

**PROJECT MANUAL
DOCUMENTS AND SPECIFICATIONS
TOWN OF SMYRNA, TENNESSEE
BASIN A SEWER REHABILITATION PHASE 1
AMERICAN RESCUE PLAN (ARP)
STATE AND LOCAL FISCAL RECOVERY FUND
(SLFRF)**

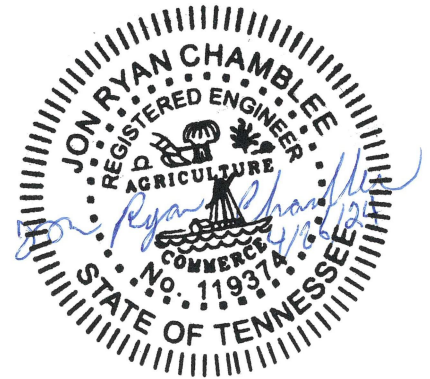


**MAYOR
HONORABLE MARY ESTHER REED**

**TOWN OF SMYRNA COUNCIL
MARC ADKINS, VICE MAYOR
H. G. COLE
TIM MORRELL
GERRY SHORT
STEVE SULLIVAN
RACQUEL PEEBLES**

**TOWN MANAGER (INTERIM)
JEFF PEACH**

**DIRECTOR OF UTILITIES
MIKE STRANGE**



TOWN OF SMYRNA, TENNESSEE

APPROVED BY: *Mike Strange*
TITLE: DIRECTOR OF UTILITIES DATE: 4-26-2024



Date: APRIL, 2024
File No.: 28299.0036
Contract Set No.: _____

INDEX TO PROJECT MANUAL

FILE NO. 28299.0036

GENERAL

This Project Manual follows the Construction Specifications Institute Format Document Identifying System and Cost Accounting Numbers.

Non-applicable division and section references have been omitted.

Recipients of bidding instruments must consult the Index to determine the full scope of the work involved and to ensure that all pages of the project manual and drawings have been included.

Neither the Owner nor the A/E will be responsible for bids submitted that are based on incomplete bidding instruments.

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INVITATION TO BIDDERS

The Town of Smyrna will accept bids on the **BASIN A SEWER REHABILITATION PHASE 1** work will include:

Approximately 10,000 L.F. of existing 8" sewer main rehabilitation by cured-in-place pipe (CIPP) lining, CIPP sewer service lining; epoxy spray liner rehabilitation of 50 manholes, installation of 75 inflow dish frame inserts pre- and post-construction video inspection; pavement repair; erosion control and appurtenances. The project shall be completed fully within one-hundred and eighty (180) consecutive calendar days.

A **Mandatory** Pre-Bid Meeting will be held on **Tuesday, June 18, 2024 at 10:30 A.M.** at the Smyrna Town Hall. Bids received from bidders who have not attended the Pre-Bid Meeting and Signed the attendance sheet at the meeting will be considered nonresponsive.

Sealed bids will be accepted until **Tuesday, July 2, 2024 at 10:30 A.M.** at which time bids will be publicly opened and read aloud. All bids must be marked in a sealed envelope and mailed or hand delivered to:

Rex S. Gaither
Smyrna Town Hall
Basin A Sewer Rehabilitation Phase 1
315 South Lowry Street
Smyrna, TN 37167

Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, Forms of Bonds and other contract documents may be examined at the following locations:

Ryan Chamblee, P.E.
Thomas & Hutton
502 Hazelwood Drive
Smyrna, TN 37167
629-900-4906
chamblee.r@tandh.com

Town of Smyrna
Michael Strange
Utilities Director
315 South Lowry Street
Smyrna, TN 37167
615-355-5711

Builder's Exchange of Tennessee
Nashville Office
2322 Winford Avenue,
Nashville, TN 37221

Copies of both plans and specifications may be obtained from Thomas & Hutton upon payment of \$250.00 per set, none of which is refundable. Bids will not be opened from Bidders who have not obtained the contract documents from the engineer.

All Bidders must be licensed Contractors in the State of Tennessee in strict accordance with State regulations. All bidders shall comply with the Tennessee Contractor' License law Section 62-6-119 (Bid documents - Required disclosure by bidders) when submitting bids. Please refer to State Licensing Board <https://www.tn.gov/commerce/regboards/contractor> for all applicable licensing laws.

Bidders may be required to obtain a Smyrna Business License. Refer to the contract documents for criteria.

All bidders shall adhere to Title VI of the Civil Rights Act enacted in 1964 which states that "No person in the United States shall, on grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or subjected to discrimination under any program or activity receiving federal financial assistance", state of Tennessee funding, and/or funded by the Town of Smyrna. In addition, the Town of Smyrna will not discriminate in the purchase of all goods and services on the basis of race, color, religion, sex, national origin, age, disability or any other lawfully protected classification.

Bids may not be withdrawn for ninety (90) days after the actual date of the opening.

The Town of Smyrna reserves the right to reject any and all bids, to waive technicalities or informalities and to accept any bid deemed to be in the best interest of the Town.

DAVIS-BACON ACT and DOMESTIC SOURCED GOOD PREFERENCE

This project is being funded by a American Rescue Plan (ARP) State and Local Fiscal Recovery Fund (SLFRF). The fund recipient must be in compliance with all applicable Davis-Bacon Act and domestic sourced goods requirements.

DISADVANTAGED BUSINESS ENTERPRISES (DBE) REQUIREMENTS

Any contract or contracts awarded by the Owner through this invitation for bids will be funded by an American Rescue Plan (ARP) State and Local Fiscal Recovery Fund (SLFRF). Certified DBEs may be listed with TDOT, the Governor's Diversity Business Office (Go-DBE) at <https://www.tn.gov/generalservices/procurement/central-procurement-office--cpo-go-dbe/current-procurement-opportunities/>, or elsewhere.

SPECIAL NOTICE TO DISADVANTAGED BUSINESS ENTERPRISES (DBE) FIRMS

All qualified Disadvantaged Business Enterprises (DBE) firms desiring to bid as a General Contractor, sub-contractor, professional service provider, supplier, or equipment vendor are encouraged to visit Go-DBE to review bidding/contract documents. Qualified Disadvantaged Business Enterprises (DBE) firms shall contact Thomas & Hutton per the contact information provided in this advertisement in order to obtain a list of prospective bidding General Contractors or to obtain copies of bidding/contract documents.

SUBMITTED BY: REX S. GAITHER
 ASSISTANT TOWN MANAGER

SECTION 00130

INSTRUCTION TO BIDDERS

1 - DEFINED TERMS

Terms used in these Instructions to Bidders that are defined in the Standard General Conditions of the construction contract, NSPE-ACEC Document 1910-8, CSI 56465 (latest edit.), have the meanings assigned to them in the General Conditions. The term "Successful Bidder" means the lowest qualified, responsible Bidder to whom the Owner (on the basis of the Owner's evaluation as hereinafter provided) makes award.

