 10 percent for 3/8 inch maximum aggregate size
 - 2. 5 to 9 percent for 1/2 inch maximum aggregate size.
 - 3. 4 to 8 percent for 3/4 inch maximum aggregate size.
 - 4. 3.5 to 6.5 percent for 1 inch maximum aggregate size.
 - 5. 3 to 6 percent for 1-1/2 inch maximum aggregate size.
 - 6. 2.5 to 5.5 percent for 2 inch maximum aggregate size.
- I. The maximum slump shall be 4 inches prior to use of any water reducer admixture and 8 inches after a water reducer admixture is added.
- J. Mixing, transporting and placing concrete shall conform to applicable portions of ACI 211, ACI 212 and ACI 304 and as specified herein. Concrete shall be agitated by at least 70 revolutions of the mixing drum but not by more than 270 revolutions. Concrete shall be placed within 1 1/2 hours after the cement has been added to the mix.

3.6 REINFORCEMENT

A. Deformed Bars

- 1. Reinforcing steel shall be new deformed bars and shall conform to ASTM A615 or ASTM A706, Grade 60, unless noted otherwise. Bars shall be tagged with mark number and size before shipment. Welded wire fabric shall conform to ASTM A185.
- 2. All reinforcing steel shall be new and free of deleterious material, such as grease, oil, paint, loose rust and other similar contaminants, which would reduce the bond between the steel and concrete.

B. Accessories

- 1. Accessories shall conform to CRSI "Manual of Standard Practice of Reinforced Concrete Construction." Include all devices necessary for proper placing, spacing, supporting, and fastening steel reinforcement in place. Accessories shall be galvanized after fabrication if underside of concrete will be exposed.

C. Concrete Squares (Precast Reinforcing Chairs)

1. Squares shall be approximately two inches square and of a thickness adequate to provide the cover for the reinforcing steel as called for on the plans. The squares shall be made using a mixture of one part Portland Cement to three parts sand (fine aggregate) and the tie wires shall be cast integrally with each square.

3.7 FORM WORK

A. Design

1. Formwork shall be designed for loads and lateral pressures outlined in Chapter 1, Recommended Practice for Concrete Formwork (ACI 347) and wind loads as specified by the controlling local building code. Formwork design and construction are the responsibility of the Contractor.

B. Forms

1. Forms shall be constructed of wood, steel, or other approved material. Material shall be chosen based on strength and concrete finish requirements.

3.8 EMBEDDED ITEMS

A. Anchor Bolts and Sleeves

1. Unless noted otherwise, anchor bolts shall conform to ASTM A36 Steel as shown on the Drawings. Sleeves, where indicated on the Drawings, shall be made with high impact plastic or schedule 40 steel pipe with sleeve bottom closures of mild steel. Furnish each bolt with one heavy hex nut and washer unless otherwise noted on the Drawings.

B. Embedded Metals

1. Curb angles, frames, beams, ducts, etc., shall be fabricated of ASTM A36 material, and in accordance with the Specification and shall have anchors attached by welding at 24 inches maximum.
2. The fabricated length of pipe sleeves shall be equal to the thickness of concrete they penetrate. Ends of pipe sleeves shall be cut square and flush with the face of concrete. Unless otherwise specified or shown on the Drawings, pipe sleeves shall be secured against movement by welding a ring or flange around the outside midpoint of the sleeve.

C. Coatings

1. Embedded metal items shall be hot-dipped galvanized in accordance with ASTM A153, Grade 1, unless otherwise noted on the Drawings.

3.9 JOINT SEALANT

- A. Joint Sealant to be Sika-1a or approved equal unless indicated otherwise on the Drawings.

3.10 ADHESIVE ANCHORS

- A. Adhesive anchors to be Rawl, Hilti or Ramset/Redhead System unless shown otherwise on the Drawings.

3.11 BONDING AGENT

- A. Concrete bonding agent to be Weldcrete by Larsen Products or approved equal.

3.12 GROUT

- A. Grout to be Master Flow 713 by Master Builders Co. or approved equal.

3.13 EVAPORATION RETARDANT

- A. Evaporation retardant shall be Sure Film J-74 by Dayton Superior or Con-Film by Master Builders or approved equal.

3.14 CURING COMPOUNDS

- A. Concrete surface curing compound and cure and seal compound shall be Kure-N-Seal 30 by Sonneborn or Cure & Seal 31% by Symons, or approved equal.

PART 4 - EXECUTION

4.1 PREPARATION

- A. In no case shall concrete be placed on muddy, spongy, or frozen subgrade.
- B. All wood scraps and debris shall be removed from the areas in which concrete is to be placed.
- C. All areas where concrete is to be placed shall be thoroughly cleaned to ensure proper placement and bonding.
- D. Forms and subgrade shall be wetted and all standing water removed prior to placing concrete.
- E. All transporting and handling equipment shall be thoroughly cleaned.

4.2 FORMWORK

- A. Installation
 - 1. Forms shall be constructed to the shape, line, and grade required and shall be maintained sufficiently rigid to prevent deformation under load, including placing and compacting of concrete. Set forms and screens for floor and decks to provide uniform slopes to drains and positive drainage for exterior slabs and steps. Forms shall be tight enough to prevent leakage of mortar. Formwork shall be secured to prevent sagging, yielding, bulging, depressions, waves, or other defects in the finished work. Forms shall be smooth and free from warp. Temporary openings shall be provided at base of column and wall forms for cleaning and inspection. All debris including mud shall be removed before placing concrete. Use of patented prefabricated panel sections for forming straight wall sections shall receive prior approval of type and procedure including type of ties to be used. Lumber once used shall be carefully cleaned and oiled before reuse.
- B. Earth Sides
 - 1. Earth sides may be utilized if clean cut and stable at time of concrete placing. Earth must be undisturbed or compacted to 95% density in accordance with ASTM D 1557, and free from surface water.
- C. Chamfering
 - 1. Exposed corners of concrete shall have 3/4" x 45° chamfers unless otherwise shown on the Drawings.
- D. Form Treatment

1. Board Forms: Keep wet previous to placing concrete; wet thoroughly just before placing.
2. Plywood Forms: For surfaces to be painted use silicone-type bondbreaker, Burke, West Chemical or approved equal, applied in accordance with manufacturer's directions. Coat other surfaces with approved stainless form oil, using minimum quantity required for satisfactory removal.
3. Metal Forms: Approved-type release compound, applied in accordance with manufacturer's directions.

E. Form Removal

1. Side forms of walls and beams can be removed after 1 to 3 days. Load-supporting forms and shoring shall not be removed until after 7 days or two-thirds of designed 28 day compressive strength is obtained or the 7-day test cylinders have been tested and results indicate an average strength adequate to support the load imposed on the concrete. All forms shall be completely removed after setting of concrete together with all temporary supports, etc., employed for construction purposes. Forms shall be readily removable without hammering or prying against the concrete. Days having temperatures below 40°F are not to be counted for form removal unless thermal protection for the concrete has been provided. Concrete against forms removed prior to seven days after concrete placement shall be cured in accordance to Paragraph 4.11.

4.3 REINFORCEMENT

A. Detailing and Fabrication

1. Reinforcing steel shall be detailed and fabricated in accordance with the ACI "Detailing Manual and Commentary." All bars shall be cold bent and continuous around corners.
2. The fabricating contractor shall prepare complete placing drawings and bending schedules. All drawings, thus produced, shall be submitted to the Construction Manager for approval. Fabrication of reinforcing steel shall not be started until Drawings have been approved by the Engineer.

B. Splicing

1. Bar splices must be approved by the Engineer. Bar splices shall be made in accordance with ACI 318 Chapter 12 unless noted otherwise on the design drawings with a minimum splice of 48 times the bar diameter. Any deviation will require approval of the Construction Manager.
2. When welded splices are specified on the design drawings, the welding shall conform to AWS D12.1 using ASTM A706 material. Welding of reinforcement is prohibited unless indicated on the Drawings or approved by the Engineer.
3. Splices in welded wire fabric shall be made by lapping a minimum of one spacing of outermost cross wires of each fabric sheet plus two inches.

C. Installation

1. Before being placed, reinforcing shall be free from loose flaky rust, oil, grease, mud, or other coating, including ice that would reduce or destroy the bond. Reinforcement shall be accurately placed and properly secured in position by precast concrete squares, metal chairs or spacers. The use of heat to bend or straighten reinforcing will be permitted only if the entire operation is approved by the Construction Manager and Engineer. Tolerances, spacing, splices, and concrete protection to conform with Chapter 7 and 12 of the ACI 318 Building Code.
2. Welding shall be done only where shown on the Drawings or approved by the Engineer conforming to AWS D12.1.
3. Reinforcing steel shall be placed with minimum cover as indicated in ACI, Section 7.7, unless otherwise shown on the Drawings.
4. With the exception of temperature reinforcement, which shall be tied to main steel, reinforcement shall be accurately placed and securely tied at all intersections and splices with 18 gauge black annealed wire, and shall be securely held in position during the placing of concrete by spacers, chairs, squares,

or other approved supports. Wire tie ends shall point away from the form. Unless otherwise indicated, the number, type, and spacing of supports shall conform to ACI "Detailing Manual and Commentary."

D. Slabs on Grade

1. Reinforcing for re-entrant corners and perimeter steel around the edge of each pouring unit shall be provided using provided using 1/2" diameter (#4) deformed bars unless indicated otherwise on the drawings. Bars used as dowels in joints shown on the Drawings shall be 5/8" diameter plain round bars 2 feet long and spaced on 24" centers, unless otherwise indicated on the Drawings.

4.4 EMBEDDED ITEMS

- A. No pours are to be made until all embedded items, anchor bolts, electrical conduits, steel frames, pipe supports, etc., are properly positioned and secured. The Contractor shall be responsible for and coordinated with other trades to obtain necessary data and information.

- B. All sleeves, inserts, anchor bolts, waterstops, and other embedded items shall be positioned accurately and supported against displacement.

C. Anchor Bolts

1. Anchor bolts shall be set true to the lines and grades shown on the Drawings and shall be set plumb and be securely braced to prevent displacement during placing of concrete. Threads shall be protected by coating with oil or grease and encasing them in burlap or paper. Upon completion of concrete placement, bolts shall be rechecked for correct location and elevations. Should any bolt exceed acceptable tolerances corrections directed by the Engineer shall be made at no additional cost to the Owner.
2. Anchor Tolerances: Tolerance limits in setting anchors and anchor bolts at the surface of the concrete and at the exposed end of bolt shall be as follows:
 - a. Location, sleeved: 3/16 inch
 - b. Location, unsleeved: 1/8 inch
 - c. Projection: plus 1/4 inch, minus 0 inch

D. Embedded Metals

1. The fabricated length of pipe sleeves shall be equal to the thickness of concrete they penetrate. Ends of pipe sleeves shall be cut square and flush with the face of concrete. Unless otherwise specified or shown on the Drawings, pipe sleeves shall be secured against movement by welding a ring or flange around the outside midpoint of the sleeve.
2. Ducts shall be fabricated as shown on the Drawings.
3. All embedded curb angles, beams, frames, pipe sleeves, etc. shall be set true to the lines and grades shown on the Drawings. Embedded items shall be secured and braced to prevent shifting during concrete placing. Where dissimilar metals are to be embedded in direct contact with one another, the contacting surfaces shall be heavily coated with bituminous mastic or other Engineer-approved surface treatment to prevent galvanic coupling.

4.5 MIXING CONCRETE

- A. The mixer and mixing time shall be in accordance with ACI 304. Hot weather concreting shall comply with ACI 305, and cold weather concreting with ACI 306.

- B. No additional water shall be added to batched concrete above the design amount without the permission of the Engineer. Such water shall be incorporated by additional mixing equal to at least half of the total mixing required for the batch. Any addition of water above that permitted by the limitation on specified

water-cement ratio, shall be accompanied by a quantity of cement sufficient to maintain the proper water-cement ratio.

- C. Concrete shall be mixed only in such quantities as required for immediate use. The maximum allowable time between charging cement to the mixing drum and final concrete placement when the mean ambient temperature is below 90°F shall be ninety (90) minutes or 300 drum revolutions, whichever comes first.

4.6 PLACING CONCRETE

- A. Concrete shall not be placed prior to a recorded pre-placement inspection and/or authorization to proceed by the Owners Representative.
- B. The slump may be increased up to six (6) inches if concrete pumping is to be used. Pumping concrete and the proposed mix design shall be approved by the Engineer.
- C. Conveying and placing of concrete shall be in accordance with ACI 304.
- D. Each days pour shall be properly scheduled to assure that concrete surfaces can be finished correctly and the use of cold joints can be minimized.
- E. Concrete shall be mechanically vibrated at regular intervals during concrete placement, except for slabs on grade that are six (6) inches or less in thickness and drilled piers (cassons) below five (5) feet from the top of the pier. Consolidation is not required below this elevation.
- F. Concrete shall be placed in layers not over twenty four (24) inches deep. Each layer shall be consolidated by mechanical internal-vibrating equipment in accordance with ACI 309 supplemented by hand spading, rodding, and tamping to work concrete into all angles and narrow places. Duration of vibration shall be limited to the time necessary to produce satisfactory consolidation without causing objectionable segregation. Vibrators shall be applied vertically and at uniformly spaced points not farther apart than the visible effectiveness of the machine. The vibrator shall not be inserted into lower courses that have begun to set. Vibrators shall not be used to transport concrete inside forms. The use of form vibrators or form tamping will not be permitted.
- G. The free fall of concrete from the end of the spout or chute, or from a transporting vehicle, shall not exceed ten (10) feet for thin walls (10 inches or less in thickness) nor more than six (6) feet for other types of construction. Concrete shall not be permitted to hit obstructions while falling before reaching its intended location.
- H. A tremie with a flexible metal spout may be used when the distance through which concrete must be dropped vertically exceeds the maximum specified above. Flexible metal spouts shall be composed of conical sections not more than three feet long, with the diameter of the outlet and the taper of the various sections such that the concrete will fill the outlet and be retarded in its flow.
- I. Chutes, troughs, or pipes used as aids in placing concrete shall be arranged and used so the ingredients of the concrete will not be separated. Chutes and troughs shall be of metal or metal-lined. When steep slopes are necessary, the chutes shall be equipped with baffle boards or a reversed section at the outlet. Open troughs and chutes shall extend, if necessary, down inside the form or through holes left in the forms; or the ends of such chutes shall terminate in vertical downspouts. All chutes, troughs, and pipes shall be kept clean and free from coatings or hardened mortar by a thorough flushing with water before and after each placement. Water used for flushing shall be discharged outside of the forms.
- J. Concrete shall be deposited as nearly as possible to its final position and shall not flow farther laterally than the overall finished concrete section depth. Each pour shall be completed in a continuous operation with no interruptions in excess of forty-five (45) minutes. Each concrete layer shall be placed and compacted before the preceding layer has taken initial set.

- K. The placing sequence shall always be arranged to allow for the effects of settling and shrinkage. Walls and columns bearing superimposed slabs or beams and walls over 10' - 0 high shall be allowed to settle 45 minutes before pouring slabs, beams or topping out. Laitance shall be removed before pouring superimposed structural members.
- L. Do not embed aluminum in concrete.
- M. Do not use contaminated, deteriorated, or retempered concrete.
- N. All materials shall be used in accordance with the manufacturers recommendations unless approved by the Engineer.
- O. Concrete that has not cured to an initial set shall be protected from precipitation to avoid excess water in mix or unsatisfactory surface finish.

4.7 BONDING

- A. The existing surfaces shall be thoroughly cleaned of all foreign material and laitance and roughened to a 1/4 inch high profile minimum before depositing new concrete on old concrete or against concrete which has set.
- B. Concrete surfaces existing prior to the start of the project shall be coated with a bonding agent before coming into contact with new concrete.

4.8 JOINTS

- A. Construction and control joints shall be placed where shown on the Drawings. Placement of construction and control joints, when not shown on the Drawings, shall be in accordance with ACI 318, Chapter 6.4, and approved by the Engineer.
- B. Waterstops shall be installed as shown on the Drawings, forming a continuous diaphragm in each joint. Support for waterstops shall be provided and waterstop material shall be protected from damage. Field joints in waterstops shall be fabricated in accordance with manufacturer's instructions.
- C. Saw cutting of control joints shall be done as soon as concrete hardens sufficiently (normally 4-12 hours) so as not to be torn or damaged by the blade. Sawing shall not be done while concrete temperature is falling. Control joints shall have a 1/4 inch wide opening minimum and be filled with sealant unless shown otherwise on the Drawings.
- D. One half of slab reinforcing shall be continued across control joints unless shown otherwise on the Drawings. Keys shall be provided only if shown on the Drawings.
- E. Construction joints shall not have joint material placed in them or otherwise be made to be flexible unless located at control joints or indicated on the Drawings. When called for on the Drawings, the concrete surface forming construction joints shall be roughened uniformly to approximately 1/4 inch, and laitance, loosened aggregate and damaged surface concrete shall be removed.

4.9 FORMED CONCRETE FINISHING

- A. Form ties shall be broken back one (1) inch from the surface of the concrete. The remaining holes shall be filled by seal patching using a 1- to -2 of cement-sand mix.
- B. All voids and honeycomb areas in formed concrete shall be filled with a 1- to -2 cement-sand patch mix. Form ridges and other projections shall be removed immediately after forms are removed. Exposed formed concrete shall be rubbed with a carborundum brick prior to placing a thin cement grout coat as necessary to

produce a true, even and consistent surface. Grout shall extend at least three (3) inches below finished backfill grade on grade walls.

- C. Concrete surfaces left low for grouting shall be roughened to expose aggregate and all loose particles removed. Anchor bolt threads shall be wire brushed and greased after concrete has set. One nut and washer shall be placed on each bolt.

4.10 EXPOSED NON-FORMED CONCRETE FINISHING

- A. Concrete slab surfaces shall be screeded to the elevations shown on the drawings. An evaporation retardant shall be sprayed on the screeded surface in accordance to the manufacturer's directions if the air temperature is expected to reach 80°F or above before cure is complete.
- B. Floating the slab surface shall start as soon as the screeded surface has stiffened sufficiently. Floating shall be performed as necessary to produce a smooth, even, textured finish. Floating shall be performed by hand using wood floats, except where required for specified finish or interior surfaces, where magnesium tools shall be used.
- C. Slab surfaces shall be tested for accuracy with a straight edge after initial bullfloating or darbying is completed. Any depressions shall be filled and high areas shall be cut down and reworked. Straight edge testing and refloating shall continue until there are no deviations of more than 1/8 inch under a ten foot straight edge.
- D. Interior slabs and the top of equipment foundations shall be troweled, except as noted on drawings, or specified otherwise. Steel troweling shall begin after straight edge testing is finished and while concrete is still green, but sufficiently hardened to bear a person's weight without deep imprint. Steel troweling shall produce a smooth troweled finish per ACI Standard 301, Section 11.7.3 "Trowel Finish". Time lapse and number of trowelings to produce a hard surface will vary depending on weather conditions. The surface shall not be over worked to prevent small, shallow "alligator" cracking.
- E. Exterior slabs and other non-formed walking surfaces shall be broomed after final floating to provide a nonskid surface. A soft bristled push broom shall be used in a swirling motion.
- F. Nonslip surfaces indicated on the Drawings shall be provided by broadcasting not less than 1/4 pound per square foot of abrasive aggregate, passing the No. 50 sieve, over the screeded and floated concrete surface. Finishing shall then proceed immediately with a steel trowel. The abrasive aggregate shall pass the No 50 sieve and consist of not less than 55 percent aluminum-oxide or silicon-carbide abrasive ceramically bonded together to form a homogeneous material that will be sufficiently porous to provide a good bond with Portland cement. The aggregate shall have an abrasive hardness of not less than 40 as determined by the test for wear resistance in the National Bureau of Standards Report BMS 98.

4.11 CURING AND SEALING

- A. Exposed concrete may be cured by one of the following methods.
 - 1. Concrete shall be kept moist for seven days minimum for regular concrete and three days for high early strength concrete. Formed surfaces shall be moist cured after the forms are removed until seven days after placement for regular concrete and three days for high early strength concrete. Days having temperatures below 40°F shall not be counted. Sealed moisture retaining cover may be used for moisture cure.
 - 2. Curing compounds may be used when meeting the following requirements
 - a. Meets ASTM C 309 minimum requirements and stricter requirements stated in this specification.
 - b. Thirty percent minimum solids by weight and applied at 200 square feet per gallon.
 - c. Maximum moisture loss of 0.50 pounds/square yard in 72 hours per ASTM C 309 at 200 square feet per gallon. This is less than the maximum allowed in ASTM C 309.

- B. Steel troweled floor slabs, not covered with other materials shall receive a coat of "Cenco Seal 301" surface hardener applied after all other equipment and work in the building has been installed and/or completed and the floor has been thoroughly cleaned of all dust, dirt, masks, and foreign matter.
- C. Floor surfaces designated to receive tile or other treatment shall not be treated with sealers or hardeners.

4.12 COLD WEATHER CONCRETING

- A. Thorough preparation for protection against cold weather damage to concrete shall be made well in advance. Cold weather concreting shall be performed in accordance with ACI 306.
- B. Concrete shall be protected from freezing for not less than the first 7 days after placement.
- C. No frozen materials shall be used.
- D. Forms, reinforcements and fillers shall be free from frost.
- E. At ambient temperatures below 40°F, maintain the concrete temperature at 60°F - 80°F just prior to placement, and maintain the concrete temperature at 50°F minimum for five days after placement (regular concrete), or at 50°F for three days after placement (high early strength concrete), or longer if determined to be necessary by the Engineer.
- F. Housings, coverings, or other protection shall remain in place for 24 hours after heating is discontinued.

4.13 HOT WEATHER CONCRETING

- A. Thorough preparation for protection against hot weather damage to concrete shall be made well in advance. Hot weather concreting shall be performed in accordance with ACI 305.
- B. The maximum concrete temperature, at time of placement, shall be limited in accordance with ACI 305, Figure 2.1.5. Provide protective measures approved by the Engineer and the Owners Representative in advance of concrete placement. Among those protective measures consider the following:
 - 1. Cool the concrete.
 - a. One or more of the ingredients cooled to keep the temperature of the concrete from being excessive at time of placement.
 - b. Replacement of part of the mixing water with an equal weight of crushed ice is recommended for effective cooling per ACI 305, figure 2.3.6.
 - 2. Cover with an evaporative retarder.
 - 3. Provide wind breaks.
 - 4. Provide sun screens.
 - 5. Place concrete when air temperature is near the lowest temperature reached in a 24 hour period.
- C. Concrete placement of slabs shall not be initiated when ambient conditions from wind and temperature may produce an evaporation rate of mix water in excess of 0.10 lb/sq ft./hr. From exposed surfaces without the use of an evaporation retardant or fogging (see Figure 1). If uncontrolled shrinkage cracking cannot be prevented concrete shall not be placed.

4.14 PUMPED CONCRETE

- A. The use of pumped concrete shall be approved in each case by the Owners Representative.

- B. The proposed mix design for each class of concrete to be pumped shall be submitted and approved by the Engineer prior to concrete placement.

PART 5 - TESTING AND INSPECTION

5.1 INSPECTION

- A. All forms, reinforcement, and anchor bolts shall be inspected and approved by the Owners Representative before concrete is placed. If work is found unsatisfactory, the work shall not proceed until all defects have been remedied and approved by the Owners Representative. Such approval will in no way relieve the Contractor of his obligation to produce finished concrete as required by the drawings and specifications.

5.2 TESTING

- A. Testing and acceptance of tests of concrete shall be done in accordance with ASTM C31, C39, C94, C143, C172, and C173, D75 and C136.
- B. An independent testing laboratory engaged by the Contractor and approved by the Owners Representative. The laboratory shall provide the following:
 - 1. Supplying molds to the job-site and taking of cylinder samples.
 - 2. Testing concrete samples taken for air, slump, temperature, compressive strength, aggregate gradation and any other information request from the Owner.
 - 3. Preparing test reports.
- C. The Contractor shall supply concrete for all tests.
- D. Concrete shall be sampled, cured, tested and accepted for compressive strength in accordance with ASTM C172, C31, C39, and C94. Compressive test cylinders shall be prepared in sets of four (4) cylinders for each test. Specimens for each set shall be obtained from the same batch of concrete after about one half of the batch has been placed in the forms. The minimum rate of sampling shall be as follows:
 - 1. Structures and Foundations
 - a. One set per 75 cubic yards of concrete. At least one set shall be obtained for each structure or foundation, except when placing a number of items, each smaller than 15 cubic yards, one set per 15 cubic yards shall suffice.
 - 2. Floors and Slabs at Grade
 - a. One set per 50 cubic yards of concrete.
 - 3. Underground Duct Envelopes and Fireproofing
 - a. One set taken at the beginning of each day's concreting work. Subsequent testing may be performed at the discretion of the Engineer.
 - 4. All Other Concrete
 - a. Same as Paragraph D1a above.
- E. Test cylinder sets shall be dated, numbered consecutively, and identified as to location.
- F. All cylinders shall be immediately stored under wet sand or burlap for about 24 hours after preparation. All vibration or impact shall be avoided during this critical period.

- G. After initial storage, the cylinders (still in their molds) shall be packed in sealed polyethylene bags, wet sand or other resilient material for shipment to the testing laboratory.
- H. Concrete slump tests shall be made in accordance with ASTM C 143 and shall be taken as necessary to assure well-placed concrete.
- I. Engineer may require in-place tests per ASTM C42 or order a load test on structures as outlined in Chapter 20 of ACI 318, Building Code Requirements for Reinforced Concrete, where he questions the quality of the concrete placed. The Contractor is not responsible for the costs of performing the tests unless the tests indicate work by the Contractor was not in accordance with the Drawings or Specifications. The Contractor shall replace or repair work not in accordance with the Drawings or Specifications as directed by the Engineer and at no additional cost to the Owner.
- J. All slump and cylinder test samples shall be taken from the end of the discharge line.

PART 6 - QUALITY OF CONSTRUCTION

- 6.1 Cutting, patching and repair of any portion of the work after it has been completed shall be done as instructed by the Owners Representative.
- 6.2 Forms equipment, and other items required for construction shall be removed from the premises when they are no longer needed. Rubbish
- 6.3 and other materials not part of the final construction shall be removed on a weekly basis maximum.

