

CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

CITY OF ELYRIA, OHIO

DEPARTMENT OF PUBLIC SERVICE  
ENGINEERING DIVISION

PROJECT SPECIFICATIONS

FOR

**CITY OF ELYRIA  
SLUDGE LINE REPLACEMENT PROJECT**

Chris Pyanowski  
Safety-Service Director

John Schneider, P.E.  
City Engineer

**Signature:**

**Date:** 09/25/2024

SUBMITTED BY AECOM

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**ATTACHMENT**

SLUDGE LINE REPLACEMENT PROJECT PLAN SET

## INVITATION TO BID

Sealed bids for this lump sum price contract will be received by the City of Elyria, Ohio, until **2:00 PM** local time on **Wednesday, October 16, 2024** for the project known as:

### SLUDGE LINE REPLACEMENT PROJECT

The bids are to be delivered to the **Office of the Engineer, Elyria City Hall, 131 Court Street, Elyria, Ohio 44035**. All bids received will then be opened and read at a public bid-opening meeting.

**DESCRIPTION OF WORK:** The Contractor shall furnish all labor, equipment, supplies, and supervision of labors necessary to complete the work. This project includes replacement of 300 lf of 6" sludge line and installation of 250 lf of 4" sludge line and all related installation and restoration work. It also includes the installation of 130 lf of 4" steam line and 2" condensate line and all related installation and restoration work. An alternate add-on for replacement of an additional 471 lf of 6" sludge line is also included in this project.

**BIDDING DOCUMENTS:** The plans, specifications, and all bidding forms may be examined at the City of Elyria Website, <http://www.cityofelyria.org/bids-requests/>, go to "Current Bids". Bidders SHALL request the electronic copy of the bid package by sending their request to [kmckillips@cityofelyria.org](mailto:kmckillips@cityofelyria.org) in order to be placed on the Planholders List.

**PROJECT RELATED QUESTIONS:** Questions related to the project will be accepted until 5:00 P.M. on Wednesday, October 9, 2024.

**BID SECURITY:** The bid must be accompanied by a bid guaranty. The bid guaranty must meet all requirements of Section 153.54 of the ORC and the Instructions to Bidders.

**BUY OHIO:** All contractors and subcontractors involved with the project will, to the extent practicable, use Ohio products, materials, services, and labor in the implementation of this project.

**COMPLETION TIME:** The contractor will have 120 days from the date of the Notice to Commence Work to complete the Work. All Work shall be completed by February 28, 2025.

**PREVAILING WAGES:** The contractor and any subcontractor must comply with the prevailing wage rate requirements on public improvements in Lorain County and the City of Elyria, Ohio, as determined by the Ohio Department of Commerce, Division of Industrial Compliance and Labor, Bureau of Wage and Hour Administration (614) 644-2239. A complete listing of prevailing wage rates on public improvements in Lorain County may be obtained from the City of Elyria Engineer's Office at (440) 326-1444 or at [www.ohio.gov/dico](http://www.ohio.gov/dico). **Please note it is the Contractor's responsibility to know the prevailing wage rates on public improvements in Lorain County.**

**COMPLIANCE WITH ALL LAWS:** All work shall be carried out in compliance with all federal, state and local laws, rules and regulations that apply to the work. Any project specification item in conflict with a federal, state, or local law, rule or regulation, shall be void.

**AFFIRMATIVE ACTION:** All bidders must comply with the provisions of Chapter 167 of the Elyria Codified Ordinances as amended. Bidders must be pre-certified or submit an acceptable Affirmative Action Plan with the bid submission. No contract will be awarded unless an acceptable

CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

Affirmative Action Plan is reviewed by the EEO Office, approved and incorporated into the contract. Each bidder must complete and sign the Elyria Equal Opportunity Clause, which is included with the specifications.

**PROPOSAL FORMS:** No proposal will be considered unless it is made on the blanks furnished by the City. No bidder shall take any exception to any requirement of the specifications. Each proposal must contain the full name of the party or parties submitting the proposal and all persons interested therein.

**AWARD OF CONTRACT:** The City reserves the right to waive any technicalities or informalities, to reject any or all bids received, and to accept any bid with any combination of alternates which is deemed most favorable to the City of Elyria, Ohio at the time and under the conditions stipulated in the project documents.

Published by order of:  
Mayor Kevin Brubaker

## INSTRUCTIONS TO BIDDERS

### 1. ORDINANCE

- 1.1 The bids for this project are being taken in accordance with Ordinance No. 2024-103 passed by the Elyria City Council on June 3, 2024.

### 2. DEFINED TERMS

- 2.1 Except as given in Section 2.2 herein, the terms used in these Instructions to Bidders which are defined in the General Conditions and have the meanings assigned to them in Section 1.01 of the noted General Conditions.

- 2.2 Additional terms used in these Instructions to Bidders are defined as follows:

**SUCCESSFUL BIDDER** - the lowest and best, responsible, and responsive bidder to whom the City (on the basis of the City's evaluation as hereinafter provided) makes an award.

**UNDERGROUND FACILITIES** - All pipes, conduits, ducts, cables, fiber optic cables, wires, service connections, manholes, closeouts, valves, vaults, pull boxes, tanks, tunnels, culverts or other such facilities or attachments, and encasements containing such facilities privately or publicly owned which have been installed underground to furnish any of the following services or materials: electricity, gas, steam, liquid petroleum products, street lighting, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems, or water.

**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.

### 3. COPIES OF BIDDING DOCUMENTS

- 3.1 Complete sets of the bidding documents may be purchased as described in the Invitation to Bid. No refund will be made for returned documents.
- 3.2 Complete sets of bidding documents must be used in preparing bids; the City does not assume any responsibility for errors or misinterpretations resulting from the use of an incomplete set of bidding documents.
- 3.3 The City in making copies of the bidding documents available on the above terms does so only for the purpose of obtaining bids for the work and does not confer a license or grant permission for any other use of the bidding documents.

### 4. QUALIFICATIONS OF BIDDERS

- 4.1 To demonstrate qualifications to perform the work, each bidder must be prepared to submit within five (5) days after the bid opening, upon the City's request, detailed written evidence

such as financial data, previous experience, present commitments and other such data as may be needed to demonstrate the bidder's qualifications.

- 4.2 Each bidder must be qualified to do business in the State of Ohio, or must obtain such qualification prior to award of the contract by the City.

**5. EXAMINATION OF CONTRACT DOCUMENTS AND SITE**

- 5.1 It is the responsibility of each bidder before submitting a bid:

5.1.1 To examine thoroughly the contract documents and other related data identified in the bidding documents. Documents are available for review in the City of Elyria Engineering Department;

5.1.2 To visit the site to become familiar with and satisfy bidder as to the general, local and site conditions that may affect cost, progress, performance or the furnishing of the work;

5.1.3 To consider federal, state and local laws and regulations that may affect cost, progress, performance, or the furnishing of the work;

5.1.4 To study and carefully correlate bidders knowledge and observations with the contract documents, and other related data;

5.1.5 To promptly notify the Engineer of all conflicts, errors, ambiguities or discrepancies which bidder has discovered in or between the contract documents and other related documents or observations.

5.1.6 To evaluate the condition, layout and nature of the project site and surrounding area;

5.1.7 To consider the availability and cost of labor;

5.1.8 To consider the availability and cost of materials, supplies and equipment;

5.1.9 To consider the cost of temporary utilities required in the bid;

5.1.10 To consider the cost of any permit or license required by a local or regional authority having jurisdiction over the project;

5.1.11 To consider the generally prevailing climatic conditions; and

5.1.12 To evaluate conditions bearing upon transportation, disposal, handling, and storage of materials.

5.2 All notices of conflicts, errors, ambiguities or discrepancies submitted by a bidder to the Engineer must be in writing and should be given at least seven (7) days prior to the bid opening. The Engineer will respond to such notices received in time, by sending an addendum to all holders of the plans and specifications.

5.3 Any reports of exploration and tests of subsurface conditions at or contiguous to the site which have been utilized by the Engineer in preparation of the contract documents are

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identified in the Supplementary Conditions. The bidder may rely upon the general accuracy of the "technical data" contained in such report but not upon other data, interpretations, opinions or information contained in such reports or otherwise related to the subsurface conditions at the site, nor upon the completeness thereof for the purpose of bidding or constructing the project, but the City is not responsible for the accuracy thereof.

- 5.4 The City may have record drawings of previous projects constructed in the past, in part or the entire site where this project is to be constructed. The bidder may examine these drawings, if available.
- 5.5 The bidder may purchase copies of the reports noted in Section 5.3 and of the drawings noted in Section 5.4 for the cost of reproduction as established by City Ordinance or by the firm printing the bid documents. Those reports and drawings are not part of the contract documents. The bidder is responsible for any interpretation or conclusion drawn from any technical data, opinions or other information contained in or developed from such reports or drawings.
- 5.6 Before submitting a bid each bidder will be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing the work, or which relates to any aspect of the means, methods, techniques, sequences, or procedure of construction to be selected and employed by bidder and all safety precautions and programs incidental thereto or which bidder deems necessary to determine its bid for the performing and furnishing the work in accordance with time, price, and other terms and conditions of the contract documents.
- 5.7 On request, the City will grant permission to each potential bidder, access to the site (by issuing a no fee excavation permit, except a fee will be required if pavement is to be cut) to conduct such examination, investigation, exploration, tests and studies as each bidder deems necessary for submission of a bid. Bidders must fill all test holes and clean up and restore the site to its former condition upon completion of such explorations, investigation, tests and studies.
- 5.8 The general nature of any work scheduled to be performed at the project site by the City, or by another prime contractor working for the City, and by any utility (if known by the City) that relates to the work for which a bid is to be submitted, is included as information in the Supplementary Conditions.
- 5.9 The submission of a bid will constitute an incontrovertible representation by bidder that bidder has complied with every requirement of this Article 5, and that without exception the bid is premised upon performing and furnishing the work required by the contract documents and applying the specific means, methods, techniques, sequences or procedures of construction selected by the bidder to complete the project as expressly required by the contract documents, that the bidder has given the Engineer written notice of all conflicts, errors, ambiguities and discrepancies that bidder has discovered (if any) in the contract documents in time for an addenda to be issued to all plan holders, and that the written resolutions thereof issued by the Engineer as an addenda is acceptable to the bidder, and that the contract documents are generally sufficient to indicate and convey understanding of all



terms and conditions for performing and furnishing the work.

## 6. AVAILABILITY OF LAND FOR WORK

- 6.1 The lands upon which the work is to be performed, the right-of-way and easements, and access thereto and other lands designated for use by the contractor in performing the work are identified in the contract documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the work are to be obtained and paid for by the contractor.
- 6.2 All easements and/or right-of-way for permanent structures or permanent changes in existing facilities have been obtained and paid for by the City unless otherwise provided in the Supplementary Conditions.
- 6.3 Any special condition set forth in easements obtained by the City, which may affect the performance or furnishing the work, if any, are identified in the Supplementary Conditions.

## 7. INTERPRETATIONS AND ADDENDA

- 7.1 All questions about the true meaning or intent of the bidding documents are to be directed to the Engineer in writing. Interpretations or clarifications considered necessary by the Engineer in response to such questions will be issued by addenda, either mailed, faxed, emailed or hand delivered to all parties recorded by the Engineer as having received the bidding documents or attended the pre-bid meeting.
- 7.2 An addendum may also be issued by the Engineer to modify the bidding documents as deemed advisable by the City.
- 7.3 A bidder may not rely upon any interpretation of the bidding documents by any means other than a written addendum.

## 8. BID SECURITY

- 8.1 Each bid must be accompanied by a bid guarantee. The bid guarantee may be a **Bid/Contract Bond**, a **Certified Check**, a **Cashier's Check** or a **Letter of Credit**. The bid guarantee shall meet all requirements of Section 153.54 of the Ohio Revised Code and any additional requirements stated herein.
- 8.2 Any bond shall be furnished by a surety company licensed to conduct business in the State of Ohio. Any check used as bid security shall be drawn on a solvent bank.
- 8.3 Any **Bid/Contract Bond** submitted shall be for the full amount of the base bid plus the highest combination of additive alternates, if any. The form of the **Bid/Contract Bond** shall be of substantially the same form as provided in Section 153.571 of the Ohio Revised Code and it shall serve as both a bid bond and a contract bond. If stated, the amount of the **Bid/Contract Bond** shall be specified in figures. Specifying the amount of the bond as a percentage or one hundred percent (100%) is **not** acceptable.
- 8.4 Section 3905.41, Ohio Revised Code, may require that a **Bid/Contract Bond** be

countersigned by an Ohio resident agent. It is the bidder's responsibility to determine the applicability of Section 3905.41, Ohio Revised Code.

- 8.5 Any **Certified Check, Cashier's Check** or a **Letter of Credit** submitted shall be made payable to the City of Elyria, Ohio, and shall be for an amount of not less than ten percent (10%) of the sum of the base bid plus the highest combination of additive alternates, if any. The amount shall be stated in figures. Any **Certified Check, Cashier's Check** or a **Letter of Credit** submitted shall be accompanied by an executed Consent of Surety form. Any letter of credit shall be revocable only by the City. If the successful bidder used a certified check, cashier's check or letter of credit, it will be returned upon provision of the **Contract Bond** required by Section 153.54, Ohio Revised Code.
- 8.6 In case a bidder, to whom a contract is awarded, fails to execute the contract within ten (10) days after notice of award is delivered in writing to the bidder, or in case a bidder fails to secure the contract with an acceptable performance bond and payments bond (each in the full amount of the contract) and execute the contract within ten (10) days after notice of the award is delivered in writing to the bidder, the bidder shall be considered as refusing the contract and shall forfeit their bid security in accordance with provisions of Section 153.54 of the Ohio Revised Code.
- 8.7 The bid security from each bidder may be held by the City for up to sixty (60) days. The bid security will be returned to the unsuccessful bidders after the contract has been signed and secured as provided herein above by the successful bidder.

## 9. **CONTRACT TIME**

- 9.1 The number of days within which, or the date by which, the work is to be substantially completed and also completed and ready for a pre-final payment, are set forth in the Invitation to Bidders and will be set forth in the Agreement Form.

## 10. **LIQUIDATED DAMAGES**

- 10.1 Provisions for liquidated damages, if any are set forth in the Agreement Form.

## 11. **SUBSTITUTE AND "OR-EQUAL" ITEMS**

- 11.1 The drawings or specifications may make a reference to a specific manufacturer's make or model identification for a material or item of equipment. The materials and equipment described in this way, by a manufacturer's brand name, establishes a standard of required type, function, quality, and expected life to be met by any proposed substitute or "or-equal" item. Such reference to a name shall be considered as requiring the contractor to furnish either that product or a substitute proposed by the contractor and approved by the Engineer as an approved equal.
- 11.2 An application for acceptance will not be considered by the Engineer until after the effective date of the Agreement.
- 11.3 Each submission by the contractor for review of a substitute shall include the name of the material or equipment for which it is to be substituted and a complete description of the

proposed item including drawings, cuts, performance and test data, and any other information necessary for an evaluation.

- 11.4 The Engineer's review of the substitution will consider the City's normal inventory of repair parts for the specified equipment and the possibility of increased down time for repairs to equipment of a type that repair parts are not in the City's inventory.

## **12. BID FORM**

- 12.1 The Bid Form is included with the bidding documents. This form shall be used by the bidder to submit its bid.
- 12.2 All blanks on the Bid Form (except the signature line) must be completed by printing in ink or by typewriter.
- 12.3 Discrepancies between the sum of the labor bid price and the material bid price for an item will be resolved by using the total bid price stated by the bidder expressed in numbers. The Bid Price shall be the sum of the total for the extension of the unit prices times the estimated quantity. Discrepancies between the multiplication of the estimated quantity of an item on the proposal and the total unit price stated by the bidder will be resolved by using the total unit price stated by the bidder and the estimated quantity.
- 12.4 Bids by entities must be executed by an authorized officer, member, partner, or the equivalent and accompanied by evidence of authority to sign.
- 12.5 Bids by a partnership must be executed in the partnership name and signed by a partner, whose title must be shown below the signature.
- 12.6 The bid shall contain an acknowledgment of receipt of all addenda.
- 12.7 The address, telephone number and email address for communication regarding the bid must be shown.
- 12.8 An out-of-state entity must provide evidence of authority to conduct business in the State of Ohio.
- 12.9 The bid price stated in the bid form shall be the full price for completion of the work which price shall include all payments by the City to the contractor for all labor, material, equipment, supervision, and overhead required to complete the work.
- 12.10 The cost of completing all work specified in the drawings and in the specifications, in accordance with the contract documents, shall be included by the bidder in the pay items listed on the Bid Form.

## **13. SUBMISSION OF BIDS**

- 13.1 Bids shall be submitted at the time and place indicated in the Invitation to Bidders and shall be bound with the other bidding documents, and enclosed in an opaque sealed envelope marked "**BID ENCLOSED**" for project (by name) plus the name and address of the bidder.

- 13.2 If the bid is sent through the mail or delivered by another delivery system, the sealed bid envelope shall be enclosed in a separate envelope with the notation "**BID ENCLOSED**" on the face of the delivery envelope. Bids received, if any, after the deadline for delivery of bids, will be returned unopened.

**14. NO MODIFICATION OF BIDS**

- 14.1 After submission of a bid to the City, no modification of the bid may be made by the bidder.

**15. WITHDRAWAL OF BIDS**

- 15.1 After submission of a bid to the City, and at any time before the deadline for bid submission, the bidder may withdraw its bid by giving a duly signed written notice requesting to withdraw the bid to the City. Thereafter, that bidder will be disqualified from further bidding on the work, including any re-bid held by the City.

**16. OPENING OF BIDS**

- 16.1 All bids received will be opened and (unless obviously non-responsive) read aloud publicly at the place where the bids are to be submitted. A summary of the prices bid will be mailed to all bidders after a tabulation of the bids is completed by the Engineer.

**17. BIDS TO REMAIN SUBJECT TO ACCEPTANCE**

- 17.1 All bids will remain subject to acceptance for sixty (60) days after the day of the bid opening, but the City may, in its sole discretion, release the bid and return the bid security prior to the end of the sixty (60) day period.

**18. AWARD OF CONTRACT**

- 18.1 The City reserves the right to reject any or all bids, including without limitation, the rights to reject any or all nonconforming, non-responsive, unbalanced or conditional bids, and to reject the bid of any bidder if the City believes that it would not be in the best interest of the City to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fail to meet any other pertinent standard or criteria established by the City.
- 18.2 In evaluating the bids to determine the lowest and best bid, the City will consider the qualification of the bidders, whether or not the bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may have been submitted with the bid or as may be requested per the contract documents before the award is made by the City.
- 18.3 The City may consider the qualifications and experience of the subcontractors, suppliers, and other persons and organizations proposed for those portions of the work as to which the identity of subcontractors, suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. The City may consider also the operating cost, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the work when such data is required to be submitted

prior to the award of the work.

- 18.4 The City may conduct such investigations as the City deems necessary to assist in the evaluation of any bid and to establish the responsibility, qualifications and financial ability of the bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the work in accordance with the contract documents to the City's satisfaction within the prescribed time.
- 18.5 If the contract is to be awarded, it will be awarded to the bidder whose evaluation by the City indicates to the City that the award will be in the best interest of the City.
- 18.6 If the contract is to be awarded, the City will give the successful bidder a Notice of Award within sixty (60) days after the day of the bid opening, unless the bidder grants a time extension to the City.

**19. SIGNING OF AGREEMENT**

- 19.1 When the City gives a written Notice of Award to the successful bidder, it will be accompanied by the required number of the unsigned counterparts of the Agreement. Within ten (10) days thereafter the contractor shall sign the Agreement and deliver all copies to the City Engineer. The City will then execute the Agreement, and the City Auditor's Certification of Funds, and will deliver one (1) fully executed Agreement to the contractor with the Notice to Commence Work. One copy of the Agreement and attached documents will be sent to the local agent of the contractor's surety.

**20. CONTRACT SECURITY**

- 20.1 When the successful bidder delivers the executed Agreement to the City, it must be accompanied by the required performance and payment bonds, unless the bond submitted with the bid was a **Bid/Contract Bond**, which will serve as the required contract security.

**21. SALES TAXES**

- 21.1 The City is exempt from Ohio State sales and use taxes on the materials and equipment to be incorporated into the work. Said taxes shall not be included in the bid price. The contractor shall contact the City Auditor's Office at 440-326-1530 for completion of the tax-exempt forms required for the project.

**22. PROGRESS PAYMENTS AND RETAINER**

- 22.1 Progress payments may be made to a Contractor before the work is completed. Progress payments so paid to a Contractor shall be based on actual measurements of labor and materials furnished, including materials delivered, under the contract to the date of estimate. The amount of a progress payment shall be determined by subtracting from the value of the portion of the work completed and materials furnished to the date of the estimate a retainer of ten percent (10%) and the sum of all previous progress payments.
- 22.2 Thirty (30) days after substantial completion of the work under the contract, and upon approval of the work by the Engineer, the ten percent (10%) retainage may be reduced to five

percent (5%).

- 22.3 After completion of all punch list items, the five percent (5%) retainage may be released. The Contractor shall be responsible for full guarantee of all work for one full year from the date of final completion of the contract. No retainer shall be subject to interest payments to the Contractor nor required to be deposited with an escrow agent who will pay interest to the Contractor.

**23. EQUAL EMPLOYMENT OPPORTUNITY**

- 23.1 In addition to the City of Elyria, Ohio, Codified Ordinance Chapter 167, the contractor shall, and all subcontractors working on the project shall, comply with the equal employment requirements for the utilization of minorities and females pursuant to Chapter 123 of the Ohio Administrative Code, the Governor's Executive Order of 1972, and the Governor's Executive Order 84-9.

**24. CONTRACTOR LICENSES AND/OR PERMITS**

- 24.1 The Contractor and all Subcontractors shall obtain, maintain and renew the necessary licenses and/or permits as required by the City of Elyria Building Department to complete the Work. The Contractor shall secure all credentials and pay for all necessary fees associated with obtaining these licenses and/or permits. Fees shall be included in the price of the contract and no additional payment will be made to the Contractor for reimbursement of fees. Licenses and/or permits shall be obtained prior to initiating any construction activity associated with that particular license.

**25. WARRANTY OF WORKMANSHIP AND MATERIALS**

- 25.1 The Successful Bidder shall warrant that all labor furnished under this project shall be competent to perform the tasks undertaken, that the product of such labor shall yield only first-class results, that all material and equipment provided shall be new and of high quality, that the completed work will be complete, of high quality, without defects, and that all work complies with the requirements of this project.
- 25.2 The duration of the Bidders warranty, including equipment and labor, shall be one (1) year from the date of Substantial Completion or upon written acceptance notice date by the City for individual pieces of equipment.

**26. STORMWATER BEST MANAGEMENT PRACTICES**

- 26.1 The Contractor and all Subcontractors shall consider and implement any and all storm water best management practices (BMPs) as per City of Elyria Codified Ordinance Chapter 960 "Storm Water Management" and as per the Ohio Department of Natural Resources in the most recent version of the Rainwater and Land Development manual for construction site runoff and post-construction site runoff as required to minimize, reduce and/or eliminate the discharge of contaminated or sediment-laden storm water from the construction site. All existing and proposed outlets and drainage courses shall be protected.

The Contractor shall develop and submit a plan for approval if the construction site is over

one acre. Weekly site inspections, including all inspections within 24 hours after a rain event, shall be the responsibility of the contractor. Completed and signed inspection forms shall be submitted to the Engineer within 48 working hours after the completion of the inspection. Maintenance of all BMPs shall be the responsibility of the contractor. The contractor and all of its subcontractors shall comply with all other storm water best requirements as specified in the specifications, documents, Storm Water Pollution Prevention Plans and/or drawings for this project. Cost for this work shall be included in 1) the individual unit price bid for Storm Water Pollution Prevention Plan (SWPPP), 2) the separate line items as applicable, or 3) the total lump sum base bid for the project, whichever is applicable and detailed in the bid form.

**27. SUBCONTRACTOR QUALIFICATIONS**

- 27.1 Within five (5) days after the bid opening and prior to Award of Contract, the Successful Bidder shall supply to the City a list of subcontractors that it intends to use for the project, if not included with the original bid submittal. The City, at its sole discretion, may request that a subcontractor be replaced or not used. If the Successful Bidder refuses to replace this subcontractor, the City reserves the right to award the contract to the next lowest and best bidder deemed most qualified to perform the Work. The City may request references for any subcontractor. If the Successful Bidder proposes to change a subcontractor at any time after submittal of the original list of subcontractors, including during construction, the new subcontractor shall be approved by the City prior to that subcontractor performing any work on the project.

**AGREEMENT FORM**

**AGREEMENT  
BY AND BETWEEN  
THE CITY OF ELYRIA  
AND**

\_\_\_\_\_  
**CONTRACT NO. \_\_\_\_-\_\_\_\_**

This Agreement is made and entered into, effective upon full execution by all parties, by and between the City of Elyria, Ohio, an Ohio municipal corporation with offices located at 131 Court St., Elyria, Ohio 44035 (the "City") and \_\_\_\_\_, an Ohio entity with offices located at \_\_\_\_\_, Ohio 44\_\_\_\_ (the "Contractor"). The Contractor and the City shall be collectively referred to as the "Parties" and individually as the "Party."

WHEREAS, this Agreement was authorized by Ordinance No. \_\_\_\_\_, which was passed by the Elyria City Council on \_\_\_\_\_; and

WHEREAS, the City desires to enter into an agreement for \_\_\_\_\_ services (the "Agreement" or "Contract"); and

WHEREAS, the Contractor has submitted a bid in response to the City's request for bid proposals; and

WHEREAS, the City has determined that the Contractor has the experience and resources to complete the work as contemplated by this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and the Contractor agree as follows:

**ARTICLE 1 – WORK**

The Contractor shall furnish all labor, equipment, supplies, and supervision of labors necessary to complete the work, which is the subject of this Agreement (the "Work"). The Contractor shall furnish all labor, equipment, supplies, and supervision of labors necessary to complete the work. The Contractor shall furnish all equipment specified herein. This contract includes a new lift station, including back-up power. The project is located in the city of Elyria, Ohio. Construction documents were prepared by AECOM Technical Services, Inc. and the Office of the Elyria City Engineer.

The City's request for bid proposals (attached as Exhibit "A") and Contractor's proposal (attached as Exhibit "B") are incorporated by reference as if fully rewritten herein. In the event that a discrepancy exists between the terms of Exhibits A and B, the terms of Exhibit A will be controlling and binding. In the event that a discrepancy exists between the terms of the Exhibits and this Agreement, the terms of this Agreement will be controlling and binding.



**ARTICLE 2 - ENGINEER TO BE CITY'S REPRESENTATIVE**

The services of the Contractor shall be carried out under the authority for contract administration of the Mayor and Safety-Service Director of the City, who is designating the City Engineer as the person who, as the City's representative, will administer the contract, undertake and assume all duties and responsibilities, and will have the authority and rights assigned to the Engineer under the specifications for this work.

**ARTICLE 3 - CONTRACT PERFORMANCE**

**COMPLETION TIME: Construction of this project shall begin at the discretion of the contractor but must be completed no later than February 28, 2025.**

**ARTICLE 4 - LIQUIDATED DAMAGES**

The City and the Contractor recognize that time is of the essence in this agreement, and that the City will suffer financial loss (including but not limited to incidental and consequential damages) if the Work is not carried out within the time specified in Article 3 herein. Both the City and the Contractor recognize the impossibility of calculating the actual loss suffered by the City if the Work is not substantially completed within the specified time. Accordingly, instead of requiring any such proof, the City and the Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the City the sum of five hundred dollars (\$500.00) for each calendar day that expires after the time specified in Article 3 herein for completing the work assigned, unless the City grants a time extension for good reason not under the control of the Contractor. In addition to the foregoing, Contractor agrees to pay for the cost of any additional inspection services that the City requires as a result of delays.

**ARTICLE 5 - CONTRACT AMOUNT**

The City shall pay the Contractor for performance of the Work, in accordance with the contract documents, a total amount of, which shall not exceed, \_\_\_\_\_ Dollars and \_\_\_\_\_ Cents (\$\_\_\_\_\_).

**The Contractor agrees that no extra work will require any extra or additional payments by the City, unless the extra work is authorized in writing by the City's Mayor before the extra work is performed.**

**ARTICLE 6 - PAYMENT PROCEDURES**

The Contractor agrees to promptly (by the 5th of each month), but not more frequently than once every thirty (30) days, submit an original invoice with one (1) copy and the required estimate computations with required certifications to the Engineer. The City will make progress payments on or about the 26<sup>th</sup> day of each month.

Prior to substantial completion, progress payments will be in an amount equal to ninety percent (90%) of the Work completed and ninety percent (90%) of the materials and equipment delivered to the project site, but not yet incorporated into the Work, less in each case, the aggregate of all payments previously made. No retainer shall be subject to interest payments to the Contractor nor required to be deposited with an escrow agent who will pay interest to the Contractor.

**Acceptance of the Work, Pre-Final Payment and Final Payment:** Upon final completion and acceptance of the work by the City in accordance with E.C.O. 143.06, the City shall pay the Contractor all funds due the Contractor, except for the five percent (5%) retainer per Section 22 of the Instructions to Bidders. The five percent (5%) retainer shall be paid by the City to the Contractor, after completion of all work and all punch list items. If defects in the Work are found during the one (1) year period after final completion, the defects are to be corrected by the Contractor. The corrected work shall be guaranteed for a period of one (1) year by the Contractor. After satisfactory completion of all work and all punch list items, the five percent (5%) retainer or any payment withheld for other purpose may be released.

## **ARTICLE 7 - CONTRACTOR'S REPRESENTATIONS**

The Contractor acknowledges that it has taken the steps reasonably necessary to ascertain the nature and the location of the Work to be performed, and that it has investigated and satisfied itself as to the general and local conditions which can affect the Work, its cost, including but not limited to (1) the cost of purchasing, transportation, handling and storage of materials and supplies, (2) the availability of labor and cost, (3) the uncertainties of weather or similar physical conditions, including the time of year the project is to be constructed, (4) all other physical conditions which can impact the cost of doing Work, (5) the character of the equipment and facilities needed to prepare to do the work and to carry out the work to be performed, considering the limited work area, and the access to the site, (6) the cost of the Contractor's overhead, (7) the cost of providing worker supervision and management, (8) the cost of providing insurance, bonds, and related expenses.

The Contractor also acknowledges that it has had sufficient time during the bidding of the project to review all contract documents, and to make all investigations necessary to reasonably ascertain the cost of doing the Work. Further, the Contractor has correlated the results of observations, examination, investigations, and review of local labor conditions with the terms and conditions of all of the contract documents, including the addenda listed on the Contractor's Bid Form, in determining the price bid for the Work. The Contractor acknowledges that the City assumes no responsibility for any understanding reached or representations made concerning conditions which can affect the Work, by any of its officers, employees, or agents before execution of this Agreement, unless that understanding or representation is expressly stated in the contract documents which are a part of the Agreement.

## **ARTICLE 8 – INDEMNIFICATION**

Contractor shall indemnify, defend and hold harmless the City, its elected officials, employees, representatives and agents (the "Indemnified Parties") from and against any and all loss, cost, expense, damage, injury, liability, claim, demand, penalty or cause of action (including attorneys' fees) directly or indirectly arising out of, resulting from or related to (in whole or in part), (1) the Work performed hereunder, (2) the contract or (3) an act or omission of Contractor, a Subcontractor or any individual partnership or joint venture or corporation (a) directly or indirectly employed by Contractor or a Subcontractor or (b) for whose acts or omissions Contractor or a Subcontractor may be liable. Contractor shall promptly advise the City in writing of any action, administrative or legal proceeding or investigation as to which this indemnification may apply, and Contractor, at Contractor's expense shall assume on behalf of the City, and conduct with due diligence and in good faith, the defense with counsel satisfactory to the City, provided, that the City shall have the right to be represented therein by advisory counsel of its own selection and at its own expense; and provided

further, that if the defendants in any such action include both Contractor and the City, and the City shall have reasonably concluded that there may be legal defenses available to the City which are different from or additional to, or inconsistent with those available to Contractor, the City shall have the right to select separate counsel to participate in a defense of such action on its own behalf at Contractor's expense. In the event of failure by Contractor to fully perform in accordance with this indemnification, the City, at its option, and without relieving Contractor of its obligations hereunder may so perform, but all costs and expenses so incurred by the City in that event shall be reimbursed by Contractor to the City, together with interest on the same from the day any such expense was paid by the City until reimbursed by Contractor at the rate of interest provided to be paid on judgments, by the law of the State of Ohio. The obligations of Contractor under this Section shall survive the expiration of the Contract.

In claims against any of the Indemnified Parties by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts or omissions they may be liable, the indemnification obligation under this Section shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers' compensations acts, disability benefits acts, or other employee benefit acts.

The Contractor acknowledges that, as a political subdivision of the State of Ohio, the City does not indemnify any person or entity. The Contractor agrees that no provision of this Agreement or any other agreement between the Contractor and the City may be interpreted to obligate the City to indemnify or defend the Contractor or any other party.

## **ARTICLE 9 - CONTRACT DOCUMENTS**

This Agreement and accompanying documents, including the Bid Form, Unit Price Schedule, Instructions to Bidders, Invitation to Bid, all Addenda listed on the Contractors Bid Form, the General Conditions, State Prevailing Wages and Technical Specifications as prepared by the City Engineer's Office, and all attachments submitted by the Contractor with its Bid Form, are made a part of the Agreement hereto as if the contents of those contract documents were fully rewritten herein. The City and the Contractor agree that there are no oral or written representations, understandings or agreements relating to this Agreement which are not fully expressed herein. No modification, change or amendment hereof shall be valid unless such is in writing and signed by the authorized representative of the party against which such modification, change or amendment is sought to be enforced.

## **ARTICLE 10 - INSURANCE**

10.1 Insurance Coverage Requirements. Contractor agrees to procure and maintain during the term of this Agreement insurance in the types and amounts shown below.

- a) Worker's Compensation in full compliance with the requirements of the State of Ohio.
- b) SEE REQUEST FOR BID PROPOSALS FOR SPECIFIC INSURANCE REQUIREMENTS.

All insurance shall be exclusive of defense costs whenever possible.