2 - COPIES OF BIDDING INSTRUMENTS

2.1 Complete sets of bidding instruments in the number and for the sum, if any, stated in the Advertisement or Invitation may be obtained from the A/E (unless another issuing office is designated in the Advertisement or Invitation to Bid). The cost will be NON-REFUNDABLE as stated in the Advertisement for Bids.

2.2 Complete sets of bidding instruments shall be used in preparing bids; neither the Owner nor the A/E assumes any responsibility for errors of misinterpretations resulting from the use of incomplete sets of bidding instruments.

2.3 The Owner and A/E, in making copies of the bidding instruments available on the above terms, do so only for the purpose of obtaining bids on the work and do not confer a license or grant for any other use.

3 - QUALIFICATIONS OF BIDDERS

To demonstrate qualifications to perform the work, each Bidder must be prepared to submit, within five (5) days of a request from the Owner, written evidence of the kinds set forth in the Supplementary Conditions, e.g., financial data, previous experience, and evidence of authority to conduct business in the jurisdiction where the project is located.

4 - EXAMINATION OF BIDDING INSTRUMENTS AND SITE

It is the contractor's responsibility to exam all bid documents prior to bidding. Should the contractor be unclear on an issue or item he shall submit his questions to the A/E at least 10 days prior to the bid date. The A/E will reply prior to the bid date. The contractor shall also visit the site to familiarize himself with all existing conditions and possible construction conditions

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as to allow himself to submit a fair and equitable bid.

4.1 Before submitting a bid, each Bidder must (a) examine the bidding instruments thoroughly; (b) visit the site to familiarize himself with local conditions that may in any manner affect the cost, progress, or performance of the work; (c) familiarize himself with federal, state, and local laws, ordinances, rules, and regulations that may in any manner affect the cost, progress, or performance of the work; and (d) study and carefully correlate his observations with the bidding instruments.

4.2 Reference is made to the Supplementary Conditions for the identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or other factors affecting the cost, progress, or performance of the work that have been relied upon by the A/E in preparing the drawings and specifications. The Owner will make copies of such reports available to any Bidder requesting them. These reports are not guaranteed as to accuracy or completeness, nor are they part of the bidding instruments. Before submitting his bid, each Bidder will, at his own expense, make such additional investigations and tests as the Bidder may deem necessary to determine his bid for the performance of the work in accordance with the time, price, and other terms and conditions of the bidding instruments.

4.3 On request, the Owner will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his bid.

4.4 The lands upon which the work is to be performed rights-of-way for access thereto, and other lands designated for use by the Contractor in performing the work are identified in the General Conditions, Supplementary Conditions, or the drawings.

4.5 The submission of a bid will constitute an incontrovertible representation by the Bidder that he has complied with every requirement of this Article 4 and that the bidding instruments are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the work.

5 - INTERPRETATIONS

All questions about the meaning or intent of the bidding instruments shall be submitted to the A/E in writing. Replies will be issued by addenda that are mailed or delivered to all parties recorded by the A/E as having received the bidding instruments. Questions received less than ten (10) days prior to the date for opening of bids will not be answered. Only questions answered by formal written addenda will be binding. Oral and other

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interpretations or clarifications will be without legal effect.

6 - BID SECURITY

6.1 Bid security shall be made payable to the Owner in an amount of five percent (5%) of the Bidder's maximum bid price and in the form of a certified or bank check or a bid bond, on the form attached, issued by a Surety meeting the requirements of paragraph 5.1 of the General Conditions.

6.2 The bid security of the successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon it will be returned. If the successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within twenty (20) days of the Notice of Award, the Owner may annul the Notice of Award, and the bid security of that Bidder will be forfeited. The bid security of any Bidder whom the Owner believes to have a reasonable chance of receiving the award may be retained by the Owner until either the seventh day after the "effective date of the Agreement" (which term is defined in the General Conditions) or the sixty-first (61st) day after the bid opening, whichever is earlier. Bid security of other Bidders will be returned within seven (7) days of the bid opening.

7 - CONTRACT TIME

The number of days within which, or the date by which, the work is to be completed (the contract time) is set forth in the Bid Form and will be included in the Agreement.

8 - LIQUIDATED DAMAGES

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

9 - SUBSTITUTE MATERIAL AND EQUIPMENT

If the Contract is awarded, this will be done on the basis of the materials and equipment described in the drawings or specified in the specifications without consideration of possible substitute of "or equal" items. Whenever it is included in the drawings or specified in the specifications that a substitute or "or equal" item of material or equipment may be furnished or used by the Contractor if acceptable to the A/E, application for such acceptance will not be considered by the A/E until after the effective date of the Agreement. The procedure for submittal of any such application by the Contractor and consideration by the A/E is set forth in paragraphs 6.7.1, 6.7.2, and 6.7.3 of the General

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Conditions, which may be supplemented in the Supplementary Conditions.

10 - SUBCONTRACTORS, ETC.

10.1 If the Supplementary Conditions require the identity of certain Subcontractors or other persons and organizations to be submitted to the Owner in advance of the Notice of Award, the apparent successful Bidder, and any other Bidder so required, will within seven (7) days after the day of bid opening submit to the Owner a list of all Subcontractors and other persons and organizations (including those who are to furnish the principal items of material and equipment) proposed for those portions of the work and for whom such identification is required. If requested by the Owner, such list shall be accompanied by an experience statement with pertinent information as to similar projects and other evidence of qualification for each such Subcontractor, person, and organization. If, after due investigation, the Owner or A/E has reasonable objection to any proposed Subcontractor or other person or organization, either the Owner or A/E may, before giving the Notice of Award, request the apparent successful Bidder to submit an acceptable substitute. If the apparent successful Bidder declines to make any such substitution, the Contract shall not be awarded to that Bidder, although his declining to make any such substitution will not constitute grounds for sacrificing his bid security. Any Subcontractor or other person or organization so listed and to whom the Owner or A/E does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to the Owner and A/E.

10.2 In Contracts in which the contract price is based on the cost of the work plus a fee, the apparent successful Bidder shall, prior to the Notice of Award, identify in writing to the Owner those portions of the work that such Bidder proposes to subcontract. After the Notice of Award, other portions of the work may be subcontracted only with the Owner's written consent.

10.3 No Contractor shall be required to employ any Subcontractor or other person or organization against whom he has reasonable objection.

11 - BID FORM

11.1 The Bid Form is attached hereto; additional copies may be obtained from the A/E.

11.2 Bid Forms must be completed in black ink or by typewriter. The bid price of each item on the form must be completed.

11.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer providing evidence of authority to sign), and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

11.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature. The official address of the partnership must be shown below the signature.

11.5 All names must be typed or printed below the signature.

11.6 The bid shall contain an acknowledgment of receipt of all addenda (the numbers of which shall be filled in on the Bid Form).

11.7 The address to which communications regarding the bid are to be directed must be shown.

12 - SUBMISSION OF BIDS

12.1 Bids shall be submitted at the time and place indicated in the Advertisement for Bids. Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in either black ink or by typewriter.