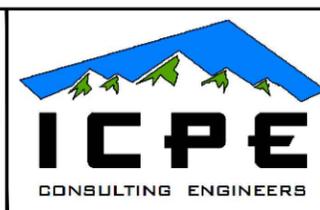
END OF SECTION 03300

Appendix A Drawings

WASHINGTON CITY GRAPEVINE SUBSTATION – PARKWAY TAP 138KV TRANSMISSION LINE



| No. | DATE | BY | APP | REVISION | REFERENCE DRAWING | NUMBER |
|-----|----------|-----|-----|------------|-------------------|--------|
| C | 04/30/25 | KAC | ML | 90% REVIEW | | |
| B | 11/29/24 | KAC | ML | 90% REVIEW | | |
| A | 08/23/24 | KAC | ML | 60% REVIEW | | |



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| | | | |
|------------|-----|------|----------|
| Des By: | KAC | Date | 08/23/24 |
| Drawn By: | KAC | Date | 08/23/24 |
| Chk'd. By: | ML | Date | - |
| ENGR. | ML | Date | - |
| APPD. | - | Date | - |
| APPD. | - | Date | - |

NOT FOR CONSTRUCTION

**WASHINGTON CITY
GRAPEVINE SUBSTATION – PARKWAY TAP
138KV TRANSMISSION LINE
COVER SHEET**

| | | | | | |
|-------------|---------|-------------|--------------|----------|---|
| SCALE | NTS | DRAWING No. | 071-079-E001 | REVISION | C |
| Project No. | 071-079 | | | | |

CONCRETE NOTES:

- CONCRETE MATERIALS, CONSTRUCTION AND WORKMANSHIP SHALL CONFORM TO ACI 318, AND IBC. ALL "APPROVALS" ARE BY THE ENGINEER. DRAWING INFORMATION CONFLICTING WITH THESE NOTES CONTROL.
- MATERIALS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
 - CONCRETE AGGREGATE - ASTM C33 (MAXIMUM SIZE 1-1/2 INCH)
 - REINFORCING STEEL (REBAR) - ASTM A615, GRADE 60
 - CEMENT - PORTLAND CEMENT, ASTM C150, TYPE V, TRICALCIUM ALUMINATE - 8% MAXIMUM
 - FLY ASH - ASTM C618, CLASS C OR F, 15% MAXIMUM AS CEMENT REPLACEMENT
 - COMPRESSIVE STRENGTH AT 28 DAYS (F'c) - 4500 PSI MINIMUM
 - SLUMP - 5 INCHES MAXIMUM
 - WATER TO CEMENT RATIO - 0.45 MAXIMUM
 - AIR ENTRAINMENT - 5 ± 1.5 PERCENT
 - CONCRETE WEIGHT - NORMAL
 - CHEMICAL ADMIXTURES - ASTM C494
 - CALCIUM CHLORIDE - NONE ALLOWED
- PROVIDE MINIMUM REBAR COVER CONFORMING TO ACI 318, CHAPTER 20 AS FOLLOWS:
 - CONCRETE DEPOSITED DIRECTLY AGAINST EARTH - 3" OR AS NOTED
 - CONCRETE EXPOSED TO WEATHER OR GROUND - 2"
- REBAR SPLICES SHALL CONFORM TO ACI 318, CHAPTER 25:

| | | | | |
|----------|----------|----------|------------|------------|
| #4 - 29" | #6 - 43" | #8 - 72" | #10 - 91" | #14 - 121" |
| #5 - 36" | #7 - 63" | #9 - 81" | #11 - 101" | |

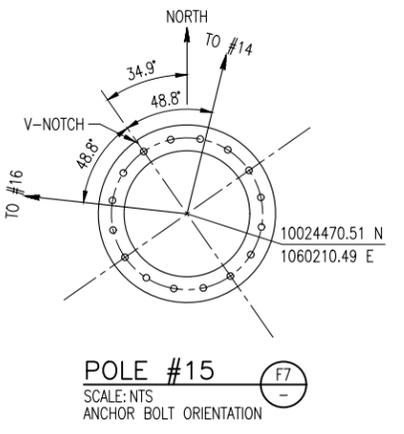
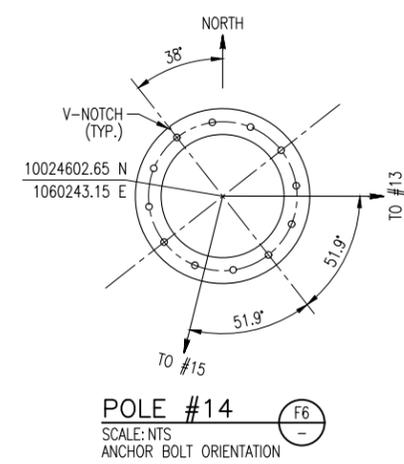
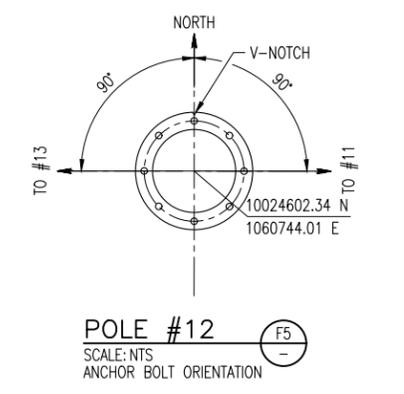
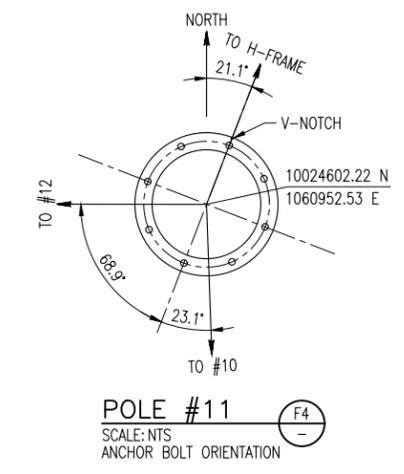
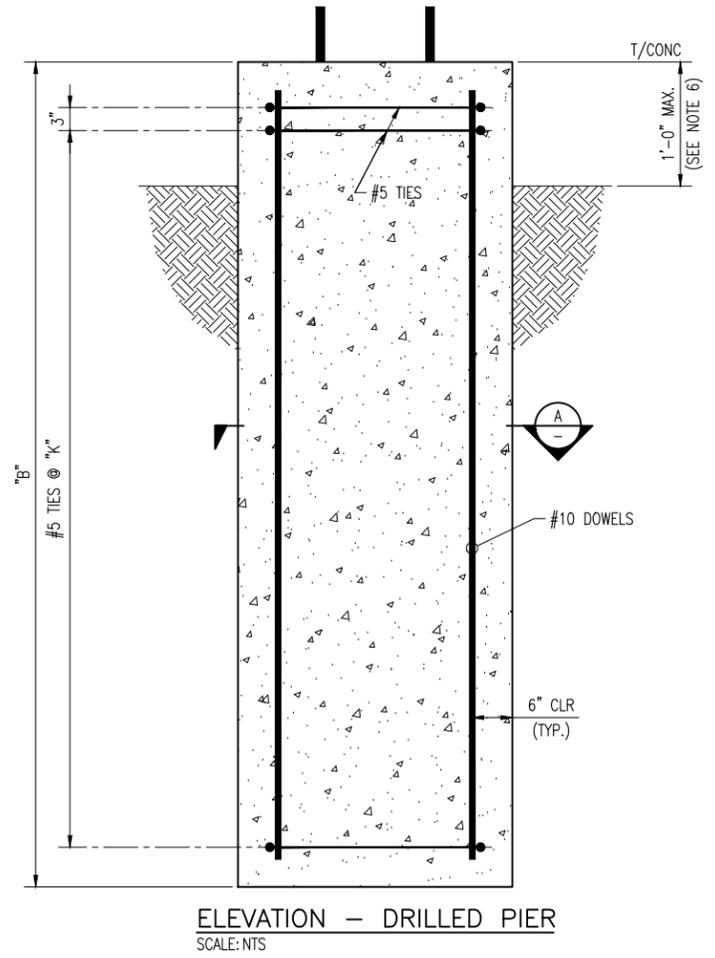
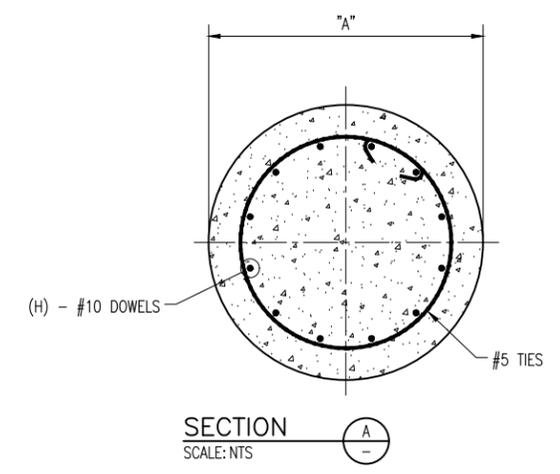
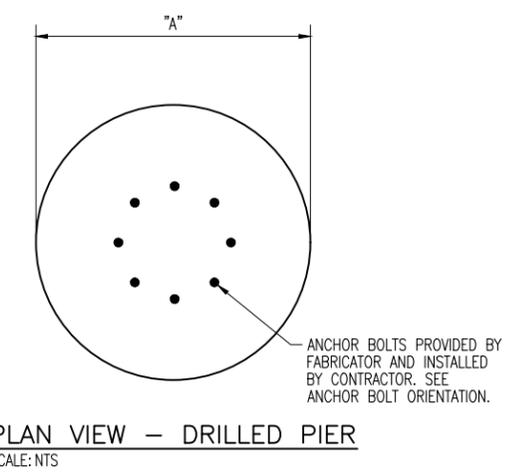
 REBAR SPACING - CLEAR DISTANCE GREATER THAN TWICE REBAR DIAMETER.
- COLD JOINT CONTACT SURFACES TO HAVE 1/4 INCH PROFILE AND LOCATIONS BE APPROVED.
- EXPOSED CONCRETE FINISH SHALL BE AS FOLLOWS:
 - EXPOSED - SMOOTH WITHOUT HONEYCOMBING OR FORM MARKS, LIGHT BROOM
- EXPOSED CORNERS SHALL HAVE A 3/4 INCH x 45 DEGREE CHAMFER.
- CONCRETE WORK IN HOT WEATHER (90+ DEGREES F) SHALL CONFORM TO ACI STANDARD 305.
- CONCRETE WORK IN COLD WEATHER (40- DEGREES F) SHALL CONFORM TO ACI STANDARD 306.
- EXPOSED (NON-FORMED) CONCRETE SURFACES SHALL HAVE SEVEN DAYS MOIST CURE OR A CURING COMPOUND APPLIED CONFORMING TO THE FOLLOWING:
 - ASTM C309 AND ASTM C1315
 - THIRTY PERCENT MINIMUM SOLIDS BY WEIGHT
- NOT USED
- PLACEMENT TOLERANCES
 - ANCHOR BOLTS (RODS)
 - LOCATION: ±1/8 INCH AT TOP OF ROD AND CONCRETE SURFACE
 - PROJECTION: + 1/2 INCH, - 0 INCH
 - PIER EXCAVATION
 - LOCATION: WITHIN 1/24 OF SHAFT DIAMETER BUT NOT MORE THAN 3 INCHES
 - PLUMB: MAXIMUM 1.5% OF PIER LENGTH AND 12.5% OF SHAFT DIAMETER, BUT NOT MORE THAN 15 INCHES
 - CONCRETE TOP OF PIER ELEVATION ±1 INCH
- CONCRETE SHALL BE PLACED PER ACI REQUIREMENTS WITH ONLY THE TOP 5'-0 OF CONCRETE PIERS REQUIRED TO BE CONSOLIDATED.
- TREMIE PIPE SHALL BE USED FOR CONCRETE PLACEMENT UNDER WATER WITH THE WATER LEVEL AT CASINGS BALANCED. THE END OF TREMIE SHALL REMAIN BELOW THE CONCRETE SURFACE DURING PLACEMENT AND THE SIDES OF EXCAVATION RETAINED.
- CONCRETE WITH FALL GREATER THAN 5'-0 SHALL BE PLACED WITH A HOPPER OR TREMIE TO PREVENT CONCRETE FROM HITTING EXCAVATED HOLE SIDES OR REINFORCEMENT.
- CASING OR APPROVED LIQUID STABILIZING AGENT SHALL BE USED WHEN PIER HOLE SIDES DO NOT STAND DUE TO SLOUGHING OR BOULDER REMOVAL OR IF BOTTOM OF A HOLE CANNOT BE KEPT FREE OF LOOSE DEBRIS.
- CASINGS SHALL BE STEEL CONFORMING TO ASTM A252 (GRADE 2) OR CONFORMING TO ASTM A36 OR ASTM A444 AND BE 1/4 INCH THICK MINIMUM IN SAFETY CONDITIONS. CASINGS LEFT IN PLACE SHALL HAVE EXTERIOR VOIDS FILLED WITH CONCRETE OR 1/2 INCH MAXIMUM COMPACTED GRANULAR MATERIAL AS DIRECTED BY THE ENGINEER.
- PIER DIAMETERS MAY BE INCREASED FOR PLACEMENT PURPOSES WITH THE SAME LENGTH AND USING THE SAME REBAR CONFIGURATION AS THE ORIGINAL PIER ON THE DRAWINGS.

DESIGN CRITERIAL

GEOTECHNICAL PARAMETERS:
 GEOTECHNICAL REPORT BY: LANDMARK TESTING & ENGINEERING
 TITLE: POLE FOUNDATION GRAPEVINE TRANSMISSION LINES
 DATED: SEPTEMBER 16, 2024
 PROJ. #: 240458

| PIER SCHEDULE | | | | | | |
|---------------|----------|-------|--------|----|-----|----------|
| ITEM | POLE NO. | A | B | H | K | COMMENTS |
| F4 | #11 | 6'-0" | 18'-0" | 18 | 10" | |
| F5 | #12 | 5'-0" | 16'-0" | 12 | 12" | |
| F6 | #14 | 7'-0" | 18'-0" | 24 | 8" | |
| F7 | #15 | 7'-0" | 18'-0" | 24 | 7" | |

NOTES:
 1. ANCHOR BOLTS PROVIDED BY POLE FABRICATOR.



NOT FOR CONSTRUCTION

WASHINGTON CITY
 GRAPEVINE SUBSTATION - PARKWAY TAP
 138KV TRANSMISSION LINE
 CONCRETE NOTES & DRILLED PIER DETAILS

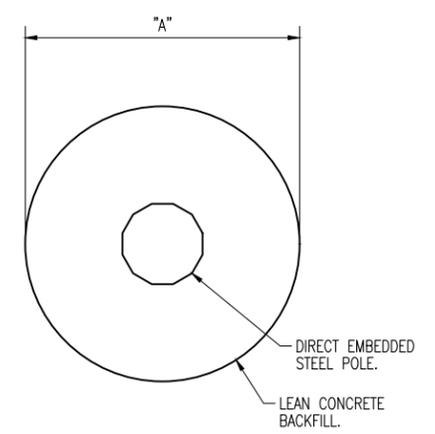
| No. | DATE | BY | APP | REVISION | REFERENCE DRAWING | NUMBER |
|-----|----------|-----|-----|--------------------|-------------------|--------|
| B | 07/17/25 | KAC | DJV | ISSUED FOR BIDDING | | |
| A | 04/30/25 | KAC | ML | 30% REVIEW | | |

| | | | |
|------------|-----|------|----------|
| Des By: | BDP | Date | 08/23/24 |
| Drawn By: | BDP | Date | 08/23/24 |
| Chk'd. By: | ML | Date | 08/23/24 |
| ENGR. | BDP | Date | 08/23/24 |
| APPD. | | Date | |
| APPD. | | Date | |

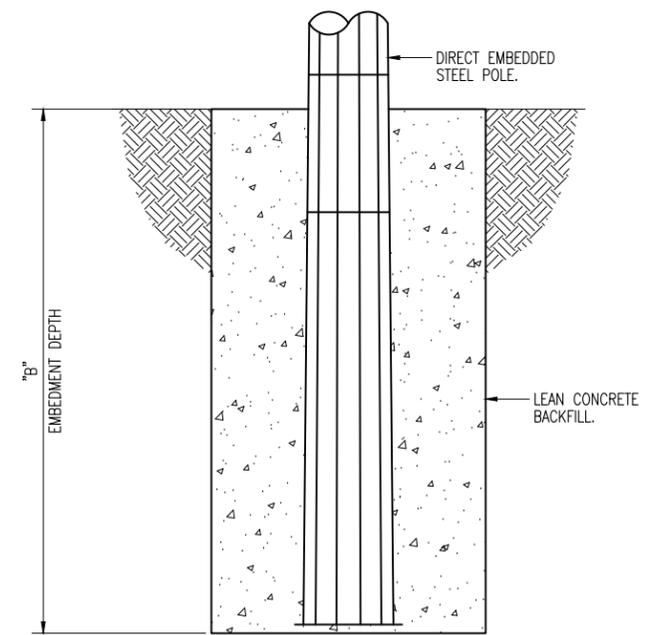
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|-------------|---------|-------------|--------------|----------|---|
| SCALE | NTS | DRAWING No. | 071-079-C101 | REVISION | B |
| Project No. | 071-079 | | | | |

| PIER SCHEDULE | | | | |
|---------------|--------------------------|-------|--------|----------|
| ITEM | POLE NO. | A | B | COMMENTS |
| F10 | 20, 21, 22 27, 28, 29 | 3'-6" | 14'-6" | - |
| F11 | 35 | 3'-6" | 15'-0" | - |

DESIGN CRITERIAL
 GEOTECHNICAL PARAMETERS:
 GEOTECHNICAL REPORT BY: LANDMARK TESTING & ENGINEERING
 TITLE: POLE FOUNDATION GRAPEVINE TRANSMISSION LINES
 DATED: SEPTEMBER 16, 2024
 PROJ. #: 240458



PLAN VIEW – DIRECT EMBEDDED POLE
 SCALE: NTS



ELEVATION – DIRECT EMBEDDED POLE
 SCALE: NTS

NOT FOR CONSTRUCTION

WASHINGTON CITY
GRAPEVINE SUBSTATION – PARKWAY TAP
138KV TRANSMISSION LINE
EMBEDDED POLE CONCRETE BACKFILL

| No. | DATE | BY | APP | REVISION | REFERENCE DRAWING | NUMBER |
|-----|----------|-----|-----|--------------------|-------------------|--------|
| B | 07/17/25 | KAC | DJV | ISSUED FOR BIDDING | | |
| A | 04/30/25 | KAC | DJV | 30% REVIEW | | |



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| | | | |
|------------|-----|------|----------|
| Des By: | BDP | Date | 08/23/24 |
| Drawn By: | BDP | Date | 08/23/24 |
| Chk'd. By: | ML | Date | 08/23/24 |
| ENGR. | DJV | Date | 07/17/25 |
| APPD. | - | Date | - |
| APPD. | - | Date | - |

| | | | | | |
|-------------|---------|-------------|--------------|----------|---|
| SCALE | NTS | DRAWING No. | 071-079-C103 | REVISION | B |
| Project No. | 071-079 | | | | |

WASHINGTON CITY

MAIN ST. TAP – GRAPEVINE SUBSTATION

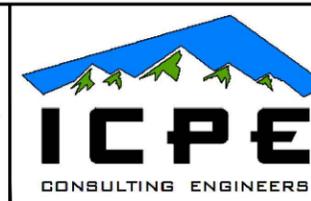
138KV TRANSMISSION LINE



NOT FOR CONSTRUCTION

**WASHINGTON CITY
MAIN ST. TAP – GRAPEVINE SUBSTATION
138KV TRANSMISSION LINE
COVER SHEET**

| No. | DATE | BY | APP | REVISION | REFERENCE DRAWING | NUMBER |
|-----|----------|-----|-----|------------|-------------------|--------|
| C | 04/30/25 | KAC | ML | 90% REVIEW | | |
| B | 11/29/24 | KAC | ML | 90% REVIEW | | |
| A | 08/23/24 | KAC | ML | 60% REVIEW | | |



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| | | | |
|------------|-----|------|----------|
| Des By: | KAC | Date | 08/23/24 |
| Drawn By: | KAC | Date | 08/23/24 |
| Chk'd. By: | ML | Date | - |
| ENGR. | ML | Date | - |
| APPD. | - | Date | - |
| APPD. | - | Date | - |

| | | | | | |
|-------|-----|-------------|--------------|----------|---|
| SCALE | NTS | DRAWING No. | 071-081-E001 | REVISION | C |
| | | Project No. | 071-079 | | |

CONCRETE NOTES:

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 - SLUMP - 5 INCHES MAXIMUM
 - WATER TO CEMENT RATIO - 0.45 MAXIMUM
 - AIR ENTRAINMENT - 5 ± 1.5 PERCENT
 - CONCRETE WEIGHT - NORMAL
 - CHEMICAL ADMIXTURES - ASTM C494
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- PROVIDE MINIMUM REBAR COVER CONFORMING TO ACI 318, CHAPTER 20 AS FOLLOWS:
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| | | | | |
|----------|----------|----------|------------|------------|
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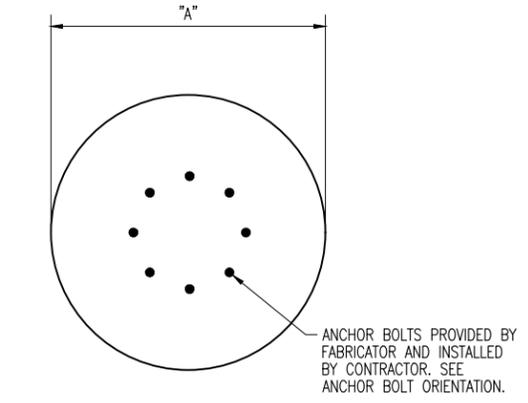
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 - THIRTY PERCENT MINIMUM SOLIDS BY WEIGHT
- NOT USED
- PLACEMENT TOLERANCES
 - ANCHOR BOLTS (RODS)
 - LOCATION; ±1/8 INCH AT TOP OF ROD AND CONCRETE SURFACE
 - PROJECTION; + 1/2 INCH, - 0 INCH
 - PIER EXCAVATION
 - LOCATION; WITHIN 1/24 OF SHAFT DIAMETER BUT NOT MORE THAN 3 INCHES
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DESIGN CRITERIAL

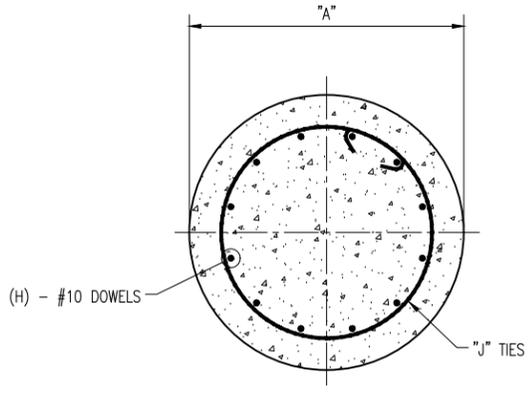
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 GEOTECHNICAL REPORT BY: LANDMARK TESTING & ENGINEERING
 TITLE: POLE FOUNDATION GRAPEVINE TRANSMISSION LINES
 DATED: SEPTEMBER 16, 2024
 PROJ. #: 240458

| PIER SCHEDULE | | | | | | | |
|---------------|----------|-------|--------|----|----|----|----------|
| ITEM | POLE NO. | A | B | H | J | K | COMMENTS |
| F1 | #5 | 5'-6" | 13'-0" | 15 | #4 | 7" | - |
| F2 | #7 | 5'-6" | 13'-0" | 15 | #4 | 7" | - |
| F3 | #10 | 7'-0" | 18'-0" | 24 | #5 | 8" | - |

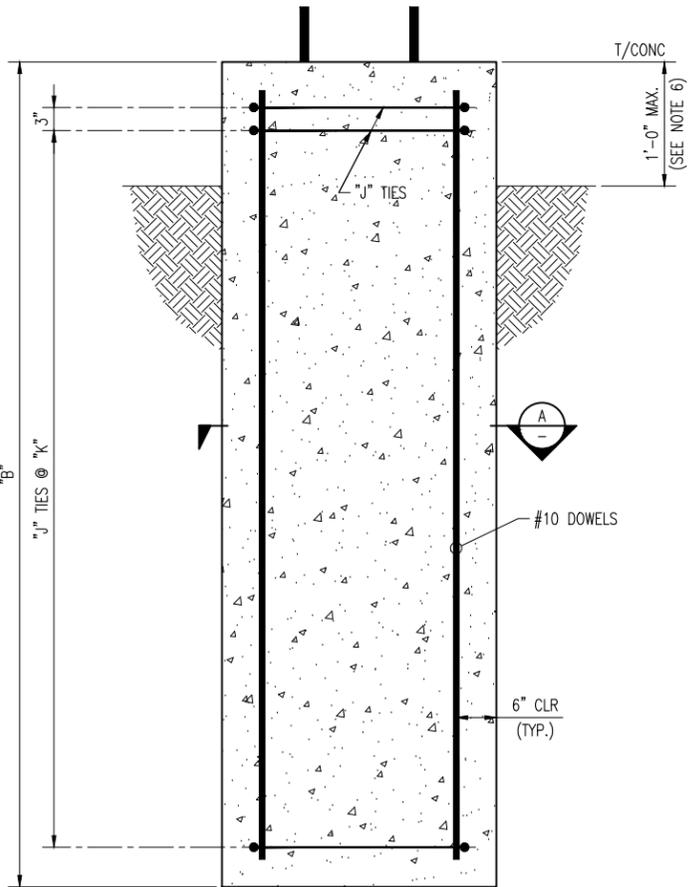
NOTES:
 1. ANCHOR BOLTS PROVIDED BY POLE FABRICATOR.



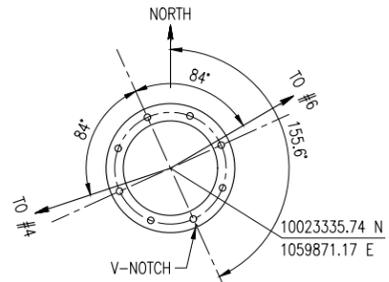
PLAN VIEW - DRILLED PIER
SCALE: NTS



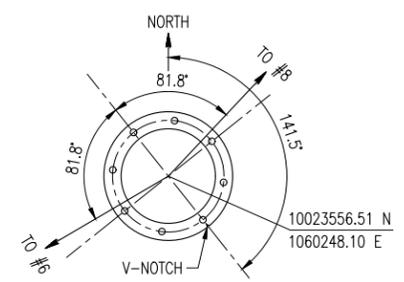
SECTION
SCALE: NTS



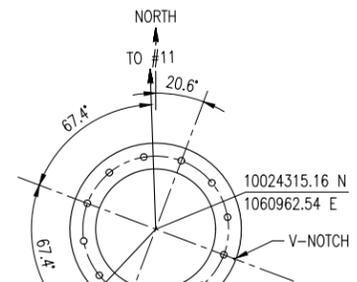
ELEVATION - DRILLED PIER
SCALE: NTS



POLE #5
SCALE: NTS
ANCHOR BOLT ORIENTATION



POLE #7
SCALE: NTS
ANCHOR BOLT ORIENTATION



POLE #10
SCALE: NTS
ANCHOR BOLT ORIENTATION

NOT FOR CONSTRUCTION

**WASHINGTON CITY
 GRAPEVINE SUBSTATION - PARKWAY TAP
 138KV TRANSMISSION LINE
 CONCRETE NOTES & DRILLED PIER DETAILS**

| | | |
|---------------------|--------------------------|-------------|
| SCALE: NTS | DRAWING No. 071-081-C102 | REVISION: B |
| Project No. 071-079 | | |

| | | | | | | | | | |
|-----------------|----------|----------|-----|--|--|--------|--|--|--|
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| No. DATE BY APP | | REVISION | | REFERENCE DRAWING | | NUMBER | | | |
| B | 07/17/25 | KAC | DJV | ISSUED FOR BIDDING | | | | | |
| A | 04/30/25 | KAC | ML | 30% REVIEW | | | | | |

Appendix B

Geotechnical Report

GEOTECHNICAL INVESTIGATION REPORT

Prepared for:

Washington City Power
Department
Attn.: Rick Hansen
111 North 100 East
Washington, Utah 84780

September 16, 2024

Pole Foundations Grapevine Transmission Lines

Prepared by:



795 East Factory Drive
St. George, UT 84790

Landmark Project No: 240458

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

conspicuously that you’ve included the material for information purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* **Confront the risk of moisture infiltration** by including building-envelope or mold specialists on the design team. **Geotechnical engineers are not building-envelope or mold specialists.**



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September 16, 2024

Washington City Power
Attention: Rick Hansen
4250 Telegraph St, Washington, UT 84780
Washington, UT 84780

Subject: Geotechnical Engineering Report
Pole Foundations – Grapevine Transmission Lines
Washington, Utah
Landmark Project No.: 240458

Reference: *Geotechnical Investigation Report, Grapevine Trailhead and Substation*
Landmark Project No. 220270, dated July 8, 2022.