10.2 Insurance Coverage Terms and Conditions.

CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

- a) The insurance policies of the Contractor, required for this Agreement, shall:
- (i) Name the “City of Elyria, Ohio” as an Additional Insured. This does not apply to Worker’s Compensation and Professional Liability.
  - (ii) Contain a waiver of subrogation provision wherein the insurer(s) waives all rights of recovery against the City; and
  - (iii) Be primary and not in excess or contingent on any other basis; and
- b) The insurance required for this Agreement shall be provided by insurance carrier(s) licensed to transact business and write insurance in the state(s) where operations are performed and shall carry a minimum A.M. Best’s rating of A- VII or above.
- c) The terms of this Agreement shall be controlling and shall not be limited by any insurance policy provision.
- d) High-risk activities may require higher insurance limits.
- e) These insurance provisions shall not affect or limit the liability of the Contractor stated elsewhere in this Agreement or as provided by law.
- f) The Contractor shall require any and all of its subcontractors to procure, maintain, and pay premiums for the insurance coverages and limits of liability outlined above with respect to products, services, work and/or operations performed in connection with this Agreement.
- g) The City reserves the right to require insurance coverages in various amounts or to modify or waive insurance requirements on a case-by-case basis whenever it is determined to be in the best interest of the City.
- h) If the Bid/Proposal specifies the need for higher limits of liability for any applicable insurance provision, the Bid/Proposal specifications shall govern.
- i) Where coverages are made on a claims-made basis, the claims-made retroactive date on the policy shall be prior to the commencement of professional activity related to this Agreement.
- j) The Contractor shall furnish a Worker’s Compensation Certificate and Certificate of Insurance evidencing that the insurance coverages required herein are in full force and effect. Acceptance of a non-conforming certificate of insurance by the City shall not constitute a waiver of any rights of the parties under this Agreement.
- k) The Certificate(s) of Insurance evidencing these coverages shall contain the following additional insured and waiver of subrogation language where applicable:
- (i) “City of Elyria, Ohio is an additional insured for purposes of commercial general liability and automobile liability”: and/or
  - (ii) “Waiver of subrogation in favor of the City of Elyria.”
- l) Any additional insured shall receive at least thirty (30) days’ notice of any cancellation,

change reducing the coverage, or refusal to renew, which is adverse to the interest of any additional insured to be affected. The City shall be provided with any notice of non-renewal, regardless of the cost. The same terms apply to any subcontractors to the extent practical.

10.3 Certificate of Insurance. This Agreement is contingent upon, and not valid or binding upon City, until such times as City receives said Certificate of Insurance.

## **ARTICLE 11 - TERMINATION**

11.1 Termination for Default. Either party may terminate this Agreement, in whole or in part, whenever such party determines that the other has failed to satisfactorily fulfill its material obligations and responsibilities hereunder and is unable to cure such failure within a reasonable period of time, not to exceed thirty (30) calendar days. Such termination shall be referred to as "Termination for Default." If the defaulting party is unable to cure the failure within the specified time period, the party seeking to terminate may, by giving written notice thereof to the defaulting party, terminate this Agreement, in full or in part, as of the date specified in the notice of termination. The Contractor, however, shall be paid for all services and/or materials provided on or prior to the date of termination. Any fees paid in advance shall be returned to the City at a prorated amount.

11.2 Termination for Financial Instability. In the event that the Contractor becomes financially unstable to the point of (i) ceasing to conduct business in the normal course, (ii) making a general assignment for the benefit of creditors, or (iii) suffering or permitting the appointment of a receiver for its business or its assets, or there is a filing by or against the Contractor of a meritorious petition in bankruptcy under any bankruptcy or debtor's law, the City may, at its option, terminate this Agreement under Section 11.1, the "Termination for Default" clause, by giving written notice thereof.

## **ARTICLE 12 – ASSIGNMENT**

No assignment by a party hereto of any rights under or interests in the Agreement will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment. No assignment will release or discharge the assignor from any duty or responsibility under the contract documents.

## **ARTICLE 13 – SAFETY**

The Contractor agrees to comply with Chapter 4121:1-3 of the Ohio Administrative Code entitled "Specific Safety Requirements of the Industrial Commission of Ohio relating to Construction," effective November 1, 1979 and with the "Federal Occupational Safety and Health Act of 1970 and Code of Federal Regulation, Title 29, Chapter XVII, Part 1926," and to also comply with all other requirements of law.

## **ARTICLE 14 – WARRANTY**

THE CONTRACTOR HEREBY WARRANTS THAT THE SERVICES WILL NOT INFRINGE, MISAPPROPRIATE OR VIOLATE ANY INTELLECTUAL PROPERTY OR ANY OTHER RIGHT OF ANY PERSON OR ENTITY. THE SERVICES WILL BE PERFORMED IN A

PROFESSIONAL AND WORKMANLIKE MANNER, CONSISTENT WITH INDUSTRY STANDARDS. THE SERVICES WILL BE PERFORMED IN STRICT ACCORDANCE WITH THE HIGHEST STANDARDS OF CARE, SKILL, DILIGENCE AND PROFESSIONAL COMPETENCE APPLICABLE TO SUPPLIERS/CONTRACTORS ENGAGED IN PROVIDING SIMILAR SERVICES IN THE LORAIN COUNTY AREA. THE CONTRACTOR HAS THE REQUISITE SKILL AND STAFF TO PERFORM THE SERVICES REQUIRED HEREUNDER FULLY, IN A TIMELY AND EFFICIENT MANNER. THE CONTRACTOR WILL PERFORM THE SERVICES IN ACCORDANCE WITH ALL APPLICABLE LAWS.

#### **ARTICLE 15 - PREVAILING WAGE RATES**

The Contractor agrees to pay wages equal to or exceeding the minimum wage rates as determined by the Ohio Department of Commerce (“ODOC”). The Contractor agrees to require all subcontractors, if any, to pay wages equal to or exceeding the minimum wage rates as determined by the ODOC.

#### **ARTICLE 16 – SUCCESSORS**

The City and the Contractor each bind themselves, their partners, successors, assigns and legal representatives in respect to all conveniences, agreements and obligations contained in the contract documents.

#### **ARTICLE 17 - OTHER PROVISIONS**

The Contractor agrees to comply with the requirements of Chapter 167 of the Elyria Codified Ordinances as amended, regarding Affirmative Action and Equal Employment Opportunity. All sections of Chapter 167 as amended on the first date of advertising this project, which are to be a part of any construction or service agreement executed by the City, are included in this Agreement by reference, as if repeated in full herein.

#### **ARTICLE 18 – REVIEW BY COUNSEL**

Each party and its counsel have reviewed and approved this Agreement and any ambiguities will not be resolved against the drafting party.

#### **ARTICLE 19 – ENTIRE AGREEMENT**

This Agreement sets forth the entire agreement between the parties and supersedes any prior agreements, negotiations or understandings of the parties.

#### **ARTICLE 20 – GOVERNING LAW**

This Agreement shall be governed by, and shall be construed and enforced in accordance with, the laws of the State of Ohio. The parties agree that any actions regarding this Agreement or the Work performed hereunder shall be brought in the Court of Common Pleas of Lorain County, Ohio. Each party consents to the exclusive jurisdiction of the Court of Common Pleas of Lorain County, Ohio, and hereby agrees not to challenge this Governing Law and Jurisdiction provision, and further agrees not to attempt to remove any legal action outside of Lorain County for any reason.

#### **ARTICLE 21 – SEVERABILITY**

If any term or provision of this Agreement is deemed by a court of law to be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each remaining term or provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

#### **ARTICLE 22 – SURVIVAL OF TERMS**

Termination or expiration of this Contract for any reason shall not release either party from any liabilities or obligations set forth in this Contract which (i) the parties have expressly agreed shall survive any such termination or expiration, or (ii) remain to be performed or by their nature would be intended to be applicable following any such termination or expiration.

#### **ARTICLE 23 – WAIVER**

No delay or omission by either party in the exercise of any right or power shall impair any such right or power or be construed to be a waiver thereof. A waiver by either of the parties of any of the covenants, conditions or agreements to be performed by the other or any breach thereof shall not be construed to be a waiver of any succeeding breach thereof or of any other covenant, condition or agreement herein contained. No change, waiver or discharge hereof shall be valid unless in writing and signed by an authorized representative of the party against which such change, waiver, or discharge is sought to be enforced.

#### **ARTICLE 24 – FORCE MAJEURE**

Neither Party shall be in default if its failure to perform any obligation hereunder is caused solely by supervening conditions beyond that Party's reasonable control, including, without limitation, acts of God, civil commotion, strikes, labor disputes, or governmental demands or requirements.

#### **ARTICLE 25 – INDEPENDENT CONTRACTOR**

It is fully understood and agreed that the Contractor is an independent contractor and is not an agent, servant, or employee of the City. The Contractor declares that it is engaged as an independent business and has complied with all applicable federal, state, and local laws regarding business permits and licenses of any kind, including but not limited to any insurance coverage, workers' compensation, or unemployment compensation that is required in the normal course of business and will assume all responsibility for any federal, state, municipal or other tax liabilities.

#### **ARTICLE 26 - ANTI-DISCRIMINATION**

Contractor agrees that in its employment of labor, skilled or unskilled, there shall be no discrimination exercised against any person because of race, color, religion, national origin, sex, gender, ancestry, age, disability, sexual orientation, sexual identity, genetic information, military status, or veteran status, and a violation of this term shall be deemed a material breach of this Contract.

#### **ARTICLE 27 – HEADINGS**

The section headings appearing in this Contract are inserted only as a matter of convenience and in

no way define, limit, or describe the scope or extent of such section.

**ARTICLE 28 - COUNTERPARTS**

This Contract may be executed in separate original or facsimile counterparts, each of which shall be deemed an original, and all of which shall be deemed one and the same instrument.

**ARTICLE 29 – OHIO REVISED CODE**

Contractor shall comply with all applicable provisions of Sections 2909.21 to 2909.34 Ohio Revised Code (Ohio Patriot Act) and Sections 3517.13 Ohio Revised Code.

**(THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK)**

**(SIGNATURE PAGE TO FOLLOW)**



CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

IN WITNESS WHEREOF, this Agreement has been executed in duplicate by the City and the Contractor on the dates below.

**CONTRACTOR NAME**

**THE CITY OF ELYRIA, OHIO**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Kevin Brubaker – Mayor      Date

\_\_\_\_\_  
Print Name

APPROVED AS TO FORM:

\_\_\_\_\_  
Date

\_\_\_\_\_  
Amanda R. Deery, Law Director

\_\_\_\_\_  
Date

**NOTICE TO COMMENCE WORK**  
**and**  
**NOTICE TO COMMENCEMENT OF A PUBLIC IMPROVEMENT**  
**PURSUANT TO REVISED CODE SECTION 1311.252**

State of Ohio

County of Lorain

I, Kevin Brubaker, being first duly sworn, say that:

- 1) Affiant is the Mayor of the City of Elyria, Ohio.
- 2) The City of Elyria, Ohio gives this Notice to Commence Work to the Contractor, for the public improvement identified as **SLUDGE LINE REPLACEMENT PROJECT**
- 3) The following is the name, address and trade of the principal contractor working on this public improvement:

NAME:  
 ADDRESS:  
 TRADE:  
 DATE OF FIRST EXECUTED CONTRACT:

- 4) The following is the name and address of the surety for the principal contractor:

NAME OF SURETY:  
 ADDRESS OF SURETY:

- 5) For the purpose of serving an affidavit pursuant to Revised Code Section 1311.26, service may be made upon the following representative of the Public Authority:

Mayor Kevin Brubaker  
 CITY OF ELYRIA, OHIO  
 131 Court Street  
 Elyria, Ohio 44035

FURTHER AFFIANT SAYETH NAUGHT.

Signature: \_\_\_\_\_

SWORN TO BEFORE ME and subscribed in my presence this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

(SEAL)

Notary Public: \_\_\_\_\_

**FINANCE DIRECTOR'S CERTIFICATION OF FUNDS**

I hereby certify that there is in the Treasury of the City of Elyria, State of Ohio, to the credit of the \_\_\_\_\_ Fund, not appropriated for any other purpose and/or in the process of collection, as required by law, the sum of \_\_\_\_\_ dollars and no cents (\$\_\_\_\_\_) to pay the cost of the attached contract for the **SLUDGE LINE REPLACEMENT PROJECT** in Elyria, Ohio.

Executed this \_\_\_\_\_ day of \_\_\_\_\_ in the year of 2024.

\_\_\_\_\_  
Finance Director

Ordinance No.: 2024-103

Passed On: June 3, 2024

Account No.:

## RESOLUTION OF DIRECTORS

Date \_\_\_\_\_

The Board of Directors of: \_\_\_\_\_ (Firm Name)

met on the \_\_\_\_ day of \_\_\_\_\_ of \_\_\_\_\_.

A motion was made, seconded and passed authorizing \_\_\_\_\_ (Name),

\_\_\_\_\_ (Title) to sign and submit a bid to the City of Elyria, Ohio, for

the: **SLUDGE LINE REPLACEMENT PROJECT**

and authorizing the same person to enter into a contract with the City of Elyria, Ohio, if the City awards the work to the firm.

By: \_\_\_\_\_ Title: \_\_\_\_\_  
(Signature)

ATTEST:

By: \_\_\_\_\_ Title: \_\_\_\_\_  
(Signature)

(CORPORATION SEAL)

NOTE: A similar form with an original signature and a current date (within 12 months) may be used in place of this form. If the form submitted with the bid has photocopy signatures, the form must be replaced with one having original signatures, before the contract is signed.

**BID FORM  
LUMP SUM CONTRACT**

**PROJECT:** SLUDGE LINE REPLACEMENT PROJECT

THIS BID IS SUBMITTED TO: Mayor Kevin Brubaker  
Office of the Safety-Service Director  
City of Elyria, Ohio  
131 Court Street  
Elyria, Ohio 44035

The undersigned **Bidder** proposes and agrees, if this **Bid** is accepted, to enter into an **Agreement** with the **City** in the form included in the **Contract Documents** to complete all **Work** as specified or indicated in the **Contract Documents** for the **Contract Price** and within the **Contract Time** indicated in this bid, and all in accordance with the **Contract Documents**.

2. **Bidder** accepts all of the terms and conditions of the **Instructions to Bidders**, including without limitation those dealing with the disposal of the **Bid Security**. This **Bid** will remain open for **sixty (60)** days after the day of **Bid Opening**. **Bidder** will sign the **Agreement** and submit the documents required by the **Contract Documents** within ten (10) days after the date of the **City’s Notice of Award**.

3. In submitting this **Bid**, the **Bidder** represents, as more fully set forth in the **Agreement**, that:

(a) The **Bidder** has examined copies of the **Invitation to Bid**, the **Instructions to Bidders**, the **Specifications**, the **Supplementary Conditions** and all other **Contract Documents**, and also the following addenda:

Addendum No. Date

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the receipt of all of which is hereby acknowledged.

(b) **Bidder** has examined the site and locality where the work is to be performed, the legal requirements (**Federal, State, and Local**, laws, ordinances, rules and regulations) and, conditions affecting cost, progress or performance of the **WORK**, and has made such independent investigations as **Bidder** deems necessary.

(c) 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, association, 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 himself any advantage over any other bidder or over the **City**.

4. Contract Time- **Bidder** agrees that the **Work** on the project will be substantially completed within 365 days from the date of the Notice to Commence Work. All **Work** on the project will be completed by February 28, 2025.

CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

5. Contract Price

- a. **Bidder** will complete the **Work** in accordance with the Contract Documents, for the lump sum price of:

**LUMP SUM PRICE** \$ \_\_\_\_\_  
(in numbers)

\$ \_\_\_\_\_  
(in words)

- b. Alternates- Include the following alternate as described in Specification Section 01 23 00:

Alternate 1- ADD for Additional Sludge Line Replacement

**ADD** \$ \_\_\_\_\_  
(in numbers)

(in words) \$ \_\_\_\_\_

The following documents are attached to, and made a condition of, this **Bid**:

(a) BID SECURITY, in the form of \_\_\_\_\_.

(b) City EEO Form, and City Affirmative Action Form

(c) Bidder's Insurance Agent's Affidavit, signed by the agent (facsimile or electronic copy is acceptable at time of bidding, provided that the original is received by the City within five (5) days of bid submission.

(d) Tax Affidavit

(e) Bidder's Affidavit

The bidder is \_\_\_\_\_ (Insert Individual, Partnership, Corporation, Limited Liability Company, Limited Partnership, Limited Liability Partnership, or Joint Venture.)



CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

**BID GUARANTY AND CONTRACT BOND**

(OHIO REVISED CODE SECTION 153.571)

Bond Number \_\_\_\_\_

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

\_\_\_\_\_  
(Bidder's Name and Address)

as principal and \_\_\_\_\_ (Name of Sureties) as sureties, are hereby held and firmly bound unto the City of Elyria, Ohio, as obligee in the penal sum of the dollar amount of the bid submitted by the principal to the obligee on \_\_\_\_\_ (Date) to undertake the project known as \_\_\_\_\_

The penal sum referred to herein shall be the dollar amount of the principal's bid to the obligee, incorporating any additive or deductive alternate proposals made by the principal on the date referred to above to the obligee, which are accepted by the obligee. In no case shall the penal sum exceed the amount of \$ \_\_\_\_\_ (Dollars in Figures) \_\_\_\_\_

\_\_\_\_\_ (Dollars in Words). (If the amount in figures and the amount in words are different, the amount in words shall be used as the amount intended.) (If the foregoing blank is not filled in, the penal sum will be the full amount of the principal's bid, including alternates. Alternatively, if the blank is filled in, the amount stated must not be less than the full amount of the bid including alternates, in dollars and cents. A percentage is not acceptable.) For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH that whereas the above named principal has submitted a bid for: SLUDGE LINE REPLACEMENT PROJECT.

Now, therefore, if the obligee accepts the bid of the principal and the principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material; and in the event the principal pays to the obligee the difference not to exceed ten percent (10%) of the penalty hereof between the amount specified in the bid and such larger amount for which the obligee may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the principal pays to the obligee the difference not to exceed ten percent (10%) of the penalty hereof between the amount specified in the bid, or the costs, in connection, and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect; if the obligee accepts the bid of the principal and the principal within ten (10) days after the awarding of the contract enters into a proper contract in accordance with the bid, plans, details, specifications, and bill of materials, which said contract is made a part of this bond the same as though set forth herein;

Now also, if the said principal shall well and faithfully do and perform the things agreed by obligee to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of the said contract or in or to the plans or specifications therefor shall in any wise affect the obligations of said surety on this bond.

Name of Bidder: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_ Title: \_\_\_\_\_  
(Printed Name)

By: \_\_\_\_\_ Attest: \_\_\_\_\_  
(Signature) (Signature)

Name of Surety: \_\_\_\_\_ (SEAL)

Surety Mailing Address: \_\_\_\_\_

By: \_\_\_\_\_ Title: \_\_\_\_\_  
(Printed Name)

By: \_\_\_\_\_ (Attorney-in-Fact)  
(Signature)

Surety Agent Mailing Address: \_\_\_\_\_



### CONSENT OF SURETY

KNOW ALL MEN BY THESE PRESENTS, that we \_\_\_\_\_

(Name of Bidder) as principal and \_\_\_\_\_ (Name of Surety Company)

a corporation created and existing under the laws of the State of \_\_\_\_\_ and having its

principal office at \_\_\_\_\_  
(Complete mailing address of Surety Company) are held firmly bound unto the **City of Elyria, Ohio**, hereby jointly and severally and binding our heirs, successors, administrators, executors, legal representatives and assigns by these presents.

THE CONDITION OF THIS OBLIGATION are such that whereas, the above named principal submits the herewith proposal for the **SLUDGE LINE REPLACEMENT PROJECT** in the City of Elyria, Ohio, in conformance with the Invitation to Bid, and with the Instructions to Bidders. We, the above named surety, will meet all stipulations and will execute the Surety Bonds as hereinafter, to the above named principal in event he should be awarded a contract and in an amount of \_\_\_\_\_ (Amount in Words) which is an amount equaling or exceeding the amount of said principal's bid plus all additive alternates, and guaranteeing its performance in conformity with the plans and specifications, and a payment bond in the amount of \_\_\_\_\_ (Amount in Words) amount equaling or exceeding the amount of said principal's bid plus all additive alternates, as guaranteeing the payment of all laborers and suppliers of materials for the project, to the City of Elyria, Ohio.

**WITNESS OUR SIGNATURES** this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

Name of Bidder: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_ Title: \_\_\_\_\_  
(Printed Name)

By: \_\_\_\_\_ Attest: \_\_\_\_\_  
(Signature) (Signature)

Name of Surety: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_ Title: \_\_\_\_\_  
(Printed Name)

By: \_\_\_\_\_ Attest: \_\_\_\_\_  
(Signature) (Signature)

Surety Agent Mailing Address: \_\_\_\_\_  
\_\_\_\_\_

## BIDDER'S INSURANCE AGENT'S AFFIDAVIT

Project: **SLUDGE LINE REPLACEMENT PROJECT**

I, \_\_\_\_\_, \_\_\_\_\_, first being duly sworn do state the following:  
(Name) (Title)

- (a) that I am an Insurance Agent.
- (b) that I have reviewed the insurance requirements in the General Conditions, and have noted therein the requirements on insurance including the cancellation, and non-renewal provisions.
- (c) that I am familiar with the insurance that \_\_\_\_\_  
(Bidder's Name)  
has in force, and that its insurance meets the City requirements, or that it can be amended to meet the City requirements.
- (d) that if an award of contract is made by the City to the Bidder an insurance certificate will be issued within ten (10) days, which will include the **City of Elyria, Ohio, as Additional Insured.**

Further, Affiant sayeth naught.

\_\_\_\_\_  
(Agents Signature)

Sworn to and subscribed in my presence this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_  
(Notary Public)

(SEAL)

**(Attach Bidders Insurance Certificate to this page)**

(The insurance certificate may be submitted after the bid opening date.)

# TAX AFFIDAVIT

State of \_\_\_\_\_  
County of \_\_\_\_\_ SS

I \_\_\_\_\_ (Name), \_\_\_\_\_ (Title), of the  
\_\_\_\_\_ (Company Name), first being duly  
sworn do depose and state that it has submitted a competitive bid for a contract, to be administered  
and awarded by the City of Elyria, Ohio.

Further, Affiant says that it was not charged with any delinquent personal property taxes, penalties or  
interest due or owing to the County of Lorain, State of Ohio, except as hereinafter stated:

\_\_\_\_\_

(If none, state "NONE". If due, state "AMOUNT DUE", together with assessed interest and penalty.)

Further, Affiant says that a copy of this statement, affirmed under oath shall be made a part of its bid  
and the contract to be awarded.

Further, Affiant sayeth naught.

Business Name: \_\_\_\_\_

By: \_\_\_\_\_ Title: \_\_\_\_\_

Sworn to and subscribed in my presence this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

(SEAL)

\_\_\_\_\_  
(NOTARY PUBLIC)  
My Commission Expires \_\_\_\_\_

### BIDDER'S AFFIDAVIT

This affidavit is to be filled out and executed by the BIDDER; if the bid is made by a corporation, then by it's properly authorized agent.

STATE OF \_\_\_\_\_

SS

COUNTY OF \_\_\_\_\_

I, \_\_\_\_\_ being first duly sworn, deposes and says that he/she is \_\_\_\_\_ (sole owner, a partner, officer of, etc.) of the \_\_\_\_\_ (Name of Business) the party making the enclosed

bid; and says further that:

(Give the names of all persons, firms or corporations interested in the enclosed bid)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_ and, that those listed are the only party or parties interested with the profits of any contract which may result from the herein contained bid; that the said proposal is made without any connection or interest in the profits thereof with any other person making any other bid or proposal for said work; that no member of the City Council, the head of any department , division, or bureau or employee therein or any officer of the City of Elyria, Ohio is directly or indirectly interested therein; that said bid is genuine and not collusion, or communication or conference, with any person, to fix the bid price of Affiant or any other bidder, or to fix any overhead, profit or cost element of said bid price, or that of any other bidder, or to secure any advantage against the City of Elyria, Ohio, or any person interested in the proposed contract; and that all statements contained in said proposal or bid are true; that such bidder has not, directly or indirectly submitted this bid, or contents thereof, or divulged information or data relative thereto to any association, or to any member or agent thereof; and further says that all the statements made by him in said proposal or bid are true.

\_\_\_\_\_  
AFFIANT

Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_  
Notary Public in and for,

\_\_\_\_\_ County, Ohio

My Commission Expires: \_\_\_\_\_

#### **PENALTY FOR FALSE CERTIFICATION**

Section 35 of the Criminal Code, as amended, provides a penalty of not more than \$10,000.00 or imprisonment of not more than ten years, or both, for knowingly and willfully making or causing to be made, "any false or fraudulent statements --- or use or cause to be made or used and false ---account, claim, certification, affidavit, or deposition, knowing the same to contain any fraudulent or fictitious statement--"relating to any matter within the jurisdiction of any Governmental Department or Agency.

## EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

**During the performance of this contract, the contractor agrees as follows:**

1. The contractor shall not discriminate against any employee or applicant for employment because of race, religion, age, color, sex, national origin or handicap. The contractor shall take affirmative action to insure that applicants are employed and that employees are treated without regard to race, religion, color, sex, national origin or handicap during employment.

As used herein, the work "treated" shall mean and include without limitation, the following:

**recruited:** whether in the form of rates of pay or other forms of compensation

**selected for training:** including apprenticeship, promoted, upgraded, transferred, laid off and terminated

The contractor agrees to and shall post in conspicuous places available to employees and applicants for employment, notices to be provided by the contracting officers setting forth the provisions of the non-discrimination clause.

2. The contractor shall, in all solicitations or advertisement for employees placed by or on the behalf of the contractor; state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin or handicap.
3. The contractor shall submit to the City, in writing, an affirmative action plan and shall furnish all information and reports required by the City or its representatives pursuant to this chapter and permit access to the contractor's books, records, and accounts by the contracting agency and affirmative action officials for purposes of investigation to ascertain compliance with the Affirmative Action Program. The contractor may comply with the provisions of this section by doing one of the following:
  - (a) The contractor may submit its Affirmative Action Program in writing at the time of its submission of bid; or
  - (b) The contractor may submit its Affirmative Action Program in writing prior to its submission of bid for pre-certification.

The contractor's Affirmative Action Program may be pre-certified upon the filing and approval of its Affirmative Action Program with the City's OEO office not more than six months prior to its bid submission. Upon pre-certification, the contractor will be issued a pre-certification compliance number for its Affirmative Action Program, which may be used and referred to in any bid submission in the place of any other written requirement for Affirmative Action Program submission. It shall be the sole responsibility of the contractor to be re-certified upon the expiration of its pre-certification. Approved programs may be reviewed before any pre-certification expiration date.

4. The contractor shall send to each labor union or representatives of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representative of the contractor's commitments under the Equal Employment Opportunity Clause of the City of Elyria and shall post copies of the notice in conspicuous places

CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

available to employees and applicants for employment.

5. The contractor shall take such action with respect to any subcontractor as the City of Elyria may direct as a means of enforcing the provisions of the EEO Clause including penalties and sanctions for noncompliance. Provided, however; that in the event the contractor becomes involved in or is threatened with litigation as a result of such direction by the City, the City will enter into such litigation as is necessary to protect the interests of the City and to effectuate the City's Equal Opportunity Program and in the case of contracts receiving federal assistance, the contractor or the City may request the United States to enter into such litigation to protect the interests of the United States.
6. The contractor shall file and shall cause his/her subcontractors, if any, to file compliance reports with the City in the form and to the extent prescribed by the City or its representative. Compliance reports shall contain information as to the employment practices, policies, programs and statistics of the contract and subcontractor(s).
7. The contractor shall include the provisions of the Equal Employment Opportunity Clause in every subcontract or purchase order so that such provisions will be binding upon each subcontractor and/or vendor.
8. Refusal by the contractor or subcontractor to comply with any provision of this program as herein stated and described will subject the offending party to any or all of the following penalties:
  - (a) Withholding of all future payments under the involved public contracts to the contractor in violation until it is determined that the contractor or subcontractor is in compliance with the provision of this contract.
  - (b) Refusal of all future bids for any public contract with the City or any of its departments or divisions until such time as the contractor or subcontractor demonstrates that he/she has established and shall carry out the policies of the programs as herein outlined.
  - (c) Cancellation of the public contract and declaration of forfeiture of the performance bond.
  - (d) In cases in which there is substantial or material violation or the threat of substantial or material violation of the compliance procedure or as may be provided by contract, appropriate proceedings may be brought to enforce these provisions, including the enjoining within applicable laws of contractors, subcontractors or other organizations, individuals, or groups who prevent directly or indirectly or seek to prevent directly or indirectly compliance with the policy as herein outlined.

\_\_\_\_\_  
Name of Company Official

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name of Company

\_\_\_\_\_  
Area Code/Telephone Number

\_\_\_\_\_  
Signature of Company Official

\_\_\_\_\_  
Date Signed

# CONTRACTOR'S/VENDOR'S AFFIRMATIVE ACTION INFORMATION SHEET

This Affirmative Action Information Sheet is to be completed and returned with the Bid.

Bidder's EEO Officer's Name: \_\_\_\_\_

Bidder's EEO Officer's Title: \_\_\_\_\_

Bidder's Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code \_\_\_\_\_

Telephone Number: (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ Fax Number: (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Note: The bidder must comply with either #1 or #2 below. (Place a check mark in the correct item.)

#1 \_\_\_\_\_ Our firm has been pre-certified, by Elyria's EEO Officer.

Our pre-certification number is: \_\_\_\_\_

Our pre-certification expires on: \_\_\_\_\_

\_\_\_\_\_ A copy of our pre-certification letter from Elyria is attached.

#2 \_\_\_\_\_ We are enclosing our own Affirmative Action Plan (number of page(s) \_\_\_) with this bid.

\*\*\*\*\*

### (For City Office Use Only)

#### CITY OF ELYRIA SIGN-OFF:

Affirmative Action/Equal Opportunity Officer: \_\_\_\_\_

Comments:

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CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT

CONTRACTOR/SUPPLIER AFFIRMATIVE ACTION PROGRAM  
TOTAL PRESENT WORKFORCE BREAKDOWN

TABLE 1

JOB CATEGORY	TOTAL MALES	MALE EMPLOYEES MINORITY GROUPS				TOTAL FEMALES	FEMALE EMPLOYEES MINORITY GROUPS				TOTAL ALL EMPLOYEES
		WHITE	BLACK	SPANISH	OTHER MINORITY		WHITE	BLACK	SPANISH	OTHER MINORITY	
OFFICIALS/ ADMINISTRATORS											
PROFESSIONALS											
TECHNICIANS											
PROTECTIVE SERVICE											
SALES											
PARAPROFESSIONALS											
OFFICE-CLERICAL											
SKILLED CRAFT SPECIFY											
JOURNEYMEN											
HELPERS											
APPRENTICES											
TRAINEES											
LABORERS											
SERVICE/CUSTODIAL											
OTHERS (SPECIFY)											
<b>TOTALS</b>											

## SUPPLEMENTARY CONDITIONS

### I. INSURANCE LIMITS:

**LIABILITY, PROPERTY DAMAGE, VEHICLE AND BUILDER'S RISK INSURANCE:** Contractor shall purchase and maintain such comprehensive general liability and other types of insurance as will provide protection from claims as set forth herein which may arise out of or result from Contractor's performance of the work and Contractor's other obligations under all contract documents, whether such performance is by Contractor, by any lower subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

The claims types for which insurance shall be provided shall include:

- a) Claims under workers compensation, disability benefits and others similar employee benefit acts;
- b) Claims for damage because of bodily injury, occupational sickness, sickness, disease, or death of any person;
- c) Claims for damages sustained by any person as a result of an employment practices offense directly or indirectly related to the employment of such person by the contractor or a subcontractor or by any other person for any other reason;
- d) Claims for damages, other than to the work itself, because of injury to or destruction of tangible property, including loss of the use resulting therefrom;
- e) Claims for damages because of bodily injury or death of any person or for property damage arising out of the ownership, leasing, renting, hires, loaned, or otherwise using, and the maintenance of any item of construction or equipment of any power tools by Contractor or a subcontractor;
- f) Claims for damages because of bodily injury or death of any person or for property damage arising out of the ownership, leasing renting or using maintenance of any motor vehicle, by Contractor or a subcontractor;
- g) Claims for damages to the work itself, and/or all existing City property located in the proximate area of the work, because of injury or destruction of the tangible property, including the loss of use resulting therefrom; and
- h) Claims for damages because of bodily injury or death of any person or property damage arising out of the use, transportation or storage of any type of explosives, explosive devices or dangerous ordnance use in doing work included in the Contract.

The insurance limits required by this section shall include the specific coverage as are applicable to the work, and shall be written for the specified limits stated herein, or for the specific limits as provided in any applicable supplementary specification, or as may be required by law, wherever is greater.

The Contractor shall have and maintain the type of insurance that provides the limits of coverage for each occurrence. If the Contractor's policy is not of the form providing coverage limits for each occurrence, then he shall obtain a rider providing coverage by occurrence for the work under this specification.

The insurance shall be written by a solvent and otherwise acceptable company(s) authorized to do business in the State of Ohio,

Evidence of insurance shall be provided by the Contractor to the City for review and acceptance by the City, before the issuance of the Notice to Commence.

Such evidence shall consist of the Contractors insurance agents "insurance affidavit" (when requested, on a form that is on file at the City Engineer's office) the Certificate of Insurance plus the Certificate of Compliance provided by the Ohio Department of Insurance for the Company(s) in question.

Failure to provide evidence of the maintenance of all of the required insurance shall suspend the City's obligation to pay for any and all work performed after the cessation of the required coverage for which evidence has previously been provided, and can be the basis of a non-compensable order to suspend work or for the termination of the contract for cause.

**CITY OF ELYRIA SLUDGE LINE REPLACEMENT PROJECT**

The Contractor's policy shall provide and the Certificate of Insurance shall reflect the fact that the City is an additional insured and all (if any) other additional insured shall receive at least thirty (30) days notice of any cancellation, change reducing the coverage, or refusal to renew, which is adverse to the interests of the City and/or other additional insured to be effected. The City and other additional insured shall be provided with any notice on non-renewal, regardless of the cause.

The liability limits for the required coverage notes above shall be at least:

	<b>EACH OCCURRENCE</b>	<b>AGGREGATE</b>
Bodily Injury & Property Damage Combined	\$ 2,000,000.00	\$ 2,000,000.00
Vehicle Liability	\$ 1,000,000.00	\$ 1,000,000.00
Builders Risk/Installation Floater (if applicable, <b>In the sole discretion of the City Engineer</b> )	(The amount of the contract)	

**ANY AND ALL LIABILITY LIMITS SHALL BE EXCLUSIVE OF DEFENSE COSTS.**

**II. CONTROLLING LAW AND JURISDICTION:**

This Agreement shall in all respects be interpreted and construed in accordance with and governed by the laws of the State of Ohio. This Agreement shall be subject to the jurisdiction of the Court of Common Pleas Lorain County, Ohio.

**III. ENGINEER:**

Unless otherwise provided, the **Engineer** shall be the City of Elyria Engineer.

**IV. CONTINGENCY, IF ANY:**

Any Extra Work performed or Extra Materials utilized as part of the Contingency line item, if included in the project, shall be approved in writing by the Engineer, and only the Engineer, prior to commencement of that activity and prior to payment for that activity. Final costs for the Extra Work incurred shall be approved by the Engineer. Approval of this activity shall be directly related to and necessary for the completion of the Scope of Work described in the bid documents, specifications or detailed plans with the construction project.

**V. GEOTECHNICAL DATA REPORT**

A Geotechnical Memorandum was prepared and utilized by the Engineer in preparation of the contract documents. The Geotechnical Memorandum is included with the bidding documents.

**VI. POTENTIALLY CONFLICTING PROJECTS**

None.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

**ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE**

and

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Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
  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.
  4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
  5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
  7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
  8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
  9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
  10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
  11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *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.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *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.
27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A 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 the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *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.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *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.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, 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.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such

construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

## 1.02 *Terminology*

- A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
  - a. does not conform to the Contract Documents; or
  - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

- c. 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 in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
  3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence 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 the Supplementary 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 Article 5.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

### **2.03 *Commencement of Contract Times; Notice to Proceed***

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the

Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

#### 2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

#### 2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
  - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
  - 2. a preliminary Schedule of Submittals; and
  - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.