12.2 Each bid must be submitted in a sealed envelope bearing on the outside the following:

- Name of Project
- Name of Bidder
- Address
- License Number
- License Expiration Date
- License Classification Applying to This Bid

13 - MODIFICATION AND WITHDRAWAL OF BIDS

13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a bid must be executed) and delivered to the place where bids are to be submitted at any time prior to the opening of bids.

13.2 If, within twenty-four (24) hours after bids are opened, any Bidder files a duly signed written notice with the Owner and promptly thereafter demonstrates to the reasonable satisfaction of the Owner that there was a material and substantial mistake in the preparation of his bid, that Bidder may withdraw his bid and the bid security will be returned. Thereafter, that Bidder will be

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disqualified from further bidding on the work.

14 - RECEIPT AND OPENING OF BIDS

14.1 The Town of Smyrna (herein called the "Owner") invites bids on the form provided, all blanks of which must be appropriately filled in. Bids will be received by the Owner at Smyrna Town Hall, 315 South Lowry Street, Smyrna, Tennessee 37167, until 10:30 A.M. Local Time, on **July 2, 2024**, and then at said time and place publicly opened and read aloud.

The envelope containing the bid must be sealed and addressed to the Town of Smyrna, with the name, address, license number, license expiration date, and classification of the Bidder written on the outside, and designated as: **BASINS A SEWER REHABILITATION PHASE 1.**

14.2 The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and instructions within Section 00030-Advertisement for Bids, and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

15 - BIDS TO REMAIN OPEN

All bids shall remain open for ninety (90) days after the day of the bid opening, but the Owner may, at his sole discretion, release any bid and return the bid security prior to that date. Mutually agreed upon extensions of time may be made if necessary.

16 - AWARD OF CONTRACT

16.1 The Owner reserves the right to reject any and all bids, to waive any and all informalities, to negotiate contract terms with the successful Bidder, and to disregard all nonconforming, nonresponsive, or conditional bids. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

16.2 In evaluating bids, the Owner shall consider the qualifications of the Bidder, whether or not the bids comply with the prescribed requirements, and alternatives and unit prices if requested on the Bid Form. It is the Owner's intent to accept alternatives (if any are accepted) in the order in which they are listed on the Bid Form, although the Owner may accept them in any order or combination.

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16.3 In evaluating bids, the Owner may also consider the qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment). The Owner may also consider operating costs, maintenance considerations, performance data, and guarantees of materials and equipment.

16.4 The Owner may conduct such investigations as he deems necessary to help evaluate any bid and to establish the responsibility, qualifications, and financial ability of the Bidders, proposed Subcontractors, and other persons and organizations to do the work to the Owner's satisfaction in accordance with the bidding instruments and within the prescribed time.

16.5 The Owner reserves the right to reject the bid of any Bidder who does not pass any such evaluation to the Owner's satisfaction.

16.6 If the Contract is to be awarded, it will be awarded to the lowest bidder who, in the Owner's estimation, can perform the work in such a way that the award will be in the best interest of the project.

16.7 If the Contract is to be awarded, the Owner will give the successful Bidder a Notice of Award within ninety (90) days after the day of the bid opening.

17 - PERFORMANCE AND OTHER BONDS

Paragraph 5.1 of the General Conditions and the Supplementary Conditions set forth the Owner's requirements as to performance and other bonds. When the successful Bidder delivers the executed Agreement to the Owner, it shall be accompanied by the required contract security.

18 - SIGNING OF AGREEMENT

When the Owner gives a Notice of Award to the successful Bidder, at least four (4)-unsigned counterparts of the Agreement and all other contract documents will accompany it. Within fifteen (15) days thereafter, the Contractor shall sign and deliver at least four (4) counterparts of the Agreement to the Owner, with all other contract documents attached. Within ten (10) days thereafter, the Owner will deliver a fully signed counterpart to the Contractor. The A/E will identify those portions of the contract documents not fully signed by the Owner and Contractor; such identification shall be binding on all parties.

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19 - POWER OF ATTORNEY

Attorneys-in-fact who sign all bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

20 - LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over the construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

21 - NONDISCRIMINATION IN EMPLOYMENT

21.1 Contracts for work under this proposal will obligate the Contractor and Subcontractors not to discriminate in employment practices.

21.2 Bidders must submit with their initial bid a signed statement as to whether they have previously performed work subject to the President's Executive Order No. 11246 or any previous Executive Order dealing with nondiscrimination in federally assisted construction contracts (11114 of 10925).

21.3 Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

21.4 Successful Bidders must, if requested, submit a list of all Subcontractors who will perform work on the project and written signed statements from authorized agents of the labor pools with which they will or may deal for employees on the work, together with supporting information to the effect that said labor pools' practices and policies are in conformity with Executive Order No. 11246 and that said labor pools will affirmatively cooperate in or offer no hindrance to the recruitment, employment, and equal treatment of employees seeking employment and performing work under the Contract. When such agents or labor pools have failed or refused to furnish such statements prior to the award of the Contract, the successful Bidder must provide certification as to what efforts have been made to secure same.

21.5 Successful Bidders must be prepared to comply in all respects with the contract provisions regarding nondiscrimination as stipulated under the Labor Standards.

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22 - PREFERENCE IN EMPLOYMENT

Preference in employment on the project will, insofar as practicable, be given to qualified local labor.

23 - BASIS FOR DETERMINING RESPONSIBILITY OF LOW BIDDER

23.1 A responsible Bidder is one who has the ability to perform the Contract and meet certain minimum and/or special standards set forth in the Instructions to Bidders. Such factors as judgement, skill, and integrity will play an important part in the overall determination. Although additional criteria may be used, a responsible Bidder must at least:

- 23.1.1 Have adequate financial resources or the ability to secure such resources;
- 23.1.2 Have the necessary experience, organization, and technical qualifications and have or show proof that he can acquire the necessary equipment to perform the proposed Contract;
- 23.1.3 Be able to comply with all required performance schedules or completion dates, taking into account all existing commitments;
- 23.1.4 Have a satisfactory record of performance, integrity, judgement, and skill;
- 23.1.5 Be otherwise qualified and eligible to receive an award under the applicable laws and regulations; and
- 23.1.6 Maintain a permanent place of business.

23.2 A prospective Contractor must affirmatively demonstrate his responsibility and, when necessary, also demonstrate that of his proposed Subcontractors and suppliers. The prospective Contractor will be required to furnish the Owner or the A/E with information sufficient to show that he currently meets these minimum standards.

24 - BASIS FOR DETERMINING RESPONSIVENESS OF LOW BIDDER

24.1 A responsive bid shall be a prerequisite to the award of a Contract. A nonresponsive bid (offer) - i.e., one not complying in all material or essential respects with the Instructions to Bidders may not be considered for award (acceptance) and may be rejected by the Owner. This compliance relates to both method/timeliness of submission and the substance of any resulting Contract.