Rick;

As requested, we have completed our Geotechnical Investigation for the above noted project. Our geotechnical recommendations, along with our field and laboratory data are presented in this report. Our scope of services was based on the Specification Documents prepared by ICPE dated June 2024, as outline in our Proposal YP5001, dated July 8, 2024

Our field investigation consisted of the drilling of six (6) boring for this specific project, and an additional boring which was completed for the attached substation project. The borings were advanced with hollow-stem auger and air-rotary methods. Soils consisted of medium dense silty sands and sandy silts to between 5.0 and 13.0 feet, underlain by weak bedrock formations (sandstone, siltstone, claystone and mudstone).

Drilled shafts are specified for support of the proposed self-supporting towers. Loading for the towers will not be known until the steel towers have been bid, therefore, the diameter of the shafts is not yet known. We have provided LPile parameters, layers thickness, and expected axial capacity for the potential shaft sizes.

Please feel free to contact our office at (435) 986-0566 if you have any questions.

Sincerely,

LANDMARK TESTING AND ENGINEERING

Steven Wells, P.E.
Geotechnical Manager

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1.0 INTRODUCTION

This report presents the results of Landmark Testing & Engineering’s geotechnical investigation for the Grapevine Transmission Lines to be constructed in the Green Springs area of Washington, Utah. Figure A-1 is a Vicinity Map showing the project location relative to surrounding features. Figure A-2 is a Site Map showing the proposed project layout and the approximate locations of the borings completed for this investigation.

We have previously completed a Geotechnical Investigation Report for the Grapevine Trailhead and Substation, Landmark Project No. 220270. Boring 4 from this project was located near one of the self-supporting tower locations for the current investigation. Information obtained from 20270, including field and laboratory test results, were used in the preparation of recommendations for this project. Pertinent data, including the boring log for Boring 4 of the trailhead report, have been incorporated into this report.

This investigation was completed to assist in developing opinions and recommendations concerning site earthwork and foundation design.

2.0 PROPOSED CONSTRUCTION

We understand that the proposed construction will consist of the construction of a new high-voltage electrical transmission line from an existing line along Interstate 15, connecting that line to a new substation at the Grapevine Wash Trailhead and extending west along Washington Parkway. Construction will include self-supporting towers at points where the transmission line turns or “dead ends.” The line between these towers will be supported by monopoles.

Loads for the self-supporting towers will not be known until the actual towers are bid. We estimate axial loading on the order of up to 100 kips. We understand that lateral capacity of the tower and drilled shafts will govern shaft dimensions for both depth and diameter

Any significant changes to the anticipated development should be reviewed by Landmark to evaluate the continued applicability of the recommendations contained in this report.

3.0 SITE SETTING

3.1 SURFACE CONDITIONS

We understand that the tower sites have been rough graded to within 1 or 2 feet of the finished grade. The tower sites along Washington Parkway are located on the south side of the right-of-way, and were constructed of between 2 and 6 feet of onsite soil placed as general fill. To our knowledge, this fill was not placed and compacted to structural fill standards. The other tower locations were in areas where no fill has been placed. Only minimal vegetation was present on the lower sites.

3.2 **GEOLOGIC SETTING**

According to the Utah Geological Survey,¹ the project site is mapped as located on:

- Qes Eolian sand deposits** - Well- to very well-sorted, very fine- to medium-grained, well-rounded, frosted quartz sand; derived principally from the Navajo and Kayenta Formations; underlain by thick pedogenic carbonate in most areas; deposited as an irregular blanket from 0 to 30 feet thick.
- Qed Eolian dune sand deposits** - Well- to very well-sorted, very fine to medium-grained, well-rounded, frosted quartz sand; derived principally from the Navajo and Kayenta Formations; forms small dunes on Qes deposits; 0 to 15 feet thick.

Underlain by bedrock layers from the following formation.

- Jk Kayenta Formation** - Interbedded, thin- to medium-bedded, moderate-reddish-brown to moderate-reddish-orange siltstone, fine-grained sandstone, and mudstone with planar, low-angle, and ripple cross-stratification; contains several poorly exposed, 1- to 5-inch-thick, light-olive-gray weathering, light-gray dolomite beds; lower part weathers to poorly exposed, commonly gypsiferous slopes, upper part to ledges and small cliffs; upper contact locally marked by a 3- to 8-inch-thick, light-gray limy dolomite bed; deposited in fluvial, distal fluvial/playa, and minor lacustrine environments; 925 feet thick.

Subsurface soils were consistent with the eolian sand deposits and bedrock encountered was consistent with the layers of the Kayenta Formation.

3.3 **GEOLOGIC HAZARDS**

The St. George basin lies within the transitional zone between the Colorado Plateau to the east and the Basin and Range Province to the west. Southwestern Utah is located on a structural block proximate to the southern segment of the Intermountain Seismic belt, which is characterized by high-angle normal faults that tend to step down to the west. The Hurricane fault with an offset of 6,000 to 8,000 feet forms the eastern edge of the transition zone. The Grand Wash-Reef Reservoir-Gunlock fault system with displacement of about 1,500 to 3,000 feet forms the western edge.

Fault Rupture

The trace of the Hurricane fault is located approximately 11 miles east of the site. Higgins and Willis indicate that the Hurricane fault displaces late Quaternary sediments and is considered active. The projected trace of the Washington fault crosses the site near the western end of the alignment, within the Solente Development. The Washington fault displaces late Quaternary sediments and is considered active. Strong ground motion associated with movement along the Hurricane or other faults associated with the Intermountain Seismic Belt is possible.

¹ Willis, G.C. and Higgins, J.M., 1995, Interim Geologic Map of the Washington, Utah 7.5-minute Quadrangle, Washington County, Utah; Utah Geological Survey Map OFR 324

Liquefaction

Liquefaction is the sudden loss of shear strength in the soil due to the build-up of excess pore water pressure.² This can occur when the soil is subjected to intense shaking such as during a seismic event. The soils that are most susceptible to liquefaction are loose, saturated sandy soils with a low fines content (material passing the #200 sieve).

According to the Utah Geological Survey,³ the soils in the project area are mapped as being within a potentially high and moderate liquefaction-susceptibility zones. Soils encountered in the borings and test pits are relatively clean silty sands overlying bedrock. These types of soils may be considered susceptible to liquefaction in the presence of shallow ground water. Groundwater was not encountered in our borings or test pits during our investigation and therefore liquefaction potential may be considered low.

Even though the site is shown on the map as having a moderate to high liquefaction hazard, a detailed liquefaction analysis was not conducted for the site for the following reasons:

- Groundwater was not encountered in our borings at the time of our investigation, and based on soil properties and site elevation, is not expected to rise to an elevation above the bedrock. “Groundwater” on the site will likely only occur during flood events. By code, floods and earthquakes are considered “extreme events;” extreme events are taken as separate events, and highly unlikely to occur simultaneously, therefore, are not considered as occurring together.
- Potential flood (flash flood) hazard areas are located in the area of the Mill Creek wash, which is part of the open space within the proposed development.
- Soils which constituted the hazard were typically shallow, and during the course of grading, as outlined in Section 5.1 of this report, the loose condition of these soils will be mitigated.

Based on this data, it is our opinion that the likelihood of seismically induced liquefaction is negligible.

3.4 SEISMICITY

Seismicity at the site was determined using the Structural Engineers Association (SEA), OSHPD Seismic Design Maps website. The location used for determination of the seismic design values was location within the Grapeview Wash Substation, and the values listed below are the values listed in our report for the substation. The following values are presented to assist with seismic design:

- Latitude = 37.15035° North, Longitude = 113.48842° West (within substation)
- Risk Category II
- Site Class = C (Very Dense Soil and Soft Rock), based on ASCE 7-16 (Table 20.3.1) as referenced in 2021 IBC 1613.3.2

2 Coduto, Donald P. (1999), Geotechnical Engineering: Principles and Practices, Prentice Hall, Upper Saddle River, NJ

3 St. George-Hurricane Metropolitan Area Geologic-Hazard Study, Knudsen, Tyler R., Utah Geologic Survey Special Study 127.

| Period (sec) | Sa (g) | Site Class |
|--------------|------------------|------------|
| 0.2 | $S_S = 0.557$ | B / C |
| 1.0 | $S_1 = 0.180$ | B / C |
| 0.2 | $S_{DS} = 0.474$ | C |
| 1.0 | $S_{D1} = 0.180$ | C |

(ASCE 7-16, SEA, Structural Engineers Association, <https://seismicmaps.org/>)

As per Section 20.1 of ASCE 7-16, “The soil shall be classified in accordance with Table 20.3-1 and Section 20.3 based on the upper 100 feet of the site profile.” However, Section 20.1 continues, “Where site specific data are not available to a depth of 100 feet, appropriate soil properties are permitted to be estimated by the registered design professional preparing the soil investigation report based on known geologic conditions.” Based on our engineering experience in the area, mapped geology and the soils encountered in the borings and test pits, it is the opinion of Landmark Testing and Engineering that the soils on site classify as Site Class C.

Landmark has previously conducted ReMi (Refraction Micro-Tremor) shear wave velocity studies to the south of the alignment, in areas underlain by similar subsurface conditions. Shear wave velocities were consistent with a Site Class C.

4.0 INVESTIGATION

4.1 FIELD INVESTIGATION

To investigate the subsurface conditions, seven (7) total borings were drilled to a depth of up to 43.5 feet. The borings were drilled with a CME 55 drill rig utilizing 8.0-inch O.D. hollow-stem augers. Samples were obtained with a 2.5- inch O.D., split barrel, sampler driven with a 140-lb auto hammer dropping 30 inches. When competent bedrock conditions were encountered, the rock was cored with an NQ sized wire-line core barrel using air as the cutting fluid. Depending on subsurface conditions, core, bag or tube samples of soils were obtained from the borings. Blowcounts shown on the attached log have not been corrected, and represent field values.

A Landmark geologist, Gregory Kaiser, supervised the drilling. A log of the subsurface conditions was prepared, samples collected sealed for transport, and relevant site photographs taken during the field investigation.

Groundwater was not encountered in the borings at the time of investigation.

The Logs of Borings are presented on Figures A-3 through A-11. A key to the soil classifications used on the logs is also attached.

Subsurface soils and bedrock consisted of the following profile:

- Up to 6 feet of moderately compacted fill. The fill was only present in Borings 5 to 7, along Washington Parkway. The fill appeared to have been sourced from the area of the site, and was silty sand (SM) with varying amounts of gravel and occasional cobbles. Uncorrected blowcounts ranged from 6 to 33; consistent to poorly to moderately compacted fill. This soil was dry to slightly moist with depth.

- Native silty soils, both sandy silt and silty sand (ML and SM). These soils either were present at the surface, or were present below the fill. Blowcounts in these soils ranged from 22 to 63, indicating medium dense to dense soils. This soil was dry to slightly moist with depth.
- The bedrock formation (Kayenta Formation) is highly layered. These layers have been exposed in the new road cut at the entrance to the Grapevine Wash Trailhead. Individual layers of bedrock encountered in the borings included: limestone, siltstone, mudstone, and sandstone. These layers ranged in thickness from 6 inches to 10 feet. In locations where we attempted to drive the sampler, sampler refusal was encountered. Sampler refusal is defined as the condition when the sampler cannot be driven 6 inches in 50 blows of the hammer. In these cases, we switched to rock coring. These layers were relatively weak, and competent, intact cores could not be collected; our cores were poor representation of the bedrock. Based on these conditions, the “bedrock” is defined as an intermediate geo-material; a material that too weak to be considered bedrock and too well cemented to be defined as a soil. Axial and lateral design of drilled shafts are treated differently for each of the 3 cases.

4.2 LABORATORY TESTING

Soil samples from the borings were taken to our St. George, Utah laboratory for testing. Tests performed on the samples included:

- Moisture content and unit weight for density determination
- Sieve analysis and Atterberg Limits for soil classification
- Soluble Sulfate Content for concrete mix design selection

Testing for adjacent projects, including the substation, included:

- Unconfined compressive strength
- Direct Shear of $\frac{3}{4}$ -minus material

The results of the laboratory tests are shown on the Boring Logs on Figures A-3 through A-11 and on the Summary of Laboratory Test Results on Table B-1. Individual test results are also included in Appendix B.

The moisture content of the samples tested ranged from 1.4 to 8.7 percent, with a single outlier measured within a mudstone layer, which was 23.5 percent. The dry density of the samples tested ranged from 92.2 to 131.9 pcf.

Atterberg Limits indicated that the soil was non-plastic, and that a large portion of the bedrock was also non-plastic. The mudstone bedrock had liquid limits between 21 and 30, and plasticity indexes between 4 and 14. The high values did not correspond to each other. These values are consistent with materials found within the Kayenta Formation.

The condition of the cores recovered from these borings was not suitable for uncompressed strength testing. The condition of the cores generally indicates a low compressive strength. Samples of the mudstone bedrock from the parcel directly to the south of this site were tested. The unconfined compressive strength of the claystone/mudstone ranged from 640 to 2,240 psi, which is low for a bedrock material. Additional field testing with a Schmidt Hammer was

conducted during construction of the Grapevine Wash Trailhead produced compressive strengths of up to 3,500 psi for intact sandstone.

We conducted a large-scale direct shear test on a sample of the 3/4-minus material from the Green Springs area previously. Due to the generally shallow thickness of the “soil” on the site, specific direct shear testing on the upper soils was not warranted. For drilled shaft design, the upper 5 feet of soil is generally not considered for capacity. The compacted internal angle of friction of the Green Springs silty sands was 33 degrees.

4.3 ANALYSIS AND CONCLUSIONS

The following items were noted for design of the project during our field and laboratory testing programs:

- The soils and bedrock encountered on the site are suitable for open hole drilled shaft construction.
- Casing of the shaft excavations, beyond the surface forming, does not appear to be required.
- Groundwater was not encountered in our borings, however, we have noted groundwater related to springs in the area.
- Concrete placed for the shafts should be designed for Sulfate Exposure Class S2 for corrosion protection.
- The surface sands have low lateral strength, and are generally neglected for lateral support of large scale drilled shafts.
- The bedrock/IGM was variable in composition, and based on the depth of the shafts, and the required factor of safety, break-out of the individual layers is not warranted.
- Fixity is expected to be at the contact point between the soil and the bedrock/IGM.
- Based on the soil profiles found in the borings, lateral design of the shafts can be segregated into 2 profiles, a shallow bedrock/IGM profile, and a deeper soil layer profile.
- No specific precautions appear to be required, beyond the typical workmanship details for shaft construction.

5.0 DRILLED SHAFT DESIGN PARAMETERS

5.1 MATERIAL PROPERTIES

We anticipate that towers will be supported on drilled shaft foundations. The upper 5 feet of soils should be discounted for unsuitable soils or frost action. Foundation excavation should be visually observed and tested by qualified personnel prior to the placement of reinforcement and concrete. Additionally, we have provided LPile parameters for each soil type encountered during our investigation for design in the following tables.

| Soil Type | Total Unit Weight (pcf) | ϵ_{50} (in/in) | K value (lb/in ³) | Friction Angle | Cohesion (psf) | Unconfined Compressive Strength (psi) | Modulus of Elasticity (psi) |
|----------------------------|-------------------------|-------------------------|-------------------------------|----------------|----------------|---------------------------------------|-----------------------------|
| SM gravelly (Sand – Reese) | 93.0 | N/A | 60 | 33 | 0 | N/A | 5,500 |

| Rock Type | Effective Unit Weight (pcf) | Unconfined Compressive Strength (psi) | Rock Modulus (psi) | RQD | K value (lb/in ³) |
|-------------------|-----------------------------|---------------------------------------|--------------------|----------|-------------------------------|
| Mixed (Weak Rock) | 120.0 | 1,000 | 50,000 | 20 (max) | 0.0005 |

5.2 SUBSURFACE PROFILE

Based on our field investigation, 2 individual subsurface profiles are appropriate for the analysis of the proposed tower drilled shafts.

Towers 6, 8, 11, 12, 15, 16 and 22 (Borings B-1 to B-6)

- Silty Sand (SM) Both fill and native 0-5 feet Sand (Reese)
- Bedrock All types 5- to depth Weak rock

Tower 29 (Boring 7)

- Silty Sand (SM) Both fill and native 0-15 feet Sand (Reese)
- Bedrock All types 15- to depth Weak rock

5.3 PRELIMINARY LPILE ANALYSIS / PUSH-OVER

Analysis for lateral capacity was conducted for each soil profile was conducted for 1-foot increment drilled shafts from 4 to 7 feet in diameter. Reinforcement was set as #4 rings at 12 inches o.c. and vertical reinforcement to meet code minimum As.

Graphs for lateral pushover are included in Appendix C. Both shear and moment graphs are presented for each condition for shafts with diameters of 4, 5, 6, and 7 feet based on typical tower base diameters.

5.4 AXIAL CAPACITY

Axial capacity of the shafts can be designed based on end bearing loading in bedrock below the point of fixity. Fixity will occur at the point where lateral bending of the shaft becomes negligible. This point will be roughly at the contact with bedrock under the expected loading. Increased loading will cause this point to occur below the contact layer.

The ultimate endearing resistance can be taken as 20 ksf. For a 4-foot diameter shaft, the unfactored axial capacity of the shaft will be 250 kips. These values are conservative as they discount skin friction, but are in excess of the expected axial loading.

6.0 FOUNDATION REVIEW AND TESTING

This report has been prepared to assist in project design and construction. Variations from the conditions portrayed in the exploratory investigations may occur which are sometimes sufficient to require modifications to the design. In order to incorporate recommendations provided into actual field conditions and to confirm that the project specifications are implemented, we recommend that observation and testing be performed during construction to monitor over-excavation, grading, and preparation of soils upon which foundations elements or structural loads may be established.

7.0 LIMITATIONS

The exploratory data presented in this report were collected to provide geotechnical design recommendations for this project and subsurface site descriptions represent conditions observed at the time and at the locations explored. The investigations may not be indicative of subsurface conditions beyond the investigation location and conditions may change with passage of time. If subsurface conditions are encountered that are significantly different than those reported herein, Landmark should be contacted immediately for the continued applicability of the recommendations. In the event changes to the project are made that differ from those presented in this report, Landmark should be made aware of the changes. Landmark will provide written verification that the recommendations and conclusions remain valid or that modifications are required.

This report has been prepared to assist in project design and construction. We respectfully request the opportunity to review the final design drawings and specifications in order to determine whether the assumptions and recommendations presented herein are applicable to the anticipated designs.

This report is not intended to be used as the sole bid document. Any information concerning the environmental conditions of the site is beyond the scope of this geotechnical study. This geotechnical report has been prepared to meet the specific needs of our client and may not be appropriate to satisfy the needs of other users.

Site conditions and standards of practice change, therefore, we should be notified to review and update the report and its recommendations if construction is not commenced within 3 years of the date it was issued.

LANDMARK TESTING & ENGINEERING

John M. Anderson, P.E.
Professional Engineer

Reviewed by:

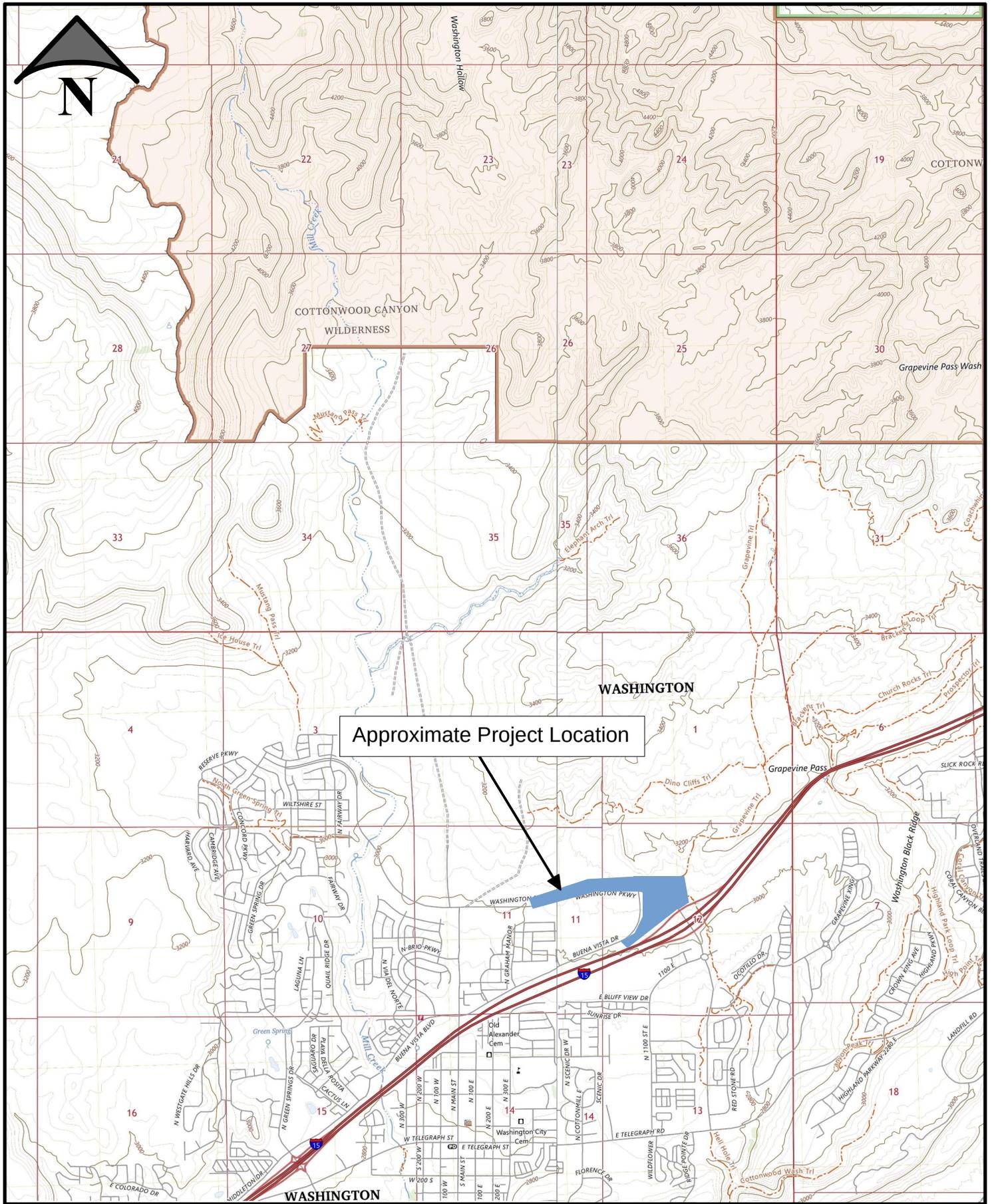


Kent R. Nelson, P.E.
Professional Engineer



APPENDIX A

Field Investigation



Vicinity Map
Landmark Project No 240458

Figure A-1



Site Map
 Landmark Project No 240458

Figure A-2

BORING NUMBER B-1

START DATE: 2024-07-25

DRILLING COMPANY: South Slope Drilling

LOGGED BY: Greg Kaiser

DRILL RIG: CME-75

REVIEWED BY: John Anderson

LATITUDE/LONGITUDE: 37.14620 -113.49214

NOTES:

GROUNDWATER: _____ feet _____ feet

| Depth (ft) | Soil Symbol | Samples No. | 3.0-inch Modified California Symbols | Lithologic Description | Dry Density (pcf) | Moisture (%) | Atterberg Limits | | Gravel | Sand | #200 Fines | Consolidation | Water-Soluble Sulfate (%) | Modified Proctor | Unconfined Compression |
|----------------|-------------|-------------|--------------------------------------|---|-------------------|--------------|------------------|--------|--------|------|------------|---------------|---------------------------|------------------|------------------------|
| | | | | | | | LL (%) | PI (%) | | | | | | | |
| Ground Surface | | | | | | | | | | | | | | | |
| 0 | | | | NATIVE: Silty SAND (SM) Loose to medium dense, dry to slightly moist, fine to medium grained, reddish brown | | | | | | | | | | | |
| | BG M | | 41 | 3.5 ft | 92.2 | 3.8 | | | | | | | | | |
| 5 | B | | 45 | Sandy SILT (ML) Very stiff, dry to slightly moist, fine to medium grained, reddish brown to gray | | | | | | | | | 0.72 | | |
| | | | | BEDROCK: SILTSTONE Weathered, weakly to moderately cemented, dry to slightly moist, fine to medium grained, reddish brown, grades denser with depth | | | | | | | | | | | |
| | | | 50(5.5") | 15 ft | | | | | | | | | | | |
| | | | 50(2.5") | BEDROCK: CLAYSTONE weathered to Sandy Lean CLAY (CL) Moderately to well cemented, dry to slightly moist, fine to medium grained, reddish brown, brown to purple dust coming out of air rotary | | | | | | | | | | | |
| | BG | | 50(4") | 25 ft | 4 | 25 | 9 | 3 | 37 | 60 | | | | | |
| | BG | | 50(1") | B-1 Terminated at 25' | | | | | | | | | | | |

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PROJECT NAME: Grapevine Transmission Line Power Poles
CLIENT: Washington City
Project No.: 240458
Project Location: Washington, Utah

FIGURE A-4

BORING NUMBER B-2

START DATE: 2024-07-25

DRILLING COMPANY: South Slope Drilling

LOGGED BY: Greg Kaiser

DRILL RIG: CME-75

REVIEWED BY: John Anderson

LATITUDE/LONGITUDE: 37.14701 -113.49054

NOTES:

GROUNDWATER: _____ feet _____ feet

| Depth (ft) | Soil Symbol | Samples No. | 3.0-inch Modified California Symbols | Lithologic Description | Dry Density (pcf) | Moisture (%) | Atterberg Limits | | Gravel | Sand | #200 Fines | Consolidation | Water-Soluble Sulfate (%) | Modified Proctor | Unconfined Compression |
|----------------|-------------|-------------|--------------------------------------|--|-------------------|--------------|------------------|--------|--------|------|------------|---------------|---------------------------|------------------|------------------------|
| | | | | | | | LL (%) | PI (%) | | | | | | | |
| Ground Surface | | | | | | | | | | | | | | | |
| 0 | | | | NATIVE: Silty SAND (SM) Loose to medium dense, slightly moist, fine to medium dense, reddish brown | | | | | | | | | | | |
| | BG M | | 38 | | | | | | | | | | | | |
| | | | | Sandy Silty CLAY (CL-ML) Very stiff, dry to slightly moist, fine to medium dense, reddish brown | | | | | | | | | | | |
| 5 | B M | | 63 | | | | | | | | | | | | |
| | | | | BEDROCK: SILTSTONE Weakly to moderately well cemented, dry to slightly moist, fine to medium dense, reddish brown | 107.9 | 4 6.8 | 21 | 14 | 5 | 36 | 59 | | | | |
| 10 | BG | | 50(3.5") | | | | | | | | | | | | |
| | | | | BEDROCK: CLAYSTONE weathered to Sandy Lean CLAY (CL) Moderately to well cemented, dry to slightly moist, fine to medium grained reddish brown, switched to air rotary at 10' | | | | | | | | | | | |
| 15 | BG | | 50(3.5") | | | | | | | | | | | | |
| | | | | Brown to reddish brown with slight purple | | | | | | | | | | | |
| 20 | BG | | 50(3") | | | | | | | | | | | | |
| | | | | B-2 Terminated at 20' | | | | | | | | | | | |

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PROJECT NAME: Grapevine Transmission Line Power Poles
CLIENT: Washington City
Project No.: 240458
Project Location: Washington, Utah

BORING NUMBER B-3

START DATE: 2024-07-24

DRILLING COMPANY: South Slope Drilling

LOGGED BY: Greg Kaiser

DRILL RIG: CME-75

REVIEWED BY: John Anderson

LATITUDE/LONGITUDE: 37.14899 -113.48823

NOTES:

GROUNDWATER: _____ feet _____ feet

| Depth (ft) | Soil Symbol | Samples No. Symbols | 3.0-inch Modified California | Lithologic Description | Dry Density (pcf) | Moisture (%) | Atterberg Limits | | Gravel | Sand | #200 Fines | Consolidation | Water-Soluble Sulfate (%) | Modified Proctor | Unconfined Compression |
|----------------|-------------|---------------------|------------------------------|--|-------------------|--------------|------------------|--------|--------|------|------------|---------------|---------------------------|------------------|------------------------|
| | | | | | | | LL (%) | PI (%) | | | | | | | |
| Ground Surface | | | | | | | | | | | | | | | |
| 0 | | | | NATIVE: Silty SAND (SM) Loose to medium dense, dry to slightly moist, fine to medium grained, reddish brown, common gravel | | | | | | | | | | | |
| | | BG M | 22 | | 109.6 | 8.7 | | | | | | | | | |
| 5 | | M | 33 | | | | | | | | | | | | |
| | | | | 9 ft | | | | | | | | | | | |
| 10 | | M | 56 | Sandy Silty CLAY (CL-ML) Hard, slightly moist, fine to medium grained, brown, common gravel | 117.7 | 7.9 | | | | | | | | | |
| | | | | 12.5 ft | | | | | | | | | | | |
| 15 | | BG M | 79(4") | SILTSTONE Weathered, weakly to moderately cemented, fine to medium grained brown, with gravel | | 7.7 | 0 | 0 | 33 | 26 | 41 | | | | |
| | | | | 15.5 ft | | | | | | | | | | | |
| | | | | CALICHE Caliche layer | | | | | | | | | | | |
| | | | 50(0.5") | 18.5 ft | | | | | | | | | | | |
| 20 | | | | BEDROCK: SANDSTONE weathered to Silty GRAVEL with Sand (GM) Very weak to weak | | | | | | | | | | | |
| | | | 50(2") | | | | | | | | | | | | |
| 30 | | BG | 50(2.5") | | | | 0 | 0 | 44 | 24 | 32 | | | | |
| | | | | 35 ft | | | | | | | | | | | |
| 35 | | | 50(1.5") | B-3 Terminated at 35' | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | | |

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PROJECT NAME: Grapevine Transmission Line Power Poles
CLIENT: Washington City
Project No.: 240458
Project Location: Washington, Utah

FIGURE A-6

BORING NUMBER B-4

START DATE: 2022-05-26

DRILLING COMPANY: South Slope Drilling

LOGGED BY: Dave Baldazzi

DRILL RIG: CME-55

REVIEWED BY: John Anderson

LATITUDE/LONGITUDE: _____

NOTES: _____

GROUNDWATER: _____ feet _____ feet

| Depth (ft) | Soil Symbol | Samples No. Symbols | 3.0-inch Modified California | Lithologic Description | Dry Density (pcf) | Moisture (%) | Atterberg Limits | | Gravel | Sand | #200 Fines | Consolidation | Water-Soluble Sulfate (%) | Modified Proctor | Unconfined Compression |
|----------------|-------------|---------------------|------------------------------|--|-------------------|--------------|------------------|--------|--------|------|------------|---------------|---------------------------|------------------|------------------------|
| | | | | | | | LL (%) | PI (%) | | | | | | | |
| Ground Surface | | | | | | | | | | | | | | | |
| 0 | | | | FILL: Silty SAND (SM) Loose, dry to slightly moist, fine to medium grained, minor cementation, reddish brown | | | | | | | | | | | |
| 5 | | M | 40 | NATIVE: Clayey SAND (SC) Loose, dry, fine grained, brown | 121.8 | 7.3 | | | 39 | 33 | | | | | |
| 10 | | M | 9 | BEDROCK: CLAYSTONE Very weak, wet, gray | 98.8 | 23.5 | 26 | 4 | | | | | | | |
| 15 | | M | 50(3") | BEDROCK: SILTSTONE weathered to Silty SAND (SM) Weak, slightly moist, coarse grained, dark reddish brown | | | | | | | | | | | |
| 20 | | M | | | | | | | | | | | | | |
| 23 | | | | Grades to gray | | | | | | | | | | | |
| 25 | | M | | Grades to reddish brown | 6 | 0 | 0 | 0 | 0 | 48 | | | | | |
| 30 | | M | | | | | | | | | | | | | |
| 35 | | M | | | | | | | | | | | | | |
| 35 | | | | B-4 Terminated at 35' | | | | | | | | | | | |

PROJECT NAME: Grapevine Transmission Line Power Poles

CLIENT: Washington City

Project No.: 240458

Project Location: Washington, Utah



BORING NUMBER B-5

START DATE: 2024-07-24

DRILLING COMPANY: South Slope Drilling

LOGGED BY: Greg Kaiser

DRILL RIG: CME-75

REVIEWED BY: John Anderson

LATITUDE/LONGITUDE: 37.14934 -113.49062

NOTES:

GROUNDWATER: _____ feet _____ feet

| Depth (ft) | Soil Symbol | Samples No. Symbols | 3.0-inch Modified California | Lithologic Description | Dry Density (pcf) | Moisture (%) | Atterberg Limits | | Gravel | Sand | #200 Fines | Consolidation | Water-Soluble Sulfate (%) | Modified Proctor | Unconfined Compression |
|----------------|-------------|---------------------|------------------------------|---|-------------------|--------------|------------------|--------|--------|------|------------|---------------|---------------------------|------------------|------------------------|
| | | | | | | | LL (%) | PI (%) | | | | | | | |
| Ground Surface | | | | | | | | | | | | | | | |
| 0 | X | | | FILL: Silty SAND with Gravel (SM) Very loose to loose, fine to medium grained, dry to slightly moist, reddish brown | | | | | | | | | | | |
| 5 | BG M | | 6 | | | | | | | | | | | | |
| 5 | BG M | | 42 | NATIVE: Silty SAND (SM) Medium dense, dry to slightly moist, fine to medium grained, reddish brown to orange | 131.9 | 5.7 | | | | | | | | | |
| 10 | BG | | 71(11.5") | Sandy Silty CLAY (CL-ML) Medium dense, dry to slightly moist, fine grained, reddish brown to brown to gray | | | | | | | | | | | |
| 15 | BG | | 50(4") | BEDROCK: CLAYSTONE Weakly to moderately cemented, dry to slightly moist, fine to medium grained, brown to purpleish brown | | | | | | | | | | | |
| 20 | BG | | 50(2.5") | BEDROCK: SANDSTONE weathered to Silty SAND (SM) Switched to air rotary at 15 feet | | | | | | | | | | | |
| 25 | BG | | 50(2") | B-4 Terminated at 25' | | 5.2 | 0 | 0 | 0 | 51 | 49 | | | | |

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PROJECT NAME: Grapevine Transmission Line Power Poles
CLIENT: Washington City
Project No.: 240458
Project Location: Washington, Utah

BORING NUMBER B-6

START DATE: 2024-07-24 **DRILLING COMPANY:** South Slope Drilling
LOGGED BY: Greg Kaiser **DRILL RIG:** CME-75
REVIEWED BY: John Anderson **LATITUDE/LONGITUDE:** 37.14955 -113.49637
NOTES: _____ **GROUNDWATER:** _____ feet _____ feet

| Depth (ft) | Soil Symbol | Samples No. Symbols | 3.0-inch Modified California | Lithologic Description | Dry Density (pcf) | Moisture (%) | Atterberg Limits | | Gravel | Sand | #200 Fines | Consolidation | Water-Soluble Sulfate (%) | Modified Proctor | Unconfined Compression |
|----------------|-------------|---------------------|------------------------------|---|-------------------|--------------|------------------|--------|--------|------|------------|---------------|---------------------------|------------------|------------------------|
| | | | | | | | LL (%) | PI (%) | | | | | | | |
| Ground Surface | | | | | | | | | | | | | | | |
| 0 | X | | | FILL: Silty SAND with Gravel (SM) Loose to medium dense, dry to slightly moist, fine to medium grained, reddish brown, common to abundant gravel/cobbles | | 8.7 | 0 | 0 | 26 | 38 | 36 | | | | |
| 5 | M | | 33 | | | 119 | 8 | | | | | | | | |
| | | | | 7 ft | | | | | | | | | | | |
| | | | | BEDROCK: CLAYSTONE Weathered, weakly to moderately cemented, dry to slightly moist, fine to medium grained, brown to purple Gypsum, grades denser with depth | | | | | | | | | | | |
| 10 | | | 50(4") | | | | | | | | | | | | |
| 15 | | | 50(3") | | | | | | | | | | | | |
| 20 | | | 94(9") | | | | | | | | | | | | |
| | | | | 20 ft | | | | | | | | | | | |
| | | | | B-5 Terminated at 20' | | | | | | | | | | | |

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PROJECT NAME: Grapevine Transmission Line Power Poles
CLIENT: Washington City
Project No.: 240458
Project Location: Washington, Utah

BORING NUMBER B-7

START DATE: 2024-07-24

DRILLING COMPANY: South Slope Drilling

LOGGED BY: Greg Kaiser

DRILL RIG: CME-75

REVIEWED BY: John Anderson

LATITUDE/LONGITUDE: 37.14811 -113.50318

NOTES:

GROUNDWATER: _____ feet _____ feet

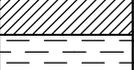
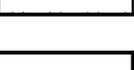
| Depth (ft) | Soil Symbol | No. Symbols | Samples | 3.0-inch Modified California | Lithologic Description | Dry Density (pcf) | Moisture (%) | Atterberg Limits | | Gravel | Sand | #200 Fines | Consolidation | Water-Soluble Sulfate (%) | Modified Proctor | Unconfined Compression |
|----------------|-----------------------|-------------|---------|------------------------------|--|-------------------|--------------|------------------|--------|--------|------|------------|---------------|---------------------------|------------------|------------------------|
| | | | | | | | | LL (%) | PI (%) | | | | | | | |
| Ground Surface | | | | | | | | | | | | | | | | |
| 0 | | | | | FILL: Silty SAND (SM) Loose to medium dense, dry to slightly moist, fine to medium grained, reddish brown | | | | | | | | | | | |
| 5 | | | | BG M 29 | | 108.8 | 1.4 2.1 | 0 | 0 | 0 | 72 | 28 | | | | |
| 10 | | | | BG M 33 | | 114.2 | 1.4 | | | | | | | | | |
| 12.5 | 12.5 ft | | | | | | | | | | | | | | | |
| 15 | | | | M 54 | NATIVE: Silty SAND (SM) Dense, dry to slightly moist | 108.4 | 2 | | | | | | | | | |
| 16.5 | 16.5 ft | | | | | | | | | | | | | | | |
| 20 | | | | M 80(14") | BEDROCK: CLAYSTONE weathered to Sandy Lean CLAY (CL) Weathered to 20 feet, weak to moderately cemented, fine to medium grained, dry to slightly moist, brown to purple | 105.6 | 2.2 | | | | | | | | | |
| 25 | | | | BG 50(5.75") | | | | 30 | 10 | 6 | 51 | 43 | | | | |
| 30 | 30 ft | | | | | | | | | | | | | | | |
| 30 | B-6 Terminated at 30' | | | | | | | | | | | | | | | |

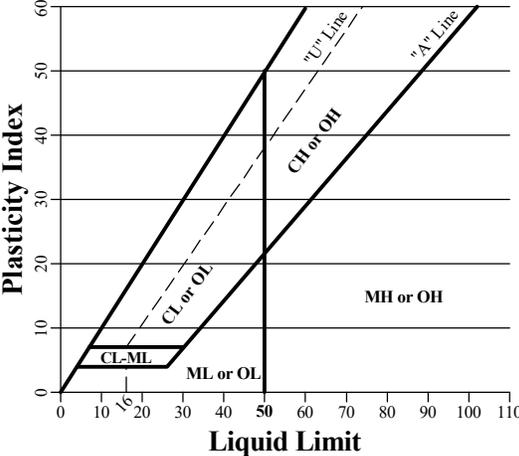
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PROJECT NAME: Grapevine Transmission Line Power Poles
CLIENT: Washington City
Project No.: 240458
Project Location: Washington, Utah

UNIFIED SOIL CLASSIFICATION SYSTEM

| MAJOR DIVISIONS | SYMBOLS | TYPICAL NAMES | |
|---|--|---|--|
| COARSE-GRAINED SOILS (More than 50% of soil Retained on No. 200 sieve size) | GRAVELS More than 1/2 of coarse fraction > No.4 sieve size |  | GW Well graded gravels or gravel-sand mixtures little or no fines. |
| | |  | GP Poorly graded gravels or gravel-sand mixtures little or no fines. |
| | |  | GM Silty gravels, gravel-sand-silt mixtures |
| | SANDS More than 1/2 of coarse fraction < No.4 sieve size |  | GC Clayey gravels, gravel-sand-clay mixtures |
| | |  | SW Well graded sands or gravelly sand mixtures little or no fines. |
| | |  | SP Poorly graded sands or gravelly sand mixtures little or no fines. |
| | |  | SM Silty sands, sand-silt mixtures |
| | |  | SC Clayey sands, sand-clay mixtures |
| | | FINE-GRAINED SOILS (Less than 50% of soil Retained on No. 200 sieve size) | SILTS & CLAYS Liquid Limit < 50 |
|  | CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. | | |
|  | OL Organic silts and organic silty clays of low plasticity | | |
| SILTS & CLAYS Liquid Limit > 50 |  | | MH Inorganic silts, micaceous or diatomaceous fine sand or silty soils, elastic silts |
| |  | | CH Inorganic clays of high plasticity, fat clays |
| |  | | OH Organic clays of medium to high plasticity, organic silty clays, organic silts |
| |  | | PT Peat and other highly organic soils |

| GRAIN SIZE CHART | | | SAMPLES | PLASTICITY CURVE | |
|------------------------|----------------------------|---------------------------|---|-------------------------------|---|
| CLASSIFICATION | Range of Grain Size | |  | Relatively Undisturbed Sample |  |
| | U.S. Standard Sieve Size | Grain Size in Millimeters | | | |
| BOULDERS | Above 12" | Above 305 |  | Block Sample | |
| COBBLES | 12" to 3" | 305 to 76.2 |  | Bag Sample | |
| GRAVEL | 3" to No. 4 | 76.2 to 4.76 |  | Auger Cuttings | |
| Coarse | 3" to 3/4" | 76.2 to 19.1 | | | |
| Fine | 3/4" to No. 4 | 19.1 to 4.76 |  | Bucket Sample | |
| SAND | No. 4 to No. 200 | 4.76 to 0.074 | | | |
| Coarse | No. 4 to No. 10 | 4.76 to 2.00 | | | |
| Medium | No. 10 to No. 40 | 2.00 to 0.42 | | | |
| Fine | No. 40 to No. 200 | 0.420 to 0.074 |  | Core | |
| SILT & CLAY | Below No. 200 | Below 0.074 | | | |
| | | |  | No Recovery | |



Landmark Testing & Engineering
 795 Factory Drive
 St. George, UT 84790
 Telephone: 435-986-0566
 Website: www.landmarktesting.com

APPENDIX B

Laboratory Test Results



UNIT WEIGHT REPORT

Client: Washington City Power Department
111 North 100 East
Washington, UT 84780

Date of Report: 8/6/2024
Reviewed By: Z. Girsberger

Project: Grapevine Transmission Line Power Poles

Project #: 240458

Location: Washington

Sampled By: G. Kaiser **Date:** 7/30/2024

Tested By: B. Holdaway **Date:** 8/1/2024

| | | |
|---|---|-------------------------------|
| Location of Sample: <u>Boring 1 at 3.0</u> | | Lab #: <u>24SG4695</u> |
| Mass of Sleeve & Wet Soil, g: <u>935.6</u> | Mass of tare & wet soil: <u>1133.8</u> | Wet Density, pcf: <u>95.7</u> |
| Mass of Sleeve, g: <u>253.5</u> | Mass of tare & dry soil: <u>1108.82</u> | Dry Density, pcf: <u>92.2</u> |
| Diameter of Sleeve, Inch: <u>2.415</u> | Mass of tare: <u>452.1</u> | % Moisture: <u>3.8</u> |
| Length of Sleeve, inch: <u>5.931</u> | | |

| | | |
|---|---|--------------------------------|
| Location of Sample: <u>Boring 2 at 5.5</u> | | Lab #: <u>24SG4698</u> |
| Mass of Sleeve & Wet Soil, g: <u>1075.19</u> | Mass of tare & wet soil: <u>1336.46</u> | Wet Density, pcf: <u>115.2</u> |
| Mass of Sleeve, g: <u>249.2</u> | Mass of tare & dry soil: <u>1284.01</u> | Dry Density, pcf: <u>107.9</u> |
| Diameter of Sleeve, Inch: <u>2.409</u> | Mass of tare: <u>511.33</u> | % Moisture: <u>6.8</u> |
| Length of Sleeve, inch: <u>5.995</u> | | |

| | | |
|---|---|--------------------------------|
| Location of Sample: <u>Boring 3 at 3.0</u> | | Lab #: <u>24SG4699</u> |
| Mass of Sleeve & Wet Soil, g: <u>1103.1</u> | Mass of tare & wet soil: <u>1363.72</u> | Wet Density, pcf: <u>119.1</u> |
| Mass of Sleeve, g: <u>248.3</u> | Mass of tare & dry soil: <u>1295.72</u> | Dry Density, pcf: <u>109.6</u> |
| Diameter of Sleeve, Inch: <u>2.411</u> | Mass of tare: <u>510.16</u> | % Moisture: <u>8.7</u> |
| Length of Sleeve, inch: <u>5.989</u> | | |

| | | |
|--|---|--------------------------------|
| Location of Sample: <u>Boring 3 at 10.5</u> | | Lab #: <u>24SG4700</u> |
| Mass of Sleeve & Wet Soil, g: <u>1186.27</u> | Mass of tare & wet soil: <u>1336.38</u> | Wet Density, pcf: <u>127.0</u> |
| Mass of Sleeve, g: <u>278.15</u> | Mass of tare & dry soil: <u>1269.75</u> | Dry Density, pcf: <u>117.7</u> |
| Diameter of Sleeve, Inch: <u>2.411</u> | Mass of tare: <u>429.8</u> | % Moisture: <u>7.9</u> |
| Length of Sleeve, inch: <u>5.969</u> | | |

| | | |
|---|---|--------------------------------|
| Location of Sample: <u>Boring 6 at 5.5</u> | | Lab #: <u>24SG4708</u> |
| Mass of Sleeve & Wet Soil, g: <u>1039.9</u> | Mass of tare & wet soil: <u>1260.0</u> | Wet Density, pcf: <u>111.0</u> |
| Mass of Sleeve, g: <u>227.6</u> | Mass of tare & dry soil: <u>1243.95</u> | Dry Density, pcf: <u>108.8</u> |
| Diameter of Sleeve, Inch: <u>2.430</u> | Mass of tare: <u>460.26</u> | % Moisture: <u>2.1</u> |
| Length of Sleeve, inch: <u>6.012</u> | | |



UNIT WEIGHT REPORT

Client: Washington City Power Department
111 North 100 East
Washington, UT 84780

Date of Report: 8/9/2024
Reviewed By: Z. Girsberger

Project: Grapevine Transmission Line Power Poles Project #: 240458

Location: Washington Sampled By: G. Kaiser Date: 7/30/2024
Tested By: L. May Date: 8/7/2024

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).



UNIT WEIGHT REPORT

Client: Washington City Power Department
111 North 100 East
Washington, UT 84780

Date of Report: 8/6/2024
Reviewed By: Z. Girsberger

Project: Grapevine Transmission Line Power Poles Project #: 240458

Location: Washington Sampled By: G. Kaiser Date: 7/30/2024

Tested By: B. Holdaway Date: 8/1/2024

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).

Table with 3 columns: Location of Sample, Lab #, and test results (Mass of Sleeve & Wet Soil, Mass of Sleeve, Diameter of Sleeve, Length of Sleeve, Mass of tare & wet soil, Mass of tare & dry soil, Mass of tare, Wet Density, Dry Density, % Moisture).



**WATER-SOLUBLE
SULFATE IN SOIL**

Client: Washington City Power Department
111 North 100 East
Washington, UT 84780

Date of Report: 8/8/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4694

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Clayey Silty Sand **Tested By:** A. Pay **Date:** 8/8/2024
Location of Sample: Boring 1 and 2 at 5' **Authorized By:** Client **Date:** 7/30/2024

| Test | Result % | Exposure Class | Test Standard |
|---------------------------------------|----------|----------------|---------------|
| Percent Water-Soluble Sulfate in Soil | 0.72 | S2 | ASTM C1580 |



SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/9/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4696

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Sandy Lean Clay **Tested By:** A. Pay **Date:** 8/8/2024
Location of Sample: Boring 1 at 19-20 **Authorized By:** Client **Date:** 7/30/2024

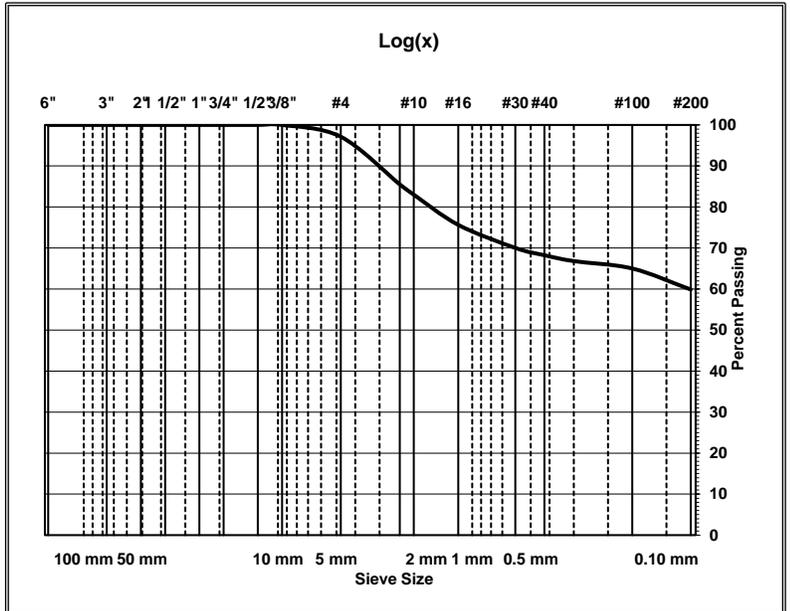
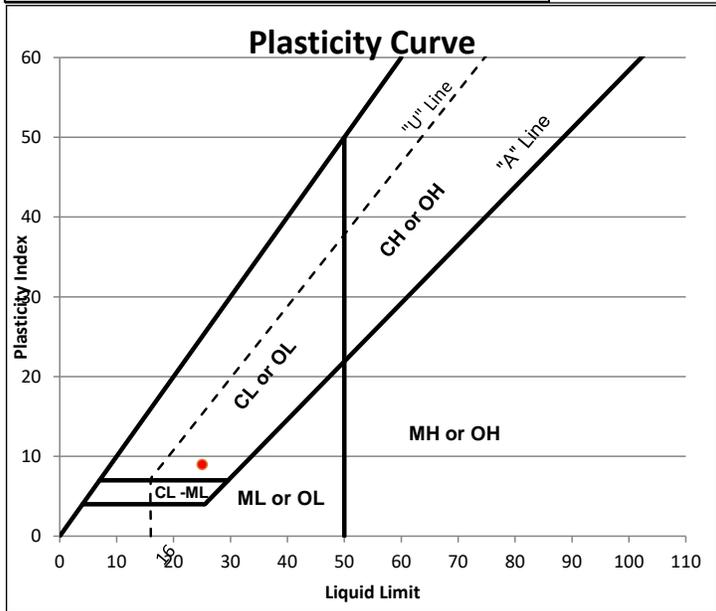
Sieve Analysis , ASTM C136 and C117

| Sieve Size | % Passing Cumulative | Specification |
|------------|----------------------|---------------|
| 150 mm | 6" | |
| 75 mm | 3" | |
| 50 mm | 2" | |
| 37.5 mm | 1-1/2" | |
| 25 mm | 1" | |
| 19 mm | 3/4" | |
| 12.5 mm | 1/2" | |
| 9.5 mm | 3/8" | 100 |
| 4.75 mm | #4 | 97 |
| 2.00 mm | #10 | 83 |
| 1.18 mm | #16 | 76 |
| 425 µm | #40 | 68 |
| 300 µm | #50 | 67 |
| 75 µm | #200 | 59.9 |

| Test | Result | Specification | Test Standard |
|-------------------------------|--------|---------------|---------------|
| Natural Moisture Content, % | 4.0 | | ASTM D 2216 |
| Liquid Limit | 25 | | ASTM D 4318 |
| Plasticity Index | 9 | | ASTM D 4318 |
| Unified Classification System | CL | | ASTM D 2487 |
| AASHTO Classification System | A-4(3) | | AASHTO M145 |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 3.0 | 37.1 | 59.9 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |





SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/9/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4697

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Orange Sandy Silty Clay **Tested By:** A. Pay **Date:** 8/6/2024
Location of Sample: Boring 2 at 5.0 **Authorized By:** Client **Date:** 7/30/2024

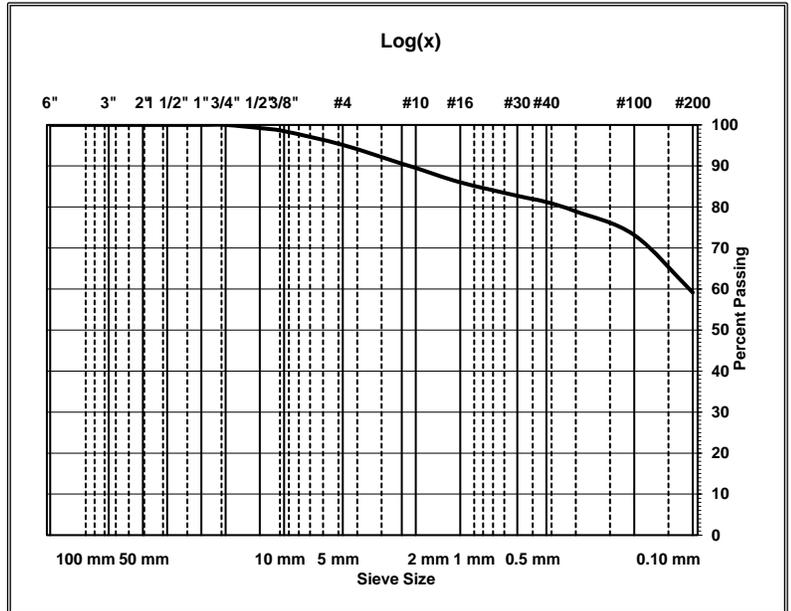
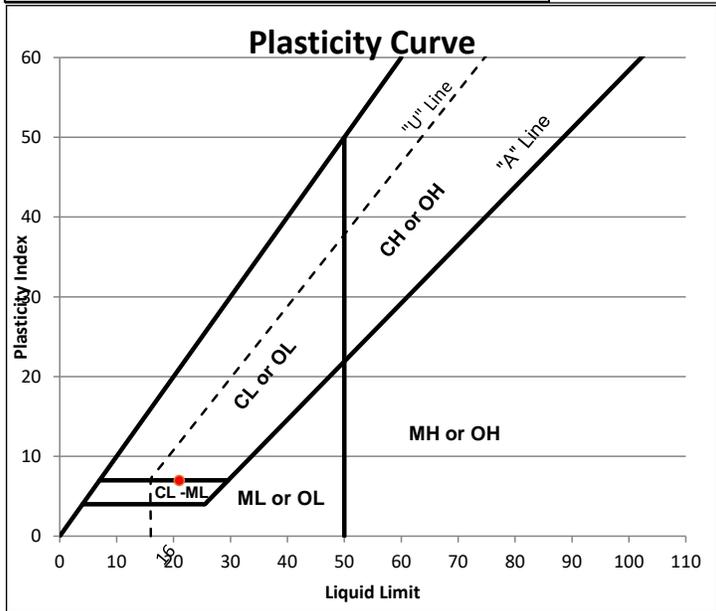
Sieve Analysis , ASTM C136 and C117

| Sieve Size | % Passing Cumulative | Specification |
|------------|----------------------|---------------|
| 150 mm | 6" | |
| 75 mm | 3" | |
| 50 mm | 2" | |
| 37.5 mm | 1-1/2" | |
| 25 mm | 1" | |
| 19 mm | 3/4" | 100 |
| 12.5 mm | 1/2" | 99 |
| 9.5 mm | 3/8" | 98 |
| 4.75 mm | #4 | 95 |
| 2.00 mm | #10 | 90 |
| 1.18 mm | #16 | 86 |
| 425 µm | #40 | 81 |
| 300 µm | #50 | 79 |
| 75 µm | #200 | 59.1 |

| Test | Result | Specification | Test Standard |
|-------------------------------|--------|---------------|---------------|
| Natural Moisture Content, % | 4.0 | | ASTM D 2216 |
| Liquid Limit | 21 | | ASTM D 4318 |
| Plasticity Index | 7 | | ASTM D 4318 |
| Unified Classification System | CL-ML | | ASTM D 2487 |
| AASHTO Classification System | A-4(1) | | AASHTO M145 |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 5.0 | 35.9 | 59.1 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |





SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/9/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4701

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Silty Gravel with Sand **Tested By:** A. Pay **Date:** 8/6/2024
Location of Sample: Boring 3 at 15.0 **Authorized By:** Client **Date:** 7/30/2024

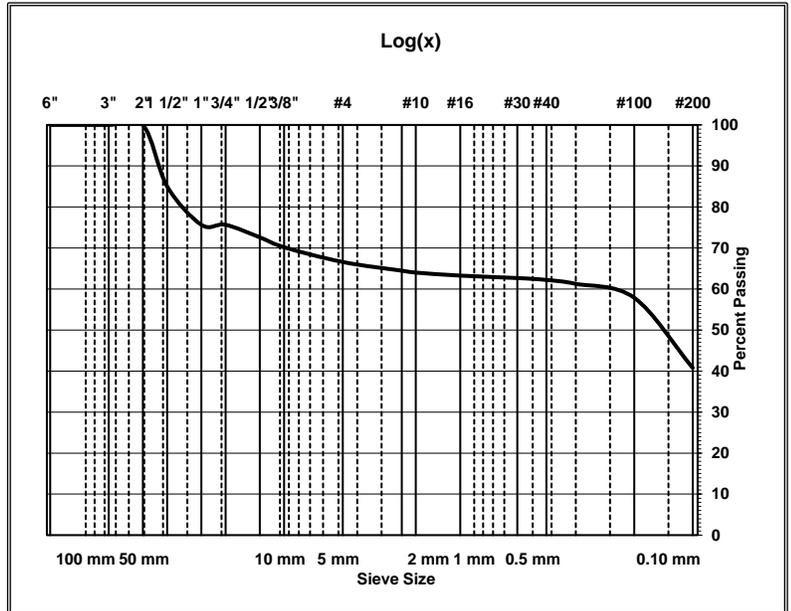
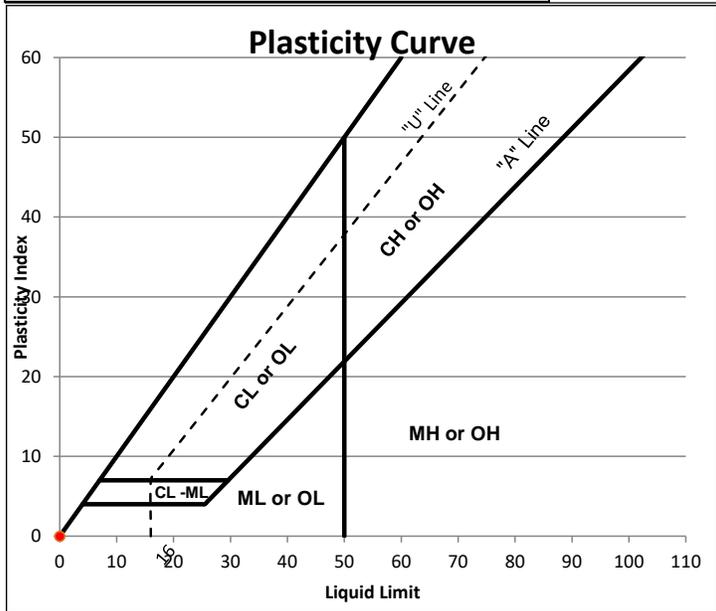
Sieve Analysis , ASTM C136 and C117

| Sieve Size | % Passing Cumulative | Specification |
|------------|----------------------|---------------|
| 150 mm | 6" | |
| 75 mm | 3" | |
| 50 mm | 2" | 100 |
| 37.5 mm | 1-1/2" | 85 |
| 25 mm | 1" | 76 |
| 19 mm | 3/4" | 76 |
| 12.5 mm | 1/2" | 73 |
| 9.5 mm | 3/8" | 70 |
| 4.75 mm | #4 | 67 |
| 2.00 mm | #10 | 64 |
| 1.18 mm | #16 | 63 |
| 425 µm | #40 | 62 |
| 300 µm | #50 | 61 |
| 75 µm | #200 | 40.8 |

| Test | Result | Specification | Test Standard |
|-------------------------------|--------|---------------|---------------|
| Natural Moisture Content, % | 7.7 | | ASTM D 2216 |
| Liquid Limit | NP | | ASTM D 4318 |
| Plasticity Index | NP | | ASTM D 4318 |
| Unified Classification System | GM | | ASTM D 2487 |
| AASHTO Classification System | A-4(0) | | AASHTO M145 |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 33.0 | 26.2 | 40.8 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |





SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/15/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4702

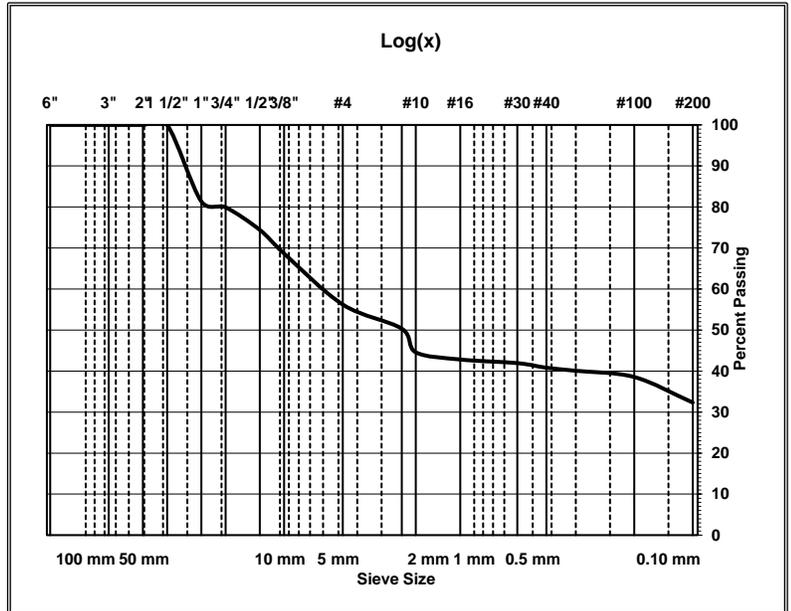
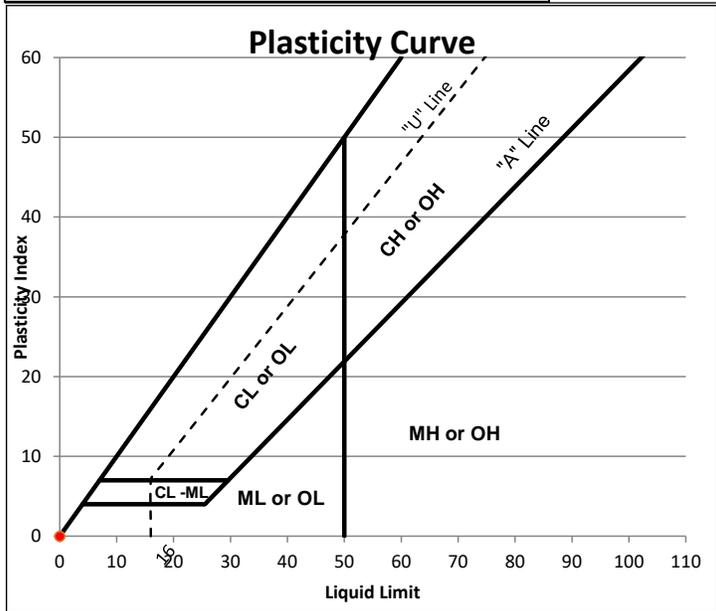
Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Silty Gravel with Sand **Tested By:** K. Barnett **Date:** 8/15/2024
Location of Sample: Boring 3 at 30' **Authorized By:** Client **Date:** 7/30/2024

Sieve Analysis , ASTM C136 and C117

| Sieve Size | | % Passing Cumulative | Specification | Test | Result | Specification | Test Standard |
|------------|--------|----------------------|---------------|-------------------------------|----------|---------------|---------------|
| 150 mm | 6" | | | Natural Moisture Content, % | | | ASTM D 2216 |
| 75 mm | 3" | | | Liquid Limit | NP | | ASTM D 4318 |
| 50 mm | 2" | | | Plasticity Index | NP | | ASTM D 4318 |
| 37.5 mm | 1-1/2" | 100 | | Unified Classification System | GM | | ASTM D 2487 |
| 25 mm | 1" | 81 | | AASHTO Classification System | A-2-4(0) | | AASHTO M145 |
| 19 mm | 3/4" | 80 | | | | | |
| 12.5 mm | 1/2" | 74 | | | | | |
| 9.5 mm | 3/8" | 69 | | | | | |
| 4.75 mm | #4 | 56 | | | | | |
| 2.00 mm | #10 | 45 | | | | | |
| 1.18 mm | #16 | 43 | | | | | |
| 425 µm | #40 | 41 | | | | | |
| 300 µm | #50 | 40 | | | | | |
| 75 µm | #200 | 32.3 | | | | | |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 44.0 | 23.7 | 32.3 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |





SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/6/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4704

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Silty Sand **Tested By:** N. Trush **Date:** 8/6/2024
Location of Sample: Boring 4 at 24-25 **Authorized By:** Client **Date:** 7/30/2024

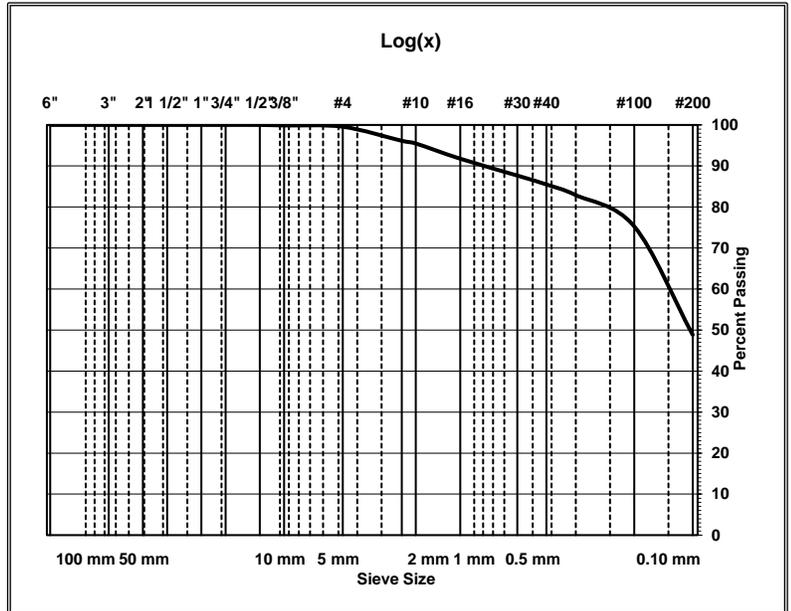
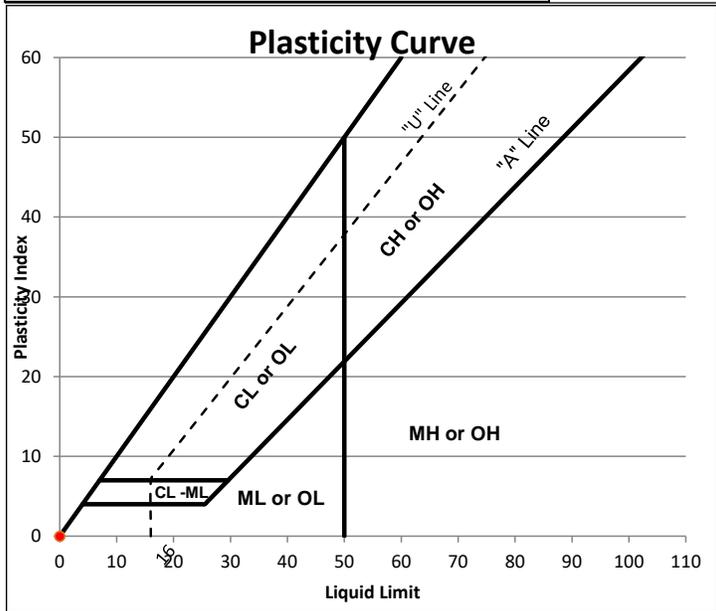
Sieve Analysis , ASTM C136 and C117

| Sieve Size | % Passing Cumulative | Specification |
|------------|----------------------|---------------|
| 150 mm | 6" | |
| 75 mm | 3" | |
| 50 mm | 2" | |
| 37.5 mm | 1-1/2" | |
| 25 mm | 1" | |
| 19 mm | 3/4" | |
| 12.5 mm | 1/2" | 100 |
| 9.5 mm | 3/8" | 100 |
| 4.75 mm | #4 | 100 |
| 2.00 mm | #10 | 95 |
| 1.18 mm | #16 | 92 |
| 425 µm | #40 | 85 |
| 300 µm | #50 | 83 |
| 75 µm | #200 | 48.8 |

| Test | Result | Specification | Test Standard |
|-------------------------------|--------|---------------|---------------|
| Natural Moisture Content, % | 5.2 | | ASTM D 2216 |
| Liquid Limit | NP | | ASTM D 4318 |
| Plasticity Index | NP | | ASTM D 4318 |
| Unified Classification System | SM | | ASTM D 2487 |
| AASHTO Classification System | A-4(0) | | AASHTO M145 |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 0.0 | 51.2 | 48.8 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |





SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/6/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4705

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Silty Sand with Gravel **Tested By:** N. Trush **Date:** 8/6/2024
Location of Sample: Boring 5 at 2.5 **Authorized By:** Client **Date:** 7/30/2024

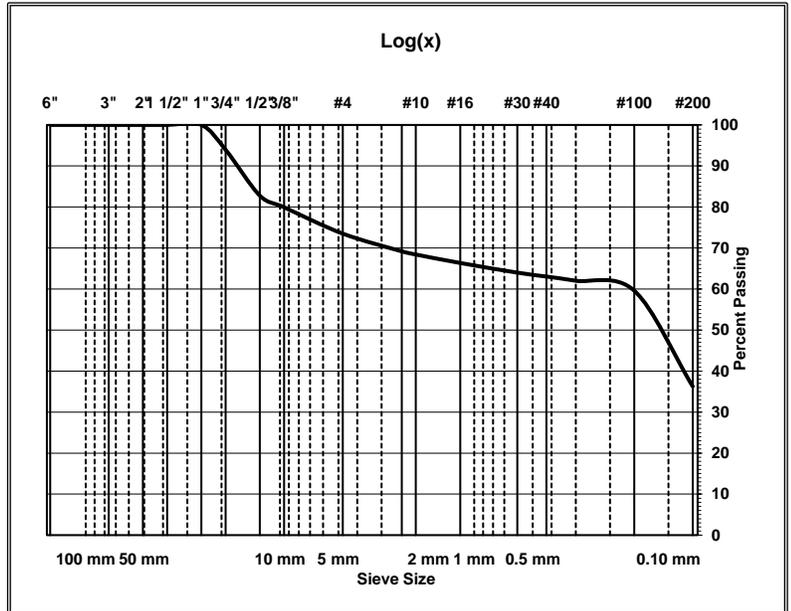
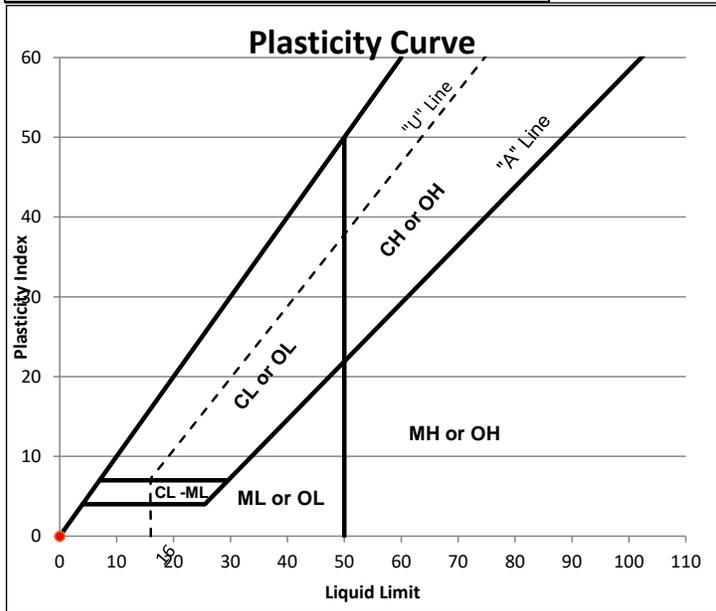
Sieve Analysis , ASTM C136 and C117

| Sieve Size | % Passing Cumulative | Specification |
|------------|----------------------|---------------|
| 150 mm | 6" | |
| 75 mm | 3" | |
| 50 mm | 2" | |
| 37.5 mm | 1-1/2" | |
| 25 mm | 1" | 100 |
| 19 mm | 3/4" | 94 |
| 12.5 mm | 1/2" | 83 |
| 9.5 mm | 3/8" | 80 |
| 4.75 mm | #4 | 74 |
| 2.00 mm | #10 | 68 |
| 1.18 mm | #16 | 66 |
| 425 µm | #40 | 63 |
| 300 µm | #50 | 62 |
| 75 µm | #200 | 36.3 |

| Test | Result | Specification | Test Standard |
|-------------------------------|--------|---------------|---------------|
| Natural Moisture Content, % | 8.7 | | ASTM D 2216 |
| Liquid Limit | NP | | ASTM D 4318 |
| Plasticity Index | NP | | ASTM D 4318 |
| Unified Classification System | SM | | ASTM D 2487 |
| AASHTO Classification System | A-4(0) | | AASHTO M145 |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 26.0 | 37.7 | 36.3 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |





SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/9/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4707

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Silty Sand **Tested By:** K. Finchum **Date:** 8/7/2024
Location of Sample: Boring 6 at 5.0 **Authorized By:** Client **Date:** 7/30/2024

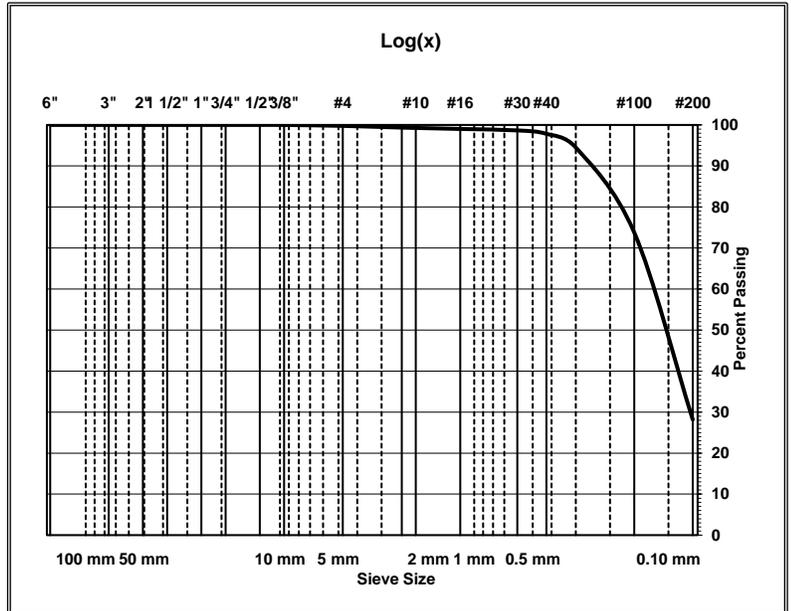
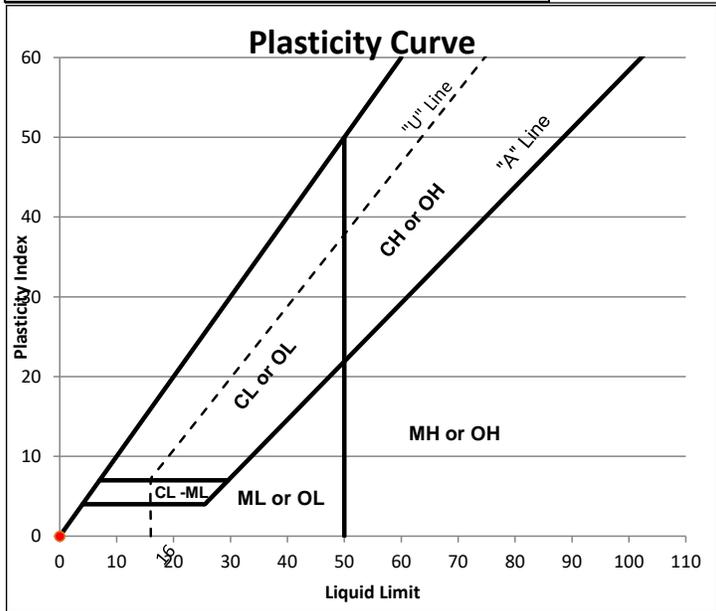
Sieve Analysis , ASTM C136 and C117

| Sieve Size | % Passing Cumulative | Specification |
|------------|----------------------|---------------|
| 150 mm | 6" | |
| 75 mm | 3" | |
| 50 mm | 2" | |
| 37.5 mm | 1-1/2" | |
| 25 mm | 1" | |
| 19 mm | 3/4" | |
| 12.5 mm | 1/2" | |
| 9.5 mm | 3/8" | 100 |
| 4.75 mm | #4 | 100 |
| 2.00 mm | #10 | 99 |
| 1.18 mm | #16 | 99 |
| 425 µm | #40 | 98 |
| 300 µm | #50 | 94 |
| 75 µm | #200 | 28.2 |

| Test | Result | Specification | Test Standard |
|-------------------------------|----------|---------------|---------------|
| Natural Moisture Content, % | 1.4 | | ASTM D 2216 |
| Liquid Limit | NP | | ASTM D 4318 |
| Plasticity Index | NP | | ASTM D 4318 |
| Unified Classification System | SM | | ASTM D 2487 |
| AASHTO Classification System | A-2-4(0) | | AASHTO M145 |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 0.0 | 71.8 | 28.2 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |





SOIL CLASSIFICATION REPORT

Client: Washington City Power Department
 111 North 100 East
 Washington, UT 84780

Date of Report: 8/15/2024
Reviewed By: Z. Girsberger
Lab#: 24SG4712

Project: Grapevine Transmission Line Power Poles **Project #:** 240458
Location: Washington **Sampled By:** G. Kaiser **Date:** 7/30/2024
Type of Sample: Brown Clayey Sand **Tested By:** K. Barnett **Date:** 8/15/2024
Location of Sample: Boring 6 at 25.0 **Authorized By:** Client **Date:** 7/30/2024

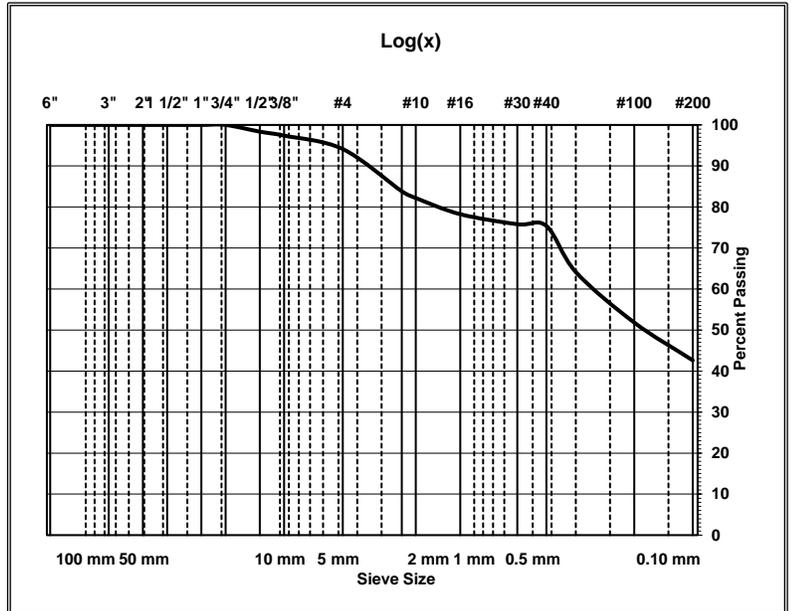
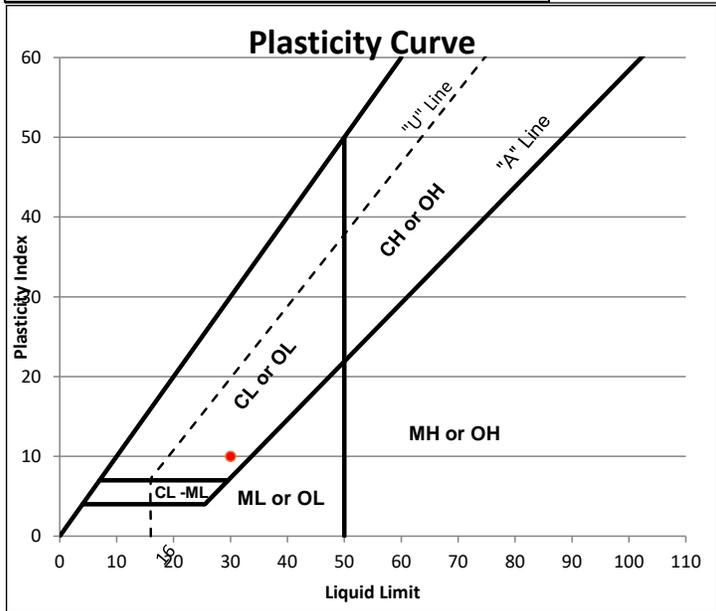
Sieve Analysis , ASTM C136 and C117

| Sieve Size | % Passing Cumulative | Specification |
|------------|----------------------|---------------|
| 150 mm | 6" | |
| 75 mm | 3" | |
| 50 mm | 2" | |
| 37.5 mm | 1-1/2" | |
| 25 mm | 1" | |
| 19 mm | 3/4" | 100 |
| 12.5 mm | 1/2" | 98 |
| 9.5 mm | 3/8" | 97 |
| 4.75 mm | #4 | 94 |
| 2.00 mm | #10 | 82 |
| 1.18 mm | #16 | 78 |
| 425 µm | #40 | 75 |
| 300 µm | #50 | 64 |
| 75 µm | #200 | 42.6 |

| Test | Result | Specification | Test Standard |
|-------------------------------|--------|---------------|---------------|
| Natural Moisture Content, % | | | ASTM D 2216 |
| Liquid Limit | 30 | | ASTM D 4318 |
| Plasticity Index | 10 | | ASTM D 4318 |
| Unified Classification System | SC | | ASTM D 2487 |
| AASHTO Classification System | A-4(1) | | AASHTO M145 |

| % Cobble > 3" | % Gravel < 3" - #4 | % Sand < #4 - #200 | % Silt-Clay < #200 |
|---------------|--------------------|--------------------|--------------------|
| 0.0 | 6.0 | 51.4 | 42.6 |

| Diameter D ₆₀ | Diameter D ₃₀ | Diameter D ₁₀ | Coefficient of Uniformity, C _u | Coefficient of Concavity, C _c |
|--------------------------|--------------------------|--------------------------|---|--|
| | | | | |