1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

### **ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. 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. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

#### **3.02 *Reference Standards***

- A. Standards, Specifications, Codes, Laws, and Regulations
  1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

### 3.03 *Reporting and Resolving Discrepancies*

#### A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

#### B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
  - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

### 3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
  1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
3. Engineer's written interpretation or clarification.

### 3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
  1. 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 its consultants, including electronic media editions; or
  2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

### 3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

## **ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS**

### 4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must

comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

#### 4.02 *Subsurface and Physical Conditions*

##### A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

##### B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. 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; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

#### 4.03 *Differing Subsurface or Physical Conditions*

##### A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
  - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
  - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
  - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
  - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any

of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

#### 4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
  - a. reviewing and checking all such information and data;
  - b. locating all Underground Facilities shown or indicated in the Contract Documents;
  - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
  - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have

been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

#### 4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

#### 4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. 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; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall

immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (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 such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H



shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

## **ARTICLE 5 – BONDS AND INSURANCE**

### *5.01 Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by 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 Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

### *5.02 Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

### *5.03 Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

#### 5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
  - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
  - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
  - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
    - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
    - b. by any other person for any other reason;
  - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
  - 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
  - a. Such insurance shall remain in effect for two years after final payment.
  - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

#### 5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

#### 5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
  2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
  3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
  4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
  5. allow for partial utilization of the Work by Owner;
  6. include testing and startup; and
  7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes

property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

#### 5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of

recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

## ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

### 6.01 *Supervision and Superintendence*

- A. 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 accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### 6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

### 6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
  2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

#### 6.05 *Substitutes and “Or-Equals”*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
1. “*Or-Equal*” *Items*: If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
      - 3) it has a proven record of performance and availability of responsive service.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.



## 2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
  - 1) shall certify that the proposed substitute item will:
    - a) perform adequately the functions and achieve the results called for by the general design,
    - b) be similar in substance to that specified, and
    - c) be suited to the same use as that specified;
  - 2) will state:
    - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
    - b) whether use of the proposed substitute item 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 other work on the Project) to adapt the design to the proposed substitute item, and
    - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
  - 3) will identify:
    - a) all variations of the proposed substitute item from that specified, and
    - b) available engineering, sales, maintenance, repair, and replacement services; and

- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

#### 6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable

objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
  2. shall 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 individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. 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.
- G. All Work performed for Contractor by a Subcontractor or Supplier will 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. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property 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 will obtain the same.

## 6.07 *Patent Fees and Royalties*

- A. 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.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to 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 specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to 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.

## 6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

## 6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not

limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

#### 6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 6.11 *Use of Site and Other Areas*

##### A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* 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.

#### 6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

#### 6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
  - 1. all persons on the Site or who may be affected by the Work;
  - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform 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 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 individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

#### 6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 6.15 *Hazard Communication Programs*

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

#### 6.16 *Emergencies*

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

#### 6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*
    - a. Submit number of copies specified in the General Requirements.
    - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.
  2. *Samples:*
    - a. Submit number of Samples specified in the Specifications.
    - b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Submittal Procedures:*
1. Before submitting each Shop Drawing or Sample, Contractor shall have:
    - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
    - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
    - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
    - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
  2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
  3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop



Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

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

6.18 *Continuing the Work*

- A. 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 permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
  6. any inspection, test, or approval by others; or
  7. any correction of defective Work by Owner.

## 6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A 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 individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

## ARTICLE 7 – OTHER WORK AT THE SITE

### 7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
1. written notice thereof will be given to Contractor prior to starting any such other work; and
  2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' 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 such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. 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 it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

### 7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
  2. the specific matters to be covered by such authority and responsibility will be itemized; and
  3. the extent of such authority and responsibilities will be provided.

- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

**ARTICLE 8 – OWNER'S RESPONSIBILITIES**

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

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

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

**ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION**

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make

exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

#### 9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

#### 9.04 *Authorized Variations in Work*

- A. 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 compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

#### 9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the 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 decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of



any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

#### 9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

### **ARTICLE 10 – CHANGES IN THE WORK; CLAIMS**

#### 10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

#### 10.02 *Unauthorized Changes in the Work*

- A. 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 as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

#### 10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
  2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
  3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; 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 as provided in Paragraph 6.18.A.

#### 10.04 *Notification to Surety*

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

#### 10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions

of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
  2. approve the Claim; or
  3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

## **ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### *11.01 Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
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. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. 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 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 outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

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.
3. Payments made by Contractor to Subcontractors for Work performed 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 will then determine, with the advice of Engineer, which bids, if any, will be acceptable. 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 and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
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.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, 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 cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. 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, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the 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.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

- e. 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.
- f. 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 of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages 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.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety 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 branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
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.
4. 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.
5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
  - 1. Contractor agrees that:
    - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
    - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
  - 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will 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.

## 11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
  - 1. 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 Agreement; and
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

## **ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES**

### *12.01 Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
  - 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 Paragraph 11.03); or
  - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
  - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
  - 1. a mutually acceptable fixed fee; or
  - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

- b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
- c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
- d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. 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 Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

#### 12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

#### 12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. 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 as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.



- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

## **ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### *13.01 Notice of Defects*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

### *13.02 Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### *13.03 Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
  - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
  - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E 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.

#### 13.04 *Uncovering Work*

- A. 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.
- B. 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.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and 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 therefor as provided in Paragraph 10.05.
- D. If the uncovered 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, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

### 13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, 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, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

### 13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

### 13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. repair such defective land or areas; or
  - 2. correct such defective Work; or
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other

dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

### 13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

### 13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, 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, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or 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 materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored

elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

## **ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION**

### *14.01 Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

### *14.02 Progress Payments*

#### *A. Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

*B. Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner 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.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
  - a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
  - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
  - a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

- c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
  - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

*C. Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

*D. Reduction in Payment:*

- 1. Owner may refuse to make payment of the full amount recommended by Engineer because:
  - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
  - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - c. there are other items entitling Owner to a set-off against the amount recommended; or
  - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

#### 14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

#### 14.04 *Substantial Completion*

- A. 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.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will 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, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion,



Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

#### 14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed 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 usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
  - 2. 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.
  - 3. 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. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

#### 14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

## 14.07 *Final Payment*

### A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
  - b. consent of the surety, if any, to final payment;
  - c. a list of all Claims against Owner that Contractor believes are unsettled; and
  - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

### B. *Engineer's Review of Application and Acceptance:*

1. 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 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, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment 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 for Payment.

### C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

#### 14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, 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.

#### 14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
  1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
  2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

### **ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION**

#### 15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

#### 15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
  2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
  3. Contractor's repeated disregard of the authority of Engineer; or
  4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. 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);
  2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
  3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, 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.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

#### 15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
  - 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
  - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

#### 15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

## **ARTICLE 16 – DISPUTE RESOLUTION**

### *16.01 Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
  - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agrees with the other party to submit the Claim to another dispute resolution process; or
  - 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

## **ARTICLE 17 – MISCELLANEOUS**

### *17.01 Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. 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
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

### *17.02 Computation of Times*

- A. 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.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

## SECTION 01 10 00

### SUMMARY OF WORK

#### PART 1 - GENERAL

##### 1.01 LOCATION OF WORK:

- A. The work of this Contract is located in the City of Elyria, Ohio, at the Elyria WWPCP located at 1194 Gulf Road in Elyria, Ohio.

##### 1.02 SCOPE OF WORK:

- A. The Contractor shall furnish all labor, equipment, supplies, and supervision of labors necessary to complete the work. This project includes replacement of 300 lf of 6" sludge line and installation of 250 lf of 4" sludge line and all related installation and restoration work. It also includes the installation of 130 lf of 4" steam line and 2" condensate line and all related installation and restoration work. An alternate add-on for replacement of an additional 471 lf of 6" sludge line is also included in this project.
- B. Contractor shall furnish all labor, equipment, supplies, and supervision of labors necessary to complete the work as shown on the contract drawings and specified herein.
- C. The Work includes, but is not necessarily limited to, the following major items along the project location:
  - 1. Removal and replacement of sludge lines as indicated
  - 2. Removal and replacement of steam and condensate lines as indicated
  - 3. Lawn and parking lot restoration as indicated
  - 4. Maintenance of traffic
  - 5. Storm Water Pollution Prevention

##### 1.03 WORK BY OTHERS:

- A. Refer to Article 7 of the General Conditions for additional requirements.

##### 1.04 WORK SEQUENCE:

##### 1.05 CONTRACTOR'S USE OF PREMISES:

- A. Contractor shall limit the use of the premises for the performance of the Work.



- B. Contractor shall coordinate with Owner necessary access for normal maintenance requirements.
- C. Contractor shall assume full responsibility for security of all his and his subcontractors' materials and equipment stored on the site.
- D. If directed by the Owner, Contractor shall move any stored items which interfere with operations of Owner.
- E. Contractor shall maintain access for plant employees to all equipment during performance of the Work.

1.06 SAFETY:

- A. Contractor is responsible for safety of personnel and plant staff during Contract period.
- B. Provide all devices, materials and equipment necessary to assure safety and health of personnel and plant staff.
- C. Comply with requirements of agencies having jurisdiction including confined space entry requirements. Various work areas at the plant are classified as confined spaces and appropriate measures shall be taken to perform work in these areas.

END OF SECTION

## SECTION 01 23 00

### ALTERNATE BID ITEMS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. This section includes administrative and procedural requirements governing Alternates.

##### 1.02 DEFINITIONS

- A. Alternate is amount proposed by Bidder and stated on Bid Form for certain work defined in Bidding Requirements that may be added to or deducted from Contract Price if OWNER decides to accept corresponding change in either amount of construction to be completed, or in materials, equipment, or installation methods described in Contract Documents.
- B. Cost or credit for each alternate is net addition or deduction from Contract price to incorporate Alternate into Work. No other adjustments will be made to Contract Price.

##### 1.03 PROCEDURES

- A. Coordination:
  - 1. Modify or adjust affected adjacent work as necessary to completely and fully integrate work of Alternate into Project.
  - 2. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for complete installation whether or not indicated as part of Alternate.
- B. Execute accepted alternates under same conditions as other work of Contract.

#### PART 2 PRODUCTS

(Not Used)

#### PART 3 EXECUTION

##### 3.01 DESCRIPTION OF ALTERNATES

A. Alternate 1: Additional Sludge Line replacement

1. Replacement of an additional 471 lf of 6” sludge line all related installation and restoration work.

\* \* \* END OF SECTION \* \* \*

SECTION 01 29 02

MEASUREMMENT AND PAYMENT (LUMP SUM)

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Summary:

1. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.02 DEFINITIONS:

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.03 SCHEDULE OF VALUES:

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

- a. Application for Payment forms with continuation sheets.
- b. Submittal schedule.
- c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Engineer at earliest possible date, but no later than fourteendays before the date scheduled for submittal of initial Applications for Payment.

- B. Format and Content: Use Contract Documents table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

- a. Project name and location.
- b. Name of Engineer.

- c. Engineer's project number.
  - d. Contractor's name and address.
  - e. Date of submittal.
2. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
- a. Related Specification Section or Division.
  - b. Description of the Work.
  - c. Name of subcontractor.
  - d. Name of manufacturer or fabricator.
  - e. Name of supplier.
  - f. Change Orders (numbers) that affect value.
  - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
    - (1) Labor.
    - (2) Materials.
    - (3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Contract Documents table of contents. Provide multiple line items for principal subcontract amounts in excess of tenpercent of the Contract Sum.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
- a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

#### 1.04 MEASUREMENT:

##### A. General:

1. In determining the quantities of excavation to which unit prices shall apply, the limits of normal width and depth of excavation shall be as described below, unless other limits are indicated on the Drawings or specified.
2. For pipes in trench, the normal width of the trench shall be measured between vertical planes which are a distance apart equal to the sum of 18 inches (450 mm) plus 1-1/3 times the nominal inside diameter of the pipe. If the width so computed is less than 3 feet (0.9 m), a width of 3 feet (0.9 m) shall be taken as the normal width for payment. The normal depth shall be measured to a distance of 0.2 feet (0.06 m) below the bottom of the pipe in earth and 0.7 feet (0.2 m) in rock, unless there be a cradle underneath the pipe, in which case the normal depth shall be measured to the underside of the cradle. The width of trench for the cradle shall be assumed to be that specified above for pipes in trench.
3. For concrete placed directly against undisturbed earth, the normal width and depth of the excavation for such concrete shall be measured to the neat lines of the concrete as indicated on the Drawings or as ordered.
4. For concrete placed against rock surfaces resulting from rock excavation, the normal width and depth of the excavation shall be measured to 4 inches outside the neat lines of the concrete as indicated on the Drawings or as ordered.
5. For other structures, except manholes as noted below, the normal width shall be measured between vertical planes 1 foot (0.3 m) outside the neat lines of the several parts of the structure, except that the width at any elevation shall be measured as not less than the width at a lower elevation. The normal depth shall

be measured to the underside of that part of the structure for which the excavation is made.

6. No additional width or depth of trenches excavated in earth or rock shall be allowed at standard circular manholes.
7. Wherever bell holes are required for jointing pipe, they shall be provided without additional compensation over and above that resulting from measurements as above described.

#### 1.05 APPLICATIONS FOR PAYMENT:

- A. The following subsections describe the measurement of and payment for the work to be done under the items listed in the BID.
  1. Estimates of lump sum items shall be based on a schedule of values dividing each such item into its appropriate component parts together with a quantity and a unit price for each part so that the sum of the products of prices and quantities will equal the Contract price for the item. This schedule shall be submitted by the Contractor and must have the acceptance of the Engineer before the first estimate becomes due. Submit the schedule of values in accordance with Articles 2.05 and 2.07 of the General Conditions.
- B. Each unit or lump-sum price stated in the BID shall constitute full compensation as herein specified for each item of work completed in accordance with the drawings and specifications, including cleaning up.
- C. The prices for those items which involve excavation shall include compensation for disposal of surplus excavated material, handling water, and installation of all necessary sheeting and bracing.
- D. In all items involving excavation, the price shall be based on doing the entire excavation in subgrade material indicated on the Contract Drawings. Where rock is required to be excavated in quantities exceeding those indicated on the Contract Drawings, the price therefore shall be in addition to the cost of excavating earth, and no deduction will be made in the amount for earth excavation.
- E. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, Monthly Application for Progress Report, and final Application for Payment involve additional requirements.
- F. Payment Application Times: Submit Application for Payment to Engineer by the fifteenth of the month. The period covered by each Application for Payment is one month, ending on the last day of the month

- G. Application for Payment Forms: Use forms acceptable to Engineer and Owner for Applications for Payment. Submit forms for acceptance with initial submittal of schedule of values.
- H. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.
1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- I. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- J. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.



1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- K. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  2. When an application shows completion of an item, submit conditional final or full waivers.
  3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- K. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of values.
  3. Pre-construction surveys and photographs.
  4. Health and safety and environmental protection plans.
  5. Contractor's construction schedule (preliminary if not final).
  6. Products list (preliminary if not final).
  7. Schedule of unit prices.
  8. Submittal schedule (preliminary if not final).
  9. List of Contractor's staff assignments.
  10. List of Contractor's principal consultants.
  11. Copies of building permits.

12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  13. Initial progress report.
  14. Report of preconstruction conference.
  15. Certificates of insurance and insurance policies.
  16. Performance and payment bonds.
  17. Data needed to acquire Owner's insurance.
- L. Application for Monthly Progress Payment: Administrative actions and submittals that must precede or coincide with submittal of monthly Application for Progress Payment include the following:
1. Schedule of values.
  2. Schedule of unit prices.
  3. Construction photographs.
  4. Contractor's updated construction progress schedule and specified reports.
  5. Documented proof that it has recorded information on the Contract Drawings to reflect "As Built" information.
- M. Application for Payment at Substantial Completion: After Engineer issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum. Documentation include, evidence of all the following:
    - a. Each item of mechanical, electrical, instrumentation, piping and HVAC equipment installed or modified under this Contract have been tested to demonstrate compliance with the performance requirements of this Contract, including successful functional testing, water testing, performance testing and facility commissioning.
    - b. All operating, maintenance manuals and as-built drawings have been provided to the Owner.
    - c. All spare parts and materials have been provided to the Owner.
    - d. All warranty certificates and test results have been provided to the Owner.

- e. The Contractor has provided instructions and training to the Owner's staff to enable the Owner to operate the Works.
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- N. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Updated final statement, accounting for final changes to the Contract Sum.
  2. Evidence that claims have been settled.
  3. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  4. Final liquidated damages settlement statement.

## PART 2 - PRODUCTS

(Not Used)

## PART 3 - EXECUTION

(Not Used)

END OF SECTION

## SECTION 01 32 17

### CONSTRUCTION PROGRESS SCHEDULES

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. CONTRACTOR shall prepare and submit to Engineer for review within 10 days after Notice to Commence Work, a construction progress schedule.

##### 1.02 FORM OF SCHEDULES:

- A. Prepare schedules in form of a horizontal bar chart.
  - 1. Provide separate horizontal bar for each trade or operation.
  - 2. Horizontal Time Scale: Identify first work day of each week.
  - 3. Scale and spacing to allow space for notations and future revisions.
- B. Format of Listings: Chronological order of start of each item of work.
- C. Identification of Listings: By major specification section numbers.

##### 1.03 CONTENT OF SCHEDULES:

- A. Construction Progress Schedule:
  - 1. Show complete sequence of construction by activity.
  - 2. Show dates for beginning and completion of each major element of construction and installation dates for major items of equipment. Elements shall include, but not be limited to, the following:
    - a. Shop drawing receipt from supplier/manufacturer submitted to ENGINEER, review and return to supplier/manufacturer.
    - b. Material and equipment order, manufacturer, delivery, installation, and checkout.
    - c. Performance tests and supervisory services activity.
    - d. Piping, duct work, and wiring installation.

- e. Construction of various facilities.
  - f. Subcontractor's items of work.
  - g. Final cleanup.
  - h. Allowance for inclement weather.
  - i. Demolition.
3. Show projected percentage of completion for each item as of first day of each month.

1.04 SCHEDULE REVISIONS:

- A. Every 30 days CONTRACTOR shall revise construction schedule to reflect changes in progress of work and submit the revised schedule to engineer on monthly basis.
- B. Indicate progress of each activity at date of submittal.
- C. Show changes occurring since previous submittal of schedule.
  - 1. Major changes in scope.
  - 2. Activities modified since previous submittal.
  - 3. Revised projections of progress and completion.
  - 4. Other identifiable changes.
- D. Provide a narrative report as needed to define:
  - 1. Problem areas, anticipated delays, and impact on schedule.
  - 2. Corrective action recommended and its effect.
  - 3. Effect of changes on schedules of other CONTRACTORS.

1.05 SUBMITTAL REQUIREMENTS:

- A. For initial submittal of construction schedule and subsequent revisions thereof, furnish six copies of schedule to ENGINEER.

END OF SECTION

## SECTION 01 33 00

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. This Section specifies the general methods and requirements of submissions applicable to the following work-related submittals.
  - 1. Shop Drawings.
  - 2. Product Data.
  - 3. Construction or Submittal Schedules.
- B. Additional general submission requirements are contained in Paragraph 6.17 of the General Conditions.
- C. Detailed submittal requirements will be specified in the technical specifications section.

##### 1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES:

- A. Shop Drawings:
  - 1. Shop drawings, as defined in the General Conditions, and as specified in individual work Sections include, but are not necessarily limited to: custom-prepared data such as usage information, coating detail drawings, and test reports including performance curves and certifications as applicable to the work.
  - 2. All shop drawings shall be submitted using the transmittal form furnished by the Engineer.
  - 3. All shop drawings submitted by subcontractors for approval shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
  - 4. The Contractor shall check all subcontractor's shop drawings regarding measurements, size of members, materials, and details to satisfy himself that they conform to the intent of the Drawings and Specifications. Shop drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission thereof.
  - 5. All details on shop drawings submitted for approval shall show clearly the relation of the various parts of the main members and lines of the structure, and

where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted for approval.

B. Product Data:

1. Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and printed installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances including certificates of compliance and applicability, catalog cuts, product photographs, printed performance curves, and test reports and certifications, and printed product warranties, as applicable to the Work.

C. Samples:

1. Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the Work.

1.03 CONTRACTOR'S RESPONSIBILITIES:

- A. The Contractor shall review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
  1. Field measurements
  2. Field construction criteria
  3. Catalog numbers and similar data
  4. Conformance with the Specifications
- B. Each shop drawing, sample, and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-in. X 17-in. and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing

of all items within the package. Provide to the Engineer a copy of each submittal transmittal form for shop drawings, product data and samples at the time of submittal of said drawings, product data and samples to the Engineer.

- C. If a shop drawing shows any deviation from the requirements of the Contract Documents, the Contractor shall make specific mention of the deviations in the Transmittal Form furnished by the Engineer and provide a description of the deviations in a letter attached to the submittal.
- D. The review and approval of shop drawings, samples or product data by the Engineer shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will not have responsibility therefor.
- E. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- F. Project work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and product data.
  - 1. Manufacturer's printed installation instructions, a part of product data submitted to the Engineer will not be reviewed and are for informational purposes only.

#### 1.04 SUBMISSION REQUIREMENTS:

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- B. All submittals shall be submitted sufficiently in advance of construction requirements to provide no less than fourteen working days, excluding Saturdays, Sundays and legal holidays for review from the time received at the Engineer's reviewing office. For submittals of major equipment, that require more than fourteen days to review, due to its sheer complexity and amount of detail and also requiring review by more than one engineering discipline, a letter will be sent by the Project Manager or his/her designee to the Contractor informing him/her of the circumstances and the date it is expected the submittal will be returned to the Contractor.
- C. Number of submittals required:
  - 1. Shop Drawings: Unless otherwise stated in the respective Specifications Sections, submit eight (8) hard copies or one (1) electronic copy.



2. Product Data: Unless otherwise stated in the respective Specifications submit eight (8) copies or one (1) electronic copy.
3. Samples: Submit the number stated in the respective Specification Sections.

D. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and number.
3. Contractor identification.
4. The names of:
  - a. Contractor
  - b. Supplier
  - c. Manufacturer
5. Identification of the product, with the specification section number, page and paragraph(s).
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the Work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8-in. X 3-in. blank space for Contractor and Engineer stamps.

E. Each shipment of drawings shall be accompanied by a transmittal form furnished by the Engineer providing a list of the drawing numbers and the names mentioned above.

F. Submittals shall be separated by specification section. Do not combine submittals for different specification sections under the same transmittal.

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES:

- A. The Engineer's review is for general conformance with the design concept and contract drawings. Markings or comments shall not be construed as relieving the Contractor from compliance with the contract plans and specifications or from departures therefrom. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.
- B. The review of shop drawings, data, and samples will be general. They shall not be construed:
  - 1. as permitting any departure from the Contract requirements;
  - 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
  - 3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.
- C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.
- D. Two (maximum) copies of shop drawings or product data will be returned to the Contractor via First Class United States Postal Service or one (1) electronic copy will be returned via email. Samples will not be returned.
- E. Submittals will be returned to the Contractor under one of the action codes indicated and defined on the transmittal form furnished by the Engineer.
- F. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing, on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Engineer, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any work done because of this type revision that is not in accordance to the Contract Documents as may be required by the Engineer.
- G. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor, and will be considered "Rejected" until resubmitted. The Engineer may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

- H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer at least seven working days prior to release for manufacture.
- I. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

1.06 DISTRIBUTION:

- A. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the Engineer. Number of copies shall be as directed by the Engineer but shall not exceed 6.

1.07 GENERAL PROCEDURES FOR SUBMITTALS:

- A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections, of the Specifications, so that the installation will not be delayed by processing times including disapproval resubmittal (if required), coordination with other submittals, inspection, testing (off-site and on-site), purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

1.08 CERTIFICATION FORMS:

- A. If specifically required in other Sections of these Specifications, the Contractor shall submit the applicable Certificate of Design for each item required, and in the form attached to this Section, completely filled in and signed and sealed by a registered professional engineer.

1.09 CERTIFICATES OF COMPLIANCE:

- A. Certificates of Compliance as required in the specifications shall include and mean certificates, manufacturer's certificates, certifications, certified copies, letters of certification and certificate of materials.
- B. The Contractor shall be responsible for providing Certificates of Compliance as required in the technical specifications. Certificates are required for demonstrating proof of compliance with specification requirements and shall be executed in 6 copies unless otherwise specified. Each certificate shall be signed by an official authorized to certify on behalf of the manufacturing company and shall contain the name and address of the Supplier, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or

dates of the tests to which the report applies. Certification shall not be construed as relieving the Supplier from furnishing satisfactory material, if after tests are performed on selected samples, the material is found not to meet the specific requirements.

END OF SECTION

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CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the state of \_\_\_\_\_ and that he/she has been employed by (Name of Contractor) \_\_\_\_\_ to design \_\_\_\_\_ in accordance with Specifications Section \_\_\_\_\_ for the (Name of Project) \_\_\_\_\_. The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the \_\_\_\_\_; that said design is in conformance with all applicable local, state, and federal codes, rules, and regulations and professional practice standards; that his/her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design.

The undersigned hereby certifies that he/she has Professional Liability Insurance with limits of \$1,000,000.00 and a Certificate of Insurance is attached.

The undersigned hereby agrees to make all original design drawings and calculations available to the Town/City of \_\_\_\_\_ or Owner's representative within seven (7) days following written request therefore by the Owner.

\_\_\_\_\_  
P.E. Name

\_\_\_\_\_  
Contractor's Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

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CERTIFICATE OF UNIT RESPONSIBILITY  
For Specification Section \_\_\_\_\_

\_\_\_\_\_  
(Section title)

In accordance with Section 01300, paragraph 1.08 of the contract documents, the undersigned manufacturer accepts unit responsibility for all components of equipment furnished under specification Section \_\_\_\_\_. We hereby certify that these components are compatible and comprise a functional unit suitable for the specified and indicated performance and design requirements.

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
Name of Corporation

\_\_\_\_\_  
Commission expiration date

\_\_\_\_\_  
Address

Seal: By: \_\_\_\_\_  
Duly Authorized Official

\_\_\_\_\_  
Legal Title of Official

Date: \_\_\_\_\_



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## SECTION 01 32 31

### PRE & POST-CONSTRUCTION INSPECTIONS

#### PART 1 - GENERAL

##### 1.01 SUMMARY:

- A. The Work in this Section includes requirements of the CONTRACTOR to perform pre and post-construction inspections for existing structures, houses, buildings, sewers, subsurface utilities, roads, structures, fences, and surface features and other facilities as described herein.
- B. The coverage of inspection shall accurately document the existing conditions within the zone of influence of the proposed construction as described herein.
- C. Methods of documentation include photographs, video, and reports as described herein.
- D. This Section does not cover acceptance and/or inspection of new Work.
- E. This Specification also includes the requirement of the CONTRACTOR to investigate, adjust and resolve third party claims due to damage allegedly caused by the CONTRACTOR'S activities.

##### 1.02 QUALIFICATIONS

- A. Color audio-video taping shall be compiled by a professional photographer actively engaged in color audio-video tape recordings of similar type projects for municipal agencies. The names of the companies and additional requested information shall be submitted to the OWNER for approval prior to engaging the companies proposed to perform the pre-construction videotaping. Submit qualifications of the professional photographer to OWNER for review within 15 days of Notice to Proceed.
- B. CCTV inspections shall be performed by CCTV inspector having a minimum of three years of experience in such work necessary to successfully meet this specification. CCTV inspector shall also provide references for five sewer inspection projects involving remote CCTV pan and tilt inspection and two project references involving walk-through inspection of sewers larger than 48-inch in diameter.

##### 1.03 SUBMITTALS

- A. The CONTRACTOR shall submit pre- and post-construction and third party property claims Inspection Documentation Reports as described herein.
- B. Video and photographs shall be accompanied by a notarized statement verifying the original unedited quality of the media.

- C. Identification: Identify each photograph with label or image caption on the front side, lower left corner with the date taken, project name and location, orientation, and description of view.
- D. Video Logs: Displayed on the storage case of each video shall be a log of the contents. The log shall describe the various segments of coverage contained within the video in terms of the names and sides of the streets or easements, coverage beginning and end points, directions of coverage, and video counter numbers.
  - 1. A cumulative alphabetical index correlating the various segments of coverage to their corresponding video shall be supplied to the OWNER.
- E. Digital files shall be organized according to the following convention:
  - 1. Site/Date/Filename.jpg
    - a. Folder Level 1 – Site
    - b. Folder Level 2 – Subject
    - c. Folder Level 3 – Date: YYYY.MM.DD folder name format
- F. Preliminary Submittals
  - 1. At least 30 days prior to construction submit qualifications of proposed videographer and CCTV inspector for OWNER’s approval.
  - 2. At least 30 days prior to construction submit a sample video of a route similar to this project to verify video and audio quality. When approved, this video will be the standard on which quality will be based and judged.
  - 3. At least 30 days prior to construction submit sample construction photographs of three different projects to verify image quality. When approved, these photographs will be the standard on which quality will be based and judged.
  - 4. At least 30 days prior to construction submit planned format and outline of a typical report.
- G. Preconstruction Documentation:
  - 1. The CONTRACTOR shall prepare and deliver to the OWNER 30 days prior to the start of construction at each site, three (3) bound copies of each of the pre-construction inspections containing:
    - a. Submittal index detailing contents and extent of coverage
    - b. Field notes taken,
    - c. Sketches and diagrams prepared,

- d. CDs of image digital files obtained,
- e. DVDs of video surveys recorded,
- f. Pre-con field survey
- g. Descriptions and reports, signed and witnessed by those taking part in the inspection.

H. Progress Documentation:

- 1. If documentation is required for an inspection resulting from a damage complaint, three (3) copies of data obtained by the CONTRACTOR from each inspection shall be promptly delivered to the OWNER within three days of re-inspection.

I. Inspection Documentation Report:

- 1. The report shall include:
  - a. Location and description of site;
  - b. Results of visual inspection;
  - c. Color video and photographs;
  - d. Sketches;
  - e. Interview of Property Owner regarding existing conditions and structural faults, with dates and extent of recent repairs.
  - f. Points where deterioration has occurred shall be noted and color photographs taken on all sides of the buildings and structures (interior and exterior) to show existing condition and any deterioration or other deficiencies.
  - g. The absence of deficiencies shall also be recorded.
  - h. The age of each structure, trees, shrubs, utilities, pavement and other details pertinent to the replacement of each item should be documented.
  - i. Field surveys:
    - (1) Field surveys shall be performed by the Contractor's approved, surveyor, licensed in the State of Ohio. Perform field surveys as required to supplement Contract Documents and to establish pre-construction baseline elevations and post-construction or progress surveys to be used in the assessment of structural or property damage. The minimum requirements shall be as follows:
      - (a) Corners of buildings or structure foundations.

- (b) The location of each elevation shall be fully described in words and located on a survey plan to be included in the report.
2. The reports for each of the structures shall be signed by the CONTRACTOR's Representative that was present during the examination of each property. The OWNER shall examine said reports and may indicate additional information that is required.
3. Maintain a separate file on each property owner in the construction area. The file shall include a record of the property owner's permission to access the property.

## **PART 2- PRODUCTS**

### **2.01 EQUIPMENT:**

- A. Only high-quality video and photographs will be considered acceptable during the initial submittals to develop the project standard. It is the CONTRACTOR's responsibility to maintain, repair, replace, and/or update the equipment such that the quality standard is achieved throughout the project duration.
- B. Photographs
  1. Digital photographs shall contain a minimum of ten million pixels.
- C. Video
  1. Video recordings shall be in high-definition and shall, by electronic means display continuously and simultaneously generated, transparent, alpha-numeric information to include the following:
    - a. Video Tape Index Number
    - b. Project Title
    - c. General Project Location:
  2. Each video tape shall begin with a single, multi-line alpha-numeric display indicating the video tape index number, project title, and general location of the project.
  3. Time and Date: During the entire duration of the recordings, the time and date.
  4. Camera Position: During the entire duration of the recordings, the position of the camera, accurately referenced and displayed in terms of the construction's engineering stationing or coordinates, shall be displayed (in standard stationing format) in the lower left hand corner of the picture. Where no stationing or coordinates appear on the Contract Documents, an appropriate system acceptable to the OWNER, shall be established and utilized.

## 2.02 TELEVISION CAMERA FOR REMOTE CCTV AND MONITOR

- A. The camera(s) shall be operative in 100 percent humidity/submerged conditions. The CCTV camera equipment will provide a view of the pipe ahead of the equipment and of features to the side and rear of the equipment through turning and rotation of the lens. The camera shall be capable of tilting at right angles along the axis of the pipe while panning the camera lens through a full circle about the circumference of the pipe. The lights on the camera shall also be capable of panning 90-degrees to the axis of the pipe. If the equipment proves to be unsatisfactory, it shall be replaced with adequate equipment. The camera unit shall have sufficient quantities of line and video cable to inspect sewers with access as far apart as 2,500 feet.
- B. The television camera, electronic systems and monitor shall provide an image that meets the following specifications:
  - 1. The gray scale shall show equal changes in brightness ranging from black to white with a minimum of five stages.
  - 2. With the monitor control correctly adjusted, the six colors - Yellow, Cyan, Green, Magenta, Red, and Blue, plus black and white shall be clearly resolved with the primary colors in order of decreasing luminance. The gray scale shall appear in contrasting shades of gray with no color tint.
  - 3. The picture shall show no convergence or divergence over the whole of the picture. The monitor shall be at least 13 inches diagonally across the picture tube.
  - 4. The live picture on the CCTV monitor shall be capable of registering a minimum of 500 lines horizontal resolution and be a clear, stable image with no interference.
- C. Lighting intensity shall be remote controlled and shall be adjusted to minimize reflective glare. Lighting and camera quality shall provide a clear, in-focus picture of the entire inside periphery of the sewers and laterals for conditions except submergence. Under ideal conditions (no fog in the sewer) the camera lighting shall allow a clear picture up to five pipe diameter lengths away for the entire periphery of the sewer. The lighting shall provide uniform light free from shadows or hot spots.
- D. Camera focal distance shall be remotely adjustable through a range of 6 inches to infinity.
- E. The monitor and software shall also be able to capture and save screen images of typical sewer details and defects.

## 2.03 WALK-THROUGH INSPECTION CAMERA

- A. The walkthrough inspection unit shall be equipped with sufficient quantities of line, two-way communication cable, and video coax cable to inspect sewer with access as far as 2,500 ft apart. Special video amplifiers and portable, industrial-grade color video

cameras shall be employed, as required, to transmit the video signal from the in-sewer inspection crew to the aboveground inspection unit.

- B. Professional grade CCTV cameras specifically adapted for large diameter sewers (up to 175 inch) shall be used to film sewer interiors. It shall be operative in 100 percent humidity conditions and shall be capable of producing a full-color picture of a minimum of six linear feet of the entire periphery of the sewer. The camera lens shall have not less than a 65-degree viewing angle. The camera shall have a minimum resolution of 320 lines. Focal distance shall be adjustable through a range of six inches to infinity.
- C. Lighting shall be sufficient for color video inspection of sewers 48-inch in height and larger. To confirm picture quality throughout conditions encountered during the investigation, a variable intensity control of the camera lights and either automatic or remote control adjustments for focus and iris shall be located at the monitoring station.
- D. A digital or 35-mm camera shall also be carried by the walkthrough inspection crew and used to photograph typical sewer details and defects. Photographs shall be submitted on CD-R's in digital format.