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24.2 Bids may be rejected if the Bidder:

- 24.2.1 Fails to bid on a listed item or bids zero on a listed item;
- 24.2.2 Fails to acknowledge an addendum;
- 24.2.3 Fails to use required Bid Forms;
- 24.2.4 Fails to sign the Bid Form properly;
- 24.2.5 Fails to conform to such essential requirements of the Instructions to Bidders as specifications, delivery schedule, or permissible alternatives;
- 24.2.6 Imposes conditions that in effect modify the requirements of the Instructions to Bidders or limit the Bidder's liability to the Owner so as to give him/her an advantage over other Bidders. Such conditions include:
 - 24.2.6.1 Attempts by the Bidder to protect himself against changes in conditions (e.g., increased costs) in a way that makes it impossible for the total price to the Owner to be determined for bid evaluation;
 - 24.2.6.2 Failure by the Bidder to state a price, stating in lieu thereof that the price shall be "price in effect at time of delivery";
 - 24.2.6.3 The Bidder's stating price with the qualification "price in effect at time of delivery";
 - 24.2.6.4 Unless authorized by the Instructions to Bidders, qualifications of the bid consisting of stipulations by the Bidder that the bid is to be considered only if he receives (or does not receive) another award under a separate procurement prior to the date of award; and/or
 - 24.2.6.5 Limitations made by the Bidder on the rights of the Owner under any contract clause that affects the quality or delivery of the bids offered;
- 24.2.7 Receives a determination in writing from the Owner that the price bid is unreasonable;
- 24.2.8 Is a debarred or ineligible person or concern;
- 24.2.9 Fails to furnish the required bid bond or other guarantees;

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- 24.2.10 After submitting a bid, transfers all of his assets or that part of his assets related to the bid during the period between the bid opening and the award, in which case the transferee may not take over the bid without the Owner's written permission, and the Owner may reject the bid; this also applies to Sub-bidders;
- 24.2.11 Fails to submit a bid before bids are opened;
- 24.2.12 Fails to list Subcontractor(s) and/or equipment manufacturer(s), if required to do so by the Instructions to Bidders; and/or
- 24.2.13 Fails to submit required information for equipment (e.g., power consumption) when requested or instructed by the Instructions to Bidders.
- 24.3 When it is in the interest of the Owner he may waive minor deviations in bids that do not:
 - 24.3.1 Affect price, quality, etc., of the articles to be furnished; or
 - 24.3.2 Prejudice the rights of another Bidder.
The Owner shall be responsible for determining "minor deviations."

25 - FOUR-HOUR SUB-BID TIME

The Contractor may use the Tennessee Contractors' Association four-hour bidding practice code for receiving sub-bids for the construction of municipal utilities. The purpose of this code agreement is to establish a formal procedure of giving and receiving prices on subcontracts, materials, and equipment that will provide the Contractor of municipal utilities with enough advance warning for him to analyze and evaluate sub-bids, materials, equipment prices, and his own bid prior to the bid filing. The use of the four-hour bidding practice code shall not in any way be a decisive factor for the acceptance or rejection of any bid or for the award of the Contract.

26 - LICENSING REQUIREMENTS

All Bidders must be licensed contractors to perform the type(s) of construction herein described, as required by the Tennessee Code Annotated, Title 62, and all subsequent amendments thereto.

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27 - DRUG-FREE WORKPLACE AFFIDAVIT

Under the provisions of Tennessee Code Annotate 950-9-113 enacted by the General Assembly effective 2001, employees with five (5) or more employees who contract with either the state or a local government to provide construction services are required to submit an affidavit stating that they have a drug free workplace program that complies with Title 50, Chapter 9, in effect at the time of submission of a bid at least to the extent required of governmental entities. The statute imposes other requirements on the contractor, but the county's responsibility is specifically limited in section (b) of the statute as follows:

(b)A written affidavit by the principal officer of a covered employer provided to a local government at the time such bid or contract is submitted stating that the employer is in compliance with this section shall absolve the local government of all further responsibility under this section and any liability arising from the employer's compliance or failure of compliance with the provisions of this section.

END OF SECTION

28299.0036
00130-12

SECTION 00330
BID PROPOSAL

TOWN OF SMYRNA
BASINS A SEWER REHABILITATION PHASE 1

Date: July 2, 2024
Receive Bids Until:
10:30 a.m. Local Time (CST)

Bids opened and read aloud at 10:30 a.m. Local Time (CST),
July 2, 2024
315 South Lowry Street
Smyrna, TN 37167

Proposal of _____

(hereinafter called "Bidder"), a corporation/partnership/individual
(STRIKE OUT INAPPLICABLE TERMS)

doing business as _____

within _____
(COUNTY AND STATE)

TO: Mr. Rex Gaither, Purchasing Agent
Town of Smyrna
315 South Lowry Street
Smyrna, TN 37167

Mr. Gaither:

The Bidder, in compliance with your Advertisement for Bids for the TOWN OF SMYRNA, TENNESSEE, **BASINS A SEWER REHABILITATION PHASE 1**, having examined the drawings and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project (including the availability of materials and labor), hereby proposes to furnish, as applicable, all labor, materials, supplies, and appurtenances to construct the project in accordance with the Contract Documents within the time set forth therein and at the unit prices stated below. The unit prices are to cover all expenses incurred in performing the work required under the bidding instruments, of which this proposal is a part.

The undersigned Bidder does hereby declare and stipulate that this proposal is made in good faith, without collusion or connection with any other person or persons bidding for the same work, and that it is made in pursuance of and subject to all the terms and

28299.0036

00330-1

conditions of the construction contract, the detailed specifications, and the drawings pertaining to the work to be done, all of which have been examined by the undersigned.

The Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" and to complete the project fully within one-hundred and eighty (180) consecutive calendar days thereafter. The Bidder further agrees to pay, as liquidated damages, the sum of Five Hundred Dollars (\$500.00) per day for each consecutive calendar day that expires after the time specified for completion of the contract until the project is fully complete.

The Bidder hereby agrees that preference will be given to domestic construction materials and further agrees to require subcontractors, material men, and suppliers to also give preference to domestic construction materials.

The Bidder acknowledges receipt of the following addenda:

No. _____ Dated _____ No. _____ Dated _____

The owner reserves the right to reject any or all bids and to waive any informality.