Direct Shear Test for Soils Under Drained Conditions



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(ASTM D3080)

Project: Landmark Testing & Engineering

No: M00431-037 (19236)

Location: Washington Vista

Date: 7/15/2021

By: EH

Boring No.: Slope

Sample: Fill

Depth:

Sample Description: Reddish brown silty sand with gravel

Sample type: Laboratory compacted

Dry unit weight 117.5 pcf

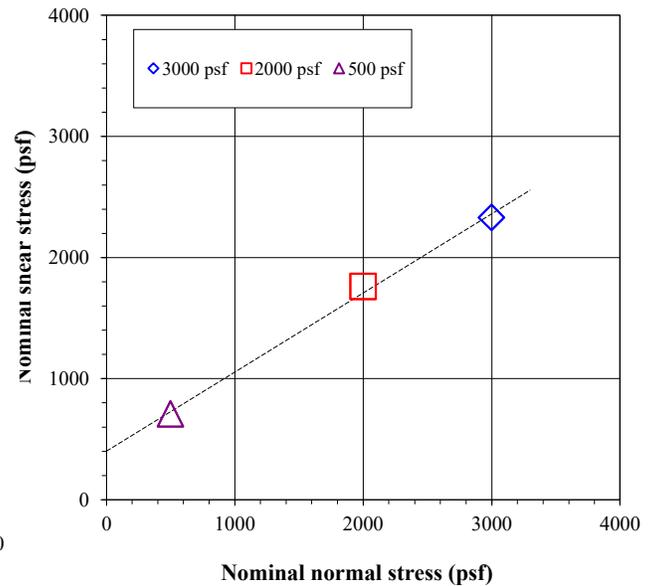
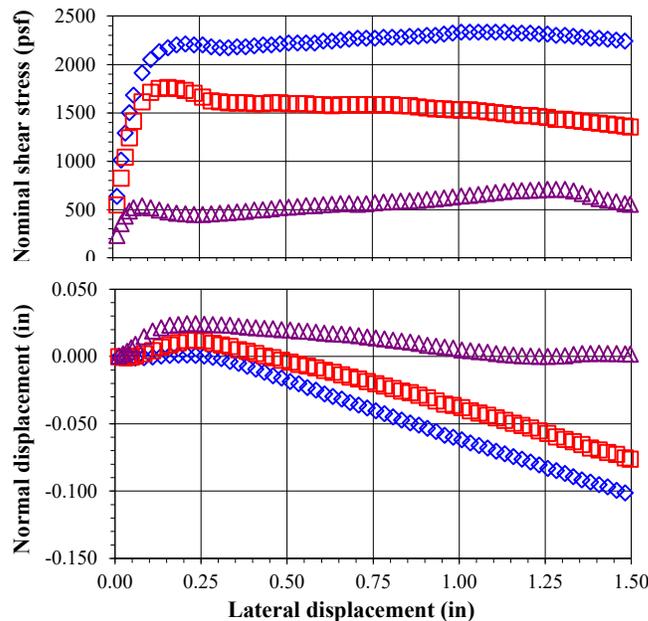
at 8.9 (%) w

Compaction specifications: Provided by client

Test type: Inundated
 Lateral displacement (in.): 1.5
 Shear rate (in./min): 0.0200
 Specific gravity, Gs: 2.70 Assumed

| | Specimen 1 | | Specimen 2 | | Specimen 3 | |
|-----------------------------------|------------|-----------|------------------------|-----------|------------|-----------|
| | Initial | Pre-shear | Initial | Pre-shear | Initial | Pre-shear |
| Nominal normal stress (psf) | 3000 | | 2000 | | 500 | |
| Peak shear stress (psf) | 2330 | | 1760 | | 707 | |
| Lateral displacement at peak (in) | 1.008 | | 0.160 | | 1.283 | |
| Load Duration (min) | 121 | | 134 | | 142 | |
| Specimen height (in) | 6.0 | 5.976 | 6.0 | 5.931 | 6.0 | 5.987 |
| Specimen length (in) | 12.0 | 11.995 | 12.0 | 11.995 | 12.0 | 11.995 |
| Specimen width (in) | 12.0 | 11.995 | 12.0 | 11.995 | 12.0 | 11.995 |
| Wt. rings + wet soil (g) | 29000 | 30833 | 29000 | 30727 | 29000 | 30858 |
| Wt. rings (g) | 0 | 0 | 0 | 0 | 0 | 0 |
| Wet soil + tare (g) | 7904.32 | | 7904.32 | | 7904.32 | |
| Dry soil + tare (g) | 7361.78 | | 7361.78 | | 7361.78 | |
| Tare (g) | 1371.13 | | 1371.13 | | 1371.13 | |
| Water content (%) | 9.1 | 16.0 | 9.1 | 15.6 | 9.1 | 16.0 |
| Dry unit weight (pcf) | 117.4 | 117.8 | 117.4 | 118.7 | 117.4 | 117.6 |
| Void ratio, e, for assumed Gs | 0.44 | 0.43 | 0.44 | 0.42 | 0.44 | 0.43 |
| Saturation (%)* | 56.2 | 100.0 | 56.2 | 100.0 | 56.2 | 100.0 |
| ϕ' (deg) | 33 | | Average of 3 specimens | | Initial | Pre-shear |
| c' (psf) | 401 | | Water content (%) | | 9.1 | 15.8 |
| | | | Dry unit weight (pcf) | | 117.4 | 118.0 |

*Pre-shear saturation set to 100% for phase calculations



Entered by: _____

Reviewed: _____

Direct Shear Test for Soils Under Drained Conditions



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(ASTM D3080)

Project: **Landmark Testing & Engineering**

Boring No.: **Slope**

No: **M00431-037 (19236)**

Sample: **Fill**

Location: **Washington Vista**

Depth:

| Nominal normal stress = 3000 psf | | | Nominal normal stress = 2000 psf | | | Nominal normal stress = 500 psf | | |
|----------------------------------|----------------------|---------------------|----------------------------------|----------------------|---------------------|---------------------------------|----------------------|---------------------|
| Lateral Displacement | Nominal Shear Stress | Normal Displacement | Lateral Displacement | Nominal Shear Stress | Normal Displacement | Lateral Displacement | Nominal Shear Stress | Normal Displacement |
| 0.000 | 0 | 0.000 | 0.000 | 0 | 0.000 | 0.000 | 0 | 0.000 |
| 0.012 | 633 | -0.001 | 0.012 | 544 | 0.000 | 0.012 | 229 | 0.000 |
| 0.024 | 1010 | -0.001 | 0.024 | 822 | -0.001 | 0.024 | 350 | 0.002 |
| 0.036 | 1290 | -0.001 | 0.036 | 1040 | -0.001 | 0.036 | 431 | 0.004 |
| 0.048 | 1500 | -0.001 | 0.048 | 1240 | 0.000 | 0.048 | 484 | 0.006 |
| 0.060 | 1680 | -0.001 | 0.060 | 1410 | 0.000 | 0.060 | 517 | 0.009 |
| 0.085 | 1910 | -0.001 | 0.085 | 1610 | 0.002 | 0.085 | 535 | 0.015 |
| 0.110 | 2050 | -0.001 | 0.110 | 1710 | 0.004 | 0.110 | 516 | 0.019 |
| 0.135 | 2130 | 0.000 | 0.135 | 1750 | 0.007 | 0.135 | 493 | 0.021 |
| 0.160 | 2170 | 0.001 | 0.160 | 1760 | 0.009 | 0.160 | 473 | 0.023 |
| 0.185 | 2200 | 0.001 | 0.185 | 1750 | 0.010 | 0.185 | 460 | 0.024 |
| 0.210 | 2210 | 0.001 | 0.210 | 1730 | 0.012 | 0.210 | 452 | 0.024 |
| 0.235 | 2200 | 0.001 | 0.235 | 1700 | 0.012 | 0.235 | 445 | 0.024 |
| 0.260 | 2200 | 0.000 | 0.260 | 1660 | 0.012 | 0.260 | 447 | 0.024 |
| 0.285 | 2180 | -0.001 | 0.285 | 1620 | 0.010 | 0.285 | 454 | 0.023 |
| 0.310 | 2170 | -0.002 | 0.310 | 1610 | 0.008 | 0.310 | 460 | 0.023 |
| 0.335 | 2170 | -0.004 | 0.335 | 1600 | 0.007 | 0.335 | 467 | 0.023 |
| 0.359 | 2180 | -0.005 | 0.359 | 1600 | 0.005 | 0.359 | 472 | 0.022 |
| 0.384 | 2180 | -0.007 | 0.384 | 1600 | 0.004 | 0.384 | 480 | 0.022 |
| 0.409 | 2190 | -0.010 | 0.409 | 1590 | 0.002 | 0.409 | 491 | 0.021 |
| 0.435 | 2200 | -0.012 | 0.434 | 1590 | 0.000 | 0.434 | 497 | 0.021 |
| 0.459 | 2200 | -0.015 | 0.459 | 1600 | -0.001 | 0.459 | 506 | 0.020 |
| 0.484 | 2210 | -0.016 | 0.484 | 1600 | -0.003 | 0.484 | 519 | 0.020 |
| 0.509 | 2220 | -0.019 | 0.509 | 1590 | -0.004 | 0.509 | 521 | 0.020 |
| 0.534 | 2220 | -0.020 | 0.534 | 1590 | -0.006 | 0.534 | 530 | 0.019 |
| 0.559 | 2220 | -0.023 | 0.559 | 1590 | -0.007 | 0.559 | 540 | 0.019 |
| 0.584 | 2220 | -0.025 | 0.584 | 1580 | -0.009 | 0.584 | 539 | 0.018 |
| 0.609 | 2240 | -0.028 | 0.609 | 1580 | -0.010 | 0.609 | 547 | 0.017 |
| 0.634 | 2240 | -0.030 | 0.634 | 1570 | -0.012 | 0.634 | 553 | 0.017 |
| 0.659 | 2250 | -0.032 | 0.659 | 1580 | -0.014 | 0.659 | 559 | 0.016 |
| 0.684 | 2260 | -0.034 | 0.684 | 1580 | -0.016 | 0.684 | 562 | 0.016 |
| 0.709 | 2270 | -0.036 | 0.709 | 1580 | -0.017 | 0.709 | 551 | 0.015 |
| 0.734 | 2270 | -0.038 | 0.734 | 1580 | -0.019 | 0.734 | 559 | 0.014 |
| 0.759 | 2270 | -0.041 | 0.759 | 1580 | -0.020 | 0.759 | 569 | 0.014 |
| 0.784 | 2280 | -0.043 | 0.784 | 1580 | -0.022 | 0.784 | 574 | 0.013 |
| 0.809 | 2280 | -0.045 | 0.809 | 1580 | -0.024 | 0.809 | 577 | 0.012 |
| 0.834 | 2280 | -0.047 | 0.833 | 1570 | -0.026 | 0.833 | 584 | 0.011 |
| 0.858 | 2290 | -0.049 | 0.859 | 1570 | -0.027 | 0.858 | 587 | 0.010 |
| 0.883 | 2290 | -0.051 | 0.883 | 1560 | -0.029 | 0.884 | 592 | 0.010 |
| 0.908 | 2300 | -0.054 | 0.908 | 1550 | -0.031 | 0.908 | 600 | 0.008 |
| 0.933 | 2300 | -0.056 | 0.933 | 1540 | -0.033 | 0.934 | 608 | 0.007 |
| 0.958 | 2310 | -0.059 | 0.959 | 1540 | -0.036 | 0.958 | 617 | 0.007 |
| 0.983 | 2320 | -0.060 | 0.983 | 1530 | -0.037 | 0.983 | 627 | 0.006 |
| 1.008 | 2330 | -0.062 | 1.008 | 1530 | -0.038 | 1.008 | 637 | 0.005 |
| 1.033 | 2330 | -0.064 | 1.033 | 1530 | -0.040 | 1.033 | 645 | 0.004 |
| 1.058 | 2330 | -0.066 | 1.058 | 1520 | -0.042 | 1.058 | 654 | 0.003 |
| 1.083 | 2330 | -0.068 | 1.083 | 1510 | -0.044 | 1.083 | 663 | 0.003 |
| 1.108 | 2330 | -0.070 | 1.108 | 1500 | -0.046 | 1.108 | 672 | 0.002 |
| 1.133 | 2330 | -0.072 | 1.133 | 1490 | -0.048 | 1.133 | 682 | 0.001 |
| 1.158 | 2320 | -0.075 | 1.158 | 1480 | -0.050 | 1.158 | 692 | 0.001 |
| 1.183 | 2320 | -0.076 | 1.183 | 1470 | -0.051 | 1.183 | 693 | 0.000 |
| 1.208 | 2320 | -0.078 | 1.208 | 1470 | -0.053 | 1.208 | 697 | 0.000 |
| 1.233 | 2310 | -0.081 | 1.233 | 1460 | -0.055 | 1.233 | 700 | 0.000 |
| 1.258 | 2310 | -0.083 | 1.258 | 1450 | -0.057 | 1.258 | 705 | 0.000 |
| 1.283 | 2300 | -0.085 | 1.283 | 1430 | -0.060 | 1.283 | 707 | 0.000 |
| 1.308 | 2300 | -0.087 | 1.308 | 1430 | -0.062 | 1.308 | 705 | 0.000 |
| 1.332 | 2290 | -0.089 | 1.332 | 1420 | -0.063 | 1.333 | 689 | 0.001 |
| 1.357 | 2280 | -0.092 | 1.357 | 1410 | -0.066 | 1.358 | 664 | 0.002 |
| 1.382 | 2270 | -0.093 | 1.382 | 1400 | -0.068 | 1.382 | 635 | 0.002 |
| 1.407 | 2270 | -0.095 | 1.407 | 1390 | -0.069 | 1.407 | 610 | 0.002 |
| 1.432 | 2260 | -0.097 | 1.432 | 1380 | -0.072 | 1.432 | 593 | 0.002 |
| 1.457 | 2250 | -0.100 | 1.457 | 1370 | -0.073 | 1.457 | 578 | 0.002 |
| 1.482 | 2240 | -0.101 | 1.482 | 1360 | -0.075 | 1.482 | 559 | 0.002 |
| 1.507 | 2240 | -0.103 | 1.497 | 1350 | -0.076 | 1.497 | 551 | 0.002 |

Direct Shear Test for Soils Under Drained Conditions

(ASTM D3080)



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Project: Landmark Testing & Engineering

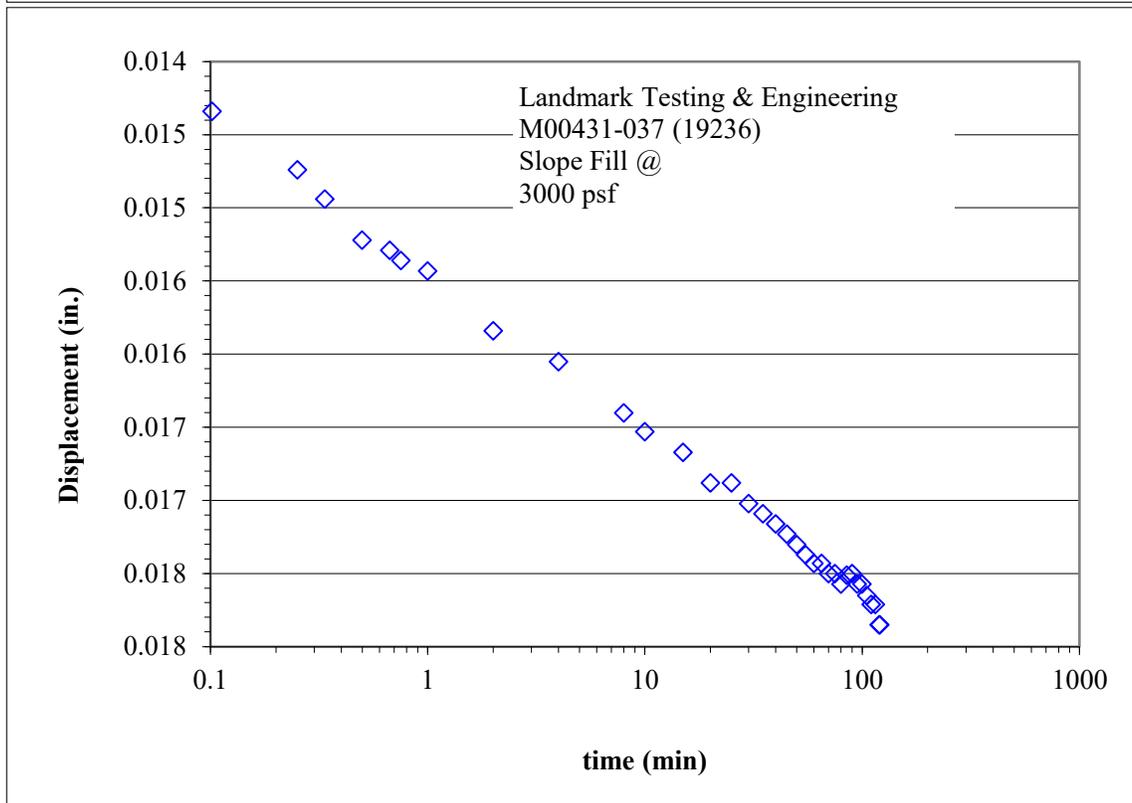
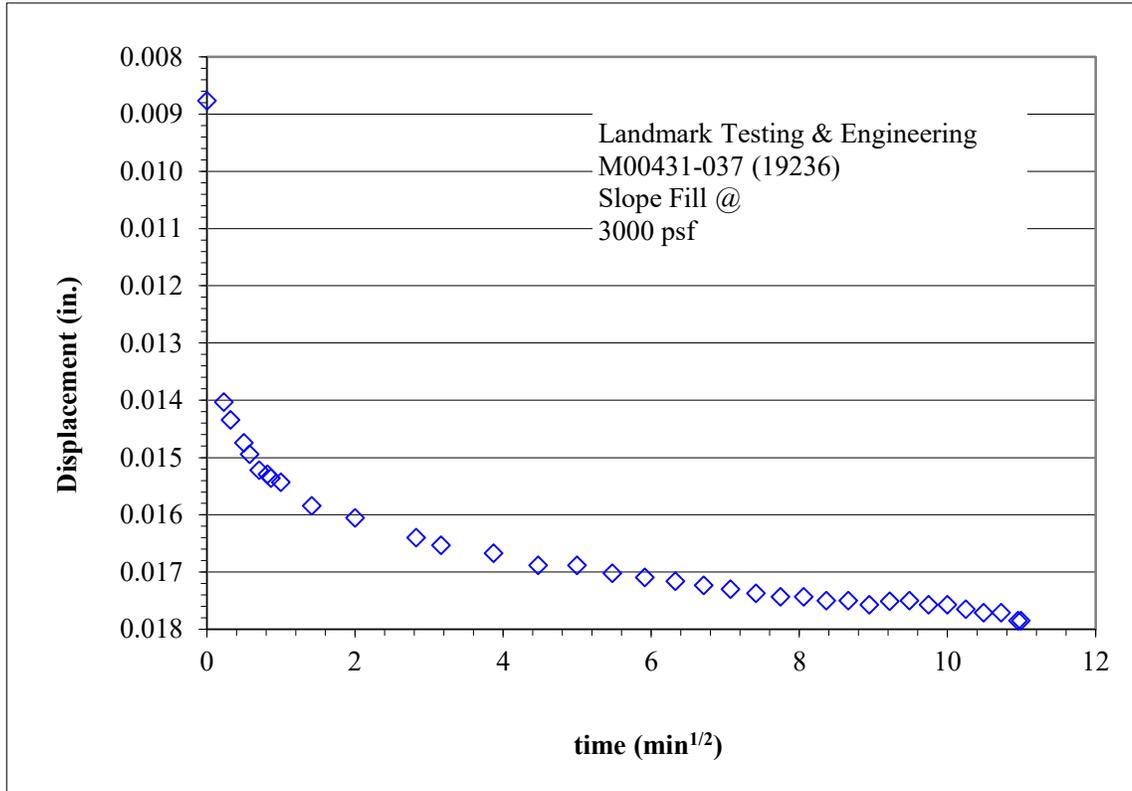
No: M00431-037 (19236)

Location: Washington Vista

Boring No.: Slope

Sample: Fill

Depth:





CORE COMPRESSIVE STRENGTH REPORT

Project Name: SGMC Ground-up Hospital Project #: 210411
 Client: Alpha Engineering
 Address: 43 South 100 East, Suite 100, St. George, UT 84770
 Date Sampled: 5/6/2021 Date Tested: 05/14/21

| Core No. | Location | Date Tested | Dry Density (pcf) | Diameter x Height (in.) | Area (sq. in.) | Ultimate Load (lb.) | Compressive Strength (psi) |
|----------|--------------------------|-------------|-------------------|-------------------------|----------------|---------------------|----------------------------|
| 1 | 21SG2300 Boring 2 at 16' | 05/14/21 | 123.6 | 1.850 x 4.012 | 2.69 | 6060 | 2250 |
| 2 | 21SG2301 Boring 2 at 20' | 05/14/21 | 133.0 | 1.863 x 3.205 | 2.73 | 1780 | 640* |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |

* Correction factor used to correct for non-standard length over diameter ratio

ASTM C39, C42, C617



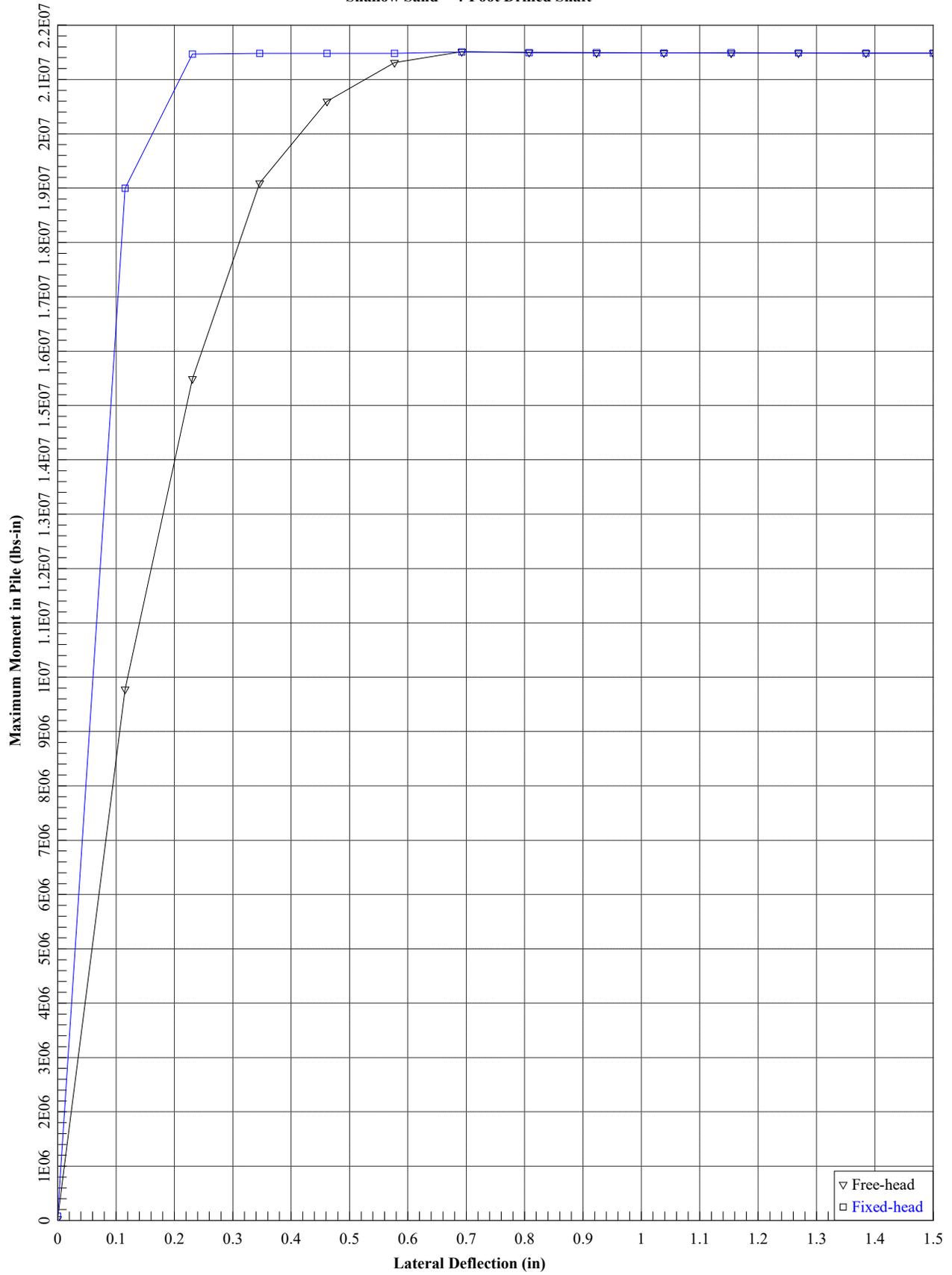
Reviewed By: Z. Girsberger

FIGURE B-1

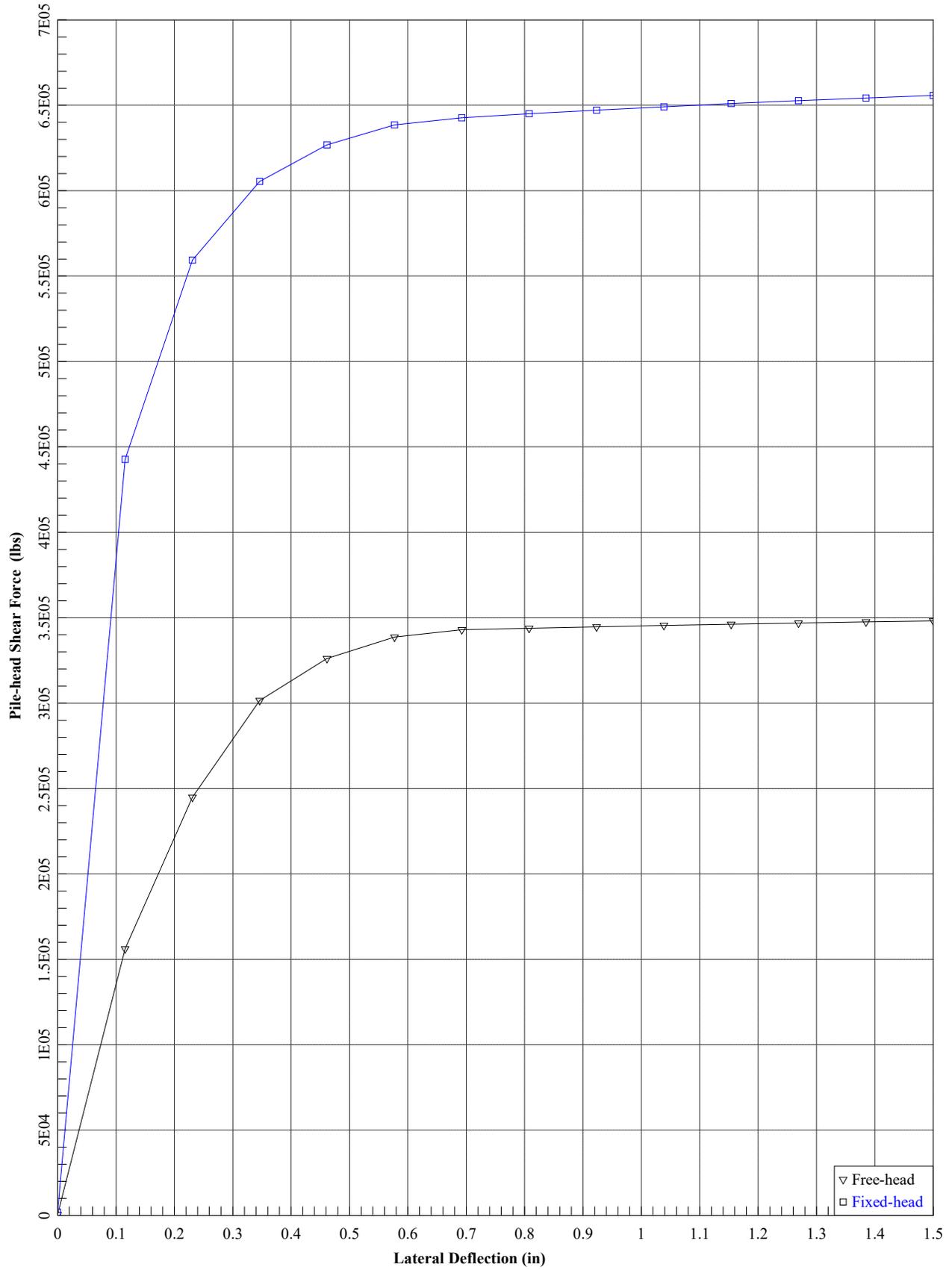
APPENDIX C

Pushover Graphs

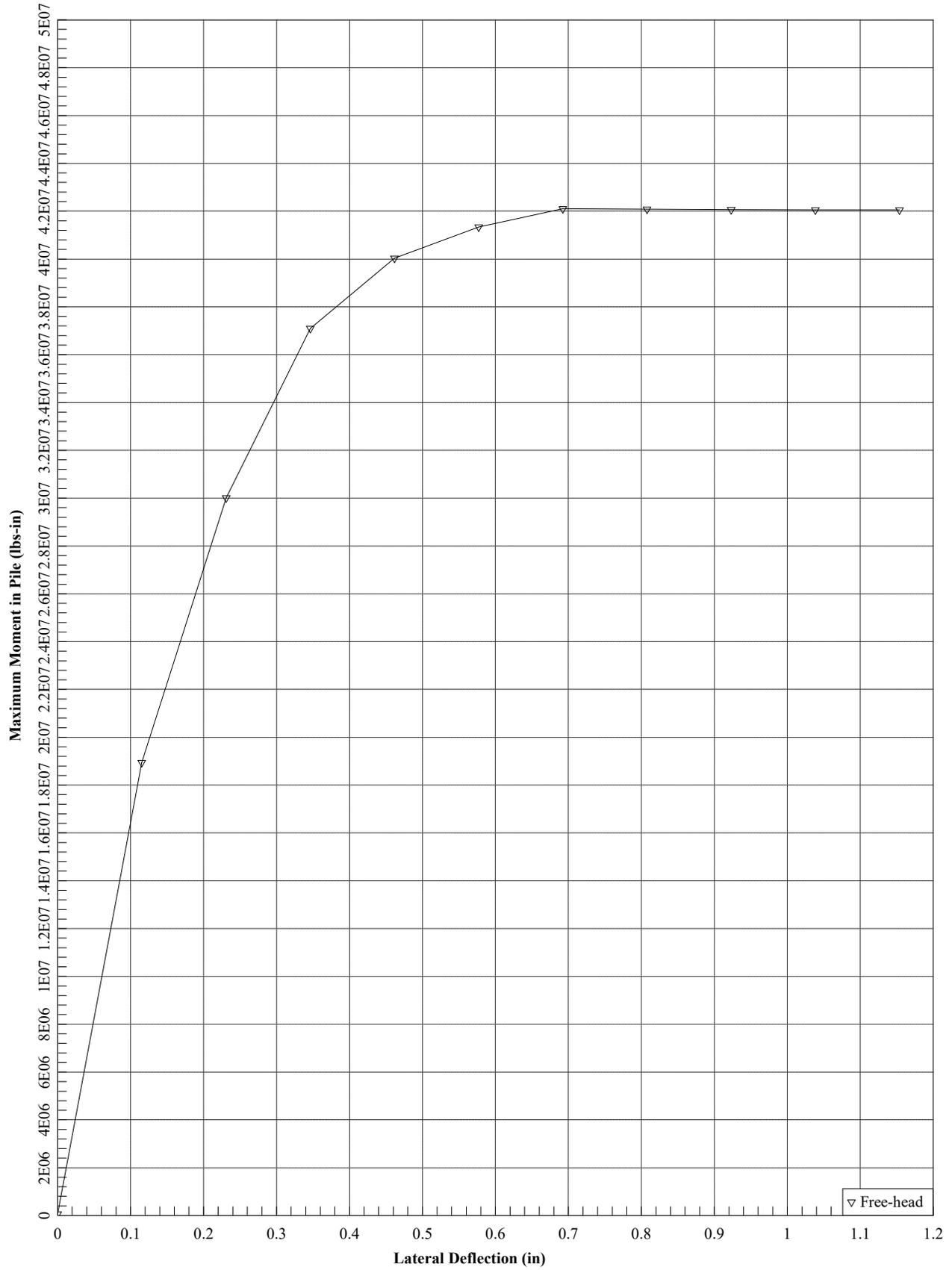
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 4-Foot Drilled Shaft



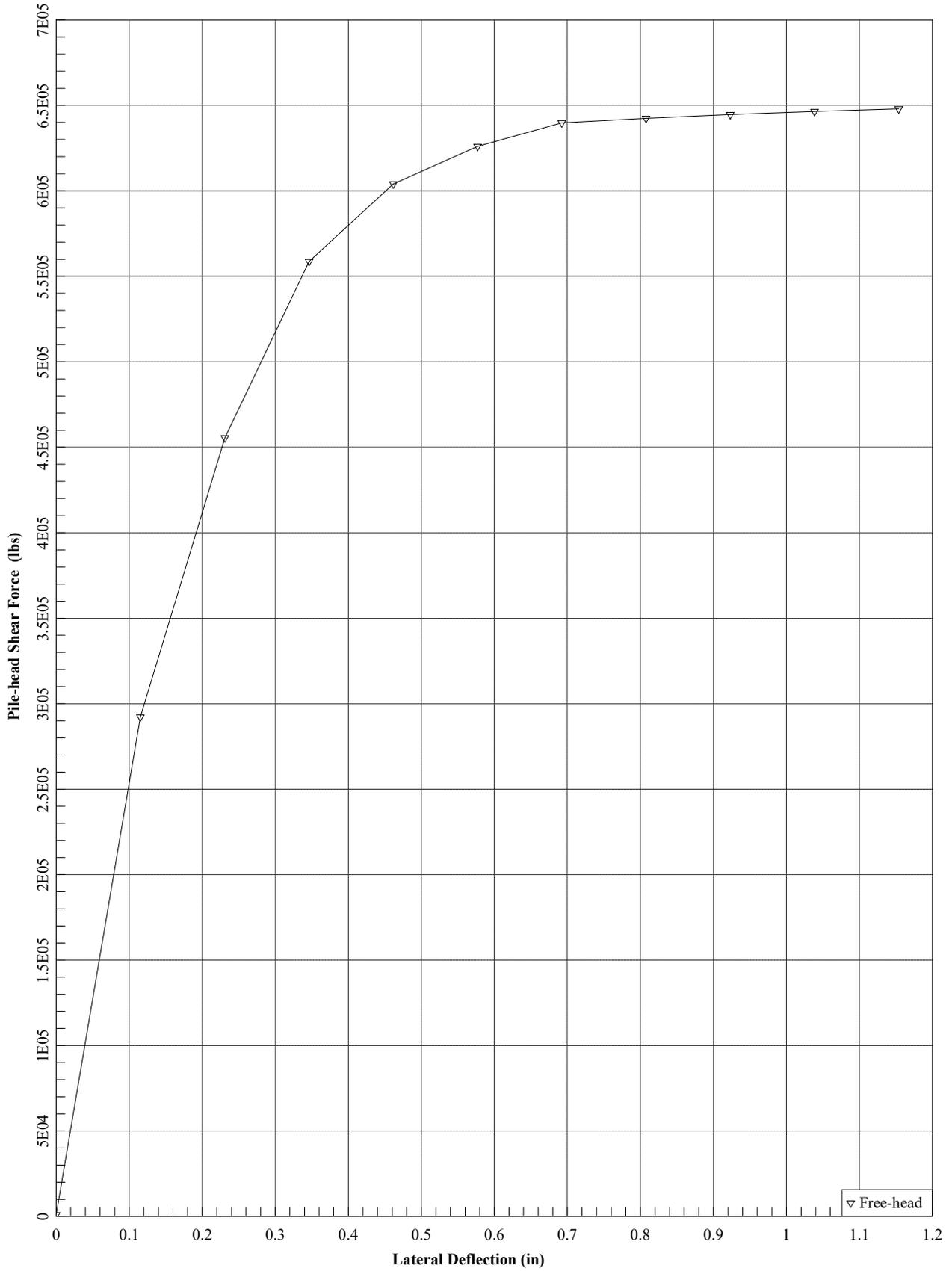
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 4-Foot Drilled Shaft



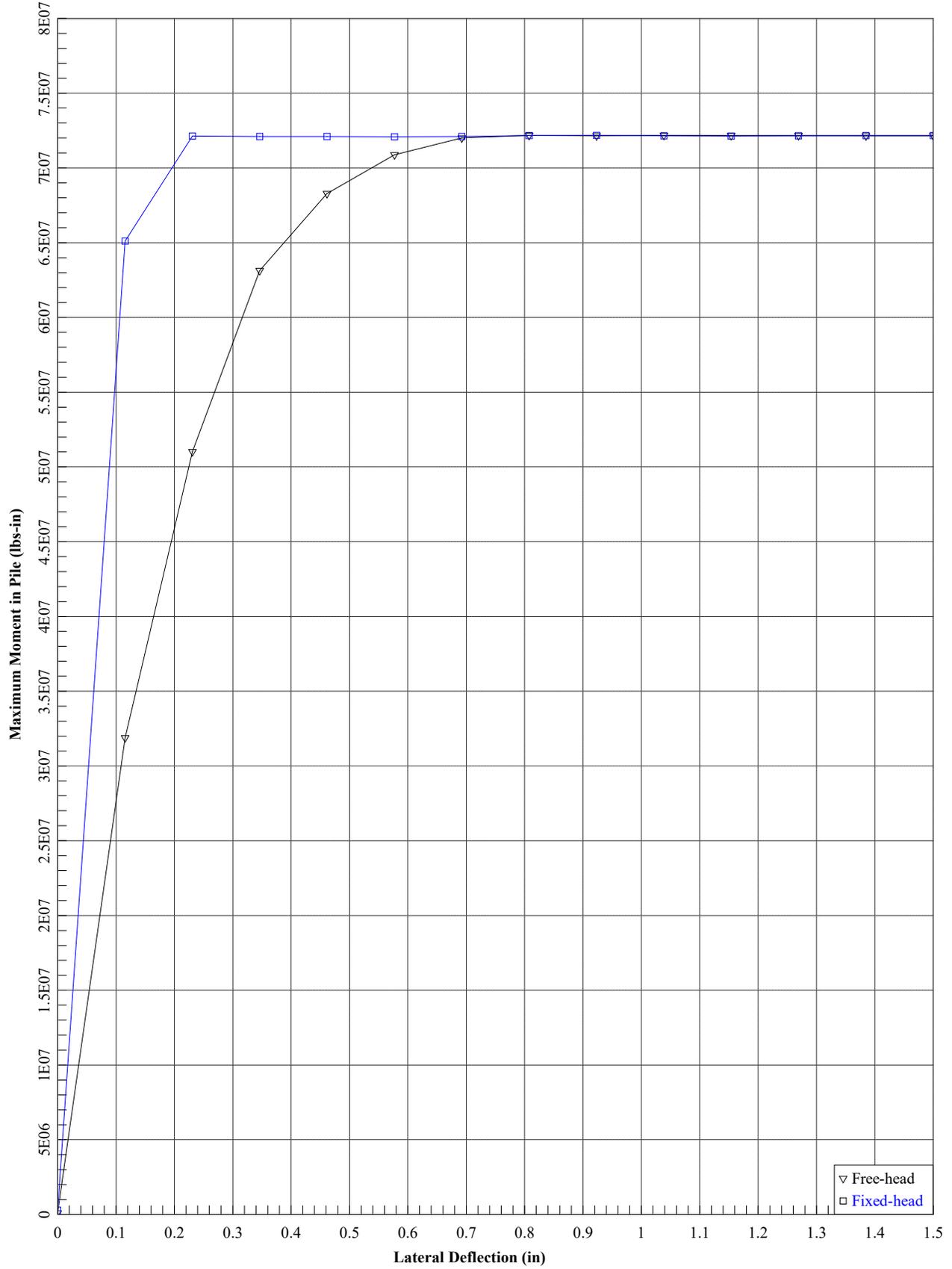
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 5-Foot Drilled



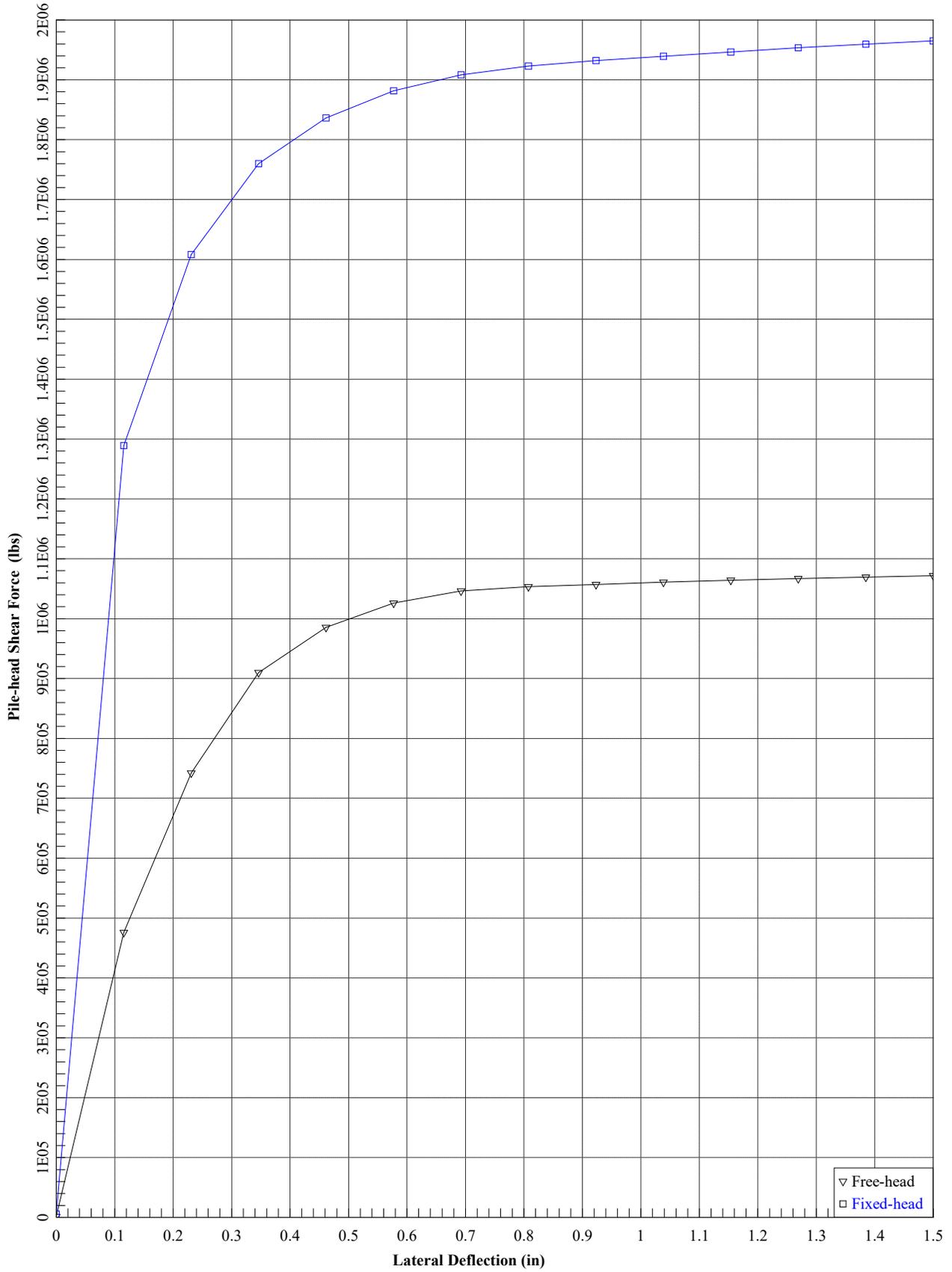
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 5-Foot Drilled



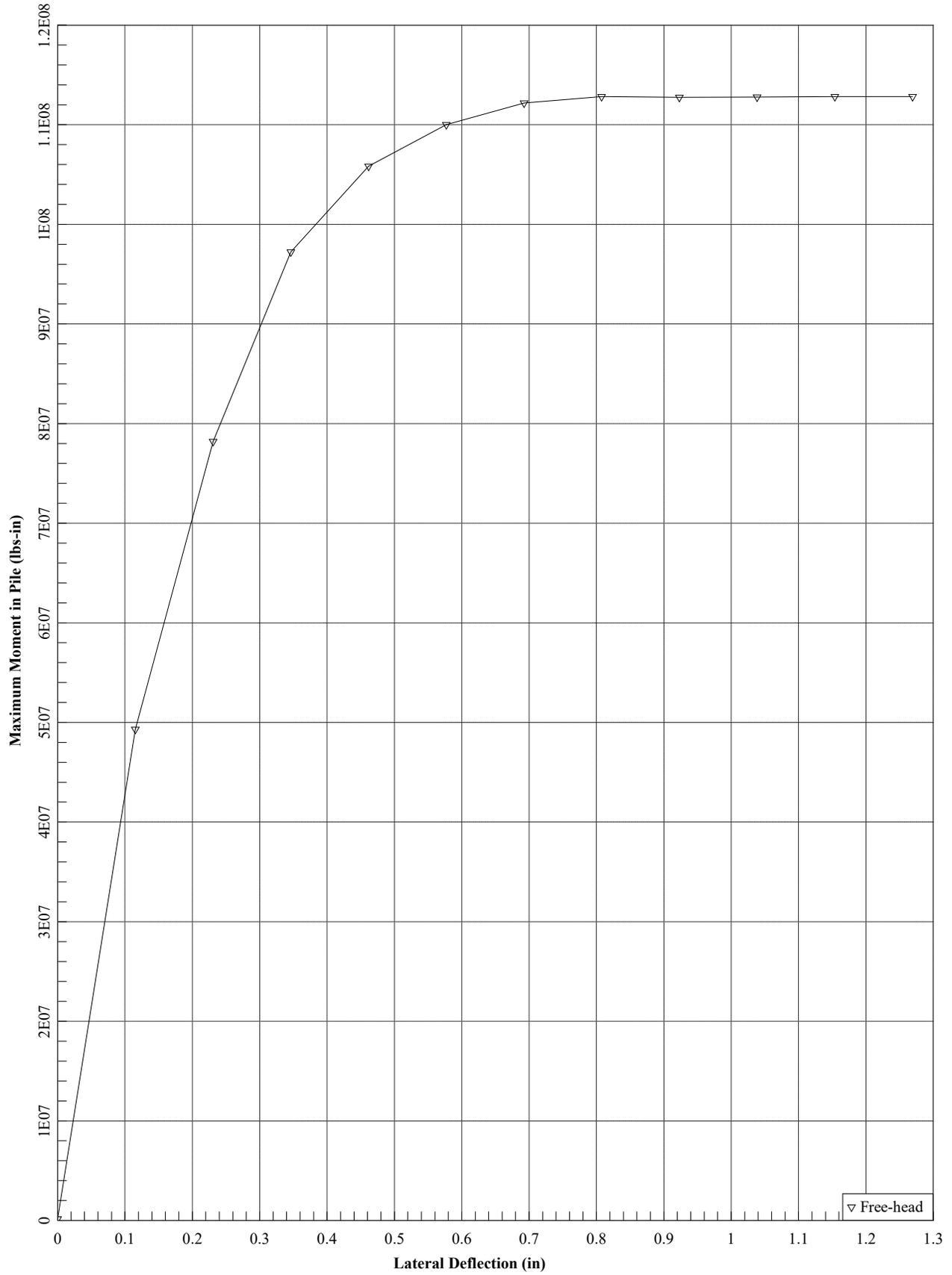
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 6-Foot Drilled



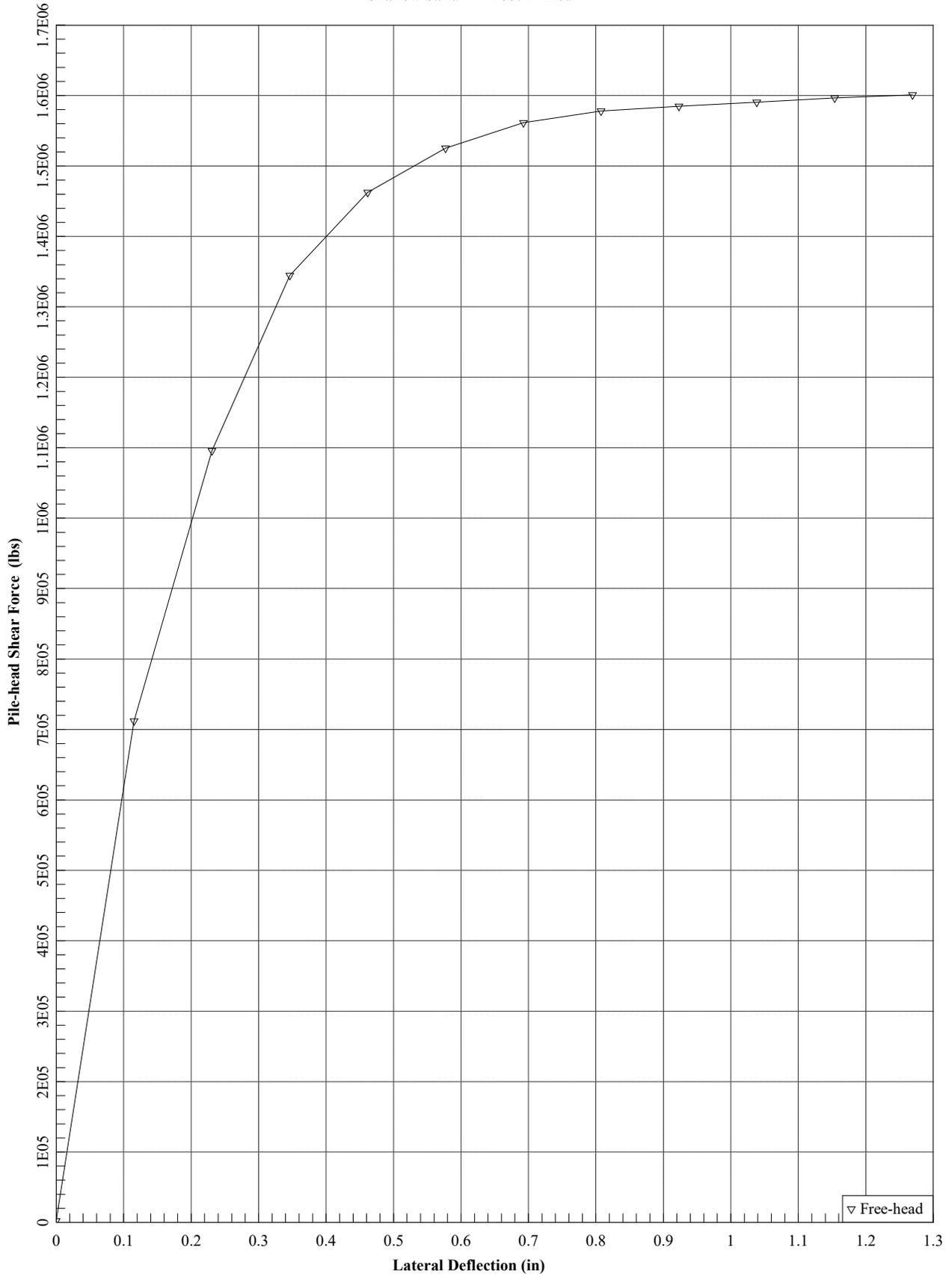
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 5-Foot Drilled



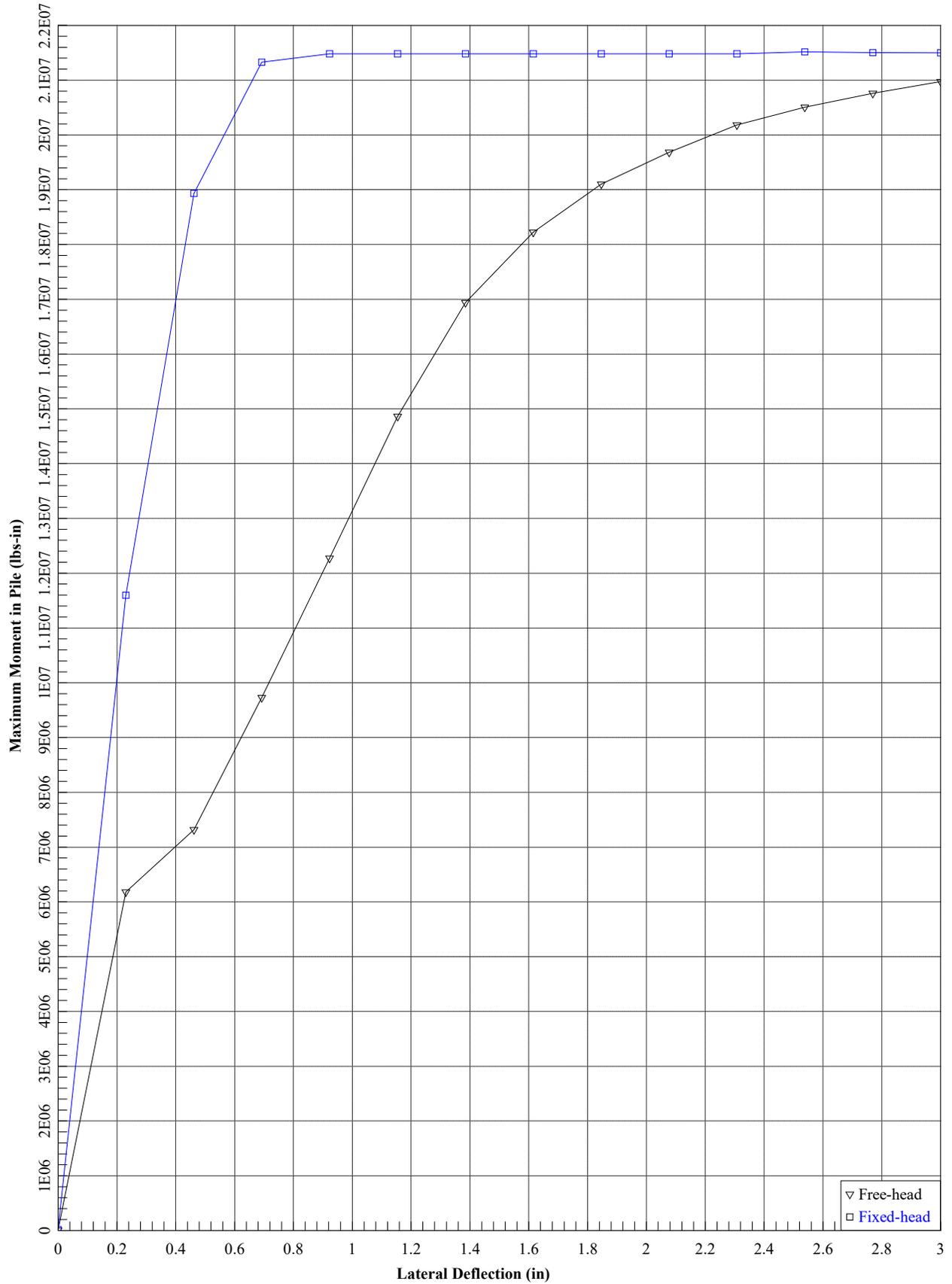
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 7-Foot Drilled