#### 2.04 VIDEO REQUIREMENTS

- A. Video:
  - 1. Video recordings shall be in high-definition and shall, by electronic means, display continuously and simultaneously generated, transparent, and alpha-numeric information to include the following:
    - a. Video Disk Index Number
    - b. Project Title
    - c. General Project Location:
  - 2. Each video disk shall begin with a single, multi-line alpha-numeric display indicating the video disk index number, project title, and general location of the project.
  - 3. Time and Date: During the entire duration of the recordings, the time and date.
- B. Camera Position: During the entire duration of the recordings, the position of the camera, accurately referenced and displayed in terms of the construction's engineering stationing, shall be displayed (in standard stationing format) in the lower left hand corner of the picture. Where no stationing appears on the Contract Documents, an appropriate stationing system acceptable to OWNER, shall be established and utilized.

## 2.05 CCTV VIDEO RECORDINGS

- A. The video and audio recordings of the sewer inspections shall be made using digital video equipment. Super-VHS recordings shall be converted to individual digital movie files (.mpeg, .mpg – one file for each reach inspection) for submission on CD-R's or DVDs. A video enhancer may be used in conjunction with, but not in lieu of, the required equipment. The digital recording equipment shall capture sewer inspection on CD-R or DVD disks, with each sewer reach inspection recorded as an individual movie file (.mpeg, .mpg).
- B. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio shall be recorded by the operating technician on the inspection video as the sewer is inspected and shall include the sewer location, identification of beginning and terminating manholes including location (address or cross streets), inspection direction, length of inspection, side sewer identification, flow information, complete descriptions of the sewer line conditions as they are encountered, description of the rehabilitation work, reason for termination, and other relevant commentary to the inspections. In addition, the audio reports shall include the distance traveled on the specific run, a description of abnormal conditions in the sewer and side sewer connections as they are encountered, explanations for pausing, backing up, or stopping the survey, and the final measured center to center distances between consecutive manholes. Audio dubbing after the inspection is prohibited.
- C. The reaches shall be documented on the video in sequential order, from upstream to downstream, wherever possible. The images recorded on the CCTV video shall be the same images that are required to be displayed on the CCTV monitor.
- D. The equipment used for the inspection shall provide for simultaneous monitoring of the in-sewer inspection by OWNER. Equipment that does not allow for out of sewer observation of the inspection will not be allowed.
- E. The inspection videos shall be digitally indexed at significant defects, and the site coding sheets shall be filled out at these same intervals. Index numbers shall be included in the inspection logs.
- F. Typed labels shall be attached to the face of each CD or DVD, or videotape cassette. The typed index labels shall include the following information:
  - 1. Content (CCTV).
  - 2. CONTRACTOR name.
  - 3. Type of survey (CCTV).
  - 4. Sewer name.
  - 5. Reaches included (from Manhole Number ## to Manhole Number ##).



6. Date of survey.
  7. Work order number (if applicable).
- G. A 5-second blank space shall be inserted at the beginning of the tape and between sewer sections in order to more clearly mark the end of one televised sewer section and the beginning of another.

### **PART 3- EXECUTION**

#### **3.01 RESPONSIBILITIES:**

- A. Nothing contained herein shall relieve the CONTRACTOR of responsibility for claims arising alleged to arise from its construction operations. Failure to inspect a structure, whether or not required by these Contract Documents, or inadequacy of the inspections shall not relieve the CONTRACTOR of its responsibility. The CONTRACTOR shall indemnify the OWNER and the ENGINEER from such claims.
- B. Re-Inspections
1. The CONTRACTOR shall also be responsible for re-inspection as often as necessary in the opinion of the OWNER to verify the adequacy of his construction methods for prevention of damage and to obtain sufficient evidence to adjust and resolve claims for damage from third parties.
  2. CONTRACTOR shall also inspect and/or re-inspect homes where homeowners claim that damage is occurring as a result of the CONTRACTOR'S blasting and/or construction operations.

#### **3.02 COLOR AUDIO-VIDEO TAPING**

- A. Coverage Continuity: In order to reduce the number of recording edits and increase the continuity of the coverage, the coverage shall not consist of a group of recordings at various positions along a proposed construction area, but shall consist of a single, continuous, unedited recording which begins at one end of the particular construction area and continues to the other end of the construction area. However, where coverage is required in areas not accessible by conventional wheeled vehicles and smooth transport of the recording system is not possible, such coverage shall consist of an organized, interrelated sequence of recordings at various positions along that proposed construction area (e.g., wooded easement area).
- B. The subject or purpose of the photograph shall be made obvious to the viewer with techniques such as pointing, a painted arrow, or pane circled around the subject, using bright paint.

- C. Close-up, detailed color photographs shall be taken of cracks, deterioration and other observable effects in the exterior portions of buildings and other property improvements including, but not limited to, retaining walls, driveways and sidewalks.
- D. Camera Height and Stability: When conventional wheeled vehicles are used as conveyances for the recording system, the distance between the camera lens and the ground shall not be less than 8 feet. The camera shall be firmly mounted, such that transport of the camera during the recording process will not cause an unsteady picture.
- E. Camera Control: Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during videodisk playback. In addition, other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chroma, white balance, and electrical focus, shall be properly controlled or adjusted to maximize recorded picture quality.
- F. Viewer Orientation Techniques:
  - 1. The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views and visual displays of visible house and building addresses shall be utilized. In easements where the proposed construction location will not be readily apparent to the video disk viewer, highly visible yellow flags shall be placed in such fashion as to clearly indicate the proposed centerline of construction.
  - 2. Name and Side of Street or Easement: During the entire duration of the recordings, the name and side of the street or easement being recorded shall appear across the bottom of the picture.
  - 3. Buildings: Identified visually by house or building number, when possible, in such a manner that the progress of the taping and the proposed system may be located by reference to the buildings.
  - 4. Audio shall accompany the video recording and shall be a corresponding and simultaneously recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator, shall assist in the maintenance of viewer orientation and in needed identification, differentiation, clarification, or objective descriptive of the structures being shown in the video portion of the recording.

G. Coverage of Taping: The area to be taped shall include, but not be limited to, existing driveways, sidewalks, curbs, ditches, streets, landscaping, trees, culverts, catch basins, headwalls, retaining walls, fences, visible utilities, and buildings located within the zone of influence of construction. Designated haul routes shall be taped. Of particular concern are existing faults, fractures, defects, or other imperfections exhibited by the above mentioned surface features. Audio description shall be made simultaneously with and support the video coverage.

1. Streets shall be recorded by audio-video tape near sites where streets are present and along sides of the streets except where specifically noted otherwise by the OWNER.
2. Easement Areas shall be recorded by audio-video tape for the full width of the permanent and temporary easements and other adjacent areas lying within the zone of influence of construction as directed by OWNER. The size and locations of easements to be taped will be shown on the Contract Documents or otherwise supplied by the OWNER.
3. The CONTRACTOR shall furnish color audio- video tapes of exterior surfaces of buildings specifically identified by the OWNER to receive such coverage. At a minimum, structures or buildings shall be videotaped if located above the work area and within a permanent easement. Buildings so identified may include houses, apartments, factories, warehouses, retail stores and other structures. Exterior building coverage shall include, but not be limited to, walls, visible foundations, chimneys, porches, and trim.
4. Bridges and those areas immediately surrounding and adjacent to bridges appearing on Contract Documents shall be audio-video taped. Exterior bridge supports, structural members, visible footings, side walls, underside, and deck shall receive especial although not exclusive attention. Existing cracks, faults, fractures, defects or other imperfections shall be of particular concern.

H. Location Information

1. DVD's and cases shall be properly identified by disc number, location and project name in a manner acceptable to the OWNER.
2. A brief report and inventory of DVD's completed, referenced by location and DVD number, shall be furnished to the OWNER upon completion of the work and delivery of the DVD's.
3. Video recordings shall begin with the date and time of recording, the project name, the sheet numbers or engineering stationing as shown on the Contract Documents, the name of the street, easement or building being taped, the direction of travel, easement, and the viewing side.

4. Houses and buildings shall be identified visually by house or building number, when possible, in such a manner that the progress of the taping and the proposed system may be located by reference to the houses and buildings.
5. The engineering stationing numbers shall be continuous and correspond to the project sewer stationing and include the standard engineering symbols. This information shall appear in the lower half of the viewing screen. Below the engineering stationing shall appear the name of the project, name of the area covered, direction of travel, viewing side, date, time, etc.

### 3.03 TIME OF EXECUTION

- A. The CONTRACTOR shall coordinate the inspections with the construction schedule so that those portions of the construction that will be completed first will be recorded first.
- B. The inspections shall be performed prior to the placement of construction materials or equipment on the proposed construction site.
- C. Visibility: Recordings shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist, or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording and to produce bright, sharp video recordings of those subjects.
- D. Snow: No inspection of site/surface conditions shall be performed when more than 10 percent of the ground area is covered with snow, unless otherwise authorized by the OWNER.

### 3.04 NOTIFICATION

- A. Dates for pre-construction survey at the site shall be coordinated with the OWNER.
- B. Private Property
  1. When planning on entering private property, the CONTRACTOR shall provide a minimum of 48 hours' notice to the OWNER of such property to obtain access permission prior to entry.
  2. In the event that a property owner denies access for the survey of structures and facilities within the specified limits,
  3. The CONTRACTOR shall immediately notify the OWNER, and then notify such property owner, by certified mail, on the intent of the survey.
  4. If after two weeks, access is still denied, the CONTRACTOR shall notify the property owner once again by certified mail, stating that this is final notification.

5. Submit to the OWNER copies of correspondences between the CONTRACTOR and the property owner(s). The OWNER will obtain the right to enter the property through the legal powers vested in the OWNER as a public entity.
6. The CONTRACTOR is fully responsible for claims and damage arising from his construction operation regardless of being denied access permission from the OWNER.

### 3.05 CCTV EXECUTION

#### A. General

1. The CCTV camera shall be positioned as close to the spring line as possible while maintaining the required equipment stability. If the flow levels are above the spring line, then the vertical position of the camera shall be just above the free water surface. CONTRACTOR shall also inspect and document manholes included in this Work. The camera shall pan the periphery of the manhole from casting to invert. If water levels prevent adequate televising of the sewer, then conducting the Work during low flow periods or other methods detailed in the Contract Documents shall be implemented.
2. The speed that the camera or survey unit is conveyed through the sewer while performing general inspections shall be uniform and shall be limited to a maximum of 30-feet per minute. The survey unit shall be slowed, stopped, or backed-up to perform detailed inspections of significant features. The camera shall be stopped at defects, changes in material, water level, size, side connections, manholes, junctions, or other unusual areas. When stopped at the defect or feature, the operator shall pan the camera to the area and along the circumference of the pipe. The operator shall also record audio of the type of defect or feature, clock position, footage, extent or other pertinent data. Still photographs or screen captures shall be taken at defects and at least every 200 feet.
3. Inspections shall be performed in the presence of OWNER.
4. At CONTRACTOR's discretion or direction of OWNER, the camera shall be stopped or backed up (when conditions allow) to view and analyze conditions that appear to be unusual or uncommon for a sound sewer. The lens and lighting shall be readjusted, if need be, in order to verify a clear, distinct, and properly lighted feature.
5. CONTRACTOR shall be responsible for traffic control measures required. Although no residential or commercial traffic is anticipated during the completion of the work, it is likely that random vehicular traffic may be experienced. Such traffic may include landfill associated vehicles and machinery, OWNER maintenance crews and other contractors and material suppliers completing work on this Project. CONTRACTOR shall be responsible for maintaining localized traffic on site during CCTV inspection work.

## B. Linear Measurement

1. The CCTV camera location footage counter shall be zeroed at the beginning of each inspection. The survey unit location entered on the footage counter at the start of the inspection shall allow for the distance from the accepted start of the length of the sewer to the initial point of observation of the camera (adjusted zero). In the case of resuming an inspection at an intermediate point within a sewer reach, the footage counter shall be set to start at the distance from the upstream maintenance hole to that point, as previously recorded by the counter. CONTRACTOR shall confirm that the footage counter starts to register immediately when the survey unit starts to move.
2. Prior to commencing inspections, CONTRACTOR shall demonstrate compliance with the linear measurement tolerance specified below:
  - a. The equipment shall measure the location of the camera unit in 1-foot increments from the beginning (upstream end) of each continuous section. This footage location shall be displayed on the CCTV monitor and recorded on the videotapes.
  - b. The accuracy of the measured location shall be within + 0.5% of the actual length of the sewer reach being surveyed, or 1 foot, whichever is greater.

## C. CCTV Monitor Display

1. The images displayed on the CCTV monitors will be a view of the pipe above the water surface as seen by the CCTV camera as the unit is conveyed through the sewer.
2. The camera lighting shall be fixed in intensity prior to commencing the survey and the white balance set to the color temperature emitted. In order to verify color constancy, ideally no variation in illumination shall take place during the survey.
3. The video equipment shall be checked using an approved test card with a color bar prior to commencing each day's survey. The camera shall be positioned centrally and parallel to the test card at a distance where the full test card just fills the monitor screen. The card shall be illuminated evenly and uniformly without reflection.

## D. Data Displays

1. The CCTV images shall include an initial data display that identifies the sewer reach being surveyed and a survey status display that provides continuously updated information on the location of the survey unit as the survey is being performed. These data displays shall be in alphanumeric form. The size and position of the data shall not interfere with the main subject of the monitor picture.

2. The on-screen display shall be white during inspections where the background behind the display is dark and, conversely, black where the background is light.
3. At the beginning of each reach of sewer being inspected, the following information shall be electronically generated and displayed on the CCTV monitors as well as included in the audio track:
  - a. Date of survey.
  - b. Interceptor name/location.
  - c. Manhole number to manhole number (in order of inspection).
  - d. Direction of survey (upstream or downstream).
  - e. Time of start of survey.
  - f. During inspections, the following information shall be electronically generated, automatically updated, and displayed on the CCTV monitors: survey unit location in the sewer line in feet and tenths of feet from adjusted zero, sewer diameter, and abbreviated manhole reference numbers (upstream and downstream manholes in order of survey direction).

E. Photographs

1. CCTV Inspection
  - a. During CCTV inspections, screen captures will be taken from the monitor images and saved electronically by the in-sewer inspection crew of typical conditions every 200 feet and at defects. The screen capture shall have the interceptor name, reach (identified by the upstream and downstream manholes), survey direction, footage, and date when photograph was taken. The annotation shall be clearly visible and in contrast to its background, shall have a figure size no greater than 1/4-inch, and shall be type-printed. The annotation shall be positioned on the front of the photograph so as to not interfere with the subject of the photograph.
  - b. The image of the sewer shall fill the photographic image. Photographs shall clearly and accurately show what is displayed on the monitor, which shall be in proper adjustment. Where significant features exist within 6-feet of each other, one photograph shall be made to record these features. Where there is a continuous feature, photographs shall not be taken at intervals of less than 6-feet unless absolutely necessary to show a change in the feature.
  - c. The images shall be kept electronically, copied to a CD, and submitted with the inspection videos and logs.

## 2. Walkthrough Inspection

- a. During walkthrough inspections, digital or 35-mm still color photos will be taken by the in-sewer inspection crew of typical conditions every 200 feet and at defects. The camera used shall be equipped to record the date on film so that it appears on the photograph.
- b. The image of the sewer shall fill the photographic image. Photographs shall clearly and accurately show what is displayed on the monitor, which shall be in proper adjustment. Where significant features exist within 6-feet of each other, one photograph shall be made to record these features. Where there is a continuous feature, photographs shall not be taken at intervals of less than 6-feet unless absolutely necessary to show a change in the feature.
- c. Photographs shall be annotated to clearly identify the interceptor name, reach (identified by the upstream and downstream manholes), survey direction, footage, and date when photograph was taken. The annotation shall be clearly visible and in contrast to its background, shall have a figure size no greater than ¼-inch, and shall be type-printed. The annotation shall be positioned on the front of the photograph so as to not interfere with the subject of the photograph.
- d. For 35-mm photographs the photographic negatives shall be supplied in suitable plastic negative holders and bound in a negative folder. The photographs shall be supplied in suitable plastic photograph holders and bound in the Survey Notebook. An electronic copy of the images shall be burned to a CD and submitted with the inspection videos and logs.

## F. MANHOLE NUMBERING, INSPECTION FORMS AND DEFECT CODES

1. CONTRACTOR will be required to use the OWNER's manhole numbering system when performing the inspections for this project, or use manhole/catch basin number for this project if not labeled using the OWNER manhole numbering system. In addition, the OWNER inspection forms and standard defect codes shall be used. The defect codes, inspection forms, and inspection protocols are included in the OWNER's Sewer Defect Identification Manual that will be distributed to CONTRACTOR.

## G. POST-SEWER INSPECTIONS

1. Following the sewer work, CONTRACTOR shall conduct a CCTV inspection of the completed work to verify that the sewer work is acceptable. Pipes shall be inspected by personnel entering the pipeline and manually recording conditions as specified herein.
2. The post-sewer CCTV inspections shall be performed throughout the entire pipe reach, manhole to manhole, where sewer work has been performed. The inspection shall document defects encountered and areas that have been



rehabilitated. The camera shall be panned, tilted and rotated at defects and at service lateral connections for a complete video documentation.

3. The post sewer inspections are intended to confirm the condition of the pipes and manholes and to verify the completeness of the sewer installation. OWNER may accompany CONTRACTOR in the pipe during the inspection or may observe the inspection from the television truck. In either case, CONTRACTOR shall take direction from OWNER regarding observations, documentation and measurements required. OWNER shall have the authority to reject any or of the inspection video if it does not comply with these specifications. Those reaches will be re-videoed at no additional cost to OWNER.
4. The camera shall be moved through the sewer in either direction. At points within the sewer showing defects, laterals, and sewer appurtenances, CONTRACTOR shall stop the camera to verify adequate video coverage. Inspection crews shall be in constant communication with each other and OWNER via walkie-talkies or other suitable means during operations.
5. If the camera cannot pass the entire sewer reach from its starting direction, the reach shall be inspected as much as possible from both upstream and downstream directions. Additional lining of the reach shall be performed and the pipe shall be re-inspected until the lining and televising has been accepted by OWNER, at no additional cost to OWNER.
6. If CONTRACTOR equipment becomes stuck in the sewer, CONTRACTOR shall be responsible for costs associated with extracting the equipment from the sewer.
7. Damages to public or private property resulting from CONTRACTOR activities shall be repaired by CONTRACTOR at no cost to OWNER.

#### H. Report

1. Two copies of the inspection videos saved in mpeg format on CD-R's or DVD, electronic version (.jpg) of still photographs saved on CD-R's or DVD, and hard copies of the inspection logs shall be submitted to OWNER for review and approval. Payment will not be made for sewer work until OWNER has reviewed and approved the post work inspection videos. CONTRACTOR shall submit the videos a minimum of 10 days in advance of payment request to provide OWNER adequate time to review the files.
2. The TV inspection report shall include video recordings, pictures and OWNER standard inspection forms and defect codes. Inspection forms and defect codes can be found in the Sewer Defect Identification Manual. CONTRACTOR shall provide equal documentation on both the videos and forms. CONTRACTOR shall maintain a copy of report material. CONTRACTOR shall provide comments as necessary to fully describe the existing condition of the sewer, both through the voice over on the videos and on the inspection forms. Photographs shall further

document both typical sewer features, and defects. The photographs shall be copied to a CD and submitted to the OWNER along with the videos and logs.

### 3.06 DOCUMENTATION

- A. The number of pre-construction photographs required will be the amount necessary to document the scope of the work as described herein.
- B. Coverage Continuity
  - 1. In order to reduce the number of recording edits and increase the continuity of the coverage. The coverage shall not consist of a group of recordings at various positions along a proposed construction area, but shall consist of a single, continuous, unedited recording which begins at one end of the particular construction area and continues to the other end of the construction area. However, where coverage is required in areas not accessible by conventional wheeled vehicles and smooth transport of the recording system is not possible, such coverage shall consist of an organized, interrelated sequence of recordings at various positions along that proposed construction area (e.g., wooded easement area).
- C. The subject or purpose of the photograph shall be made obvious to the viewer with techniques such as pointing, a painted arrow, or pane circled around the subject, using bright paint.
- D. Close-up, detailed color photographs shall be taken of cracks, deterioration and other observable effects in the exterior portions of buildings and other property improvements including, but not limited to, retaining walls, driveways and sidewalks.
- E. Camera Height And Stability
  - 1. When conventional wheeled vehicles are used as conveyances for the recording system, the distance between the camera lens and the ground shall not be less than 8 feet. The camera shall be firmly mounted, such that transport of the camera during the recording process will not cause an unsteady picture.
- F. Camera Control
  - 1. Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during videotape playback. In addition, other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chroma, white balance, and electrical focus, shall be properly controlled or adjusted to maximize recorded picture quality.
- G. Viewer Orientation Techniques.
  - 1. The audio and video portions of the recording shall maintain viewer orientation. To this end, overall establishing views and visual displays of visible house and

building addresses shall be utilized. In easements where the proposed construction location will not be readily apparent to the videotape viewer, highly visible yellow flags shall be placed in such fashion as to clearly indicate the proposed centerline of construction.

2. Name and Side of Street or Easement: During the entire duration of the recordings, the name and side of the street or easement being recorded shall appear across the bottom of the picture.
3. Buildings: Identified visually by house or building number, when possible, in such a manner that the progress of the taping and the proposed system may be located by reference to the buildings.
4. Audio shall accompany the video recording and shall be a corresponding and simultaneously recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator, shall assist in the maintenance of viewer orientation and in needed identification, differentiation, clarification, or objective descriptive of the structures being shown in the video portion of the recording.

### 3.07 SCOPE OF INSPECTION COVERAGE

#### A. Building Exteriors

1. Furnish tapes of exterior surfaces of buildings either specifically identified by the OWNER or those within the zone of influence of the CONTRACTOR'S operations. Such buildings may include houses, apartments, factories, warehouse, retail stores, and other structures close to the work area. Coverage shall include, but not be limited to, walks, visible foundations, exterior walls, porches, trim, visual external survey of the building or structure, interior basement foundations.

B. Color photographs showing visually evident external structural cracks and damage. Document the location and width of existing cracks in each structure. Install crack monitors selectively where crack width exceeds 1/8-inch if approved by the Property Owner. A photograph shall be taken of each crack monitor installation.

C. Internal video survey shall be conducted for underground sanitary and storm sewer utilities, pipelines, and culverts within the limits and distances specified in this Section. A remotely-controlled and operated robotic camera shall be used for non-man entry sewer diameters.

#### D. Easements

1. Where construction will extend through easement areas, the permanent and temporary easements and other adjacent areas lying within the construction's zone of influence shall be recorded. The term easement shall be understood to mean areas not defined as streets.

- a. Easements: In easements where hand-held video equipment shall be used and the engineering stationing cannot automatically be reproduced on the tape, local landmarks along the route or other recognizable features off to the side of the sewer route shall be visually and audibly noted at frequent intervals to identify camera location.
- E. Detour & Haul Streets: Where construction traffic will extend to a street the full width of the street right-of-way and the areas adjacent to both sides of that right-of-way shall be recorded. The term street shall be understood to mean a highway, road, street, avenue, boulevard, lane, circle, alley, etc.; and be inclusive of associated catch basins, sidewalks, and curbs.
- F. Visible utilities features including but not limited to power poles, overhead lines and fire hydrants.
- G. Utilities (including underground water, sewer, gas laterals and electric cables etc. for each building or structure),

### 3.08 ZONE OF INSPECTION COVERAGE

- A. The recordings shall contain coverage of surface features located within the construction's zone of influence. The construction's zone of influence shall be defined as:
  - 1. The area within right-of-ways and easements and adjacent areas which may be affected by routine construction operations within the limits defined below, and
  - 2. Areas directed by OWNER.
- B. CONTRACTOR shall conduct inspections at the following locations for pre- and post-construction inspection, progress documentation, and re-inspection documentation:
  - 1. Blasting: Record conditions within a 500 foot radius from the blast face when projected to the ground surface.
  - 2. Sewer Access Structures: Perform pre-construction inspection for structures, houses, utilities and other facilities located entirely or partially within a 100 foot radius from the center of each excavation.
  - 3. Perform pre-construction inspection for structures, houses, utilities and other facilities located entirely or partially within a 40 foot radius from the centerline of each open-cut excavation.
- C. In addition to the locations identified above, the survey shall extend to areas expected to be disturbed by CONTRACTOR's operations, including but not limited to roadways, pavements, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery, and fences. Of particular concern shall be the existence or nonexistence of faults, fractures, or defects.

- D. Conduct internal video recording of pipes to be abandoned at least 45 days prior to the start of abandonment. Provide inspection report to OWNER and identify location and size of connections into the sewer to be abandoned.
- E. Completion
  - 1. Upon completion of excavation, the CONTRACTOR shall make similar examination of properties structures, and conditions where complaints of damage have been received or damage claims have been filed. Give notice to interested parties so that the parties may be present during the final examination. Records of the final examination shall be signed and distributed.

**END OF SECTION**

## SECTION 01 35 43

### PROTECTION OF ENVIRONMENT

#### PART 1 - GENERAL

##### 1.01 SCOPE OF WORK:

- A. The work covered by this Section consists of furnishing all labor materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.
- B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.
- C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching, or other special surface treatments as are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area.
- D. Ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.
- E. Schedule and conduct all work in a manner that will minimize the level of noise escaping the site, especially at night and on weekends.

##### 1.02 APPLICABLE REGULATIONS:

- A. Comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement.
- B. United States Environmental Protection Agency (USEPA):
  - 1. EPA-72-015: Guidelines for Erosion and Sedimentation Control Planning and Implementation
  - 2. EPA 43019-73-007: Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity

### 1.03 NOTIFICATIONS:

- A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectional acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Engineer, of any non-compliance with State or local requirements. The Contractor shall, after receipt of such notice from the Engineer or from the regulatory agency through the Engineer, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

### 1.04 IMPLEMENTATION:

- A. Prior to commencement of the work, meet with the Engineer to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.
- B. Remove temporary environmental control features, when approved by the Engineer, and incorporate permanent control features into the project at the earliest practicable time.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.01 EROSION CONTROL & INLET PROTECTION:

- A. Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures such as siltation basins, hay check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Offsite surface water shall be diverted around the site to a downstream channel ahead of siltation barriers. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.
- B. Contractor shall protect catch basins, inlet basins and manhole covers from water runoff generated by Work activities.

### 3.02 PROTECTION OF STREAMS, WETLANDS, AND SURFACE WATER:

- A. Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
- B. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan approved by the Ohio EPA. Contractor shall submit to copies of approved contingency drawings or plans to the Engineer.

### 3.03 PROTECTION OF LAND RESOURCES:

- A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of project that will appear to be natural and not detract from the appearance of the project.
- B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
- C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.
- D. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of.

All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1-in. in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.



Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.

- E. The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands or floodplains. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- F. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as approved by the Engineer.
- G. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

#### 3.04 PROTECTION OF AIR QUALITY:

- A. Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- B. Dust Control. The Contractor will be required to maintain all demolition sites, excavations, embankments, stockpiles, access roads, plant sites, waste areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded, and which would cause a hazard or nuisance to others.
- C. Comply with local environmental regulations for dust control. If Contractor's dust control measures are considered inadequate by Engineer, Engineer may require Contractor to take additional dust control measures.
- D. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.
- E. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control

shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

3.05 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION:

- A. During the life of this Contract, maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

END OF SECTION

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## SECTION 01 43 00

### QUALITY REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. This section covers Quality Assurance and Control requirements for this contract.
- B. The Contractor is responsible for controlling the quality of work, including work of its subcontractors, and suppliers and for assuring the quality specified in the Technical Specifications is achieved.
- C. Refer to the Article 6 - Contractor's Responsibilities, paragraphs 6.01, 6.02, and 6.03.

##### 1.02 CONTRACTOR FURNISHED TESTING LABORATORY SERVICES:

- A. An independent commercial testing laboratory acceptable to the Engineer shall perform all tests that require the services of a laboratory to determine compliance with the Contract Documents. The laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- B. Preliminary Testing Services: The Contractor shall be responsible for all testing laboratory services in connection with concrete materials and mix designs, the design of asphalt mixtures, gradation tests for structural and embankment fills, backfill materials, and all other tests and engineering data required for the Engineer's review of materials and equipment proposed to be used in the Work. The Contractor shall obtain the Engineer's acceptance of the testing laboratory before having services performed, and shall pay all costs for services.
- C. The Contractor shall not retain any testing laboratory against which the Owner or the Engineer have reasonable objection, and if at any time during the construction process the services become unacceptable to the Owner, or the Engineer, either the Owner or the Engineer may direct in writing that such services be terminated. The request must be supported with evidence of improper testing or unreasonable delay. If the Engineer determines that sufficient cause exists, the Contractor shall terminate the services and engage a different testing laboratory.
- D. Transmittal of Test Reports: Written reports of testing and engineering data furnished by the Contractor for the Engineer's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings.

- E. The Contractor's testing laboratory shall furnish four copies of a written report of each test performed by laboratory personnel within three days after each test is completed. Distribution shall be two copies of each test report to the Engineer's Representative, one copy to the Owner, and one copy for the Contractor.

#### 1.03 QUALITY ASSURANCE:

- A. Codes and Standards: Refer to Article 3 - Contract Documents: Intent, Amending, Reuse, paragraph 3.03 of the General Conditions.
- B. Copies of applicable referenced standards are not included in the Contract Documents. Where copies of standards are needed by the Contractor for superintendence and quality control of the work, the Contractor shall obtain a copy or copies directly from the publication source and maintain at the jobsite, available to the Contractor's personnel, subcontractors, and Engineer
- C. Quality of Materials: Unless otherwise specified, all materials and equipment furnished for permanent installation in the Work shall conform to applicable standards and specifications and shall be new, unused, and free from defects and imperfections, when installed or otherwise incorporated in the Work. The Contractor shall not use material and equipment for any purpose other than that intended or specified unless the Engineer authorizes such use.
- D. Where so specified, products or workmanship shall also conform to the additional performance requirements included within the Contract Documents to establish a higher or more stringent standard or quality than that required by the referenced standard.

#### 1.04 OFFSITE INSPECTION:

- A. When the specifications require inspection of materials or equipment during the production, manufacturing, or fabricating process, or before shipment, such services shall be performed by the Owner's independent testing laboratory, or inspection organization acceptable to Engineer in conjunction with or by the Engineer.
- B. The Contractor shall give appropriate written notice to the Engineer not less than 30 days before offsite inspection services are required, and shall provide for the producer, manufacturer, or fabricator to furnish safe access and proper facilities and to cooperate with inspecting personnel in the performance of their duties.

#### 1.05 MATERIALS AND EQUIPMENT:

- A. The Contractor shall maintain control over procurement sources to ensure that materials and equipment conform to specified requirements in the Contract Documents.
- B. The Contractor shall comply with manufacturer's printed instructions regarding all facets of materials and/or equipment movement, storage, installation, testing, startup, and

operation. Should circumstances occur where the contract documents are more stringent than the manufacturer's printed instructions, the Contractor shall comply with the specifications. In cases where the manufacturer's printed instructions are more stringent than the contract documents, the Contractor shall advise the Engineer of the disparity and conform to the manufacturer's printed instructions. In either case, the Contractor is to apply the more stringent specification or recommendation, unless approved otherwise by the Engineer.

#### 1.06 SHOP AND FIELD TESTING:

- A. The Contractor is responsible for providing advance notice of and access for the shop and field testing specified in the technical specification sections.
- B. The Contractor and its Subcontractor shall permit inspections, tests, and other services as required by the Contract Documents.
- C. Contractor shall provide twenty one days written notice to the Engineer so that the Engineer may schedule and witness off site and on site tests. The Engineer's witnessing of tests does not relieve the Contractor and/or Subcontractors of their obligation to comply with the requirements of the Contract Documents.

#### 1.07 MANUFACTURER'S FIELD SERVICES:

- A. When specified in the technical specifications sections, the Contractor shall arrange for and provide technical representation from manufacturer's of respective equipment, items or components. The manufacturer's representative shall be a factory trained service engineer/technician with the type and length of experience specified in the technical specifications.
- B. Services Furnished Under This Contract: An experienced, competent, and authorized factory trained service engineer/technician representative of the manufacturer of each item of equipment for which field services are indicated in the specifications shall visit the site of the Work and inspect, operate, test, check, adjust if necessary, and approve the equipment installation. In each case, the manufacturer's service representative shall be present when the equipment is placed in operation. The manufacturer's service representative shall revisit the jobsite as often as necessary until all problems are corrected and the equipment installation and operation are satisfactory to the Engineer.

#### 1.08 CERTIFICATION FORMS AND CERTIFICATES:

- A. The Contractor shall be responsible for submitting the certification forms and certificates in conformance with the requirements specified in Section 01 33 00 - Submittals.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 – EXECUTION

### 3.01 QUALITY CONTROL:

- A. Quality control is the responsibility of the Contractor, and the Contractor shall maintain control over construction and installation processes to assure compliance with specified requirements.
- B. Certifications for personnel, procedures, and equipment associated with special processes (e.g., welding, cable splicing, instrument calibration, surveying) shall be maintained in the Contractor's field office, available for inspection by the Engineer. Copies shall be made available to the Engineer upon request.
- C. Means and methods of construction and installation processes are the responsibility of the Contractor, and at no time is it the intent of the Engineer to supersede or void that responsibility.

END OF SECTION

## SECTION 01 50 00

### TEMPORARY FACILITIES

#### PART 1 - GENERAL

##### 1.01 SCOPE OF WORK:

- A. The Contractor shall provide all temporary facilities for the proper completion of the work, as required and as specified.

##### 1.02 SANITARY REGULATIONS:

- A. The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required.
- B. The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or on adjacent property.

##### 1.03 SMOKING:

- A. Smoking shall be allowed only in designated areas.

##### 1.04 WATER SUPPLY:

- A. For all necessary operations at the site of the work (except as noted in the next paragraph below) the Owner, without charge therefore, shall provide reasonable quantities of water at the then existing pressure from a mutually convenient hydrant of the water distribution system. The Contractor shall furnish all necessary pipe or hose extensions to conduct the water to the points of use and shall exercise due care not to waste water. The Contractor shall not contaminate the water supply and shall comply with all applicable regulations and code requirements.
- B. The Owner reserves the right to limit, suspend, or terminate the supplying of water as set forth above should it consider such action to be necessary on account of damage to the distribution system, the necessity of conserving water, or other emergency. In this event, the Contractor shall obtain water from some other approved source, at his own expense.

##### 1.05 TEMPORARY HEAT:



- A. If temporary heat is required for the protection of the Work, the Contractor shall provide and install suitable heating apparatus, shall provide adequate and proper fuel, and shall maintain heat as required.

1.06 ELECTRICAL ENERGY:

- A. The Contractor shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work and during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, and meters.
- B. The Contractor shall provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

1.07 TELEPHONE SERVICE:

- A. The Contractor shall make all necessary applications and arrangements and pay all fees and charges for telephone service required for the temporary facilities for the project.