The Bidder agrees to furnish, pay for and install all labor, materials, supplies, equipment, and all incidentals necessary for the construction, testing, and placing into complete operations of the **BASINS A SEWER REHABILITATION PHASE 1**, all in accordance with the construction drawings and specifications, for the unit prices as shown below:

(SEE FOLLOWING PAGES)

28299.0036

00330-2

**TOWN OF SMYRNA, TENNESSEE
 BASIN A SEWER REHABILITATION PHASE 1
 BID SCHEDULE**

| ITEM | DESCRIPTION | ESTIMATED QUANTITY | UNIT | UNIT PRICE | ITEM TOTAL |
|--------------------|--|--------------------|---------------|-------------------|-------------|
| 1 | 8-INCH DIAMETER SANITARY SEWER REHABILITATION BY CURED-IN-PLACE PIPE (CIPP) LINING | 10,000 | LF | | |
| 2 | 8-INCH DIAMETER SANITARY SEWER LINE POST-REHAB TELEVISION INSPECTION (CCTV) | 10,000 | LF | | |
| 3 | DIRECTED HEAVY CLEANING OF 8-INCH DIAMETER SANITARY SEWER LINES FOR LARGE DEPOSITS OR DEBRIS OR HEAVY ROOT GROWTH | 2,000 | LF | | |
| 4 | INTERNAL PREPARATORY TRECHLESS POINT REPAIRS INCLUDING REMOVAL OF PROTRUDING TAPS, CUTTING OF OFFSET JOINTS AND DROPPED PIPE SECTIONS. | 10 | EACH | | |
| 5 | MANHOLE REHABILITATION (METHOD 1) EPOXY SPRAY LINER - 0 TO 6 FT IN DEPTH | 20 | EACH | | |
| 6 | MANHOLE REHABILITATION (METHOD 1) EPOXY SPRAY LINER - 6 TO 8 FT IN DEPTH | 15 | EACH | | |
| 7 | MANHOLE REHABILITATION (METHOD 1) EPOXY SPRAY LINER - 8 TO 10 FT IN DEPTH | 10 | EACH | | |
| 8 | MANHOLE REHABILITATION (METHOD 1) EPOXY SPRAY LINER - GREATER THAN 10 FT IN DEPTH | 5 | EACH | | |
| 9 | MANHOLE REHABILITATION (METHOD 2) INFLOW DISH | 75 | EACH | | |
| 10 | MANHOLE REHABILITATION (METHOD 3) REPLACE FRAME AND COVER | 2 | EACH | | |
| 11 | SERVICE LINE - CIPP LINER IN 8-INCH MAIN AND SERVICE LENGTH UP TO 15' | 82 | EACH | | |
| 12 | SERVICE LINE - CIPP LINER IN 8-INCH MAIN AND SERVICE LENGTH GREATER THAN 15' | 20 | EACH | | |
| 13 | SERVICE LINE CLEANOUT | | | | |
| 13A | SERVICE LINE CLEANOUT (WITHIN PAVEMENT) | 30 | EACH | | |
| 13B | SERVICE LINE CLEANOUT (OUTSIDE OF PAVEMENT) | 72 | EACH | | |
| 14 | CATEGORY 1 TRENCH REPAIR | 4 | EACH | | |
| 15 | CATEGORY 2 TRENCH REPAIR | 2 | EACH | | |
| ALLOWANCE | | | | | |
| 16 | ALLOWANCE AS SPECIFIED IN SECTION 01150 | 1 | LS | \$25,000.00 | \$25,000.00 |
| BID SUMMARY | | | | | |
| | | | _____ DOLLARS | TOTAL BID | |
| BIDDER | | | | DATE | |
| BY _____ | | | | (SIGNATURE) TITLE | |
| ADDRESS _____ | | | | | |
| CITY _____ | | STATE _____ | | ZIP CODE _____ | |
| PHONE _____ | | FAX _____ | | EMAIL _____ | |

Note: Amounts shall be shown in both words and figures. In the case of discrepancy, the amounts shown in words will govern. The above lump sum prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for. The Bidder understands that the Owner reserves the right to make award on any basis deemed to be in the best interest of the Owner provided it is consistent with the Bidder's above indicated request. The Owner also reserves the right to reject any or all bids and to waive any informality in the bidding.

The Town reserves the right to choose or remove any portion of the work to meet any budget restraints. The Contractor agrees to perform the work, chosen by the Town, at the unit bid costs, whether full or partial quantities are selected.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of ninety (90) calendar days after the scheduled closing time for receiving bids. Upon receipt of written notice of the acceptance of his bid, the Bidder will execute the formal contract attached within ten (10) days and deliver a surety bond or bonds as stipulated in Paragraph 22 of the General Conditions. The bid security attached in the sum of FIVE PERCENT (5%) Dollars (\$_____) shall become the property of the Owner in the event the contract and bond are not executed within the time set forth as liquidated damages for the delay and additional expense to the Owner caused thereby.

All the various phases of work enumerated in the detailed specifications with their individual jobs and overhead, whether specifically mentioned, included by implication, or appurtenant thereto, are to be performed by the Contractor under one of the items listed in the bid schedule, irrespective of whether they are named in said list. Payment for work performed will be in accordance with the bid schedule, subject to changes provided for in the construction contract.

28299.0036

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(SEAL - if Bid is by
a corporation)

Respectfully submitted,

Bidder

By _____ (sign)

_____ *

Title:

Business Address:

Telephone Number:

Contractor's License Number:

Contractor's Monetary Limit:

Expiration Date:

***Type or print name below signature.**

END OF SECTION

28299.0036

00330-5



TOWN OF SMYRNA

TITLE VI COMPLIANCE SURVEY

The Town of Smyrna intends to fully comply with the Tennessee Department of Transportation's policy regarding TITLE VI of the CIVIL RIGHTS ACT of 1964; 49 CFT, PART 21; related statutes and regulations to the end that no person shall be excluded from participation in or be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance from the U.S. Department of Transportation on the grounds of race, color, gender, age, disability or national origin.

Please complete the following information:

NAME OF COMPANY _____

NAME OF OWNER/CONTRACTOR: _____

ADDRESS OF OWNER/CONTRACTOR: _____

COUNTY: _____

TYPE OF SERVICES PROVIDED: _____

CONTRACT: _____

OWNER/CONTRACTOR

(Race/Gender)

| | |
|-------------------------|-------|
| White Male | _____ |
| White Female | _____ |
| African-American Male | _____ |
| African-American Female | _____ |
| Hispanic Male | _____ |
| Hispanic Female | _____ |
| Native American Male | _____ |
| Native American Female | _____ |
| Asian-American Male | _____ |
| Asian-American Female | _____ |
| Other _____ Male | _____ |
| Other _____ Females | _____ |

EMPLOYEES

(Number in each category)

| | |
|--------------------------|-------|
| White Males | _____ |
| White Females | _____ |
| African-American Males | _____ |
| African-American Females | _____ |
| Hispanic Males | _____ |
| Hispanic Females | _____ |
| Native American Males | _____ |
| Native American Females | _____ |
| Asian-American Males | _____ |
| Asian-American Females | _____ |
| Other _____ Males | _____ |
| Other _____ Females | _____ |



TOWN OF SMYRNA CONSTRUCTION CONTRACT CERTIFICATE OF NON-DISCRIMINATION

As Bidder, Contractor, or Subcontractor on Town of Smyrna Construction or Other Project,

1. the undersigned states that he does not discriminate against any subcontractor, employee or applicant for employment on the grounds of race, color, religion, sex, national origin, age, disability or any other lawfully protected classification, if awarded a contract for this project, agrees in performance of work:
2. not to discriminate against any subcontractor, employee, or applicant for employment on the grounds of race, color, religion, sex, national origin, age, or disability:
3. to maintain payrolls of laborers and mechanics employed on this contract until 90 days after final release and final payment by the Town;
4. require a similar certificate to be executed by each subcontractor at the time a subcontractor is executed under the contract with the requirement that such subcontractor agrees to require a similar certificate of requirement on any lower tier of subcontractors.