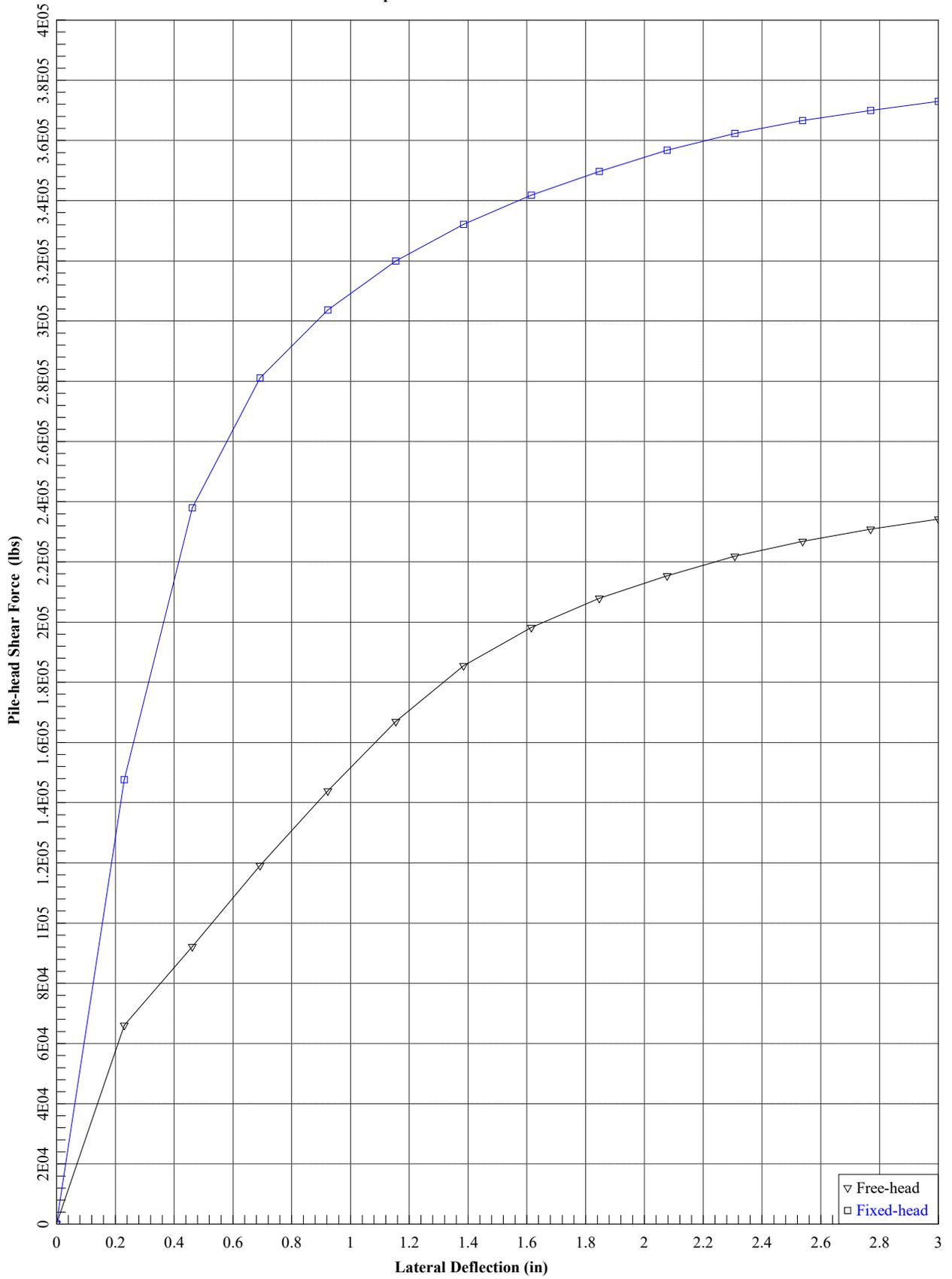
Pushover Analysis with Free and Fixed-head Conditions
Shallow Sand - 7-Foot Drilled



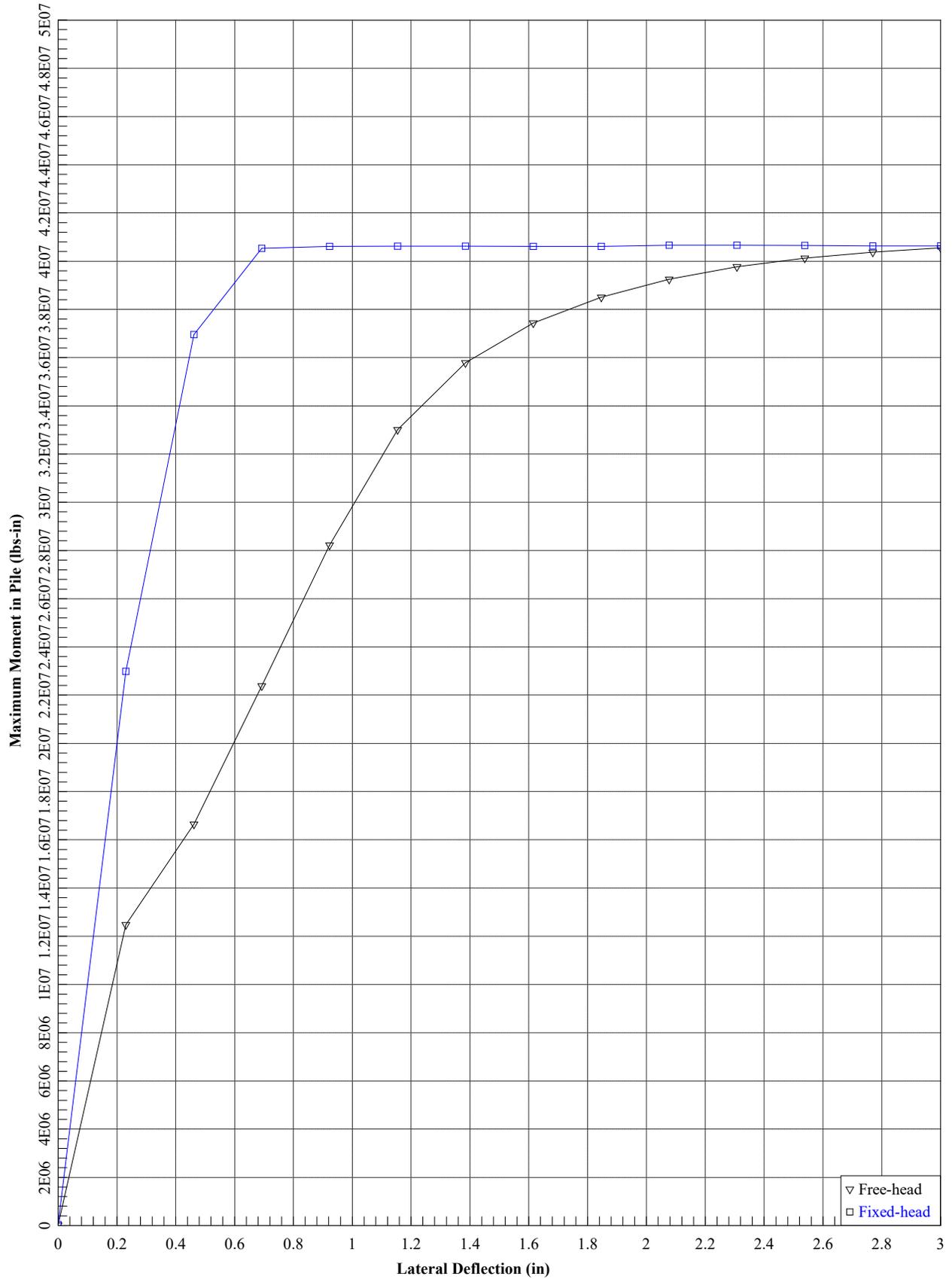
Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 4-Foot Drilled Shaft



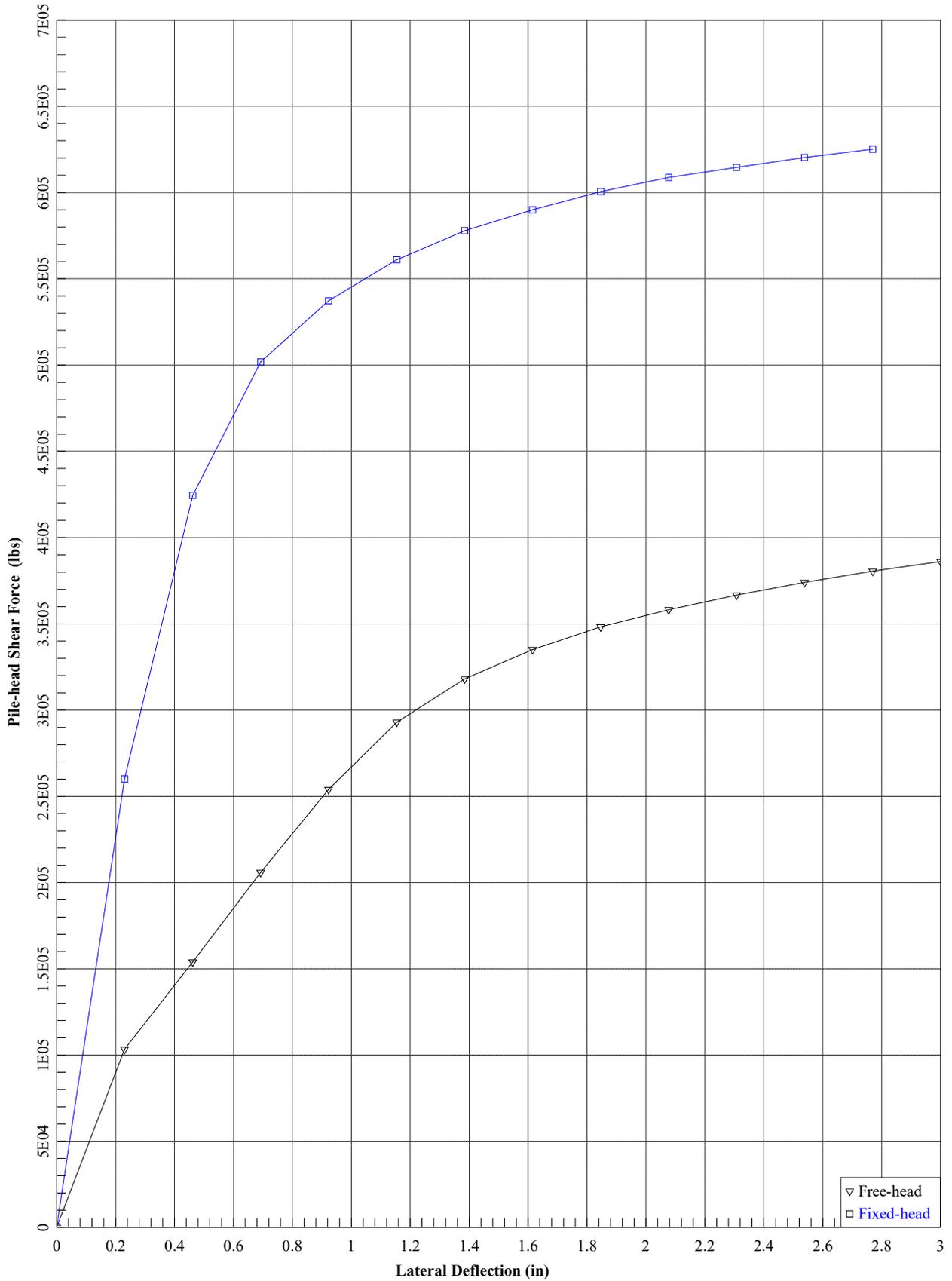
Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 4-Foot Drilled Shaft



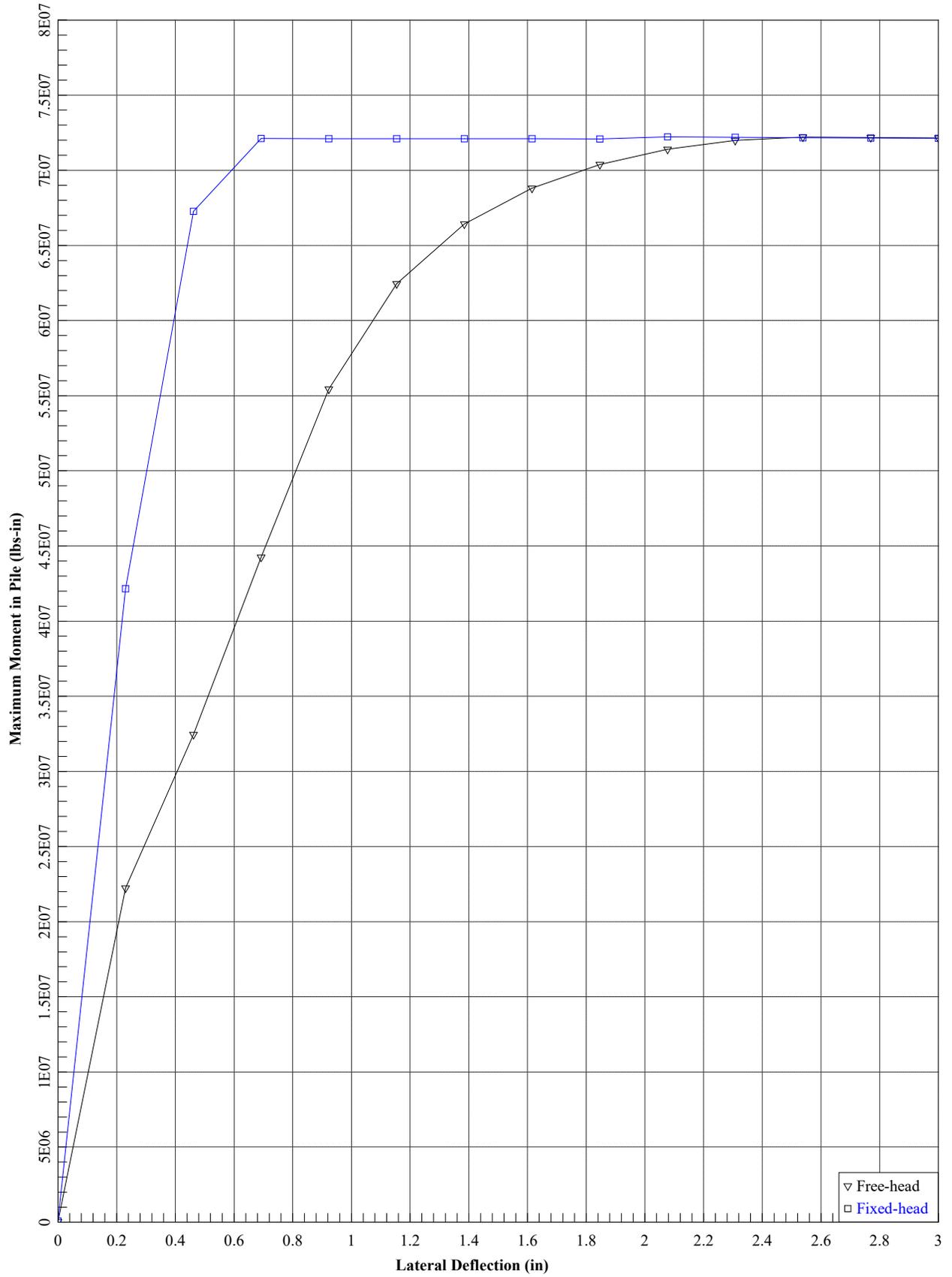
Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 5-Foot Drilled Shaft



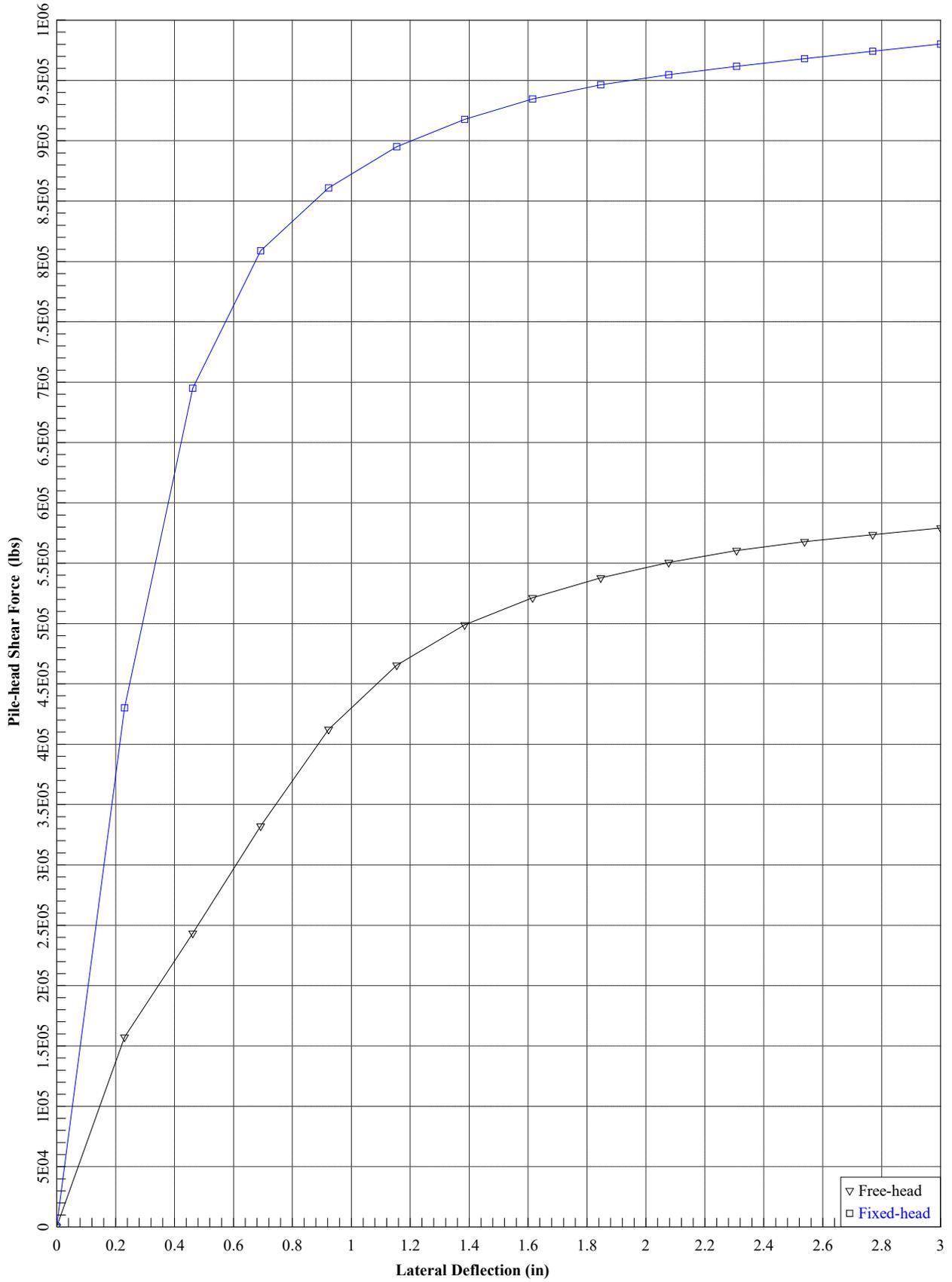
Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 5-Foot Drilled Shaft



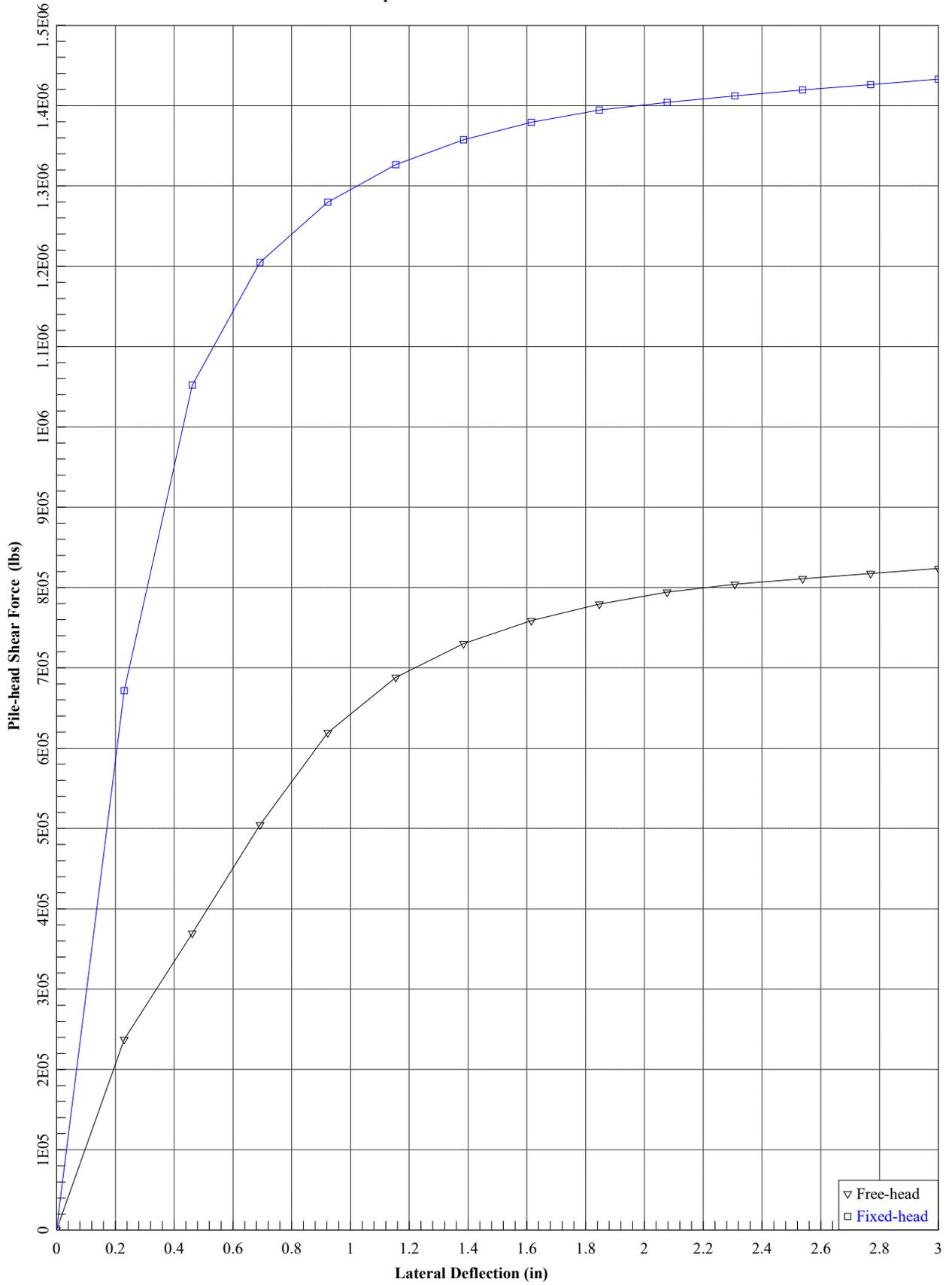
Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 6-Foot Drilled Shaft



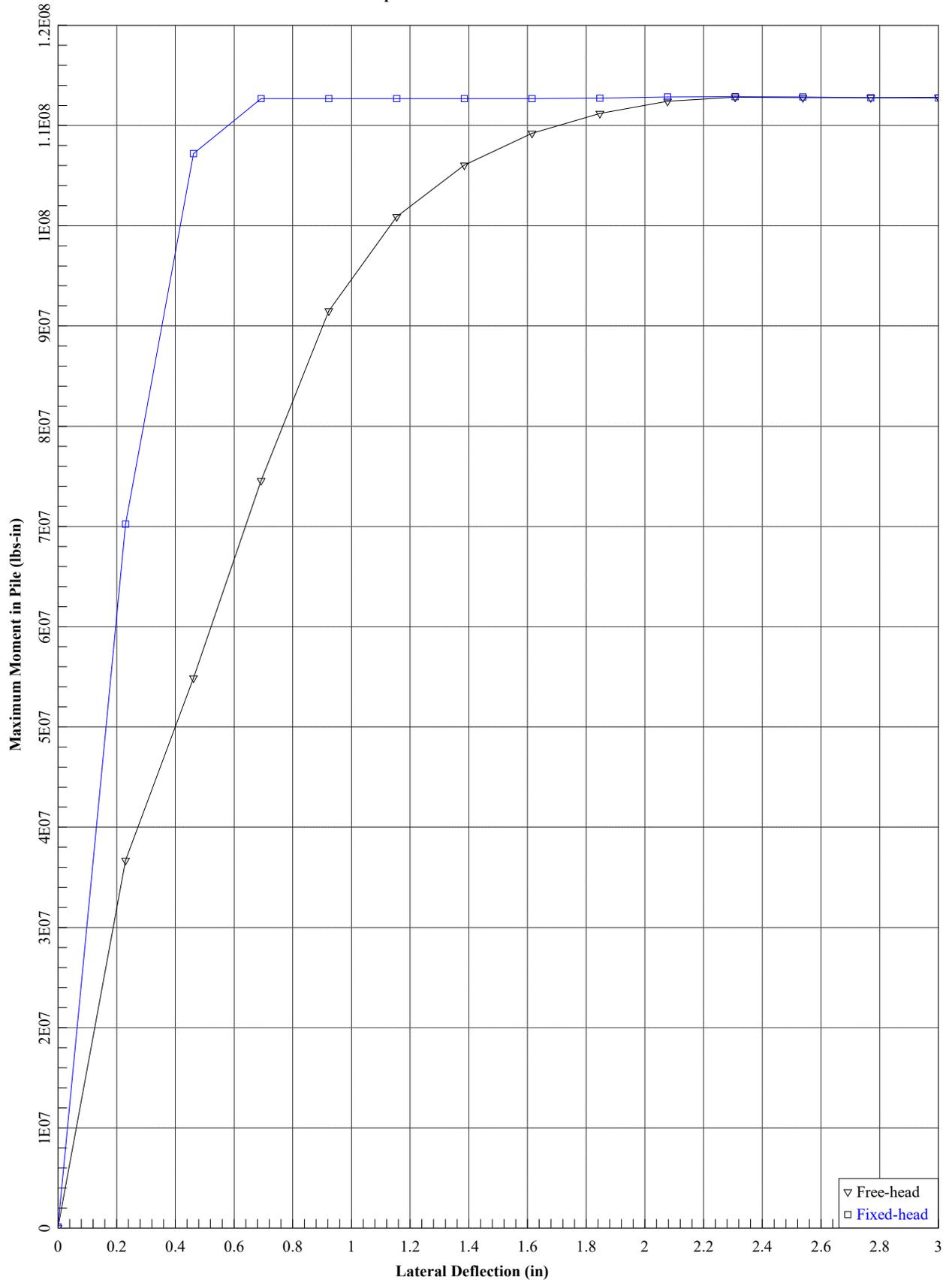
Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 6-Foot Drilled Shaft



Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 7-Foot Drilled Shaft



Pushover Analysis with Free and Fixed-head Conditions
Deep Sand - 7-Foot Drilled Shaft



Pushover Analysis with Free and Fixed-head Conditions