1.08 PRECAUTIONS DURING ADVERSE WEATHER:

- A. During adverse weather and against the possibility thereof, the Contractor shall take all necessary precautions so that the Work may be properly done, satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other suitable means.
- B. During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by suitable means which will result in a moist or a dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will be warm throughout when used.

1.09 CONTRACTOR'S FIELD OFFICE:

- A. Field Offices, General: Prefabricated or mobile unit with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. The Contractor shall maintain a temporary field office or other storage facility as needed near the work for his own use during the period of construction at which readily accessible copies of all contract documents shall be kept. The office shall be located where it will not interfere with the progress of the work. In charge of this office there shall be a competent full-time superintendent of the Contractor.

- C. The Contractor shall not occupy space within the wastewater pollution control plant for purposes other than those stipulated for construction. Temporary space shall be provided for contract worker's use during the project.

END OF SECTION

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## SECTION 01 66 10

### DELIVERY, STORAGE AND HANDLING

#### PART 1 - GENERAL

##### 1.01 GENERAL:

- A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.

##### 1.02 TRANSPORTATION AND DELIVERY:

- A. Transport and handle items in accordance with manufacturer's printed instructions.
- B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
- C. All items delivered to the site shall be unloaded and placed in a manner which will not hamper the Contractor's normal operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.
- D. Provide equipment and personnel to unload all items delivered to the site.
- E. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

##### 1.03 STORAGE AND PROTECTION:

- A. Store and protect products and equipment in accordance with the manufacturer's instructions, with seals and labels intact and legible of equipment.
- B. Arrange storage of products and equipment to permit access for inspection. Periodically inspect to make sure products and equipment are undamaged and are maintained under specified conditions.

END OF SECTION

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## SECTION 01 74 23

### CLEANING UP

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK:

- A. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible. Any dust created in the building created as a result of the work must be cleaned up upon completion of the work.
- B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
- C. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.
- D. The Contractor shall thoroughly clean all materials and equipment installed by him and his sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
- E. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

## PART 2 - PRODUCTS

### 2.01 MATERIALS:

- A. Use only those cleaning materials which will not create hazards to property and persons or damage surfaces of material to be cleaned.
- B. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

## PART 3 - EXECUTION

### 3.01 FINAL CLEANING:

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.

END OF SECTION

SECTION 01 77 00  
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SCOPE OF WORK:

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
  - 1. Closeout procedures.
  - 2. Final cleaning.
  - 3. Adjusting.

1.02 RELATED WORK:

- A. Warranties and Bonds are included in Section 01 78 36.

1.03 CLOSEOUT PROCEDURES:

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit closeout submittals specified in other Division 01 Sections, including project record documents, final completion photographic documentation, damage or settlement surveys, and similar final record information.
- D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payment, and sum remaining due.

1.04 FINAL CLEANING:

- A. Complete the final cleaning operations in Section 01 74 23 before requesting inspection for Certification of Substantial Completion.

1.05 ADJUSTING:

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.



PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01 78 36

### WARRANTIES AND BONDS

#### PART 1 - GENERAL

##### 1.01 SCOPE OF WORK:

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.

##### 1.02 RELATED WORK:

- A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.
- B. General closeout requirements are included in Section 01 77 00 Contract Closeout.
- C. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Division 31 through 33.
- D. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

##### 1.03 SUBMITTALS:

- A. Submit written warranties to the Owner prior to the date fixed by the Engineer 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 the Owner.
- B. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner within fifteen days of completion of that designated portion of the Work.
- C. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Engineer for approval prior to final execution.

- D. At Final Completion, compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- E. 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 8-1/2-in. by 11-in. paper.
- F. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified, and the name of the product or work item.
- G. 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, supplier, and manufacturer.
- H. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name, address, and telephone numbers of the Contractor and equipment supplier.
- I. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

#### 1.04 WARRANTY REQUIREMENT:

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work 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.
- C. 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 Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise

available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights or remedies.

- E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.05 DEFINITION:

- A. Standard Product Warranties are pre-printed written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the 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 the Owner.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

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## SECTION 23 05 25

### HVAC DIRECT BURIED PIPING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

###### A. Scope:

- A. Provide new direct buried factory insulated and jacketed supply and return hot water piping and appurtenances as indicated on CP-01 drawings and specified herein. The system shall be composed of carrier piping with insulation and direct applied jacket. No secondary containment casing (conduit) will be provided.

###### B. Rated Characteristics and Media:

1. The system shall have a rated temperature of 32 to 250 degrees F and a rated pressure of 150 psig at 250 degrees F. Media shall be plain water or glycol solution.

##### 1.02 SUBMITTALS:

###### A. Shop Drawings:

1. HVAC Buried Piping System – Manufacturer’s complete description of the design, fabrication and assembly of the system, materials of construction and field installation instructions, not later than 28 calendar days prior to start of factory fabrication.

#### PART 2 - PRODUCTS

##### 2.01 MANUFACTURERS:

- A. The system basis of design is the Xtru® System and the Polytherm® System as manufactured by Perma-Pipe, Inc.

##### 2.02 SYSTEM TYPE:

- A. All straight sections, anchors, fittings, and other accessories of the system shall be factory fabricated and assembled including carrier pipe, coatings, insulation and jacket. Field fabrication shall be limited to welding and threading joints between fittings and straight pipe sections; welding and threading joints between straight pipe sections; coating,

insulating and jacketing the aforementioned field joints; and providing concrete around anchors.

- B. Water spread limiting devices shall be required at all ends of pipe fittings, anchors, and field joints. Such end seals shall be designed and factory fabricated to prevent the ingress of moisture into the system. All steel pipe shall be welded. Joints shall be butt-weld.

## 2.03 CARRIER PIPING:

- A. General: Metallic pressure pipe, fittings, and piping accessories shall conform to the requirements of ASME B31.1 and shall be types suitable for the media, and the temperature and pressure of the media.

- B. Pipe:

- 1. Steel Pipe:

- a. Pipe shall conform to ASTM A 53, Type E or S, Grade B, standard weight (Schedule 40), black or to ASTM A 106, Grade B, standard weight (Schedule 40).

- C. Pipe Fittings:

- 1. Fittings for Steel Pipe:

- a. Welding fittings shall conform to the requirements of ASTM A105 or ASTM A234, Grade B and be same schedule as adjoining pipe.

- D. Coating:

- 1. The exterior of steel pipe and fitting surfaces shall be coated.

## 2.04 INSULATION:

- A. Recycled Materials:

- 1. Provide thermal insulation containing recycled materials to the extent practicable, provided that the materials meet all other requirements of this Section. The minimum recycled material content shall be in compliance with specified Department of Environmental Protection rules and regulations.

- B. Factory Applied Foam Insulation:

- 1. Prefabricated pipe and fittings shall be insulated in the factory. Insulation for prefabricated insulated pipe and fittings shall be closed cell polyurethane foam meeting the requirements of ASTM C591 having a density not less than 2 pounds per cubic foot (pcf). The insulation thermal conductivity factor shall not exceed the

numerical value of 0.18 Btu-inch/square foot-degree F-hour at 75 degrees F, when tested in accordance with ASTM C518.

2. The polyurethane foam shall be spray-applied and completely fill the annular space between the carrier pipe and the jacket. The jacket shall be applied over the insulation after the insulation foam has cured. The insulation shall be bonded to the carrier pipe and jacket. Systems using open cell insulation or a non-bonded design shall not be permitted. Foam injected polyurethane foam manufacturing processes shall not be permitted. The insulated pipe shall be guaranteed 100 percent free of insulation voids.
3. Factory Tests - Quality assurance procedures at the manufacturing plant shall include:
  - a. Foam density testing
  - b. Thermal conductivity testing
  - c. Closed cell content testing
  - d. Compressive strength testing
  - e. Dimensional stability testing
  - f. Visual (no void) test

C. Factory Applied Mineral Fiber Batt Insulation:

1. Prefabricated pipe and fittings shall be insulated in the factory. Insulation for prefabricated insulated pipe and fittings shall be mineral wool batt meeting the requirements of ASTM C 547 having a density not less than 4 pounds per cubic foot (pcf) . The insulation thermal conductivity factor shall not exceed the numerical value of 0.24 Btu-inch/square foot-degree F-hour at 75 degrees F , when tested in accordance with ASTM C518. Insulation jacket shall have vapor barrier and be factory cleanable, grease resistant, non-flaking and non-peeling.
2. The insulated pipe shall be guaranteed 100 percent free of insulation voids.

D. Field Applied Insulation:

1. Field-applied insulation for field joints matching the pipe insulation. Field joints shall only be placed in straight sections. Field insulation of fittings shall not be permitted. Thickness shall match adjacent piping insulation thickness. Field-applied insulation shall be protected with a field jacket closure matching the pipe insulation jacket. All insulation and coating materials for making field joints shall be furnished by the system manufacturer.



2. The field-applied insulation mold shall be of removable design to facilitate visual inspection of the joint. Air pressure testable field joints shall not be permitted.

E. Insulation Thickness:

1. Insulation thickness shall be 1 inch minimum.

2.05 DIRECT APPLIED JACKET:

- A. Provide factory-fabricated, factory-applied jacket over the insulation. Jacket shall be seamless glass fiber reinforced thermosetting resin pipe (RTRP) conforming to ASTM D 2997 or ASTM D 2996 with polyester isothalic resin and outer surface coated with a pigmented protected resin containing a parafinated wax and ultraviolet inhibitors. Polyvinylchloride (PVC) or tape material shall not be permitted.
- B. The minimum thickness of the HDPE jacket shall be as follows:
  1. For jacket OD 12 inch and smaller; 0.100 inch thick.
- C. The minimum thickness of the FRP jacket shall be 0.250 inch thick.
- D. Deformation onset temperature of jacket shall be equal to or greater than 140 degrees F for HDPE and equal to or greater than 170 degrees F for RTRP. Melting temperature of jacket shall be equal to or greater than 250 degrees F.
- E. Jacket shall be directly applied by a filament winder/chop spray up manufacturing process for RTRP, or an extruder manufacturing process for HDPE. Directly extruded HDPE jackets shall be treated to ensure bonding between the insulation and jacket.

2.06 END SEALS:

A. General:

1. Each prefabricated piping component of the system shall have a complete sealing of the insulation to provide a permanent water and vapor seal at each end of the component. Prefabricated pipe components modified in the field shall be provided with an end seal which is equivalent to the end seals furnished with the prefabricated component of piping. End seals shall be tested and certified in accordance with paragraph Jacket and End Seal Testing and Certification.

B. Types:

1. End seals provided shall be one of the following types. Gland type end seals shall not be permitted. Mastic seals shall not be considered an equal to tapered jacket or molded caps and shall not be permitted.

- a. Carrying the outer jacket over tapered pipe insulation ends and extending it to the carrier pipe. Sufficient surface bonding area shall be provided between the jacket and the carrier pipe.
- b. Using specially designed molded caps made of polyethylene or rubber of standard manufactured thickness. A minimum 1-1/2 inch surface bonding area shall be provided between the cap and both the jacket and carrier pipe.
- c. Using elastomer-ring end seals designed and dimensioned to fit in the annular space between the jacket and the carrier pipe.
- d. Using a waterproof mastic seal vapor barrier over the exposed insulation ends.
- e. Heat-shrinkable sleeves.

2.07 ANCHOR PLATES:

- A. Anchor plate shall be ASTM A36 steel, welded to carrier pipe, 1/2-inch minimum thickness. Exterior surface of the anchor plate shall be coated with the same coating materials as the casing.

2.08 JACKET AND END SEAL TESTING AND CERTIFICATION:

- A. Testing and certification procedures by an independent testing laboratory shall demonstrate that jackets and end seals are capable of resisting penetration of water into the jacket and insulation. The test shall be performed on the type of prefabricated system to be furnished. The test shall consist of hot and cold cycle testing followed by immersion in a water filled chamber with a head pressure. The hot and cold cycle testing shall consist of 14 days of temperature cycling. A fluid with a temperature of 40 degrees F shall circulate through the carrier pipe alternating every 24-hours with a fluid with a temperature of 200 degrees F circulating through the carrier pipe for a low temperature hot water or dual temperature service or 75 degrees F for a chilled water service. While the hot and cold cycle test is being performed, the test sample shall be either buried or encased in dry bedding sand with a minimum of 12 inches of sand all around the test sample. The carrier pipe size of the test sample shall be 2 inches in diameter and shall be restrained during the test period. The insulation thickness shall not exceed the maximum thickness provided for the piping in the project. Transition time for temperature cycle testing shall not exceed 15 minutes in going from cold to hot and 30 minutes in going from hot to cold. The fluid in the carrier pipe may be water, oil or heat transfer fluid. Following the hot and cold cycling test, the test sample shall be immersed in a water-filled chamber. The pressure on the highest point of the test sample shall not be less than 20 feet of water head pressure subjected over the entire length of the 8 foot test sample of prefabricated pipe. The water shall contain a dye penetrant, which will be used to check for end seal leakage. The pressure in the chamber shall be held for not less than 48 hours. Upon completion of this pressure test, the test sample shall be cut open. With the use of a

light that will readily show the presence of the dye that was in the water, the test sample shall be inspected. Evidence of the dye inside the test sample shall indicate that the end seal is not acceptable and cannot be certified.

2.09 GLYCOL SOLUTION:

- A. A 40 percent concentration by volume of industrial grade ethylene or propylene glycol shall be provided for the system. The glycol shall be ethylene or propylene to match existing glycol in the existing hot water distribution system to which the system will be connected. Glycol shall be tested in accordance with ASTM D1384 with less than 0.5 mils penetration per year for all system metals. The glycol shall contain corrosion inhibitors. Silicate based inhibitors shall not be used. The solution shall be compatible with pump seals, other elements of the system, and water treatment chemicals used within the system.

2.10 PIPE SLEEVES:

- A. Sleeves in Concrete Walls. Ductile iron pipe or cast iron pipe, service weight.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Installation, workmanship, inspection, and testing shall be in accordance with the specified Codes with the additions specified herein.

3.02 PIPE WELDING:

- A. The Design Builder shall be responsible for welding quality and shall:
  - 1. Conduct tests of the welding procedures used in the work, determine the suitability of the procedures used, determine that the welds made will meet the required tests, and determine that the welding operators have the ability to make sound welds under standard conditions.
  - 2. Comply with ASME B31.1.
  - 3. Perform all welding operations required for construction and installation of the system.
- A. Welding Procedures:
  - 4. Field and shop bevels shall be done by mechanical means or by flame cutting. Where beveling is done by flame cutting, surfaces shall be thoroughly cleaned of scale and oxidation just prior to welding.

5. Split welding rings shall be used for field joints on carrier pipes 2-1/2 inch and larger to ensure proper alignment, complete weld penetration, and prevention of weld spatter reaching the interior of the pipe. Field joints on piping 2 inch and smaller shall be made with welding sockets.
6. Piping shall not be split, bent, flattened, or otherwise damaged before, during, or after installation. Where the pipe temperature falls to 32 degrees F or lower, the pipe shall be heated to approximately 100 degrees F for a distance of 1 foot on each side of the weld before welding, and the weld shall be finished before the pipe cools to 32 degrees F.
7. Defective welds shall be replaced and re-inspected in accordance with ASME B31.1. Repairing defective welds by adding weld material over the defect or by peening will not be permitted. Welders responsible for defective welds shall be re-tested for qualification.

### 3.03 PIPE THROUGH PENETRATIONS:

- A. Furnish pipe sleeves where piping passes through building foundation walls and/or manholes. Sleeves shall be installed and secured in proper position and location during construction. Furnish sleeves of sufficient length to pass through entire thickness of walls.
- B. Pipe Penetrations Through Building Exterior Construction: Provide a mechanically adjustable segmented elastomeric seal as indicated with sleeve sized as recommended by seal manufacturer.
- C. Sleeves through walls shall terminate flush with the finished surface on either side of the wall.
- D. Excavation, Trenching, and Backfilling:
  1. Excavation, trenching, and backfilling shall be performed by the system manufacturer's design and as specified in. Backfilling shall not begin until heat shrink sleeves have cooled. Pipe shall lay on a 12 inch minimum sand bed and shall be backfilled with sand on all sides, including top of pipe, to a minimum of 12 inches as measured from outside of jacket. Bedding for system shall be compacted, firm and stable. The entire trench width shall be evenly backfilled in 6 inch compacted layers. Bedding and backfill shall be free from rocks or substances which could damage the system. Concrete anchor and thrust blocks shall be installed in undisturbed earth. Backfilling shall not commence until system has been satisfactorily pressure tested (both hydrostatic test of carrier pipe and air test of conduit where applicable). Minimum depth of burial to the top of the casing shall be 39 inches. Maximum depth of burial to the top of the casing shall be 10 feet.

### 3.04 FIELD QUALITY CONTROL:

#### A. System Manufacturer's Representative Responsibilities

1. The system manufacturer's representative shall be present at the job site and witness when the following types of work are being performed:
  - a. Unloading and Inspection.
  - b. Inspection of trenches, then inspection of the pipe bedding, prior to commencing installation of system.
  - c. Pressure testing.
  - d. Field joint closure work.
  - e. Backfill above the top of the piping.
  - f. Operational tests.

### 3.05 FIELD TESTS:

A. Deficiencies discovered during field tests shall be corrected. Major deficiencies, or failure to correct deficiencies, may be considered cause for rejecting the entire installation. Mercury shall not be used in thermometers required for the tests.

#### B. Pressure Tests:

1. Before conducting pressure tests. Lines shall be flushed with high pressure water until discharge shows no foreign matter. The carrier pipe shall be hydrostatically tested. Casings (conduits) shall be pneumatically tested.
  - a. Pneumatic Test:
    - (1) Casing (conduit) shall be pneumatically tested after welding and before field coating using air as the test medium. The test pressure shall be 5 psig. Persons not working on the test operations shall be kept out of the testing area while testing is proceeding. The test shall be made on the system as a whole or on sections that can be isolated. Joints in sections shall be tested prior to backfilling when trenches must be backfilled before the completion of other pipeline sections. The test shall continue for 24 hours from the time of the initial readings to the final readings of pressure and temperature. The initial test readings of the instrument shall not be made for at least 1 hour after the casing has been subjected to the full test pressure, and neither the initial nor final reading shall be made at times of rapid changes in atmospheric conditions. There shall be not

indication of reduction of pressure during the test after corrections have been made for changes in atmospheric conditions in conformity with the relationship  $T(1)P(2) = T(2)P(1)$ , in which T and P denote absolute temperature and pressure, respectively, and the numbers denote initial (1) and final (2) readings. Pressure shall be measured with a pressure guage conforming to ASME B40.1. A throttling type needle valve or a pulsation dampener and shutoff valve may be included. The diameter of the face shall be at least 4-1/2 inches with a measurable range of 0 to 15 psig and graduations of at least 0.6 psig. During the test, the entire system shall be completely isolated from all compressores and other sources of air pressure. Each joing shall be tested while under test pressure by means of soap and water or an equivalent nonflammable solution prior to backfilling or concealing any work. All labor, materials and equipment for conducting the tests shall be furnished by the Design Builder and shall be subject to inspection at all times during the test. Maintain proper safety precautions for air pressure testing at all times during the tests.

b. Hydrostatic Test:

- (1) Carrier piping shall be tested hydrostatically before insulation is applied at field joints and shall be proved tight at 150 psig or 1.5 times the specified supply operating pressure, whichever is greater, for 2 hours. There shall be no indication of reduction of pressure during the test. Pressure shall be measured with a device calibrated to be read in increments not greater than 0.1 psi.

END OF SECTION

## SECTION 31 10 00

### SITE CLEARING AND PREPARATION

#### PART 1 - GENERAL

##### 1.01 SUMMARY

###### A. Section Includes:

1. Clearing and grubbing.
2. Tree and shrub protection and removal.
3. Removal of debris related to clearing and grubbing operations.

B. Contractor shall perform a field investigation in the locations identified on the drawings to understand the extent of effort associated with site clearing. Contractor shall use this field investigation as a basis for bidding, and no additional costs will be approved by Owner for clearing or disposal of additional debris from the Site.

C. No tree over a 4 inch caliper shall be removed without the prior written approval of Owner, unless it is indicated to be removed on the Drawings. Wherever and whenever possible, trees shall be protected and saved, and only those trees which are directly in the line of construction (as shown on the drawings), shall be removed.

##### 1.02 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00 - Submittals and the Contract Documents.

###### 1. Certificates

- a. Copy of herbicide label bearing EPA registration number.
- b. Copy of Arborist Certification.

B. If Contractor desires to remove trees that are not marked on the Contract Drawings for removal, he shall survey and mark all trees over a 4 inch caliper that he proposes to remove and submit a Removal Plan. Such Removal Plan shall include a listing of trees proposed to be removed, their location, species, and size. Trees so marked shall not be removed until Owner approves the Removal Plan. If trees that are not marked for removal are damaged or removed, whether purposefully or accidentally, the Contractor shall replace the trees or be liable for damages.

##### 1.03 QUALITY ASSURANCE

A. Comply with the requirements specified in Section 01 43 00 – Quality Requirements and the Contract Documents.

B. Certifications:

1. Certified Arborist: All tree pruning, tree repair, and tree removal shall be performed by competent workers, under the supervision of an arborist holding certification from the International Society of Arboriculture (ISA) or equivalent education and experience.

1.04 DELIVERY STORAGE AND HANDLING

- A. Comply with the requirements specified in the Contract Documents and Specifications.
- B. Herbicide: Comply with Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) – Title 7 U.S.C. Section 136. Submit copy of herbicide label, bearing EPA registration number to Owner.

1.05 SITE CONDITIONS

- A. Existing facilities, structures, and utilities are shown in accordance with available surveys and records. The indicated locations of underground utilities and structures are approximate. Other utilities may exist which are not indicated.

1.06 DEFINITIONS

- A. Tree Caliper: Trunk caliper (trunk diameter) is measured 6 inches from the ground on trees up to and including 4 inches in caliper, and 12 inches above the ground for larger trees.
- B. Clearing: Removal and disposal of above-ground items defined herein.
- C. Grubbing: Removal and disposal of below-ground items defined herein.

PART 2 - PRODUCTS

2.01 ACCESSORIES

- A. Herbicide: Registered EPA Pesticide.
- B. Tree Wound Paint: Bituminous based paint formulated for tree wounds.
- C. Accessories shall comply with local, state, and federal rules and regulations.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify survey benchmarks and intended elevations for the Work are as indicated.



- B. Verify temporary erosion and sediment control measures are installed before commencing with any other work at the site.
- C. Verify location and existence of all underground utilities and structures by contacting Ohio Utilities Protection Service, as required by law. Access this information by dialing 811 or 1-800-362-2764 at least 48 hours but no more than 10 working days (excluding weekends and legal holidays) before beginning any digging.
- D. Provide 72-hour notice to existing utility owners, prior to beginning construction.
- E. Contact utility companies and authorities to make arrangements for handling and disposal of utilities encountered during construction.

### 3.02 PREPARATION

- A. Install project signage as required in the Contract Documents and Specifications upon mobilization at the site.
- B. Protect bench marks, survey control points, and existing structures to remain from damage or displacement.
- C. Protect trees and vegetation to remain. Do not cut or injure trees and vegetation outside easement lines and outside designated clearing areas.
- D. Protect all underground utilities and structures that are to remain. If damage occurs, immediately notify the utility owner within the hour.
- E. Protect site features to remain from damage by construction equipment and vehicular traffic.
- F. Identify waste and salvage areas for stockpiling of removed materials.

### 3.03 RESTORATION

- A. Existing surfaces, features, utilities, or structures that are to remain but are damaged during construction shall be restored to at least the condition in which they were found immediately before work began, unless noted otherwise.
- B. Restore damaged utilities to the satisfaction of the utility owner.
- C. Restore damaged private property to the satisfaction of the property owner.

### 3.04 EXISTING STRUCTURES AND PROPERTY

- A. Remove and reset existing signs, posts, catch basin frames and grates, manhole frames and covers, and concrete curbing within construction path unless directed otherwise.
- B. Store items as indicated in Contract Drawings and Specifications, at a site designated by Owner.

### 3.05 CLEARING

- A. Remove and dispose of offsite:
  - 1. Trees, snags, brush, shrubs, downed timber, decayed wood and other vegetative growth.
  - 2. Rocks, tiles, lumps of concrete, trash piles, debris, refuse and rubbish, and fencing. Remove all evidence of their presence from the surface.
- B. Clear ground as indicated in Contract Drawings, unless otherwise noted.
- C. Manual cutting of trees, stumps, and stubs during clearing shall be as close to ground surface as practicable but no higher than 6 inches above ground for small trees (8 inches or less), and not higher than 12 inches above ground for larger trees (greater than 8 inches).
- D. Obey all federal, state and local regulations and guidance regarding the cutting and disposal of diseased trees and vegetation.

### 3.06 GRUBBING

- A. Remove and dispose of all stumps, buried logs, matted roots, roots larger than 2 inches, and organic materials off site.
- B. Roots larger than 2 inches in diameter shall be removed to a depth of 12 inches, and roots larger than 1/2 inches in diameter to a depth of 6 inches.
- C. Areas designated to receive pavement or structures shall be grubbed a depth of 18 inches. Measure depths of grubbing from existing ground surface or proposed finished grade, whichever is lower.
- D. Apply herbicide to remaining roots and vegetation to inhibit growth.
- E. Depressions made by grubbing shall be filled with suitable material and compacted to conform to original adjacent grade as specified in the Contract Documents.
- F. Do not grub areas within drip line of trees to remain to avoid damage to roots.

### 3.07 TREE REMOVAL

- A. Remove trees within clearing limits as indicated on Contract Drawings by felling or cutting individual vegetation and grubbing.

### 3.08 TREE PROTECTION

- A. Protect designated trees within the clearing limits. Trees protection measures shall extend to the drip line of the tree.

### 3.09 PRUNING

- A. Trim dead branches 1-1/2-inches or more in diameter and branches to heights and in a manner as indicated. Neatly cut limbs and branches close to the bole of the tree or main branches. Paint cuts more than 1-1/4-inches in diameter with tree wound paint.

### 3.10 BURNING

- A. Burning is not permitted on site.

### 3.11 CLEANING

- A. Promptly dispose of excess and unsuitable material off site.
- B. Remove debris, junk, and trash from site.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris caused by construction activities within the public way, easement limits, or adjacent private property.

### 3.12 CLOSEOUT ACTIVITIES

- A. Provide in accordance with Section 01 77 00 - Contract Closeout and the Contract Documents.

END OF SECTION

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## SECTION 31 23 16

### ROCK EXCAVATION AND DISPOSAL

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. Provide rock excavation and disposal in compliance with Contract Documents.
- B. Rock excavation could be performed by any of the following methods typically used in the construction industry. The contractor is advised to evaluate the subsurface information provided and determine the appropriate removal method.
  - 1. Expansive tools (no blasting allowed).
  - 2. Mechanical means.

##### 1.02 SUBMITTALS:

- A. Submit for information only the following shop drawings in accordance with Section 01 30 00. The submittal is for information only, since the contractor is responsible for all means and methods. This submittal will not be reviewed by the Engineer.
  - 1. Proposed rock excavation technique.

##### 1.03 QUALITY REQUIREMENTS:

- A. Comply with the requirements specified in Section 01 43 00.
- B. If rock is excavated beyond the limits of payment indicated on the drawings, specified, or authorized in writing by the Engineer, backfill excess excavation, whether resulting from overbreakage or other causes, at no additional compensation and as specified in Part 3 - Execution.

##### 1.04 JOBSITE CONDITIONS:

- A. Protect structures, underground utilities, and other construction from damaged caused by rock removal and shoring system installation.
- B. Subsurface conditions are provided as an attachment to the Contract Documents. The contractor should anticipate that the rock will not be removed with conventional excavation equipment and that the use of special equipment (rock splitting equipment, pneumatic hammers, etc) will be required.

## PART 2 - PRODUCTS

- A. Not applicable.

## PART 3 - EXECUTION

### 3.01 ROCK REMOVAL

- A. Excavate and remove rock by methods determined by the contractor.
  - 1. Drill holes and utilize expansive tools or wedges, or other techniques to fracture rock.
- B. Cut away rock at bottom of excavation to form level bearing.
- C. Remove shaled layers to provide sound and unshattered base for footings and foundations.
- D. In utility trenches, excavate to 6 inch below invert elevation of pipe and 24 inch wider than pipe diameter.
- E. Remove excavated materials from site and dispose offsite..
- F. Correct unauthorized rock removal with lean concrete fill.

### 3.02 PROCEDURE:

- A. Excavate rock in pipe trenches to no less than 6 inches below the proposed invert of the pipe. Backfill trench, before pipe is laid, to correct subgrade elevation. Use compacted, specified material indicated on drawings, or the material specified for bedding pipe to backfill excess excavation. Furnish and place at no additional compensation.
- B. Fill excess excavation below elevation of the top of bedding, cradle, or envelope when in pipe trenches with material of same type and placed and compacted in same manner as specified for bedding, cradle, or envelope.
- C. Remove shattered rock. If rock below normal depth is shattered due to drilling of Contractor and Engineer considers such shattered rock to be unfit for foundations, remove it and backfill excavation with concrete as specified, except that in pipe trenches, use screened gravel for backfill. Do such removal and backfilling at no additional compensation.
- D. Remove dirt and loose rock, as directed, from designated areas and clean surface of rock using steam to melt snow and ice, if necessary. Remove water in depressions, so that whole surface of designated area can be inspected to determine whether seams or other defects exist.

- E. Roughen surfaces of rock foundations sufficiently, cut into benches or steps to bond well with masonry and embankments to be built thereon.
- F. Remove from the rock surface to remain all vegetation, dirt, sand, clay, boulders, scale, excessively cracked rock, loose fragments, ice, snow, and other objectionable substances. Use picking, barring, wedging, streams of water under sufficient pressure, stiff brushes, hammers, steam jets, and other effective means to accomplish this cleaning, and remove free water left on the surface of rock. Perform all of above before any masonry or embankment is built on or against rock.
- G. Remove piles of boulders or loose rock encountered within limits of earth embankments for disposal.
- H. Backfill with material obtained from outside sources at no additional compensation, when material specified for backfilling is not available in sufficient quantity from other excavations.

3.03 CONTRACT CLOSEOUT:

- A. Provide in accordance with Section 01 77 00.

END OF SECTION

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SECTION 31 23 19  
CONTROL OF WATER

PART 1 - GENERAL

1.01 SUMMARY

- A. The work of this Section includes control, handling, treatment, and disposal of groundwater, surface water, construction water, and any other water that may be encountered during the course of the Work.

1.02 PERFORMANCE REQUIREMENTS

- A. Control, handle, treat, and dispose of water of any origin (including groundwater, surface water, and pipeline flows) to permit construction to proceed on stable subgrades, to maintain stability of excavations, to prevent flooding, and to prevent damage to the environment, structures, and adjacent property. Contractor shall be responsible for control of water at all times during construction, and shall provide adequate backup systems to accomplish control of water.
- B. Methods of control, handling, and disposal of water shall be by whatever means are necessary and in conformance with this Section to maintain satisfactory working conditions and to maintain the progress of the Work. If, after installation and while in operation, the water control system fails to meet the performance requirements of this Section, Contractor shall modify or augment the water control system, at no additional cost to Owner.
- C. Contractor shall be responsible for evaluating the need to install dewatering wells, including gravity wells and wellpoint systems.
- D. Contractor shall bear the cost of loss or damage arising from removal or disturbance of groundwater, including subsidence or loss of structural support, that may occur in the prosecution of the Work.
- E. Perform this work without interference with the operations of other contractors, or the rights of public and private owners.

1.03 SUBMITTALS

- A. Submit a Water Control Plan describing the proposed method for control, handling, treatment, and disposal of water. As a minimum, describe the following:
  - 1. Water control methods (such as cutoff, sumping, predrainage), major equipment (excludes sump pumps), standby equipment, and power supply.

2. Dewatering well and wellpoint systems, if used, including plan location, size, depth, spacing, length and type of screen; pumping capacity; locations of headers and discharge lines; and means of discharge and disposal of water.
  3. Schedule of installation and operation of water control facilities.
  4. Means of monitoring groundwater levels and piezometric pressures.
- B. Submit a Water Treatment and Disposal Plan describing the proposed method for treatment and disposal of water. As a minimum, describe the following:
1. Sediment and pollution control facilities;
  2. Discharge locations to be used.
- C. Owner may require resubmittal if the system or any part thereof is materially modified during installation or operation.
- D. Submit, for information only, copies of permits required by regulatory agencies for control, handling, treatment, and disposal of water.
- E. Submit, for information only, copies of well abandonment records required by regulatory agencies.

#### 1.04 REGULATORY REQUIREMENTS

- A. Construct dewatering wells in conformance with “State of Ohio Technical Guidance for Well Construction and Ground Water Protection” by the State Coordinating Committee on Ground Water, 2000. File a well log for each well in conformance with Ohio Revised Code 1521.05.
- B. Abandon dewatering wells in conformance with Ohio Administrative Code 3745-9-10 Well Abandonment Regulations.

#### 1.05 CONTAMINATED WATERS

- A. In the event that contaminated waters are encountered, Contractor is required to notify Owner prior to discharging contaminated water into the sanitary sewer system. Contractor may be required to provide laboratory test results documenting contaminant concentrations. Compensation to Contractor for testing, treatment, and disposal of groundwater containing contaminants not anticipated in the Contract shall be determined in accordance with Article 12 of the General Conditions provisions.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.01 CONTROL OF SURFACE WATER

- A. Prevent surface water, including runoff from adjacent properties, backup from storm sewers, and leakage from adjacent utilities, from draining into excavations. Intercept and divert surface water by use of surface grading, dikes, curbs, ditches, sumps, and other means.
- B. Extend the initial ground support system above outside grade as necessary to prevent flooding of the excavation from surface runoff. Allow no ponding of water outside the excavation.
- C. Assess and take appropriate precautions to prevent storm sewer overflow from flooding excavations.
- D. Assess the location and condition of adjacent water utilities, and re-route or provide supplementary support to avoid settlement damage to the utility and consequent leaks.

### 3.02 CONTROL OF WATER IN EXCAVATIONS

- A. Control water inflows to excavations to:
  - 1. Reduce water pressures acting on initial ground support systems designed to be leaky.
  - 2. Prevent piping or loss of fines through initial ground support systems.
  - 3. Prevent flowing or fast raveling ground.
  - 4. Prevent blowout, boiling, or heave in the excavation bottom.
  - 5. Maintain a firm working surface in the excavation bottom.
- B. Maintain the bottom of the excavation free of standing water to:
  - 1. Prevent swelling and softening of bearing soils.
  - 2. Avoid interference with construction activities such as placement of bedding and backfill, placement of pipe, erection of formwork, and placement and curing of concrete.
- C. Loss of fines through a leaky initial support system shall be prevented by the use of straw, hay, oakum, gravel, geotextile, or other filtering material.

### 3.03 PUMPING AND CONVEYANCE SYSTEMS

- A. Provide standby pumps and standby power supply where disruption of water control systems could allow water inflows to threaten the Work or the safety of personnel. Take immediate steps to control water inflow to the excavation that could cause loss or damage to adjacent structures or property.
- B. Convey all water from excavations through pipes or hoses. Conveyance in open ditches or trenches is prohibited. No water shall be discharged into the Work completed or under construction.
- C. Temporary drains used to construct tunnels or shafts shall be removed or grouted completely when no longer required.