Contractor's Name _____

Date _____

Signature _____

Title _____

Printed or typed name and title



AFFIDAVIT

STATE OF TENNESSEE DRUG-FREE WORKPLACE AFFIDAVIT

COUNTY OF _____ OF PRIME BIDDER

NOW COMES AFFIANT, who being duly sworn, deposes and says:

1. He/She is the principal officer for _____;
2. That the bidding entity has submitted a bid to the Town of Smyrna for the construction of _____;
3. That the bidding entity employs no less than five (5) employees;
4. That Affiant certifies that the bidding entity has in effect, at the time of submission of its bid to perform the construction referred to above, a drug-free workplace program that complies with §50-9-113, *Tennessee Code Annotated*.
5. That this affidavit is made on personal knowledge.

Further Affiant saith not.

AFFIANT

SUBSCRIBED AND SWORN TO before me this ____ day of _____, 20__.

NOTARY PUBLIC

My Commission expires:_____

BASIN A SEWER REHABILITATION PHASE 1

50-9-113. State and local government construction contracts.

- (a) Each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services or who is awarded a contract to provide construction services or who provides construction services to the state or local government shall submit an affidavit stating that such employer has a drug-free workplace program that complies with this chapter, in effect at the time of such submission of a bid at least to the extent required of governmental entities. Any private employer that certifies compliance with the drug-free workplace program, only to the extent required by this section, shall not receive any reduction in workers' compensation premiums and shall not be entitled to any other benefit provided by compliance with the drug-free workplace program set forth in this chapter. Nothing in this section shall be construed to reduce or diminish the rights or privileges of any private employer who has a drug-free workplace program that fully complies with this chapter. For purposes of compliance with this section, any private employer shall obtain a certificate of compliance with the applicable portions of the Drug-free Workplace Act from the department of labor and workforce development. No local government or state governmental entity shall enter into any contract or award a contract for construction services with an employer who does not comply with the provisions of this section.
- (b) For the purposes of this section, "employer" does not include any utility or unit of local government. "Employer" includes any private company and/or corporation.
- (c) If it is determined that an employer subject to the provisions of this section has entered into a contract with a local government or state agency and such employer does not have a drug-free workplace pursuant to this section, such employer shall be prohibited from entering into another contract with any local government or state agency until such employer can prove compliance with the drug-free workplace program pursuant to this section. If the same employer again contracts with any local government or state agency and does not have a drug-free workplace program pursuant to this section, then such employer shall be prohibited from entering into another contract with any local government or state agency for not less than three (3) months from the date such violation was discovered and verified and shall be prohibited from entering into another contract until such employer complies with the drug-free workplace program pursuant to this section. If the same employer for a third time contracts with any local government or state agency and does not have a drug-free workplace program pursuant to this section, then such employer shall be prohibited from entering into another contract with any local government or state agency for not less than one (1) year from the date such violation was discovered and verified and shall be prohibited from entering into another contract until such employer complies with the drug-free workplace program pursuant to this section.
- (d) A written affidavit by the principal officer of a covered employer provided to a local government at the time such bid or contract is submitted stating that the employer is in compliance with this section shall absolve the local government of all further responsibility under this section and any liability arising from the employer's compliance or failure of compliance with the provisions of this section.

[Acts 2000, ch.918, §§ 1,2.]



TOWN OF SMYRNA CONSTRUCTION CONTRACT
CERTIFICATE OF NON-ILLEGAL IMMIGRANT USE

As Bidder, Contractor, or Subcontractor on Town of Smyrna Construction Project,

1. the undersigned states that he does not knowingly utilize the services of **illegal immigrants** in the performance of a contract for goods or services entered into with the Town of Smyrna:
2. and will not knowingly utilize the services of any subcontractor who will utilize the services of **illegal immigrants** in the performance of the contract;
3. If any person who contracts to supply goods or services to the Town of Smyrna or who submits a bid to contract to supply goods or services to the state or other state entities, is discovered to have knowingly utilized the services of **illegal immigrants** in the performance of the contract to supply goods or services to the Town of Smyrna, the Town of Smyrna shall declare that person to be prohibited from contracting for or submitting a bid for any contract to supply goods or services to the Town of Smyrna for a period of one (1) year from the date of discovery of the usage of **illegal** immigrant services in the performance of a contract to supply goods or services to the Town of Smyrna

Contractor's Name _____ Date _____

Signature _____ Title _____
Printed or typed name and title



TOWN OF SMYRNA CONSTRUCTION CONTRACT

CERTIFICATE OF NON-COLLUSION

As Bidder, Contractor, or Subcontractor on Town of Smyrna Construction or Other Project:

the undersigned hereby declares that no person or party other than the undersigned has any interest whatever in the submitted bid proposal, that it is without any connection or collusion with any person or persons making or having made any proposal for the same work and without any previous understanding with such person or persons as to relative prices, obviating competition, and that it is made in good faith.

Contractor's Name _____ Date _____

Signature _____ Title _____
Printed or typed name and title

INSURANCE REQUIREMENTS

The Contractor shall purchase and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, employees or subcontractors.

A. MINIMUM SCOPE AND LIMITS OF INSURANCE

1. Workers Compensation

Workers Compensation insurance shall be in compliance with the State of Tennessee and shall be statutory. Employers Liability shall be included with a minimum limit of \$500,000 per accident/per disease/per employee.

2. Commercial General Liability

Commercial General Liability insurance shall have a minimum limit per occurrence of \$1,000,000 and a minimum general aggregate of \$2,000,000. It shall include completed operations, product liability and personal injury liability insurance.

3. Automobile Liability

Automobile Liability Insurance shall have a minimum combined single limit per occurrence of \$1,000,000. This insurance shall include third-party bodily injury and property damage liability for owned, hired, borrowed and non-owned automobiles.

B. DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retentions must be declared to the Town of Smyrna. The Contractor shall be responsible for all deductibles and self-insured retentions.

C. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages

- a. The Town, its elected and appointed officials, agents, employees and volunteers shall be named as an additional insured as regards negligence by the contractor.
- b. The Contractor's insurance shall be primary as respects the Town, its elected and appointed officials, agents, employees and volunteers. Any insurance or self-insurance maintained by the Town of Smyrna shall be excess and non-contributory of the Contractor's insurance.

2. Workers Compensation and Employers Liability Coverage

The insurer shall agree to waive all rights of subrogation against the Town, its elected and appointed officials, agents, employees and volunteers for losses arising from work performed by the Contractor for the Town of Smyrna.

BASIN A SEWER REHABILITATION PHASE 1

3. All Coverages

- a. Coverage shall not be canceled, suspended, or voided by either party (the Contractor or the insurer) or reduced in coverage or in limits except after 30 days written notice has been given to the Town of Smyrna. Ten-day written notice of cancellation is acceptable for non-payment of premium. Notifications shall comply with the standard cancellation provisions in the Contractor's policy.
- b. Neither the acceptance of the completed work nor the payment thereof shall release the Contractor from the obligations of the insurance requirements or indemnification agreement.
- c. The insurance companies issuing the policies shall have no recourse against the Town of Smyrna for payment of premiums or for assessments under any form of the policies.
- d. Replacement certificates, policies or endorsements shall be provided to the Town for any such insurance expiring prior to the completion of services.
- e. Any failure of the Contractor to comply with reporting provisions of the policy shall not affect coverage provided to the Town, its elected and appointed officials, agents, employees and volunteers.

D. ACCEPTABILITY OF INSURERS

All required insurance shall be provided by a company or companies licensed to conduct business in the State of Tennessee. Insurance shall be underwritten by insurers with an A.M. Best Company ratings no less than an A.

E. VERIFICATION OF COVERAGE

The Contractor shall furnish the Town with Certificates of Insurance reflecting proof of required coverage. The Certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. **The Certificates are to be received and approved by the Town before work commences and upon any contract renewal thereafter.**

Upon failure of the Contractor to furnish, deliver and maintain such insurance as requested, this contract, at the election of the Town, may be suspended, discontinued or terminated. Failure of the Contractor to purchase and/or maintain any required insurance shall not relieve the Contractor from any liability or indemnification under the contract.

The Certificate of Insurance naming the "Town of Smyrna" as **Additional Insured** shall be addressed to the attention of:

Town of Smyrna: Department of Safety & Risk Management
ATTN: Henry Urbina
315 S Lowry St
Smyrna, TN 37167

It can also be submitted electronically to henry.urbina@townofsmyrna.org. The subject line has to indicate the name of the project.

The Town reserves the right to request complete certified copies of all required insurance policies at any time.

F. SUBCONTRACTORS

Contractor shall include all subcontractors as insureds under its policies **OR** shall be responsible for verifying and maintaining the Certificates provided by each subcontractor. Subcontractors shall be subject to all of the requirements stated herein. The Town of Smyrna reserves the right to request copies of subcontractor's Certificates at any time.

G. WORKERS' COMPENSATION INDEMNITY

In the event Contractor is not required to provide or is exempt from providing workers' compensation coverage, the parties hereby agree that Contractor, its owners, agents and employees will have no cause of action against, and will not assert a claim against the Town of Smyrna, its elected and appointed officials, agents, employees and volunteers, under any circumstances. The parties also hereby agree that the Town of Smyrna, its elected and appointed officials, agents, employees and volunteers shall in no circumstance be, or considered as, the employer or statutory employer of Contractor, its owners, agents and employees. The parties further agree that Contractor is a wholly independent contractor and is exclusively responsible for its employees, owners, and agents. Contractor hereby agrees to protect, defend, indemnify and hold the Town of Smyrna, its elected and appointed officials, agents, employees and volunteers harmless from any such assertion or claim that may arise from the performance of this contract.

HOLD HARMLESS AND INDEMNITY REQUIREMENT:

Contractor shall indemnify and hold harmless, to the maximum extent permitted by law, the Town of Smyrna and its officers, agents, employees, volunteers, from and against any and all liability, damages, losses, (whether in contract or in tort, including personal injury, accidental death or property damage, and regardless, of whether the allegations are false, fraudulent or groundless), and costs (including reasonable attorney's fees, litigation, arbitration, mediation, appeal expenses) which in whole or in part are caused by the negligence, recklessness or intentional wrongful misconduct of the Contractor and persons employed by or utilized by the Contractor in Contractor's performance of this Agreement.

The contractor further agrees to protect, defend, and save the Town, its elected and appointed officials, agents, employees and volunteers while working in the scope of their duties as such, harmless from and against all claims, demands, and causes of action of any kind of character, including the cost of their defense, arising in favor of the contractor's employees or third parties on account of bodily or personal injuries, death or damage to property arising out of services performed or omissions of services or in any way resulting from the acts of omissions of the

BASIN A SEWER REHABILITATION PHASE 1

contractor and/or its agents, employees, subcontractors, representative of the Town under this agreement.

Pursuant to Tennessee Attorney General Opinion 93-01, the Town will not indemnify, defend or hold harmless in any fashion the Contractor from any claims arising from any failure, regardless of any language in any attachment or other document that the Contractor may provide.

APPLICABLE LAW:

Any contract resulting from this RFB shall be governed by and construed under the laws of the State of Tennessee.

SMYRNA/LOCAL BUSINESS LICENSE

Compensation of more than \$100,000 from contracts performed in one county by a contractor described in Tenn. Code Ann. § 67-4-708(4)(A) will be sourced to that county and the tax from such contracts will be distributed to that county. Compensation of \$100,000 or less from contracts performed in one county by such person will be sourced to the county of the person's domicile or location. If the person does not have a domicile or location in Tennessee, such compensation will be earmarked and allocated to the state's general fund.

For purposes of distribution of the municipal business tax provided for in Tenn. Code Ann. § 67-4-705, receipts will be sourced to the municipality in which the person's established physical location, outlet, or other place of business is located. Receipts from sales made by persons operating from an established physical location, outlet, or other place of business in one municipality who extend their operations outside the boundaries of the municipality without establishing a physical location, outlet, or place of business outside the boundaries of the municipality will be sourced to the municipality in which the person's established physical location, outlet, or other place of business is located.

If the person has no established physical location, outlet, or other place of business in the state, then such receipts will not be subject to the municipal business tax. Receipts from all taxable sales of any services or tangible personal property by a provider of video programming services will be sourced to the municipality where the property or service is received by the customer regardless of whether or not the provider has a physical location, outlet, or other place of business in that municipality.

Compensation of more than \$100,000 from contracts performed in one municipality by a contractor described in Tenn. Code Ann. § 67-4-708(4)(A) will be sourced to that municipality and the tax from such contracts will be distributed to that municipality. Compensation of \$100,000 or less from contracts performed in one municipality by such person will be sourced to the municipality of the person's domicile or location. If the person does not have a domicile or location in Tennessee, such compensation will not be subject to the municipal business tax. (*from Tennessee Business Tax Guide/ Tenn. Dept. of Revenue 2019; See also, Tennessee Works Tax Act (2023), Public Chapter 377, 2023 Session of the 113th General Assembly*)

SPECIFICATION COMPLIANCE

Unless otherwise noted, all quotations for the project shall be in complete accordance with the specifications detailed herein.

Bidders shall note in the space provided below any exceptions or deviations in any way from the specifications of any section of this RFB. Bidders should provide complete detail of exceptions or deviations.

Proposal Exceptions

| Section | Brief Description |
|---------|-------------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

By signature below, vendor acknowledges any quotation to be in full compliance with all aspects of each section of the RFB not noted above. The undersigned hereby declares that no person or party other than the undersigned has any interest whatever in this proposal, that it is without any connection or collusion with any person or persons making or having made any proposal for the same work and without any previous understanding with such person or persons as to relative prices, obviating competition, and that it is made in good faith.