### 3.04 DEWATERING WELLS

- A. Dewatering from wells shall be kept to the minimum necessary to accomplish the work.
- B. Wells shall be cased, screened, and filtered in such a manner that after development, no further fines are removed. Monitor each well for fines removal immediately after installation and at least weekly during operation.
- C. Provide means to adjust water discharge from each individual well, and monitor the discharge from each well on a daily basis.
- D. Design and operate wells in a manner that will preclude piping of fines (sediment consisting mainly of silt and sand) at a rate exceeding 15 mg/L. Wells that do not meet this criteria shall be abandoned and replaced if necessary, at no additional cost to Owner. Check each well for piping of fines using a centrifugal tester immediately after installation, and furnish sediment content test results to Owner within 24 hours.
- E. Ventilate enclosures around wells and water discharge points to prevent the accumulation of combustible gas that may escape from solution in groundwater.
- F. Abandon dewatering wells in accordance with legal requirements. Abandon well casings and pipes in place, by grouting the full depth of casings and pipes by tremie method or by pressure injection from the ground surface. Grout shall consist of cement and water, with the minimum amount of water necessary to allow pumping.
- G. Cut off well casings and pipes to at least 2 feet below final grade.

### 3.05 TREATMENT AND DISPOSAL OF WATER

- A. Water from excavations and dewatering wells shall be discharged into the nearest sanitary sewer in conformance with all applicable codes and regulations. Discharge into storm sewers, open waterways, or on open ground is prohibited.

- B. Prior to discharging water from excavations and dewatering wells, remove suspended solids, oils, cement, bentonite, and other visible contaminants normally found in excavation discharge by use of settling basins, on-site treatment plant, or other means. Reduce contaminant concentrations to levels acceptable to authorities having jurisdiction over receiving sewers.
- C. Select treatment systems that can be readily expanded if greater capacity becomes necessary during the course of the work.
- D. On completing the work, clean out and dispose of all sediments and residues in settling basins and treatment facilities. Dispose of sediments and residues off the Site in accordance with applicable regulations.

END OF SECTION

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## SECTION 31 23 33

### TRENCH EXCAVATION AND BACKFILL

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. The work specified in this Section includes trench excavation in soil and rock, pipe laying, backfilling, and compaction.
- B. Pipe to be installed under this Section is specified in other Sections. See the appropriate Section on pipe for any additional requirements for laying and jointing pipe, specific to the pipe material being used.

##### 1.02 REFERENCES

- A. ASTM C33                      Standard Specification for Concrete Aggregates
- B. ASTM D75                      Standard Practice for Sampling Aggregates
- C. ASTM D698                      Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>)
- D. ASTM D2487                      Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- E. ASTM D3740                      Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
- F. ASTM D5195                      Standard Test Method for Density of Soil and Rock in Place at Depths Below the Surface by Nuclear Methods
- G. OSHA 29 CFR                      US Department of Labor, Occupational Safety and Health Administration, Code of Federal Regulations Title 29 Labor
- H. ODOT State of Ohio Department of Transportation Construction and Material Specifications

##### 1.03 DEFINITIONS

- A. Definitions of terms in OSHA 29 CFR, Subpart P—Excavations, 1926.650(b), in its entirety, shall apply to this Section. Of particular interest to this Section are the following terms: excavation, trench, protective system, support system, shoring system, sloping system, benching system, shield, trench box, cave-in, and competent person.

#### 1.04 CLASSIFICATION OF EXCAVATION

- A. Excavation is unclassified, and includes all materials encountered regardless of type and extent. Unclassified excavation includes removal of fill, rubble, building debris, soil, boulders, and bedrock, regardless of means necessary to break up materials for removal.

#### 1.05 TRENCH EXCAVATION

- A. Trench excavation shall conform to OSHA 29 CFR Subpart P – Excavations, in its entirety.
- B. Protective systems for trench excavation shall conform to OSHA 29 CFR Subpart P, section 1926.652. Protective systems as defined in 1926.652 include sloping and benching systems, shield systems, and support systems.
- C. Contractor shall select protective systems suited to ground conditions described in the Geotechnical Memorandum, provided for information only.
- D. Protective systems shall be designed by a registered Professional Engineer licensed in the State of Ohio, having at least 5 years of experience designing similar support systems in similar ground conditions; except shield and support systems independently pre-manufactured and sold in interstate commerce shall be selected as appropriate for the Work by a registered Professional Engineer licensed in the State of Ohio.
- E. Additional requirements for initial ground support systems for trench excavations are shown on the Drawings and in Section 31 80 00 - Protection of Structures.

#### 1.06 INITIAL GROUND SUPPORT SYSTEM DESIGN

- A. Initial ground support systems greater than 20 feet deep shall be designed for the minimum ground loads and surcharge loads. Contractor shall verify that ground loads and surcharge loads are adequate for the expected ground conditions, and are appropriate for the type of support system proposed. Contractor shall add construction loads appropriate to the means and methods of construction.
- B. Design of the initial ground support system shall consider:
  - 1. Ground conditions described in the Geotechnical Memorandum, provided for information only.
  - 2. Methods for control of water.
  - 3. Maintenance of soil stability at the bottom of the excavation.
  - 4. Deformation of the support system under load.
  - 5. The proximity of existing underground and above-ground structures, including buried water lines and the potential effect of their rupture on the support system.



6. Effects of vibration on adjacent structures, from driving and pulling sheeting and piling.
7. All loading conditions, including loading due to delay in adding support members, removal of support members, and dynamic loading.
8. Placement of permanent lining and structures.

#### 1.07 PIPELAYING TOLERANCES

- A. Pipe shall be laid to within 0.05 foot of grade as measured at pipe invert, and to within 0.10 foot of line. Variation shall be further limited as necessary to prevent a level or reverse sloping invert.

#### 1.08 SUBMITTALS

- A. Submit drawings, computations, and supporting information describing trench protective systems, in sufficient detail to demonstrate conformance with regulatory requirements.
  1. For all protective systems, where applicable to selection or design, submit:
    - a. OSHA soil classifications used in design.
    - b. Design loading conditions.
    - c. Tabulated data used in design.
    - d. Designs prepared by a registered Professional Engineer, signed and sealed.
    - e. Designer's qualifications.
  2. For sloping and benching systems, submit in addition, trench configurations and maximum allowable slopes.
  3. For shield systems, submit in addition:
    - a. Plan indicating the sizes, types, and configurations of structural components
    - b. Lateral load capacity.
    - c. Connection details, where shields are to be stacked.
  4. For support systems, submit in addition:
    - a. Plan indicating the sizes, types, and configurations of structural components.
    - b. Maximum allowable spacing between compression members.
    - c. Connection details for structural components.

- d. Methods of installation.
- 5. For shield systems or support systems that are manufactured or pre-engineered, submit in addition:
  - a. Specifications, recommendations, and limitations issued by the manufacturer.
  - b. Manufacturer's written approval of any deviation from said specifications, recommendations, and limitations.
- 6. Submit the resume of any persons designated as a "competent person," capable of identifying excavation hazards and authorized to take corrective measures to eliminate them.
- 7. Contractor shall respond promptly to requests by Owner for additional information to demonstrate conformance with regulatory requirements.
- B. Submit samples, certifications, and test results of imported bedding and backfill materials, and geotextile.
- C. Where boring under obstructions, submit proposed methods of boring, ground support, and backfilling the annular space between the installed pipe and the tunnel support system.

#### 1.09 MATERIAL APPROVAL

- A. Material approval shall be based on the results of gradation tests performed by a commercial testing laboratory in conformance with Section 01 43 00 – Quality Requirements.
- B. Sample the aggregate source in accordance with ASTM D 75.
- C. Perform gradation tests at the place of production prior to shipment. As a minimum, sample each 1,500 tons of prepared materials for gradation testing, or no fewer than 3 samples. Sample more often as directed by Owner if gradation varies, or if the material appears to depart from the Specifications. Provide test results to Owner within 48 hours after sampling.

### PART 2 - PRODUCTS

#### 2.01 PIPE

- A. Pipe shall be as specified in Division 33 - Utilities.

#### 2.02 FOUNDATION STABILIZATION MATERIAL

- A. Foundation stabilization material shall be used to replace compressible, soft, unstable, or otherwise unsuitable soils in the bottom of the excavation. Foundation stabilization

material shall consist of standard or coarse-graded foundation stabilization material, or pipe bedding material.

- B. Standard foundation stabilization material shall consist of a mixture of sand and gravel, conforming to the following grading requirements:

Sieve Size	Percent Passing by Weight
3-inch	100
No. 4	25 - 85
No. 40	0 - 20
No. 200	0 - 2

- C. Coarse-graded foundation stabilization material shall consist of clean, hard, durable crushed gravel or crushed rock with 100 percent by weight passing the 3-inch sieve, and with less than 8 percent by weight passing the 1/4-inch sieve.

### 2.03 PIPE BEDDING MATERIAL

- A. Pipe bedding material shall provide full and continuous support for the pipe.
- B. Pipe bedding material for trench in soil shall consist of crushed rock, crushed gravel, or sand.
  - 1. For pipe larger than 18 inches in diameter, crushed rock pipe bedding shall be used.
  - 2. For pipe 18 inches and smaller in diameter, crushed gravel or sand bedding shall be used.
- C. Crushed rock pipe bedding shall consist of clean, hard, durable crushed limestone or dolomite. Crushed rock pipe bedding shall conform to the following grading requirements (ASTM C33 - Size No. 57; or ODOT Table 703.01-1, Size No. 57):
- D. Crushed gravel or sand bedding shall be comprised of natural gravel or natural sand materials conforming to the gradation requirements for ODOT Item 703.11 Structural Backfill Type 2.

### 2.04 PIPE COVER MATERIAL

- A. Pipe cover material shall be used over the pipe and bedding material to the top of the pipe zone as shown on the Drawings.
- B. Pipe cover material shall be crushed rock, crushed gravel, or sand conforming to the requirements for pipe bedding material.

## 2.05 BACKFILL ABOVE THE PIPE ZONE.

- A. Backfill under pavement shall be per trench detail on drawings.
- B. In off-road areas, parks, and undeveloped lands where minor settlement will not adversely affect the function, appearance, or value of the excavated area, or where CLSM backfill or granular backfill are not specified or shown on the Drawings, earth backfill may be used.
- C. Backfill beneath utilities exposed by trenching shall conform to the requirements of CLSM or granular backfill, and shall be placed to conform to existing backfill under undisturbed portions of the utility.

## 2.06 GRANULAR BACKFILL

- A. Granular backfill shall conform to the requirements of ODOT 304, except that steel slag is prohibited.

## 2.07 EARTH BACKFILL

- A. Earth backfill shall consist of soil, loam, or other excavated materials that are suitable for use as backfill. Earth backfill shall not include organic matter; refuse; rock, Portland concrete, asphalt concrete, or other consolidated masses larger than 1/2 cubic foot; or other unsuitable material.

## 2.08 UNSUITABLE MATERIALS

- A. The following materials shall not be used as backfill of any type:
  - 1. Soils classified under ASTM D 2487 as Pt, OH, CH, MH, or OL.
  - 2. Soils that cannot be compacted sufficiently to achieve the density specified for their intended use.
  - 3. Soils containing any material which may be classified as hazardous or toxic according to applicable regulations.
  - 4. Soils containing concentrations of chloride or sulfate ions greater than, or having a soil resistivity or pH less than, soils in place.
  - 5. Frozen ground.
  - 6. Recycled portland cement concrete or asphalt concrete.
  - 7. Steel slag aggregate.
  - 8. Lightweight aggregate.

## 2.09 ENVIRONMENTALLY CONTAMINATED MATERIAL

- A. At the Owner's direction, or where shown specifically on the Drawings, excavated material containing solid waste, petroleum contaminants, or special waste shall not be used as backfill above the pipe zone, within the confines of the area where the contaminated material originated.
- B. Excavated material containing solid waste, petroleum contaminants, or special waste shall not be used as backfill for manholes and miscellaneous concrete structures.
- C. Excavated material containing solid waste, petroleum contaminants, or special waste that cannot be used as backfill shall be disposed of in conformance with environmental regulations and Contract provisions.

## PART 3 - EXECUTION

### 3.01 EXCAVATION

- A. Excavate the trench to maintain vertical side walls to the top of the pipe.
- B. Support the ground and control loss of soil into the excavation to prevent damage to adjacent structures and utilities, to maintain stability of the excavation walls, and to preserve the original strength of soils surrounding the excavation.
- C. In the event that systematic ground losses during excavation cause or threaten to damage structures or utilities, cease excavation and modify equipment and methods to reduce ground movements to prevent damage.
- D. As the excavation progresses, perform frequent inspections for indications of distress, such as surface cracking and subsidence along the excavation perimeter, and excessive deflection or failure of support system elements.
- E. Allow no cobbles, bedrock, or unyielding debris to project more than 3 inches within 6 inches of pipe or structure.
- F. Supplement the support system as designed to address variations in ground conditions as they are exposed in the excavation.
- G. Stockpiling of excavated spoils alongside the trench or excavation, within a distance equal to the depth of excavation, is prohibited.
- H. Where pipe is to terminate into manholes or shafts, place and compact backfill for the manhole or shaft to a minimum elevation of 1 foot above top of pipe prior to excavating trench and placing pipe.

### 3.02 CONTROL OF WATER

- A. Standing water in the trench during excavation is prohibited. Maintain the water table below the bottom of the excavation sufficiently to ensure a firm working surface.
- B. Control groundwater to prevent washout from behind sheeting, or raveling of trench walls.
- C. Provide dams, cutoffs, or other barriers periodically to preclude transport of water along the trench bottom during construction.
- D. Comply with all requirements of Section 31 23 19 Control of Water.

### 3.03 TRENCH WIDTH

- A. Trench width shall be as shown on the Drawings, and shall be no greater than necessary to ensure working room to properly and safely place and compact backfill in the pipe zone. The space between the pipe and trench wall shall be wider than the compaction equipment used in the pipe zone.
- B. Confine trench widths to dedicated rights-of-way or construction easements.
- C. The pipe zone, as shown on the Drawings, shall be considered to include the full width of the excavated trench.

### 3.04 OPEN TRENCH LENGTH

- A. The length of open trench in any location during work periods shall not exceed 50 feet. At the end of the workday, not more than one pipe-length of open trench shall be permitted.
- B. Open trench within the right-of-way or within 75 feet of any public roadway shall be barricaded with concrete Jersey barriers or covered with road plates.

### 3.05 BORING UNDER OBSTRUCTIONS

- A. Contractor may, with the approval of Owner, tunnel or bore under roadways, driveways, sidewalks, curbs or other obstructions provided that any tunnel section exceeding 2 feet in length is supported in conformance with OSHA regulations.
- B. The tunneling method used shall be compatible with requirements for maintaining line and grade, shall fully support overlying utilities or structures, and shall not damage the carrier pipe. Pipe ramming as a method of tunneling or boring is prohibited.
- C. The annular space between the carrier pipe and the initial tunnel support system, or between the carrier pipe and the ground, shall be backfilled completely with grout having a minimum 28-day compressive strength of 2,000 psi. Grouting shall be completed no later than one day of installing the carrier pipe.

### 3.06 FOUNDATION STABILIZATION

- A. Where the existing material in the bottom of the excavation is unsuitable for supporting the pipe or manhole, over-excavate and remove the unsuitable material, as approved by Owner.
- B. Where unsuitable material extends below the depth of overexcavation, place geotextile for stabilization over unsuitable material exposed in the trench as approved by Owner.
- C. Backfill the excavation with foundation stabilization material over the full width of the excavation, to the required trench bottom grade.
- D. Spread foundation stabilization material in uniform, loose lifts not to exceed 12 inches. Vibrate or tamp to maximize stability of the material and to maintain uniform pipe grade, applying at least two passes of compactive effort. Vibrate using a boom-mounted vibratory plate compactor, or tamp using the excavator bucket.
- E. Use of foundation stabilization material made necessary by Contractor's failure to maintain bottom stability due to inappropriate means of ground support or groundwater control shall be at no additional cost to Owner.

### 3.07 USE OF PORTABLE TRENCH SHIELDS

- A. A portable trench shield used during backfill operations shall be lifted above each layer of backfill material prior to compacting the layer. Do not advance the trench shield in a manner that would separate the pipe joint or leave voids in the ground.

### 3.08 USE OF SHEETING AND BRACING

- A. Where sheeting is required, sheeting shall be installed in advance of excavation and in a manner to minimize settlement adjacent the excavation due to ground movement, lost ground, or groundwater flow.
- B. Sheeting shall be removed, where permitted, as the excavation is backfilled, and in a manner to maintain stability and strength of soils, and to avoid disturbing adjacent utilities and structures. Voids left on removal of sheeting shall be backfilled to prevent subsidence.
- C. Sheeting may be left in place at Contractor's expense and with the written approval of Owner, provided that the top 6 feet below final grade is removed. Provide additional clearance as necessary for new or relocated utility lines or other structures.

### 3.09 CONTROL OF VIBRATIONS

- A. Control of vibrations to prevent damage to the Work or to adjacent property caused by vibrations from driving sheet piles shall conform to the requirements of Section 31 80 00 - Protection of Structures.

### 3.10 PLACING PIPE BEDDING MATERIAL

- A. Remove any loose, sloughing, or caving soil from the bottom and sidewalls of the excavation immediately prior to placing pipe bedding.
- B. Place pipe bedding material over the full width of the trench and to achieve pipe grade and elevation shown on the Drawings.
- C. Spread pipe bedding material in uniform, loose lifts not to exceed 8 inches. Vibrate or tamp each lift to maximize stability of the material and to maintain uniform pipe grade, applying at least two passes of compactive effort. Vibrate using a boom-mounted vibratory plate compactor, or tamp using the backhoe bucket.
- D. Raise the pipe bedding material uniformly on each side of the pipe so as not to laterally displace the pipe. Completely fill the space under the haunch of the pipe. Supplement the compaction equipment by using shovel slicing or spud bars to compact the material under the haunch of the pipe.

### 3.11 LAYING AND JOINTING PIPE

- A. Pipe shall be lowered, not dropped, into the trench. Cable, rope, or other devices for lowering pipe and fittings into trench shall be attached to the outside of the pipe or fitting, not through the interior.
- B. Prevent soil or foreign material from getting into the pipe during the laying operation.
- C. Ensure that each section of pipe is supported by compacted bedding material over full length of the barrel. Provide bell holes in pipe bedding, no larger than necessary, to ensure uniform support.
- D. Check each pipe for proper line and invert grade, and make appropriate adjustments, prior to making joint. If grade is low, remove pipe, prepare bedding for full pipe length, and re-lay. Do not bring pipe invert to grade by packing bedding material at points along its length.
- E. Clean all surfaces to be joined, particularly the gasket, to remove any soil or foreign material prior to applying joint lubricant. Assemble the joint in accordance with the pipe manufacturer's recommendations. Use mechanical means to pull pipe together and close joints tightly "home" as defined by the pipe manufacturer. Do not use excessive force that may result in over-assembled joints, dislodged gaskets, or damaged ends of pipe.
- F. If the joint cannot be properly made using normal force, disassemble the joint and check the position of the gasket. If the joint cannot be properly made after verifying position of the gasket, remove the pipe and replace with satisfactory pipe.
- G. Lifting holes in the pipe shall be sealed with specifically manufactured plugs, grouted into place.



- H. Pipe shall not be deflected either vertically or horizontally in excess of the printed recommendations of the pipe manufacturer.
- I. When field cutting or machining the pipe is necessary, use only tools and methods recommended by the pipe manufacturer and approved by Owner.

### 3.12 PLACING PIPE COVER MATERIAL

- A. After laying and jointing the pipe, place pipe cover material and compact to a height above the barrel as shown on the Drawings.
- B. Spread pipe cover material in uniform, loose lifts not to exceed 12 inches. Vibrate or tamp each lift to maximize stability of the material, applying at least two passes of compactive effort. Vibrate using a boom-mounted vibratory plate compactor, or tamp using the excavator bucket.
- C. Raise the pipe cover material uniformly on each side of the pipe so as not to laterally displace the pipe.

### 3.13 BACKFILL ABOVE THE PIPE ZONE

- A. Backfill trench as soon as practicable after pipe is installed to prevent disturbance of pipe and embedment.
- B. Portions of the trench excavated with sloped or benched walls shall be backfilled for the full width of the trench as specified herein.
- C. Do not permit backfill to free fall onto pipe with less than 2 feet of cover over the top of the pipe. Do not allow backfill to drop with force capable of damaging or displacing the pipe. Place backfill in a manner which avoids segregation. Stop backfill at the necessary grade to provide for placement of subgrade, surface course, or topsoil as required.
- D. Where trenching operations expose existing pipelines and telephone or electrical conduits, replace any bedding in a manner to restore the original grade and level of support of the pipe or conduit. Complete the trench backfill above the existing pipeline or conduit with the backfill shown or specified, or as directed by Owner.

### 3.14 PLACING GRANULAR BACKFILL

- A. Prior to placing granular backfill, bring the moisture content of the material within the range necessary to obtain the specified compaction, as determined by laboratory testing. Employ whatever means necessary to adjust the moisture content of the backfill, or provide alternative acceptable material.
- B. Place granular backfill in uniform, loose lifts not to exceed 8 inches. Compact each lift to a minimum of 98 percent maximum dry density at optimum moisture content as determined by ASTM D 698.

- C. Compact each lift using mechanical devices, hoe rams, jumping jacks, hand devices, or other equipment.

### 3.15 PLACING EARTH BACKFILL

- A. Deposit material from the excavation in maximum lifts of 12 inches and compact each lift to 90 percent of maximum dry density at moisture content within 2 percent of optimum as determined by ASTM D 698.

### 3.16 BACKFILL OF MANHOLES AND MISCELLANEOUS CONCRETE STRUCTURES

- A. Backfill around manholes and miscellaneous concrete structures on open-cut excavation shall conform to requirements for adjacent pipe.
- B. Backfill shall not be placed nor excavation support systems removed until internal supporting walls of structures have been completed.
- C. Remove all form materials and trash from the excavation before placing any backfill. Remove loose, sloughing, or caving soil from bottoms and sidewalls of excavation.
- D. Backfill around manholes and miscellaneous concrete structures only after the concrete has attained 2/3 of the specified compressive strength. Obtain Owner's approval of concrete work and attained strength prior to backfilling.
- E. Raise backfill uniformly around manholes and miscellaneous concrete structures to prevent unbalanced lateral loading.
- F. Do not operate earth-moving equipment within 5 feet of walls of manholes and miscellaneous concrete structures for the purpose of depositing or compacting backfill materials.
- G. Where compacting granular backfill adjacent to concrete walls, use hand-operated tampers or other equipment that will not damage the manhole or structure.

### 3.17 DENSITY TESTING

- A. Compaction of earth backfill above the pipe zone shall be tested in conformance with Section 01 43 00 – Quality Requirements.
- B. All material and backfill operations are subject to testing by Owner with the assistance of Contractor. Contractor shall cooperate with density testing work by leveling small test areas as designated by Owner, and allowing sufficient time for testing. Backfill test holes with material similar to that excavated, and compact to the specified density.
- C. Testing of in-place density and moisture content shall conform to ASTM D 5195, or other ASTM standard method or equivalent.

- D. Failure to achieve the specified backfill density will be just cause for rejection of any or all portions of the excavation section tested. Cost of retesting backfill not meeting specified densities shall be paid by Contractor, at no additional cost to Owner.

END OF SECTION

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## SECTION 31 80 00

### PROTECTION OF STRUCTURES

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. The work of this Section includes protection of structures from damage due to ground settlement and vibrations.

##### 1.02 PROTECTION AND RESTORATION OF STRUCTURES

- A. In this Section, the term "structure" means any public, commercial, or institutional building; school, church, residence, or associated service building (garage, storage shed, and the like).
- B. Contractor is responsible for control of ground movements and protection of the Work and adjacent structures and utilities.
- C. Perform trench excavations, including installation of initial ground support systems, in a manner that will minimize ground movement in front of and surrounding the excavation, and minimize subsidence of the surface, structures, and utilities above and in the vicinity of the excavation.
- D. Contractor shall be responsible for repairing damage to structures resulting from construction. In the event of damage to a structure, the Contractor shall restore the structure to conditions existing prior to construction, and to the satisfaction of the Owner, within 60 days of damage occurring.

##### 1.03 ALLOWABLE GROUND SETTLEMENTS

- A. Control ground settlements as necessary to prevent settlement damage to existing utilities and structures along the tunnel alignment. Ground settlements include settlements due to lost ground, consolidation of compressible soils, and to dewatering.
- B. Except where more stringent requirements are specified, the average ground settlement over any distance of 100 feet along excavation shall not exceed 1.5 inches.
- C. Except where more stringent requirements are specified, ground settlement at the structure nearest to any excavation shall not exceed 2.5 inches
- D. In the event that specified allowable ground settlements are reached or exceeded, or lesser ground settlements cause or threaten to cause damage to utilities or structures, as indicated by settlement monitoring or direct observation, cease excavation immediately. Contractor shall immediately implement a contingency plan to modify equipment and methods of excavation to reduce ground settlements to within specified requirements.

END OF SECTION

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## SECTION 32 12 00

### ASPHALT PAVING

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. This section describes the requirements for materials, testing, and installation of asphalt concrete pavement; including but not limited to the aggregate base course, tack coat, prime coat and seal coat.
- B. Subgrade preparation shall be as specified in Section 31 23 33 - Trench Excavation and Backfill, and as specified herein.
- C. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the reference thereto. Latest revisions shall apply, unless otherwise indicated.
- D. Except as specifically modified in this specification, paving and surfacing operations and materials shall comply with City of Elyria Standards and applicable sections of the 2016 Ohio Department of Transportation (ODOT) Construction and Material Specifications, including current revisions thereto.
  - 1. Item 202-Removal of Structures and Obstructions
  - 2. Item 203-Roadway Excavation and Embankment
  - 3. Item 204-Subgrade Compaction and Proof Rolling
  - 4. Item 301- Asphalt Concrete Base
  - 5. Item 304 -Aggregate Base
  - 6. Item 305-Portland Cement Concrete Base
  - 7. Item 401- Asphalt Concrete Pavements – General
  - 8. Item 407-Tack Coat
  - 9. Item 408-Prime Coat
  - 10. Item 441-Contractor Mix Design and Quality Control – General
  - 11. Item 448-Asphalt Concrete
  - 12. Item 641-Pavement Marking – General
  - 13. Item 644 – Thermoplastic Pavement Markings

14. Item 705-Concrete Incidentals

1.02 REFERENCES

- A. American Society of Testing and Materials (ASTM).
- B. Ohio Department of Transportation (ODOT), "Construction and Materials Specifications", Latest Edition.

1.03 QUALITY ASSURANCE

- A. Comply with the requirements specified in Section 01 43 00 – Quality Requirements and the Contract Documents.
- B. Qualifications:
  - 1. Contractor shall employ an independent testing laboratory to perform necessary field density tests. The results from the field density tests shall be to the satisfaction of Owner that proper compaction is obtained and that placement conditions are in compliance with the specifications.
  - 2. Asphalt Job-Mix Formula (JMF) shall be prepared by an approved certified independent laboratory under the supervision of a certified asphalt technician.

1.04 SUBMITTALS

- A. Submittals shall be as specified in Section 01 33 00 - Submittals and the Contract Documents.
- B. Shop Drawings:
  - 1. Asphalt Job-Mix Formula for pavement:
    - a. Submit for each separate mix to be incorporated into work.
    - b. Include maximum theoretical density for each proposed mix.
    - c. Use only ODOT approved job mix formulas.
  - 2. Manufacturer's Certificate of Compliance, with Standard Specifications, for the following materials:
    - a. Aggregate: Gradation, source test results as defined in the Standard Specification.
    - b. Asphalt for Binder: Type and grade and viscosity-temperature curve.
    - c. Prime Coat: Type and grade of asphalt.



- d. Tack Coat: Type and grade of asphalt.
  - e. Additives.
  - f. Mixes: Conforms to JMF.
3. Statement of qualification for independent testing laboratory.
4. Test Results:
- a. Marshall Mix Design.
    - (1) Aggregate gradation.
    - (2) Asphalt content.
    - (3) Stability number.
  - b. Field density.
    - (1) Asphalt
    - (2) Aggregate Base.
  - c. Permeability.
  - d. Asphalt compaction temperature

#### 1.05 JOB CONDITIONS

- A. Weather limitations for the placement of asphalt concrete, tack coat, and prime coat shall be as stated in ODOT Items 401.06, 407.04, and 408.04 respectively.
- B. Do not place paving and surfacing materials on wet surface or when weather conditions would prevent the proper construction of paving and surfacing.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. Asphalt concrete pavement, shall conform to Asphalt Concrete Pavements – General as referenced in ODOT Item 401.
- B. Surface and intermediate courses shall conform to ODOT Item 448, Types 1 and 2.
- C. Base Course shall conform to ODOT Item 301, Asphalt Concrete Base.
- D. Tack coat and prime coat shall conform to ODOT Items 407 and 408, respectively.

- E. Aggregate base shall be in conformance with Item 304 of the referenced ODOT Specifications.
- F. Concrete base shall be in conformance with Item 305 of the referenced ODOT Specifications.
- G. Sand (Blotter Material): Clean, dry, with 100 percent passing a 4.75 mm (No. 4) sieve, and a maximum of 10 percent passing a 75 mm (No. 200) sieve.

## 2.02 ASPHALT CONCRETE MIX (JOB-MIX)

### A. General:

- 1. Asphalt Concrete: Provide dense hot applied asphalt plant mixes in accordance with ODOT Item 441 and 448. Reclaimed asphalt materials shall not exceed 10% of the mix design. Comply with the following:
  - a. Asphalt Surface Course: ODOT Item 448, Type 1, Medium Traffic.
  - b. Asphalt Leveling Course: ODOT Item 448, Type 2, Medium Traffic.
- 2. Asphalt Concrete for patching: Provide hot applied asphalt plant mixes in accordance with ODOT Item 441 and 448. Reclaimed asphalt materials shall not exceed 10% of the mix design. Comply with the following:
  - a. Asphalt Surface Course: ODOT Item 448, Type 1, Medium Traffic.
  - b. Asphalt Leveling Course: ODOT Item 448, Type 2, Medium Traffic.
- 3. Source Changes:
  - a. Should material source(s) change, establish a new asphalt job-mix formula before the new material(s) is used.
  - b. Perform check tests of properties of the plant-mix bituminous materials on the first day of production and as requested by Owner to confirm that properties are in compliance with design criteria.
  - c. Make adjustments in gradation or asphalt content as necessary to meet design criteria.

B. JMF(s) shall not be modified except with the written approval of Owner.

C. Composition: Hot-plant mix of aggregate, mineral filler (if required), and paving grade asphalt cement. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that the resulting mixture meets the grading requirements of the job-mix formula.

## 2.03 PERMANENT PAVEMENT MARKINGS

- A. All markings shall comply with ODOT Items 641 and 644 and shall include reflective glass beads.
- B. Payment shall be in accordance with the requirements of Section 01 29 01 – Measurement and Payment.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Traffic Control:
  - 1. Minimize inconvenience to traffic, but keep vehicles off freshly treated or paved surfaces to avoid pickup and tracking of asphalt.
- B. Asphalt Driveways:
  - 1. Re-pave driveways where existing pavement was removed.
  - 2. Leave driveways in as good or better condition than before start of construction.
- C. Gravel Driveways Resurfacing:
  - 1. Replace gravel surfacing on driveways which were gravel surfaced prior to construction.
  - 2. Provide compacted gravel surfacing to depth equal to original, but not less than 4 inches.
  - 3. Leave each driveway in as good or better condition as it was before start of construction.
- D. Preparation, Application and Installation of All Materials:
  - 1. Asphalt concrete pavement shall be installed in accordance with the ODOT Construction and Materials Specifications.

### 3.02 LINE AND GRADE

- A. Provide and maintain intermediate control of line and grade, independent of the underlying base to meet finish surface grades and minimum thickness.

### 3.03 SPREADING EQUIPMENT

- A. Spreading Equipment shall be in conformance to ODOT Item 401.12.

### 3.04 PREPARATION

A. Existing Roadway:

1. Modify profile by grinding, milling, or overlay methods as approved, to provide meet lines and surfaces and to produce a smooth riding connection to existing facility.
2. Remove existing material to a minimum depth of 1-inch.
3. Paint edges of meet line with tack coat prior to placing new pavement.

B. Thoroughly coat edges of contact surfaces (curbs, manhole frames, etc.) with emulsified asphalt or asphalt cement prior to laying new pavement. Prevent staining of adjacent surfaces.

C. Base Course:

1. Hauling Materials:

- a. Do not haul over surfacing in process of construction.
- b. Loads: Of uniform capacity.
- c. Measure capacity of truck to determine vehicle load and quantity.
- d. Maintain consistent gradation of material delivered; loads of widely varying gradations will be cause for rejection.

2. Spreading Materials:

- a. Distribute material to provide required density, depth, grade and dimensions with allowance of subsequent lifts.
- b. Produce even distribution of material upon roadway without segregation.
- c. Immediately change material placement methods if segregation of coarse from fine materials occurs during placement.

### 3.05 PAVEMENT APPLICATION

A. General: Place asphalt concrete mixture on an approved, prepared base in conformance with Standard Specifications.

B. Prime Coat:

1. Apply uniformly to clean, dry surfaces. Avoid overlapping applications.
2. Do not apply when moisture content of upper 3-inches of base exceeds optimum moisture content of base, or if free moisture is present.

3. Application Rate: Minimum 0.15 to maximum 0.5 gallons per square yard of surface area.
  4. Remove or redistribute excess material.
- C. Tack Coat shall conform to ODOT Item 407 and the requirements below:
1. Apply uniformly to clean, dry surfaces. Avoid overlapping of applications.
  2. Do not apply more tack coat than necessary for the day's paving operation.
  3. Touch up missed or lightly coated surfaces and remove excess material.
  4. Application Rate:
    - a. 0.05 to 0.06-gallon/ square yard on new asphalt. 0.08 to 0.09 gallon/square yard on milled asphalt.
    - b. Apply at rate, within range specified, sufficient to assure good bonding, but not so heavy that surplus asphalt flushes into asphalt concrete being placed.
- D. Pavement Mix:
1. Prior to Paving:
    - a. Sweep primed surface free of dirt, dust, or other foreign matter.
    - b. Patch holes in primed surface with asphalt concrete pavement mix.
    - c. Blot excess prime material with sand.
  2. Compacted Lift Thickness:
    - a. Minimum: Twice the maximum aggregate size, but in no case less than 1-inch.
  3. Total Compacted Thickness: As shown or to match existing pavement.
  4. Apply such that meet lines are straight and edges are vertical.
  5. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.
  6. Joints:
    - a. Offset edge of each layer a minimum of 6-inches so joints are not directly over those in underlying layer.

- b. Offset longitudinal joints in roadway pavements, so longitudinal joints in surface course coincide with pavement centerlines and lane divider lines.
      - c. Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.
    - 7. Succeeding Lifts: Apply tack coat to pavement surface between each lift.
  - E. Compaction shall conform to ODOT Item 401.16 and the requirements below:
    - 1. Uniformly compact each course to the target density arrived at in the compaction control strip.
    - 2. Roll until roller marks are eliminated and a minimum 95 percent compaction is obtained.
    - 3. Joint Compaction:
      - a. Place wearing layer as continuously as possible.
      - b. Cut back previously compacted mixture when work is resumed to produce a slightly beveled edge for full thickness of layer.
      - c. Cut away waste material and lay new mix against fresh cut.
  - F. Tolerances:
    - 1. General: Conduct measurements for conformity with crown and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.
    - 2. Completed Surface or Wearing Layer Smoothness:
      - a. Uniform texture, smooth, and uniform to crown and grade.
      - b. Maximum Deviation: 1/8-inch from lower edge of a 12-foot straightedge, measured continuously parallel and at right angle to centerline.
      - c. If surface of completed pavement deviates by more than twice the specified tolerances, remove and replace wearing surface.
    - 3. Transverse Slope Maximum Deviation: 1/4-inch in 12-feet from the rate of slope shown.
    - 4. Finished Grade:
      - a. Perform a field differential level survey on a maximum 15-foot grid and along all grade breaks.

- b. Maximum Deviation: 1/4-inch from the grade shown.

G. Sealing Joints:

1. General: Seal longitudinal and transverse joints, joints at abutting pavements, areas where the asphalt concrete was placed by hand, patched surfaces, gutters, around metal castings, and other areas as directed by Owner in accordance with ODOT 401.17.
2. Preparation:
  - a. Maintain surfaces that are to be sealed free of holes, dry, and clean of dust and loose material.
  - b. Seal in dry weather and when the temperature is above 35 degrees F.
3. Application:
  - a. Fill cracks over 1/16-inch in width with an asphalt-sand slurry or approved crack sealer prior to sealing.
  - b. When sealing patched surfaces and joints with existing pavements, extend minimum 3-inches beyond edges of patches.

3.06 PATCHING

A. Preparation:

1. Remove damaged, broken, or unsound asphalt concrete adjacent to patches. Trim to straight lines exposing smooth, sound, vertical edges.

B. Application:

1. Patch Thickness: 3-inches or thickness of adjacent asphalt concrete, whichever is greater.
2. Place asphalt concrete mix across full width of patch in layers of equal thickness.
3. Spread and grade asphalt concrete with hand tools or mechanical spreader, depending on size of area to be patched.

C. Compaction:

1. Roll patches with power rollers capable of providing compression of 200 to 300 pounds per linear inch. Use hand tampers where rolling is impractical.
2. Begin rolling top course at edges of patches, lapping adjacent asphalt surface at least 1/2 the roller width. Progress toward center of patch overlapping each preceding track by at least 1/2 the width of roller.

3. Make sufficient passes over entire area to remove roller marks and to produce desired finished surface.

D. Tolerances:

1. Finished surface shall be flush with and match grade, slope, and crown of adjacent surface.
2. Tolerance: Surface smoothness shall not deviate more than plus 1/4-inch or minus 0-inches when a straight edge is laid across patched area between edges of new pavement and surface of old surfacing.

### 3.07 AGGREGATE BASE COURSE FIELD QUALITY CONTROL

A. In-Place Density Tests:

1. Construct base course so areas shall be ready for testing.
2. Allow reasonable length of time for testing laboratory to perform tests and obtain results during normal working hours.
3. Perform 1 test for each 500 square yards of material placed.

### 3.08 ASPHALT PAVEMENT FIELD QUALITY CONTROL

A. General: Contractor shall provide services of an independent testing laboratory to conduct tests.

B. Field Density Tests:

1. Asphalt paving shall be tested in accordance with ODOT specifications and testing laboratory recommendations.
2. Measure with properly operating and calibrated nuclear density gauge.
3. Maximum Density: In accordance with ASTM D2041, using a sample of mix taken prior to compaction from the same location as the density test sample.

C. Testing Frequency:

1. Quality Control Tests:
  - a. Mix Design Properties, Measured Maximum (Rice's) Specific Gravity: Once every 1,000 tons or once every 8 hours, whichever is greater.
2. Density Tests: Once every 500 tons of mix or once every 4 hours, whichever is greater.



### 3.09 PERMANENT PAVEMENT MARKINGS

- A. Apply permanent pavement markings in accordance with ODOT Items 641 and 644.
- B. All pavement markings shall be the entire width of the pavement.
- C. All pavement markings removed during construction, including stop bars, turn arrows, crosswalks, etc., shall be replaced. The color and width of pavement markings shall match existing markings.
- D. Moving marking operations shall be performed by a truck equipped with necessary flashers and warning signs and shall be protected by a similarly equipped trailing vehicle or vehicles separated a sufficient distance to provide adequate advance warning to overtaking traffic. The marking operation should use the extreme left or right lane when possible.
- E. Stationary marking operations in intersections, school zones, gores and other areas shall be protected with traffic control devices such as advance warning signs and cones.

END OF SECTION

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## SECTION 32 16 00

### CURBS, CURB RAMPS, APRONS, AND SIDEWALKS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Furnish and install materials and perform related work necessary to complete work shown or specified. Contractor shall be responsible for all work involved in the repair and replacement of existing curbs, gutters, sidewalks, curb ramps, and aprons damaged or destroyed during construction of the work. Replacement in kind with respect to base courses, surface courses, and thicknesses, unless otherwise indicated or directed. Finish elevations, lines, and grades shall be the same as items removed unless otherwise shown on the Drawings.
- B. Notify Owner a minimum of 48 hours in advance of Work to require Owner testing.
- C. Subgrade preparation shall be as specified in Section 31 23 33 – Trench Excavation and Backfill and as specified herein.
- D. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the reference thereto. Latest revisions shall apply, unless otherwise indicated.
- E. Perform cutting and patching of pavements as indicated, specified, or directed by Owner.
- F. Except as specifically modified in this specification, paving and surfacing operations and materials shall comply with applicable sections of the 2013 Ohio Department of Transportation (ODOT) Construction and Material Specifications, including current revisions thereto.
  - 1. Item 202-Removal of Structures and Obstructions
  - 2. Item 203-Roadway Excavation and Embankment
  - 3. Item 204-Subgrade Compaction and Proof Rolling
  - 4. Item 304-Aggregate Base
  - 5. Item 451-Reinforced Portland Cement Concrete Pavement
  - 6. Item 452-Non-Reinforced Portland Cement Concrete Pavement
  - 7. Item 499-Concrete – General
  - 8. Item 508-Falsework and Forms

9. Item 509-Reinforcing Steel
10. Item 605-Underdrains
11. Item 608-Walks, Curb Ramps, and Steps
12. Item 609-Curbing, Concrete Medians, and Traffic Islands
13. Item 703-Aggregate
14. Item 705-Concrete Incidentals

#### 1.02 REFERENCES

- A. ODOT Construction and Material Specifications, Latest Edition.

#### 1.03 QUALITY ASSURANCE

- A. Comply with the requirements specified in Section 01 43 00 – Quality Requirements and the Contract Documents.
- B. Testing Laboratory Services:
  1. Owner shall employ an independent testing laboratory to perform necessary field density tests to demonstrate that proper compaction is obtained and that placement conditions are in compliance with the specifications and to the satisfaction of Owner.
  2. Contractor shall employ a testing laboratory service for all testing required to determine mix designs, maximum theoretical densities, and specification compliance.

#### 1.04 SUBMITTALS

- A. Submittals shall be as specified in Section 01 33 00 – Submittals and the Contract Documents.
- B. Submit the following:
  1. Name and location of concrete ready-mix plant.
  2. Type and composition of proposed materials and mixes, including moisture - density curves.
  3. Certificates of Compliance certifying compliance with the referenced specifications and standards.
  4. Statement of qualification for independent testing laboratory.
  5. Test Results: Concrete.

- a. Mix Design.
  - (1) Aggregate graduation.
  - (2) Cement content.
  - (3) Water content.
  - (4) Air Content.
- b. Slump.
- c. Pavement thickness.
- d. Compressive Strength.

#### 1.05 JOB CONDITIONS

- A. Replacement of concrete pavement shall be as stated in ODOT Item 451.07.
  - 1. Do not place paving and surfacing materials on wet surface or when weather conditions would prevent the proper construction of paving and surfacing.
  - 2. Do not place paving and surfacing materials when natural light is not sufficient to properly observe work on operations.
  - 3. Do not place aggregates on frozen subgrade or when air temperature is below 35°F.

### PART 2 - PRODUCTS

#### 2.01 AGGREGATE BASE

- A. Aggregate base shall be in conformance with Item 304 Aggregate Base of the referenced ODOT Specifications.

#### 2.02 CONCRETE

- A. Reinforced Portland cement concrete pavement shall be in conformance with Item 451 of the referenced ODOT Specifications.
- B. Non-reinforced Portland cement concrete pavement shall be in conformance with Item 452 of the referenced ODOT Specifications.
- C. Concrete shall be in conformance with Item 499 of the referenced ODOT Specifications.
- D. Concrete Sidewalks and Curb Ramps shall be in conformance with Item 608 of the referenced ODOT Specifications.

## 2.03 REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT, WALKS, AND STEPS

### A. Forms:

1. Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal of forms. Use straight forms, free of distortion and defects.
2. Forms shall meet the requirements of ODOT Item 508.
3. Coat forms with a non-staining form release agent that will not discolor or deface surface of the concrete.

### B. Welded Wire Mesh:

1. Welded steel wire fabric in conformance with ODOT Item 509.

### C. Reinforcing Bars:

1. Deformed Steel Bars in conformance with ODOT Item 509.

## 2.04 WALKS, CURB RAMPS AND STEPS

- A. Concrete Sidewalks, and Curb Ramps shall be in conformance with Item 608 of the referenced ODOT Specifications.

## 2.05 CURBING

- A. Concrete Curbing shall be in conformance with Item 609 of the referenced ODOT Specifications.

## 2.06 CONCRETE FINISHES

- A. Finish concrete sidewalks in accordance with ODOT Item 608.03.

## 2.07 ACCESSORIES

### A. Expansion Joint Materials:

1. Comply with requirements of ODOT Items 705.03 and 705.04 for preformed expansion joint fillers and sealers.

### B. Curing and Sealing Compound

1. Comply with requirements of ODOT 705.07 (Type 2).

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Contractor is responsible to provide equipment, workmanship, and materials required to achieve a finished product which meets these specifications.
- B. Use compaction equipment suitable for the material being placed. Compacting equipment shall include at least one piece of equipment capable of providing a smooth, even surface for the pavement surface course.
- C. Prior to placing paving and surfacing materials, level the subgrade to produce smooth, even finished pavement grades. Fill all gullies and ruts with additional ODOT Item 304 aggregate base material. Subgrade and aggregate base materials shall be compacted in accordance with ODOT Item 203.
- D. Do not place paving and surfacing material before subgrade is reviewed and accepted by Owner. Do not place paving and surfacing materials on a frozen or muddy subgrade.
- E. Provide adequate drainage at all times to prevent water from standing on subgrade.

### 3.02 CUTTING AND PATCHING

- A. At time of installing permanent pavement, edges of existing pavement shall be cut back 24-inches or more, as required, to sound undamaged material with vertical face cleaned and prepared for bonding with new pavement as indicated, specified, or as directed by Owner.
- B. Where work is located in sidewalks and similar narrow paved areas, the whole width shall have permanent pavement replaced.
- C. Disturbed or eroded gravel base course to be restored as required before placing pavement.
- D. Manhole covers, catch basin grates, valve boxes, and similar items shall be adjusted to conform with pavement grade or as directed by Owner; items shall be removed and reconstructed as necessary. This work shall be completed prior to final paving.
- E. Surface of existing pavement to which new pavement is to bond shall be treated with cut back asphalt or emulsified asphalt, applied at a rate between 0.05 and 0.15 gallons per square yard of surface.

### 3.03 CURB CONSTRUCTION

- A. Construct curb in accordance with ODOT Item 609.
- B. Construct curbs and ramps as indicated in the Contract Drawings.
- C. Replace curb in kind if not specified otherwise on the Contract Drawings.

### 3.04 SIDEWALK CONSTRUCTION

- A. Construct sidewalk in accordance with ODOT Item 608.
- B. Place, process, finish, and cure concrete according to ODOT Items 451, 499, 508, and 608.
- C. Slope sidewalks away from structures at 1/4-inch per foot, unless noted otherwise. Sidewalk cross slope shall not exceed 1/4-inch per foot.
- D. Expansion and contraction joints shall be installed as indicated on the drawings, as required, and as directed by Owner. Expansion joints shall be required whenever new concrete abuts fixed objects or existing concrete surfaces, whether or not shown on the drawings.
- E. Finished sidewalk shall present a uniform appearance for both grade and alignment. Remove any section of sidewalk showing abrupt changes in alignment or grade or that is more than 2 inches away from its location as staked and construct new sidewalk in its proper location.

### 3.05 CURB RAMP CONSTRUCTION

- A. ADA compliant curb ramps shall be installed at intersections and other major pedestrian crossing points where adjacent curb and sidewalk are being constructed, reconstructed, and/or altered due to new roadway/sidewalk, street opening, and utility trench construction.
- B. ADA compliant curb ramps shall be installed to replace or upgrade existing pedestrian curb ramps at intersections and other major pedestrian crossing points due to new roadway/sidewalk, street opening and utility trench construction.
- C. A companion ADA compliant curb ramp shall be installed for the opposite side of the street for each new ramp regardless of project or other work limits.
- D. All material and workmanship shall be in accordance with the Ohio Department of Transportation, Construction and Material Specifications, Latest Edition The ODOT, Construction and Materials Specifications shall govern all construction items that are a part of this plan
- E. The Contractor shall be responsible for Curb Ramp and sidewalk layout. Contractor shall be responsible for having the finished work conform to the lines, grades, elevations and dimensions to meet ADA Requirements. Any inspection or checking of the Contractor's layout by the City and the acceptance of all of any part of it shall not relieve the Contractor of its responsibility to secure proper dimensions, grades and elevations of the several parts of the work. The Contractor shall use competent personnel and suitable equipment for the layout work required.
- F. Truncated Domes For Ramps: All curb ramps shall have a Distinctively-Textured walking surface, detectable by cane, to warn pedestrians with visual impairments of an impending hazard on the circulation route ahead. The detectable warnings shall consist of truncated



dome with a diameter of nominal 0.9 IN. (23 MM), a height of nominal 0.2 IN. (60 MM). The detectable warnings shall be 24 IN. (610 MM) in the direction of travel and extend the full width of the curb ramp or flush surface, except the flare surface. The location of the detectable warning shall be located so that the edge nearest the curb line or other potential hazard is 6 to 8 Inches (150 to 205 MM) from the curb line or other potential hazard.

1. Truncated domes shall be a contrasting color.
- G. The attached drawings for different types of ADA compliant curb ramps are for the most prevalent situations. However, under circumstances that are not detailed in the drawings, it is the contractor's responsibility to layout the curb ramp to meet ADA Requirements.
- H. Dimensions are based on a 6-inch curb height, and shall be proportionally adjusted for other curb heights.
- I. The thickness of concrete in the Curb Ramp, including flared sides and rolled edges, shall be as per City Specification
- J. Ramps specified at 8-inch thickness shall be 8-inch thick everywhere in the ramp including the flared areas.
- K. A 3-foot minimum width ramp may be used when existing space prohibits the construction of a 4-foot wide ramp with the approval of the City of Elyria.
- L. The ramp slope shall not exceed 12:1 at any Curb Ramp locations where pedestrian traffic must travel along or across the Curb Ramp.
- M. Cross-slope of Curb Ramps and sidewalks shall not exceed 48:1.
- N. Transitional sections of sidewalk, that do not meet current standards and specifications, shall be installed to connect the new or replaces Curb Ramps. These transitions segments of sidewalk shall provide a smooth transition between the existing and new concrete.
- O. All existing manhole covers, valve boxes, gratings, etc., that are located within the pedestrian right-of-way, shall be flushed mounted with the walking surface. Existing obstructions shall not have more than  $\pm 1/4$  inch difference in elevation than the surrounding surface.
- P. The location of Curb Ramps in new construction shall take precedence over the location of drainage structures, guardrails and traffic utility or light poles.
- Q. The bottom edge of the Curb Ramp shall be flushed with the edge of the adjacent pavement and gutter line.
- R. Curb Ramps shall be aligned with the sidewalk and the crosswalk where possible. If alignment is not possible the Contractor is to notify the City of Elyria prior to proceeding with construction activities at this location.

- S. Crosswalk markings placed in conjunction with Curb Ramp Types CR-3, CR-7, AND CR-9 shall be located such that, at a minimum, the Curb Ramp, exclusive of the flared sides or rolled edges, shall be completely contained with the crosswalk.
- T. Crosswalk markings places in conjunction with Curb Ramp Types CR-1, CR-2, CR-4, CR-5, CR-6, CR-8, CR-10, CR-11 shall be located at least 2-feet beyond the outside of the flared sides.
- U. The rolled edges shall be constructed so that they are parallel to the direction of pedestrian traffic.
- V. Rolled edges shall only be used adjacent to tree lawns, utility strips and large obstructions such as signal controllers.
- W. The normal gutter flow line shall be maintained throughout the Curb Ramp area, and appropriate drainage structures shall be used, as needed, to intercept the flow of water prior to the Curb ramp area. Positive drainage shall also be provided to carry water away from the intersection of the Curb Ramp and gutter line.
- X. Surface texture of Curb Ramps shall be coarse-broomed or other approved method transverse to ramp slope (minimum 1/8 inch - maximum 3/16 inch deep) beyond the TRUNCATED DOMES part of the ramp.
- Y. Curb poured separately from the ramp shall be separated from the ramp by 1/2 inch pre-molded expansion joint filler per ODOT CMS 705.04.
- Z. When less than 3-feet of a curb section remains after the curb cut is located, it shall also be removed and replaced. New curb shall be constructed in a minimum of 3-foot sections and a maximum of 5-foot sections, or as directed by the City of Elyria.
- AA. Fill for sidewalk and Curb Ramps, if required, shall be limestone screenings compacted in layers not exceeding 2-inches. The cost for the sub-base is considered incidental to ramp construction and no additional cost will be paid for by the City.
- BB. Curb Ramps and surrounding concrete walk shall be constructed of Portland cement concrete,
- CC. 1/2 inch pre-molded expansion material shall be placed whenever new concrete touches existing construction 1/2 inch joint filler per ODOT CMS 705.04.
- DD. Forms shall consist of wood or metal and extend for the full depth of the concrete, and of sufficient strength to resist the pressure of the concrete without springing.
- EE. An approved curing compound shall be properly applied immediately after finishing the concrete.

3.06 FINISHING

- A. Finish in accordance with ODOT Item 608 and 609.

3.07 PROTECTION

- B. Protect concrete from damage and replace if damage occurs.

3.08 FIELD QUALITY CONTROL

- C. Work specified within this Section shall be tested in accordance with ODOT specifications and testing laboratory recommendations, or as directed by Owner. All quality control field testing services shall be provided by Owner.

3.09 CLEANING

- D. Clean job site of rubbish, excess material, structures, and equipment. Restore damaged property.

END OF SECTION

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## SECTION 32 90 10

### SITE RESTORATION AND LANDSCAPING

#### PART 1 - GENERAL

##### 1.01 SCOPE OF WORK

- A. Restore all surfaces within the work limits that are damaged or disturbed by construction operations.
- B. Replace or repair all pavements, roadways, curbing, gutters, guardrails, culverts, sidewalks, structures and appurtenances, fencing, mailboxes, and other like items, which were damaged or removed during the work.
- C. Replace or repair all pavements, roadways, curbing, gutters, curb ramps, etc. per City requirements.
- D. Grade all disturbed ground to original contours or to contours as directed by Owner. Grading shall be performed in accordance with the requirements elsewhere in these Specifications.
- E. Furnish and install topsoil, fertilizer, seed, mulch, and related items necessary to complete work shown or specified.
- F. Contractor shall seed and mulch all vegetated areas cleared, damaged or destroyed during construction work. All areas that previously supported vegetation or trees shall be seeded and mulched.
- G. Culverts, sewers, and drainage ditches shall be repaired immediately to restore flows.
- H. Upon completion of work, remove all temporary facilities, sheds, offices, barricades, tree protection, signs, fences and other facilities and restore ground to original contours.
- I. Replace any ornamental shrubbery destroyed or damaged by Contractor's operations. Use approved nursery for this work.
- J. Replace any vegetation, including trees, hedges, or shrubbery being used as a visual barrier, that is damaged or removed during the work to provide a visual barrier equivalent to the barrier damaged or removed.
- K. Notify Owner 30 days prior to commencing restoration work on City properties or within City rights-of-way.

##### 1.02 QUALITY ASSURANCE AND QUALITY CONTROL

- A. Comply with the requirements specified in Section 01 43 00 – Quality Requirements and the Contract Documents.

- B. Quality and size of replaced items shall be equal or better than that which existed prior to construction.
- C. Unless otherwise shown or specified, pavement and sidewalk replacement must be of the same type material and construction as the original work.
- D. Where joints are made in existing work they shall be straight, neat, and sealed.
- E. All work must meet the approval of Owner.

### 1.03 SUBMITTALS

- A. Comply with the requirements specified in Section 01 33 00 – Submittals and the Contract Documents.
- B. Submit the following:
  - 1. Manufacturer's Certificate of Compliance certifying compliance with applicable standards and specifications.
  - 2. Prior to placement of any mulch, deposit, at a location on the site suitable to Owner, 1/2 cubic yard sample of mulch for examination. After mulch sample is reviewed by Owner, provide mulch conforming to accepted sample.
  - 3. Submit vendor's certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
  - 4. Submit seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight and crop year identification, and percentages of purity, germination and weed seed for each grass seed species.
  - 5. Prior to end of maintenance period, furnish 2 copies of written maintenance instructions for maintenance and care of installed lawn areas.

### 1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with the requirements specified in Section 01 66 10 – Delivery, Storage, and Handling and the Contract Documents.
- B. Contractor shall be responsible for the delivery, storage, and handling of fencing products, in accordance with these specifications.
- C. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.
- D. Deliver packaged materials in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, weight and conformance to state law. Protect materials from deterioration during delivery and while stored at site.

- E. Do not drop materials.

#### 1.05 SITE CONDITIONS

- A. Seed between March 15 and June 1 and/or between September 1 and November 15. Do not sow seed during adverse weather conditions. Do not broadcast seed during high wind. Do not sow seed when the moisture content of the soil is too low or too high for seed germination.
- B. Prepare a proposed planting schedule. Schedule dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation or reasons for delays.

#### 1.06 WARRANTY

- A. Guarantee new material through one full growing season after planting is completed.
- B. Guarantee materials replaced under this for one full growing season from date of replacement.
- C. Repair damage to plants or lawns during plant replacement.
- D. Guarantee lawn areas for duration of one full year after seeding to be alive and in satisfactory growth at end of guarantee period.
- E. For purpose of establishing an acceptable standard, scattered bare spots, none of which is larger than 1 square foot will be allowed up to a maximum of 3% of lawn area.

### PART 2 - PRODUCTS

#### 2.01 QUALITY ASSURANCE

- A. Ability to deliver:
  - 1. Investigate sources of supply and make assurances that material will be supplied as indicated in planting schedule in sizes, variety and quality noted and specified before submitting BID.
  - 2. Failure to take this precaution will not relieve responsibility for furnishing and installing material in accordance with Contract requirements and without additional expense to Owner.
- B. Inspection:
  - 1. Upon delivery and before planting, Owner will inspect materials. Plant no material prior to inspection by Owner.

C. General:

1. Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
2. Check material prior to commencing of planting operations. Notify Owner at least 48-hours in advance of all planned planting operations and identify specific material and its location.
3. Furnish suitable quantities of water, hose and appurtenances.
4. Use loam having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.
5. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 60 days.
6. Repair or replace seeded areas, plants, shrubs, and trees which, in judgment of Owner, have not survived and grown in a satisfactory manner, for a period of one year after acceptance.
7. Provide, as specified, seedings or plantings replacements of the same type and size.
8. Dry loam test samples to constant weight at temperature of 230 degrees Fahrenheit, plus or minus 9 degrees.

2.02 TOPSOIL

- A. Topsoil will be stockpiled for re-use in landscape work. If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required to complete landscape work.
- B. Provide new topsoil which is fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 1-1/2 inches in any dimension and other extraneous or toxic matter harmful to plant growth.
- C. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than 4-inches; do not obtain from bogs or marshes.

2.03 LAWN PRODUCTS

- A. Limestone shall be agricultural grade with a minimum total neutralizing power of 90. At least 40% of the limestone shall pass a No. 100 sieve, and at least 90% shall pass a No. 8 sieve.



- B. Fertilizer shall be 12-12-12 grade.
- C. Grass seed mix for all areas shall be as shown on the plans.
  - 1. Seed shall not contain more than 5% inert matter. Seed shall not contain objectional weeds.
  - 2. Mulch shall be straw, grass, hay, pine needles, or wood fiber. Straw shall be threshed straw of cereal grain such as oats, wheat, barley, rye, and rice. Mulch shall not contain objectional weed seeds or other material that might be detrimental to the planting being established.
- D. Asphalt adhesive shall be emulsified asphalt. Adhesive shall meet the requirements of ASTM D977 for Grade SS-1.

#### 2.04 TREES

- A. Existing trees to be removed within City rights-of-way are identified on the drawings. The replacement tree species type are shown on the drawings.

### PART 3 - EXECUTION

#### 3.01 GRADING

- A. Fine grade all non-paved areas disturbed during construction. Areas shall be smooth and uniform. Finish elevations and grades shall be the same as elevations and grades prior to construction, unless otherwise shown on the drawings.

#### 3.02 PREPARATION OF SEEDED AREAS

- A. Prior to preparation of areas to be seeded, remove existing grass, vegetation, and turf. Dispose of such materials outside of the project sites. Do not turn over any removed material into the soil being prepared for seeding.
- B. Loosen subgrade of areas to be seeded to a minimum depth of 4-inches. Remove stones over 1-1/2-inches in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas, which will be planted promptly after preparation.
- C. Place 6-inches of topsoil over area to be seeded.
  - 1. Spread planting soil mixture to minimum depth required to meet lines, grades and elevations shown, after light rolling and natural settlement.
  - 2. Place approximately one-half of total amounts of planting soil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil.

3. Grade areas to be seeded to smooth, even surface with loose, uniformly fine texture. Roll and rake and remove ridges and fill depressions as required to meet finish grades. Limit fine grading to areas, which can be planted immediately after grading.
4. Moisten prepared areas to be seeded before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
5. Restore areas to be seeded to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

### 3.03 SEEDING

- A. Loosen the seed bed, if not loose, to a depth of from 1- to 2-inches below finished grade.
- B. Apply fertilizer in the amount of 20 pounds per 1,000 square feet.
- C. Sow grass seed at the rate of not less than 2-1/2 pounds per 1,000 square feet in each of two directions at right angles to each other. Total seed rate shall be 5 pounds per 1,000 square feet.
- D. Apply agricultural grade limestone in the amount of 25 pounds per 1,000 square feet.
- E. Seeds and fertilizers can be sown with standard agricultural drills. Grass seeds may be sown broadcast or with a special seeder attachment on agricultural drills, but shall not be covered with more than 1/2-inch of soil, whether drilled or raked in. If not covered by the drill, all uncovered seed shall, immediately after sowing, be slightly raked or harrowed to cover the seed.

### 3.04 MULCHING

- A. Apply mulching material following seeding.
- B. Apply mulching material, except wood fiber, at a rate of 46 pounds per 1,000 square feet. Apply wood fiber at a rate of 35 pounds per 1,000 square feet.
- C. Punch mulching material into the soil so the mulch is partially covered. The punching operations shall be performed longitudinally with a mulch tiller. Use proper mulch tilling equipment. Evenly distribute mulch.
- D. Unless otherwise noted, hold the mulch in place with tackifier when the seeded area has a slope steeper than 4-feet horizontal to 1-foot vertical. Apply tackifier immediately after the mulch is placed. Apply tackifier at manufacturers recommended rate.

### 3.05 TREES

- A. Notify Owner 30 days prior to removing existing trees within a right-of-way, so the Owner can coordinate with the City

### 3.06 WATERING

- A. Thoroughly water seed and trees immediately after planting.
- B. Water grass and trees as necessary to establish and maintain growth until project is completed.

### 3.07 MAINTENANCE

- A. Maintain landscaped areas for not less than 60 days after planting.
- B. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintain until time of final acceptance. Reseed and re-fertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified and reasonably free of weeds and undesirable coarse native grasses.
- C. Begin maintenance immediately after each planting and continue until final acceptance of work. Water, mulch, weed, prune, spray, fertilize, cultivate and otherwise maintain and protect all plants.
- D. Reset settled plants to proper grade and position, and restore planting saucers and remove dead material. Tighten and repair guys. Correct defective work as soon as possible within guarantee period.

### 3.08 PROTECTION

- A. Provide protection against traffic and construction operations by erecting barricades immediately after landscaping is completed and by placing warning signs.
- B. If landscaping is damaged or destroyed, the affected landscaping shall be repaired or replaced to the satisfaction of Owner at Contractor's expense.
- C. Protect work until accepted.

### 3.09 CLEAN-UP

- A. Remove soil or similar material, which has been brought onto paved areas, keeping these areas clean.
- B. Upon completion of planting, remove excess soil, stones, and debris which have not previously been cleaned up; legally dispose of off-site.
- C. Prepare lawns and planting areas for final inspection.

- D. Protect slopes and embankments against erosion until work is accepted. Repair eroded portions of seeded or sodded areas by refilling, re-sodding, re-mulching and reseeded as required by condition and to satisfaction of Owner. Protection may be by installation of sod strips or other methods.

### 3.10 INSPECTION AND ACCEPTANCE OF SEEDED AREAS

- A. Seeded areas will be inspected at completion of installation and accepted subject to compliance with specified materials and installation requirements.
- B. Inspection to determine acceptance will be made by Owner upon Contractor's request. Provide notification at least 10 working days before requested inspection date.
- C. Inspections shall be scheduled by Contractor to take place immediately after a maintenance occurrence.
- D. Seeded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, uniform, close stand of the specified grass is established free of weeds, undesirable grass species, disease, insects, and surface stones.
  - 1. Scattered bare spots, none of which is larger than one square foot, will be allowed up to a maximum totaling 3% of the individual lawn areas.
  - 2. Where inspected seeded areas do not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by Owner and until the work is found acceptable.

END OF SECTION

## SECTION 33 01 35

### MAINTENANCE, SUPPORT, AND RESTORATION OF UTILITY FACILITIES

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. This section provides for the protection, support, maintenance, and reconstruction or relocation of existing underground and above ground utility facilities if affected by reasons of construction operations. The existing utility facilities include gas, electric, water, telephone, cable television, sewer, and storm drainage, in addition to others shown on the drawings and specified in the Specifications.
- B. Working methods and procedures that might, in the opinion of Owner, cause damage to any underground utility facility will not be acceptable. However, Owner's acceptance of construction methods and procedures does not relieve Contractor of his responsibilities regarding the protection and preservation of the utilities.
- C. For the purpose of establishing the exact location of subsurface utilities, Owner may direct the excavation of test pits. Failure of Owner to direct the digging of test pits will not be considered as relieving Contractor of his responsibilities regarding the protection and preservation of utilities.

##### 1.02 SUBMITTALS

- A. Shop and Work Drawings:
  - 1. Prepare and submit, to the Utility owner and to Owner, working drawings and shop drawings showing the plan and scheduling for performance of the work.
  - 2. Show on the drawings the actual location of existing facilities, any interference which these facilities present to the new work, proposed construction, and details of proposed support system.
  - 3. Start work only after approval in writing has been received from the Utility owner and Owner.
- B. Notification of Utilities
  - 1. Pursuant to Section 153.64 of the Ohio Revised Code, Owner has contacted owners of underground facilities for information relating to the existence and location of underground utility facilities within the construction area.
    - a. There are utility companies which are not members of an underground utility protection service. Contractor must contact Owner for a listing of the non-member utilities.

2. Within ten (10) calendar days of the award of this Contract, Owner will give notice by certified mail of the award of this Contract and the name and address of Contractor to all owners of underground utility facilities known to be located in the construction area.
3. Contractor shall be responsible for all losses costs and expenses, direct or indirect, arising out of or in any way related to damage or injury to any underground utility facility in the following circumstances:
  - a. Contractor fails to comply with the above paragraph hereof and the damage or injury could have been prevented or mitigated, in whole or in part, if Contractor had complied with such paragraph hereof.
  - b. The underground utility facility was located as marked by Owner of the underground utility facility or Contractor had actual notice of the location of the underground utility facility.
  - c. Contractor hereby agrees to indemnify and save harmless Owner from and against all liabilities, claims, or demands arising out of or in any way related to such damage or injury and further from and against any judgment, settlement, penalty, loss, costs, expenses, liability, or damages that Owner may directly or indirectly sustain, suffer, or incur as a result thereof.
4. Contractor shall immediately alert the occupants of nearby premises as to any emergency that Contractor may create or discover at or near such premises. Contractor shall report immediately to Owner or operator of the underground utility facility any break or leaks on its lines or any dent, gouge, groove, or other damage to such lines or to their coating or cathodic protection, made or discovered in the course of their excavation.
5. In the event of a dispute as to the application of Section 153.64 of the Ohio Revised Code, the dispute shall be resolved in accordance with the provisions of this Contract.

### 1.03 SITE CONDITIONS

#### A. Location of Facilities:

1. Owner has relied upon the utility owners to provide information about the existence and location of underground facilities. Reasonable diligence has been made by Owner to reflect the information obtained from the utility companies on the Contract Drawings; however, the locations are not guaranteed correct. Owner accepts no responsibility for and makes no representation or warranty as to the accuracy or completeness of the utility information provided on the Contract Drawings.
2. Verify by field investigation the locations of facilities within and adjacent to the limits of the project which may be affected by construction operations, as herein

specified, and that may adversely affect the construction operations. Avoid damage or disruption of facilities during this operation.

3. Whenever an existing facility is encountered which is not shown on the Drawings, or when a facility is determined to differ from that indicated, determine ownership, use, and disposition of such facility, and perform all necessary work approved by Owner and the Utility owner. Payment for such work will be made in accordance with the General Terms and Conditions.

B. Responsibilities:

1. For work not shown on the drawings, Contractor shall pay Utility directly if the Utility performs work not shown on the Drawings as an aid to Contractor's construction. Obtain and pay for all necessary permits. If Contractor elects to remove, replace, or relocate any poles, utilities, or structures, he shall be responsible to make all arrangements and obtain all necessary utility engineering, design, permits, and approvals from the Utility and Owner.
2. Contractor shall be responsible to restore any damaged or displaced property to the pre-existing condition all with the full knowledge and approval of Owners of the property. This applies equally to all above and below ground properties, utilities, structures, and appurtenances involved. Where the damaged item involves public health and safety, it must be repaired within 24 hours or Owner may have the repairs made at the expense of Contractor. Contractor shall repair all other items expeditiously.

C. Location of Buried Utilities and Structures:

1. It is Contractor's responsibility to accurately locate all utilities, structures, and appurtenances in the field. Contractor shall also make all arrangements and liaisons necessary with the Utility companies concerned to mark their lines, structures, and appurtenances by coded symbols on the pavement or marked stakes. All of the above shall be done in advance of any construction, and notification shall be given to the Utility and Owner six (6) weeks prior to utility field markings.
2. Contractor shall perform subsurface investigations as necessary and sufficiently in advance of trenching or excavation to enable adequate planning of construction.
3. Subsurface investigations shall be performed as necessary to field verify the locations, depth of bury, diameter, and pipe material of existing underground utilities at crossings and at tie-in points before ordering materials or commencing excavation. Immediately notify Owner if conflicts are encountered.
4. The cost of subsurface investigations shall be incidental to the work being performed.

D. Coordination with Utilities:

1. Establish through Owner direct and continuous contact with the respective Utilities and cooperate with them in all phases of the work.
2. Contact the Utility early enough to allow sufficient time to accomplish the work they are required to perform, giving special consideration to the lead times required for cable work. Provide the Utility with the schedule of utility relocation to coordinate with the sequence of construction.
3. To locate buried telephone cables, call the local telephone company's "buried cable location service" at least 48-hours prior to starting any excavation.
4. Prior to disconnecting any water service, notify the Utility owner 48-hours in advance for permission. Coordinate as required.
5. Power poles shall be supported at the expense of the Contractor.

## PART 2 - MATERIALS (Not Used)

## PART 3 - EXECUTION

### 3.01 SETTLEMENT OR MOVEMENT

- A. In case of settlement or other movement, which might cause damage, take immediate remedial measures to correct the conditions and damages caused by the settlement.

### 3.02 EXCAVATION AND BACKFILLING OF UTILITY TRENCHES

- A. Excavate and backfill utility facility trenches in accordance with the Specifications. Proceed with caution in the areas of utility facilities and expose them by hand or other excavation methods acceptable to the facility owner.

### 3.03 REPLACEMENT OR RELOCATION OF EXISTING UTILITIES

- A. All existing utility systems which conflict with the construction of the work herein shall be relocated or temporarily removed and replaced, as required. Such relocating or temporary removal and replacement shall be accomplished by Contractor. Any relocated utility that is not removed and remains in-place shall be plugged or bulkheaded at its upstream and downstream ends to prevent loss of ground and infiltration of cementitious materials (cement concrete, grout, CLSM, etc.) into the remaining void space and beyond.
- B. It shall be Contractor's responsibility to liaison with all Utility companies, and replacements and relocations shall be completed in compliance with their requirements. In all cases existing utility service shall be maintained until the new lines are completed and ready for use. Homeowners shall have 48-hour prior notice of any interruption of service necessary to affect changeover to the new lines.



- C. Permit Owners of the utilities and their agents access to the site of the work at all times during relocation or protection of their facilities, and cooperate with them in performing this work.
- D. Cooperate with the Utility owners concerned and notify Owner not less than thirty (30) days in advance, unless noted otherwise, of the time scheduled to perform any work that will endanger or affect their facilities.
- E. Any public utility facilities being constructed under this Contract shall be subject to inspection by the Utility owner during construction, and the Utility owner shall be given the opportunity to inspect material to be used in reference to the specifications and plan details applying to such materials.
- F. No additional compensation will be allowed for any delays, inconvenience, or damage sustained by Contractor for the relocation and replacement of permanent and temporary utilities due to interference from said utility appurtenances or the operation of moving them either by the utility company or by Contractor.
- G. Notify Owner at least thirty (30) days in advance of any utility mark out required.

END OF SECTION

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## SECTION 40 23 19.04

### DUCTILE IRON PIPE AND FITTINGS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION:

- A. Provide and test ductile iron pipe, fittings and appurtenances as indicated and in compliance with Contract Documents.
- B. Options:
  - 1. For buried exterior pipelines provide push-on joint pipe.
    - a. Provide restrained push-on pipe as specified
    - b. Provide either restrained push-on joint fittings as specified and indicated or provide mechanical joint fittings with restraint system as specified herein
  - 2. For piping exposed as in buildings and galleries, provide flanged or rigid-joint, grooved-coupled pipe and fittings.
  - 3. Cast iron pipe and fittings are not acceptable.

##### 1.02 REFERENCES”

- A. American Society of Mechanical Engineers (AMSE):
  - 1. B16.1: Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
  - 2. B16.21: Nonmetallic Flat Gaskets for Pipe Flanges.
  - 3. B16.42: Ductile Iron Pipe Flanges and Flanged Fittings.
  - 4. B31.1: Power Piping.
- B. ASTM International (ASTM):
  - 1. A240: Specification for Heat Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels.
  - 2. A307: Carbon Steel Bolts and Studs, 60,000 psi Tensile.
  - 3. A380: Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment and Systems.

4. A530: Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe.
5. A774: Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.
6. A778: Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products.

C. American Water Works Association (AWWA):

1. A21.4: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. A21.10: Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
3. A21.11: Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe Fittings.
4. A21.15: Flanged Ductile-Iron Pipe with Threaded Flanges.
5. A21.50: Thickness Design of Ductile-Iron Pipe.
6. A21.51: Ductile-Iron Pipe, Centrifugally Cast in Metal Molds, or Sand-Lined Molds, for Water or Other Liquids.
7. A21.53: Ductile-Iron Compact Fittings, 3-in through 16-in. for Water and Other Liquids.
8. C105/A21.5: Polyethylene Encasement for Ductile Iron Pipe Systems.

D. ISO:

1. 8179-1: Ductile Iron Pipes – External Zinc-Based Coating – Part 1: Metallic zinc with finishing layer. Second edition 2004-06-01.

E. Fluid Sealing Association: Technical Handbook.

1.03 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00

1. Pipe manufacturer's technical specification and product data.
2. Certified shop and erection drawings. Contractor shall submit electronic files of the piping layout including the following.
  - a. Pipe layouts in full detail.

- b. Location of hangers and supports.
  - c. Location and type of anchors.
  - d. Location of couplings and expansion joints.
  - e. 1/2-inch = 1 foot-0 inch (1 mm = 25 mm) scale details of all wall penetrations and special fittings.
  - f. Schedules of pipe, fittings, special castings, couplings, expansion joints and other appurtenances.
3. Certificates: Sworn certificates in duplicate showing compliance with material used and shop tests performed.
  4. Catalog cuts and technical data for expansion joints, couplings, gaskets, pipe supports and other accessories.
  5. Brochures and technical data on coatings and linings and proposed method of application.
  6. Manufacturer's descriptive literature and technical data on insulation and proposed method of installation.

**B. Material Certification:**

1. Provide certification from the pipe and fittings manufacturer that the materials of construction specified are recommended and designed for the service conditions specified and indicated. If materials other than those specified are proposed based on incompatibility with the service conditions, provide technical data and certification that the proposed materials are recommended and designed for the service conditions specified and indicated including an installation list of a minimum of five (5) installations in operation for a minimum of five (5) years. Provide proposed materials at no additional cost to the Owner.
2. Where materials are not specified, provide technical data and certification that the proposed materials are recommended and designed for the service conditions specified and indicated.

**C. A copy of the contract mechanical process, civil and structural drawings, with addenda that are applicable to the equipment specified in this section, marked to show all changes necessary for the equipment proposed for this specification section. If no changes are required, mark all drawings with "No changes required" or provide a statement that no changes are required.**

1. Failure to include all drawings or a statement applicable to the equipment specified in this section will result in submittal return without review until a complete package is submitted.

2. A copy of this specification section with addenda and all referenced specification sections with addenda, with each paragraph check-marked to indicate specification compliance or marked and indexed to indicate requested deviations and clarifications from the specified requirements.
  - a. If deviations and clarifications from the specifications are indicated, therefore requested by the Contractor, provide a detailed written justification for each deviation and clarification.
  - b. Failure to include a copy of the marked-up specification sections and or the detailed justifications for any requested deviation or clarification will result in submittal return without review until marked up specifications and justifications are submitted in a complete package.

#### 1.04 QUALITY ASSURANCE:

- A. Provide in accordance with Section 01 43 00 and as specified.
- B. Provide manufacturer's certification in writing, that materials meet or exceed minimum requirements as specified.
- C. Inspect and test at foundry according to applicable standard specifications.
- D. Owner reserves right to inspect and test by independent service at manufacturer's plant or elsewhere at his own expense.
- E. Visually inspect before installation.
- F. Job Conditions:
  1. Coordinate dimensions and drillings of flanges with flanges for valves, pumps and equipment to be installed in the piping systems.

#### 1.05 DELIVERY, STORAGE AND HANDLING:

- A. Comply with the requirements specified in Section 01 66 10.
- B. During loading, transportation and unloading, prevent damage to pipes and fittings. Load and unload each pipe under control at all times. Under no circumstances will a dropped pipe be used unless inspected and accepted by Engineer. Place skids or blocks under each pipe in the shop and securely wedge pipe during transportation.

### PART 2 - PRODUCTS

#### 2.01 PIPE:

- A. Ductile Iron:

1. Design conforming to AWWA A21.50.
2. Manufacture conforming to AWWA A21.15 or AWWA A21.51.
3. Thickness class, unless otherwise indicated or specified:
  - a. Minimum Thickness Class 52.
  - b. Minimum thickness Class 53 for use with threaded flanges.
  - c. Minimum thickness Class 53 for use with flanged pipe.
  - d. Minimum thickness for use with grooved couplings conforming to AWWA C606.

#### 2.02 PIPE FOR USE WITH COUPLINGS:

- A. As specified above except ends shall be plain.
- B. With bolted split sleeve couplings, ends cast or machined at right angles to axis.
- C. With grooved type coupling:
  1. Ductile-Iron of thickness class specified above.
  2. Grooved End dimensions conforming to AWWA C606 for flexible or rigid joints to suit joint requirements.

#### 2.03 FITTINGS:

- A. Provide fittings conforming to AWWA A21.10 or AWWA A21.53, at least Class 150 and match piping class.
- B. Provide all bell push-on or mechanical-joint fittings unless otherwise indicated or specified.
- C. Face and drill flanged fittings conforming to AWWA A21.10 except special drilling or tapping for correct alignment and bolting.
- D. If flanged fittings are not available under AWWA A21.10 provide fittings conforming to ASME B16.1 in 125 lb. pressure class.
- E. Provide standard base fittings where indicated.
- F. Provide grooved-end fittings ductile-iron conforming to AWWA A21.10 for center-to-face dimensions.
  1. End preparation for grooved-ends conforming to AWWA C606 for flexible or rigid joints as required by type of joint.

2.04 NONSTANDARD FITTINGS:

- A. Acceptable design.
- B. Same diameter and thickness as standard fittings.
- C. Manufactured to meet requirements of same specifications as standard fittings except for laying length and types of ends.

2.05 WALL CASTINGS:

- A. Provide size and type indicated and specified.
  - 1. Piping 24-inches (600 mm) and Smaller: Mechanical Joint with specified restraint or Restrained Push-On.
  - 2. Piping 30-inches (750 mm) and Larger: Restrained Push-On.
- B. Wall Castings: Conform to requirements of AWWA A21.10 or fabricate of Class 53 ductile iron pipe with screwed on flanges and welded on waterstop. Screwed on mechanical or push-on joints are not acceptable.
- C. Provide water stop **centered** in wall. Weld water stops on in factory under controlled conditions to ensure adequate strength to permit waterstop to absorb thrust up to the pressure rating of the pipe.

<b>Wall Castings with annealed ductile iron water stops</b>	
<b>Pipe Size</b>	<b>Waterstop thickness, inches</b>
4 inch-12 inch (100-300 mm)	0.50 (13 mm)
14 inch-24 inch (350 -600 mm)	0.75 (19 mm)
30 inch-36 inch (750-900 mm)	1.00 (25 mm)
42 inch-48 inch (1050-1200 mm)	1.25 (32 mm)

<b>Wall Castings with fabricated steel water stops</b>	
<b>Pipe Size</b>	<b>Waterstop thickness, in</b>
4 inch-16 inch (100-400 mm)	0.25 (6 mm)
18 inch-24 inch (450 -600 mm)	0.38 (10 mm)
30 inch-36 inch (750-900 mm)	0.50 (13 mm)
42 inch-48 inch (1050-1200 mm)	0.75 (19 mm)
54 inch-64 inch (1050-1200 mm)	1.00 (25 mm)

- D. On flanged wall castings, provide space between the wall and flange to permit mounting the nuts on the flange bolts.
- E. Flanged wall castings located with the flange flush with the wall are not acceptable.



- F. Locate push-on joint wall castings with space between the bell and the wall to insert the follower bolts.
- G. As an option, fabricated wall pipe of Type 316L stainless steel may be substituted for ductile iron wall castings specified above.
  - 1. Provide with waterstops of above dimensions and welded continuously on both sides of waterstop.
  - 2. Flanges of Type 316 stainless steel. Bolts for connection to buried pipe Type 316 stainless steel. Provide flange insulation gaskets, sleeves and washers for all flanges.
  - 3. Provide pipe ID to match connecting ductile iron pipe ID and provide pipe wall thickness to match pressure rating of connecting ductile iron pipe.
- H. Testing: Factory pressure test all wall castings to pipe and joint pressure rating for a minimum of 5 minutes. No visible leakage is acceptable.

#### 2.06 ADAPTERS:

- A. Furnish and install for joining pipe of different types, unless solid sleeves indicated.
  - 1. Provide ends conforming to above specifications for the correct type of joint, to receive adjoining pipe.
  - 2. Joining two classes of pipe may be of lighter class provided annular space in bell-and-spigot type joints sufficient for jointing.

#### 2.07 JOINTS:

- A. Provide push-on joint and mechanical joint pipe with necessary accessories, conforming to AWWA A21.11.
  - 1. Provide gasket composition designed for exposure to liquid within pipe.
- B. Provide pipe flanges and accessories conforming to AWWA A21.15.
  - 1. Provide flat faced flanges.
  - 2. Provide 1/8-inch (3 mm) thick, full faced gaskets designed for exposure to liquid within pipe.
- C. Provide restrained joint on pipe and fittings where indicated. Provide restrained joint which is:
  - 1. Boltless
  - 2. Capable of being deflected after assembly

3. Designs using set screws or requiring field welding are not acceptable.
4. Manufacturers:
  - a. American Cast Iron Pipe Co. Flex-Ring.
  - b. U.S. Pipe TR FLEX.
  - c. Clow Super-Lock.

#### 2.08 MECHANICAL JOINT FITTINGS – RESTRAINT SYSTEM:

- A. Provide restraint devices for pipe consisting of multiple gripping wedges incorporated into a follower gland meeting requirements of AWWA A21.10.
  1. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, retaining full mechanical joint deflection during assembly and allowing joint deflection after assembly.
  2. Provide actuation of the gripping wedges ensured with torque limiting twist off nuts.
  3. Provide restraint devices Listed by Underwriters Laboratories (3 inch (75 mm) through 24 inch (600 mm) size) and Designed by Factory Mutual (3 inch (75 mm) through 12 inch (300 mm) size).
  4. Gland body, wedges and wedge actuating components must be domestic manufactured in the USA.
- B. Working Pressure Rating:
  1. 16-inch (400 mm) and Smaller: 350 psi (2413 kPa).
  2. 18-inch (450 mm) thru 48-inch (1200 mm): 250 psi (1724 kPa).
  3. 54-inch (1400 mm): 200 psi (1379 kPa).
  4. Minimum safety factor: 2 to 1.
- C. Materials:
  1. Gland body, wedges and wedge actuating components: Grade 65-45-12 ductile iron in accordance with ASTM A536.
  2. Ductile iron gripping wedges: Heat treated, 370 to 470 BHN.
  3. Provide three (3) test bars incrementally poured per production shift as per Underwriter's Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation in accordance with ASTM E8.

4. Provide chemical and nodularity tests performed as recommended by the Ductile Iron Society, on a per ladle basis.
5. Provide an identification number consisting of year, day, plant and shift (YYDDD)(plant designation)(Shift number) cast into each gland body.
6. Record all physical and chemical test results such that they can be accessed via the identification number on the casting. Provide the Material Traceability Records (MTRs) available, in hard copy.
7. Provide coating for restraint devices consisting of the following:
  - a. Process all wedge assemblies and related parts through a phosphate wash, rinse and drying operation prior to coating application.
  - b. Coating: A minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.
  - c. Surface pretreat all casting bodies with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. Coating: Polyester based powder to provide corrosion, impact and UV resistance.
  - d. Coating system: MEGA-BOND by EBAA Iron, Inc.

D. Manufacturer:

1. EBAA Iron MEGALUG Series 1100

2.09 FLANGE ADAPTORS:

A. Provide restrained flange adaptors for pipe consisting of multiple individual gripping wedges incorporated into a follower gland meeting requirements of AWWA A21.10.

1. Provide actuation of the gripping wedges ensured with torque limiting twist off nuts.
2. Provide restraint devices Listed by Underwriters Laboratories (3-inch (75 mm) through 12 inch (300 mm) size) and Designed by Factory Mutual (4-inch (100 mm) through 12-inch (300 mm) size).
3. Gland body, wedges and wedge actuating components must be domestic manufactured in the USA.

B. Joint Deflection capability:

1. 3-inch through 8-inch (30 mm through 200 mm): 5 degrees
2. 10-inch and 12-inch (250 mm and 300 mm): 3 degrees

3. 14-inch and 16-inch (350 mm and 400 mm): 2 degrees
  4. 18-inch and 20-inch (450 mm and 500 mm): 1.5 degrees
  5. 20-inch, 42-inch and 48-inch (500 mm, 1050 mm and 1200 mm): 1 degrees
  6. 30-inch and 36-inch (750 mm and 900 mm): 3 degrees
- C. Provide flange adaptor to maintain seal with and 0.6 inch (15 mm) gap between end of pipe and mating flange
- D. Working Pressure Rating:
1. 16-inch (400 mm) and Smaller: 350 psi (2413 kPa)
  2. 18-inch (450 mm): 300 psi (2068 kPa)
  3. 20-inch (500 mm): 250 psi (1724 kPa)
  4. 24-inch (600 mm): 200 psi (1379 kPa)
  5. 30-inch through 48-inch (750 mm through 1200 mm): 150 psi (1034 kPa)
  6. Minimum safety factor: 2 to 1.
- E. Materials:
1. Gland body, wedges and wedge actuating components: Grade 65-45-12 ductile iron in accordance with ASTM A536.
  2. Ductile iron gripping wedges: Heat treated, 370 to 470 BHN.
  3. Provide three (3) test bars incrementally poured per production shift as per Underwriter's Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation in accordance with ASTM E8.
  4. Provide chemical and nodularity tests performed as recommended by the Ductile Iron Society, on a per ladle basis.
  5. Provide an identification number consisting of year, day, plant and shift (YYDDD)(plant designation)(Shift number) cast into each gland body.
  6. Record all physical and chemical test results such that they can be accessed via the identification number on the casting. Provide the Material Traceability Records (MTRs) available, in hard copy.
  7. Provide coating for restraint devices consisting of the following:

- a. Process all wedge assemblies and related parts through a phosphate wash, rinse and drying operation prior to coating application.
- b. Coating: A minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.
- c. Surface pretreat all casting bodies with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. Coating: Polyester based powder to provide corrosion, impact and UV resistance.
- d. Coating system: MEGA-BOND by EBAA Iron, Inc.

F. Manufacturer:

- 1. EBAA Iron MEGAFLANGE Series 2100

2.10 FLEXIBLE CONNECTIONS:

A. Use as specified or indicated:

- 1. Bolted split sleeve couplings
- 2. Grooved couplings
- 3. Expansion joints

2.11 BOLTED SPLIT SLEEVE COUPLINGS:

- A. Provide in accordance with Section 40 23 19.04.
- B. Pressure rating at least equal to that of related pipeline.
- C. Provide with gaskets of composition designed for exposure to liquid within pipe.

2.12 GROOVED COUPLINGS:

- A. Conform to AWWA C606.
- B. Minimum pipe wall thickness specified under "Pipe For Use With Couplings."
- C. Where grooved couplings are indicated to provide for expansion or flexibility, cut pipe grooves to provide necessary expansion or flexibility.
- D. Where grooved couplings are used instead of flanged joints, joint to be of rigid type with pipe grooves cut to bring pipe ends together. Beam strength of joint shall be equal to or greater than that of flanged joint.

2.13 EXPANSION JOINTS:

- A. Provide in accordance with Section 40 23 19.0.
- B. Pressure rating at least equal to that of related pipeline.

2.14 FILLING RINGS:

- A. Provide where necessary.
- B. Materials, workmanship, facing, and drilling, conforming to 125-lb. ANSI (Class 125).
- C. Suitable length with nonparallel faces and corresponding drilling, if necessary, for correct assembly of adjoining piping or equipment.

2.15 CONNECTIONS – TAPPED:

- A. Provide service saddles for all taps for lines 24-inch (600 mm) and smaller.
  - 1. Body: Ductile iron ASTM A395 or Bronze.
  - 2. Straps and Hardware: Type 316 stainless steel.
- B. For 30-inch (750 mm) and larger provide watertight joint with adequate strength against pullout. Use only tapered thread taps.
  - 1. Maximum size of taps in pipe or fittings without bosses not to exceed that listed in table of Appendix to AWWA A21.51 based on: 2 full threads.
  - 2. Where size of connection exceeds that given above for pipe, provide boss on pipe barrel or use tapping saddle. Make tap in flat part of intersection of run and branch of tee or cross, or connect by means of tapped tee, branch fitting and tapped plug or reducing flange, or tapping tee and tapping valve, or permitted.
  - 3. Provide taps and piping for gauges and pressure sensing instruments in accordance with ANSI/HI standards so that there are no erroneous readings.

2.16 PIPE COATING:

- A. Outside of pipe and fittings within structures: Clean and apply one shop coat with a 3 to 5 mil (75 to 125  $\mu$ m) DFT of moisture cured urethane.
- B. Outside surfaces of castings to be encased in concrete: No coating.
- C. Machined surfaces cleaned and coated with rust-preventative compound at shop.
- D. Outside of buried pipe and fittings:

1. Provide the exterior of all buried ductile iron pipe coated with a layer of arc-sprayed zinc in accordance with ISO 8179.
2. Mass of zinc applied: 200 g/m<sup>2</sup> of pipe surface area.
3. Provide a finishing topcoat applied to the zinc.
4. Provide the coating system conforming ISO 8179-1 “Ductile iron pipes - External zinc-based coating - Part 1: Metallic zinc with finishing layer. Second edition 2004-06-01”.

2.17 CEMENT LINING:

- A. Inside of pipe and fittings: Provide double thickness cement lining and bituminous seal coat conforming to AWWA A21.4.

2.18 GLASS LINING:

- A. Glass Lining: Vitreous material that is smooth, continuous and formulated to prevent the adherence of grease, scum and crystalline metal salt deposits in sludge, scum and related process piping systems in wastewater and sewage treatment systems.
- B. Provide lining consisting of two coats, separately applied and separately fired at a maturing temperature of approximately 1400 degrees F (760 degrees C) creating a molecular bond with the base metal and a total minimum lining thickness of 8-10 mils.
- C. Lining minimum hardness: 5-6 on the MOHS scale.
- D. Provide lining capable of withstanding an instantaneous thermal shock of 350 degrees F (195 degrees C) differential without crazing, blistering or spalling.
- E. Provide lining capable of withstanding a strain of 0.001 inch/inch (0.025 mm/mm), the yield point of the base metal, without damage to the glass lining.
- F. Provide lining resistant to corrosion of between PH-3 to 10.
- G. Testing Procedure: In accordance with industry standards “MP-9.2 .1-Industry Continuity Test Procedures-Porcelain Enamel (Glass) Lined Pipe and Fittings”.

1. Acceptance Criteria:

Pipe Diameter	Maximum Pinholes/Fitting	Maximum Pinholes/ 20 Foot Pipe Length
8-inches and Smaller	3 to 5	10 to 12
10 to 18-inches	5 to 8	18 to 20
20-inches and Larger	8 to 10	25 to 28

<b>Pipe Diameter</b>	<b>Maximum Pinholes/Fitting</b>	<b>Maximum Pinholes/6 m Pipe Length</b>
200 mm and Smaller	3 to 5	10 to 12
250 to 450 mm	5 to 8	18 to 20
500 mm and Larger	8 to 10	25 to 28

- H. The above criteria represents non-visible pinholes detectable by low voltage spark test only. Any pinholes that are visible to the naked eye and expose the base metal are not acceptable.
- I. Factory test all pipe and fittings, with certified copies of the test results accompanying each shipment.
- J. Provide documents identifying each individual item by mark number and description, the Quality Control Sequence Number, date tested, inspector, and the number of pinholes detected per item.
- K. Fabricators:
  - 1. Custom-Fab.

2.19 CERAMIC EPOXY LINING:

- A. Material:
  - 1. Amine cured novalac epoxy containing at least 20 percent by volume of ceramic quartz pigment, Tnemec 431 or approved equal.
  - 2. Permeability rating: 0.00 when tested according to Method A of ASTM E-96-66, Procedure A with a test duration of 30 days.
  - 3. Provide the following testing performed on coupons from factory lined ductile iron pipe:
  - 4. ASTM B-117 Salt Spray (scribed panel) - Results to equal 0.0 undercutting after two years.
  - 5. ASTM G-95 Cathodic Disbondment 1.5 volts at 77 degree F (25 degrees C). Results to equal no more than 0.5mm undercutting after 30 days.
  - 6. Immersion Testing rated using ASTM D-714-87.
  - 7. 20 percent Sulfuric Acid - No effect after two years.
  - 8. 140 degrees F (60 degrees C) 25 percent Sodium Hydroxide - No effect after two years.



9. 160 degrees F (71 degrees C) Distilled Water - No effect after two years.
10. 120 degrees F (49 degrees C) Tap Water (scribed panel) - 0.0 undercutting after two years with no effect.
11. An abrasion resistance of no more than 3 mils (75  $\mu\text{m}$ ) loss after one million cycles using European Standard EN 598: 1994 Section 7.8 Abrasion Resistance.

B. Lining Thickness:

1. 40 mils (1015  $\mu\text{m}$ ) nominal dry film thickness. No lining shall take place when the substrate or ambient temperature is below 40 degrees F (5 degrees C). The surface also must be dry and dust free.
2. Provide the number of coats of lining material as recommended by the lining manufacturer.

C. Preparation and Application: As recommended by the lining manufacturer

D. Lining Inspection:

1. Check all ductile iron pipe and fitting for thickness using a magnetic film thickness gauge using the method outlined in SSPC-PA-2 Film Thickness Rating.
2. Test the interior lining of all pipe barrels and fittings for pinholes with a nondestructive 2,500 volt test. Any pinholes found shall be repaired prior to shipment at no additional cost to the Owner.
3. Mark each pipe joint and fitting with the date of application of the lining system along with its numerical sequence of application on that date and records maintained by the applicator of his work.
4. Certification: The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, lining manufacturers recommendations for preparation and application and that the material used is as specified.

2.20 GASKETS, BOLTS, AND NUTS:

A. Provide ring or full face synthetic rubber gaskets for flanged joints and neoprene faced phenolic for insulating gaskets in accordance with AWWA A21.11 and ASME B16.21.

1. 1/8 inch (3 mm) thick.

B. Make flanged joints with:

1. Bolts.
2. Bolt studs with nut on each end.

3. Studs with nuts where flange is tapped.
  4. Plastic bolt sleeves and washers for insulating joints.
- C. Number and size of bolts conform to same ANS as flanges.
- D. Provide Type 316 stainless steel bolts, washers and nuts for all services:

## PART 3 - EXECUTION

### 3.01 HANDLING AND CUTTING:

- A. Mark pipe and fittings "Rejected" and remove from site when cracked or has received a severe blow.
- B. If permitted, cut on sound barrel at a point at least 12 inch (300 mm) from visible limit of crack, at Contractor's expense.
- C. Machine cut with milling type cutters, knives, or saws. Snap cutters, torch, or hammer and chisel NOT ALLOWED. Examine for possible cracks.
- D. Chamfer cut ends if used for push-on joints.
- E. Do not cut glass lined pipes.

### 3.02 INSTALLATION:

- A. Visually inspect before installation.
- B. Ensure pipelines parallel to building walls wherever possible. Install piping to accurate lines and grades. Where temporary supports are used, ensure rigidity to prevent shifting or distortion of pipe. Provide for expansion where necessary.
- C. Pitch piping toward low points. Provide for draining low points.
- D. Before assembly, remove dirt and chips from inside pipe and fittings.
- E. Piping Support: Provide in accordance with Section 40 23 19.01.
- F. Pipe and Fittings:
  1. Remove and replace defective pieces.
  2. Clear of all debris and dirt before installing and keep clean until accepted.
  3. Lay accurately to lines and grades indicated or required. Provide accurate alignment, both horizontally and vertically.

4. Provide firm bearing along entire length of buried pipelines.

**PIPE DEFLECTION ALLOWANCES**

<b>Maximum permissible deflection, inches* (mm)</b>		
Size of pipe, inches (mm)	Push-on joint	Mechanical joint
4 (100)	19 (482)	31 (787)
6 (150)	19 (482)	27 (685)
* Maximum permissible deflection for 20-feet (6.1 metres) lengths; for other lengths in proportion of such lengths to 20-feet (6.1 metres).		

- a. For push-on joint or similar pipe, clean bell of excess tar or other obstruction and wipe out before inserting next pipe spigot. Shove new pipe into place until properly seated and hold securely until joint completed.
  - b. Set castings to be encased in concrete accurately with bolt holes, if any, carefully aligned. Clean off rust and scale before setting.
- G. Temporary Plugs: When pipe laying not in progress, close open ends of pipe with temporary watertight plugs. If water in trench, do not remove plug until danger of water entering pipe passed.
- H. Appurtenances: Set valves, fittings and appurtenances as indicated.

3.03 JOINTS AND COUPLINGS:

A. Push-on Joints:

- 1. Insert gasket into groove bell. Apply thin film of nontoxic gasket lubricant over inner surface of gasket in contact with spigot end.
- 2. Insert chamfered end into gasket. Force pipe past it until it seats against socket bottom.

B. Bolted Joints:

- 1. Remove rust-preventive coatings from machined surfaces.
- 2. Clean pipe ends, sockets, sleeves, housings, and gaskets and smooth all burrs and other defects.
- 3. Use torque wrench to tighten to correct range of torque not to exceed values specified below:

<b>TORQUE RANGE VALUES</b>		
<b>Nominal pipe size, in</b>	<b>Bolt diameter, in</b>	<b>Range of torque, ft-lb</b>

3	5/8	40-60
4-24, incl.	3/4	75-90
30, 36	1	100-120
42, 48	1-1/4	120-150

<b>TORQUE RANGE VALUES</b>		
<b>Nominal pipe size, mm</b>	<b>Bolt diameter, mm</b>	<b>Range of torque, Nm</b>
75	16	55-80
100-600, incl.	19	100-120
750, 900	25	135-160
1050, 1700	32	160-200

C. Flanged Joint:

1. Make up tight.
2. Do not put strain on nozzles, valves, and other equipment.
3. Bolt threads must fully engage the nuts. At a minimum the bolt must be flush with the nut and no more than 1/2-inch (13 mm) excess thread protruding from the nut.

D. Mechanical Joints:

1. Wire brush surfaces in contact with gasket and clean gasket.
2. Lubricate gasket, bell, and spigot with soapy water.
3. Slip gland and gasket over spigot, and insert spigot into bell until seated.
4. Seat gasket and press gland firmly against gasket.
5. After bolts inserted and nuts made finger-tight, tighten diametrically opposite nuts progressively and uniformly around joint by torque wrench. Torque bolts to values specified above.

E. Flexible Joints:

1. Clean and dry before assembly.
2. Place gaskets, rings, glands and followers in position in back of spigot ball.
3. Coat ball and socket with thin film of lubricant conforming to joint manufacturer's standards.
4. Insert ball and seat in socket. Seat gasket against ball.
5. Boltless joints:

- a. Assemble retainer rings and glands conforming to manufacturer's standard.
- b. Lock in place with lead strips.

F. Grooved Couplings:

1. Clean grooves and other parts.
2. Coat ends of pipe and outside of gasket with soft soap or silicone and slip gasket over one pipe end.
3. Bring pipes to correct position and **center** gasket over pipe ends with lips against pipe.
4. Place housing sections, insert bolts and tighten nuts until housing sections in metal-to-metal contact.
5. After assembly and inspection and before backfilling, coat exterior surfaces of buried couplings, including bolts and nuts, with heavy-bodied bituminous mastic.

G. Tapped Connection:

1. Drill and tap normal to longitudinal axis.
2. Drilled by skilled mechanics using proper tools.
3. Use only tapered threads.

H. Electrical Conductors:

1. Install pipes so terminal strips are aligned.
2. Install jumper strips and tighten bolts.

3.04 POLYETHYLENE ENCASEMENT

- A. Provide polyethylene encasement for use with ductile iron pipe in accordance with ANSI/AWWA C105/ A21.5, Polyethylene Encasement for Ductile Iron Pipe Systems.
- B. Provide the polyethylene encasement for use with ductile iron pipe systems consisting of three layers of co-extruded linear low density polyethylene (LLDPE), fused into a single thickness of not less than eight mils.
- C. Provide the inside surface of the polyethylene wrap in contact with the pipe exterior infused with a blend of antimicrobial compound to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
- D. Install ductile iron pipe and the polyethylene encasement in accordance with AWWA C600 and ANSI/AWWA C105/A21.5 and also in accordance with all recommendations

and practices of the AWWA M41, Manual of Water Supply Practices – Ductile Iron Pipe and Fittings.

- E. Overlap the wrap one foot (300 mm) in each direction at joints and secure in place around the pipe. Provide any wrap at tap locations taped tightly prior to tapping and inspected for any repairs following the tap and repair as required.

### 3.05 FIELD TESTING:

- A. Provide in accordance with Section 09 91 13.
- B. Clean of all dirt, dust, oil, grease and other foreign material, before conducting pressure and leakage tests.
- C. Pressure and Leakage Tests:
  - 1. Conduct combined pressure and leakage test in pipelines.
  - 2. Furnish and install temporary testing plugs or caps; pressure pumps, pipe connections, meters, gages, equipment, and labor.
  - 3. Test when desired and comply with specifications.
  - 4. Test pipelines in excavation or embedded in concrete before backfill or placing of concrete and test exposed piping before field painting.
  - 5. Fill section of pipe with water and expel air. If hydrants or blowoffs are not available at high points for releasing air, make necessary taps and plug after test completion.
  - 6. Maintain section full of water for 24 hours before conducting combined pressure and leakage test.
  - 7. Conduct pressure and leakage test consisting of first raising water pressure (based on elevation of lowest point of section under test and corrected to gage location) to pressure **in psi** numerically equal to pipe pressure rating, but not more than 150 psi (1050 kPa).
  - 8. Maintain pressure and make leakage test by metering water flow into pipe. Acceptable results:
    - a. Average leakage during test: less than 10 gallons (1 liter) per inch (mm) of diameter per 24 hours per mile (km).
    - b. No visible leakage in joints.
  - 9. If unable to achieve and maintain specified pressure for one hour with no additional pumping, section fails test.

10. If section fails pressure and leakage test, locate, uncover, and repair or replace defective pipe, fitting, or joint, at no additional expense and without time extension. Conduct additional tests and repairs until section passes test.

11. Modify test procedure only if permitted by Engineer.

3.06 FIELD PAINTING:

A. Provide in accordance with Section 09 91 13

3.07 CONTRACT CLOSEOUT:

A. Provide in accordance with Section 01 77 00

END OF SECTION