COMPANY

TELEPHONE NUMBER

REPRESENTATIVE NAME & TITLE

FAX NUMBER

SIGNATURE

E-MAIL ADDRESS

BASIN A SEWER REHABILITATION PHASE 1

SECTION 00514

AGREEMENT

THIS AGREEMENT, made this the _____ day of _____, 20_____, by and between the Town of Smyrna of Rutherford County, Tennessee, acting herein through its Mayor and hereinafter called the "Owner", and _____ doing business as a _____ of the City/Town of _____ County of _____ State of _____ and hereinafter called the "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned to be made and performed by the Owner, the Contractor hereby agrees with the Owner to commence and complete **TOWN OF SMYRNA, TENNESSEE, BASIN A SEWER REHABILITATION PHASE 1**, hereinafter included in the phrase "the Project", for the sum of _____

(\$ _____) and all extra work in connection therewith under the terms as stated in the General, Supplementary, and Special (if applicable) Conditions of the Contract and at his own and proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance and other accessories and services necessary to complete the said Project in accordance with the conditions and at the price(s) stated in the Contractor's Bid Form and also in accordance with the Contract Documents. The Contract Documents shall collectively include the General, Supplementary, and Special (if applicable) Conditions; the plans (which include all maps, plats, blueprints, and other drawings and printed or written explanatory matter thereof); the specifications; and all other documents bound in the Project Manual. All Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents. In the event of any conflict between this Agreement and any other part of the Contract, including any of the Contract Documents, then the provisions of this Agreement shall control.

The Contractor hereby agrees to commence work under this Contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and to complete the entire Project fully within one hundred and eighty (180) consecutive calendar days thereafter for **TOWN OF SMYRNA, TENNESSEE, BASIN A SEWER REHABILITATION PHASE 1**.

BASIN A SEWER REHABILITATION PHASE 1

The parties hereto recognize that time is of the essence of the Contract, and that the Owner will suffer financial loss if the Project is not fully complete within the period of time specified, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize that the actual damages that the Owner would suffer in the event that the Project is not completed on time are indeterminable or difficult to measure when judged from the time when the Contract is entered into. Additionally, the parties acknowledge the delays, expense, and difficulties involved in proving the actual loss suffered by the Owner if the Project is not completed on time, whether in litigation, arbitration, or an alternative dispute resolution proceeding. Accordingly, instead of requiring any such proof, the Owner and the Contractor agree that as liquidated damages for delay (but not for penalty), and as a condition of the Owner's consent to engage Contract for the Project, the Contractor shall pay the Owner Five Hundred Dollars (\$500.00) per day, for each consecutive calendar day that expires after the time specified for completion until the Project is complete. The parties further agree that this liquidated daily amount is a reasonable estimate of the potential damages that the Owner could suffer as a result of Contractor's failure to timely complete the Project. The parties additionally agree that the Owner may withhold from any payment that would otherwise be due and payable to Contractor, all liquidated damages that have accrued through the date upon which such payment is due. The parties agree that all liquidated damages are the property of the Owner, beginning on the date when such damages accrue, and that from and after such date, the Owner has no duty to keep and maintain such funds in a third-party escrow account nor shall the owner be subject to any damages or penalty, statutory or otherwise, for withholding such funds.

The Owner agrees to pay the Contractor in current funds for the performance of the Contract, subject to additions and deductions as provided in the General Conditions and Supplementary Conditions of the Contract and only as approved by written notice from the owner. Progress payments shall be submitted by the contractor with a five percent (5%) retainage withheld. Retainage shall be released to the contractor upon completion of the project in accordance with the Contract Documents. The contractor shall not be due any additional cost above said contract total amount, whether lump sum or unit cost basis, for any work performed without prior written approval from the owner regardless of any perceived agreement with any other agent of the city.

Thomas and Hutton Engineering Co., 502 Hazelwood Drive, Smyrna, TN 37167 is the Engineer of Record for the project.

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in four (4) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

BASIN A SEWER REHABILITATION PHASE 1

(SEAL)

CONTRACTOR: _____

By: _____

Title: _____

Attest:

Address: _____

Telephone No: _____

Contractor's License No. _____

(SEAL)

OWNER:

Town of Smyrna _____

By: _____

Attest:

Title: _____

Address: 315 South Lowry Street _____

Smyrna, Tennessee 37167 _____

Telephone No. (615) 459-2553 _____

END OF SECTION

STANDARD ADDENDUM TO AGREEMENT



This standard contract addendum is executed on the _____ day of _____, 20____ by and between **THE TOWN OF SMYRNA, TENNESSEE**, a municipal corporation in the State of Tennessee, herein further referenced and identified as ("The Town") and _____ herein further referenced and identified as ("Vendor") in order to amend the terms of the Agreement, including all attachments, exhibits, or any actual or virtual documents or writing, including, but not limited to, all any "clickwrap," "clickthrough" or "click and accept" agreement or other Terms of Service scheduled for presentation to the Town Council for approval on the ____ day of , 20_____.

WITNESSETH

WHEREAS, the parties wish to execute this addendum to the Agreement for the purposes of substituting, clarifying or inserting certain terms of or into their original Agreement executed on the ____ day of _____, 20____; and

WHEREAS, the terms of this addendum to the Agreement shall take precedence over all other terms, conditions or language to the contrary or in conflict with the language contained in the Agreement; however, any term or clause not modified by the provisions herein shall be governed by the original agreement. The parties agree that this addendum shall not be construed to create any ambiguity, it being the expressed intent of the parties that this addendum shall control;

THEREFORE, In consideration of using Vendor's form Agreement, the mutual promises set out herein, and other good and valuable consideration, the sufficiency of which is hereby acknowledged by Vendor the parties hereto agree to the following:

1. VENUE: The parties agree that venue for any legal or other dispute arising under the terms of the original agreement or this addendum to agreement shall lie exclusively in the courts of Rutherford County, Tennessee or the United States District Court, for the Middle District of Tennessee. The parties hereby waive their right to a jury trial;

2. CHOICE OF LAW: The Agreement shall be deemed to be entered into under Tennessee law, and the rights and obligation of the parties are governed by the laws of the State of Tennessee, without regard to its conflict of laws principles, and all obligations of the parties are performable in Smyrna, Tennessee.

3. INDEMNIFICATION: The parties hereto agree that Vendor shall indemnify The Town for any and all claims of negligence, tortious conduct or otherwise unlawful acts committed by Vendor in the performance of their obligations under the terms of the original agreement or this addendum to agreement and Vendor agrees to pay any and all costs associated with the enforcement of the terms of this indemnity agreement by The Town, including but not limited to, court costs, civil judgments, assessments or any other reasonable fees associated therewith. In addition, Article II, Section 29 of the Tennessee Constitution prohibits municipalities from lending their credit to private or public entities and, therefore, prohibits an agreement by the Town to indemnify a third party or agree to a limitation of liability provision. Any indemnity or hold harmless provision contained in the Agreement requiring the Town to indemnify or hold harmless Vendor or any other person or entity or any limitation of liability in favor of Vendor shall be deemed null, void and unenforceable against the Town under any and all circumstances.

4. NON-APPROPRIATION: Vendor acknowledges that the Town is a governmental entity, and the validity of the Agreement is based upon the availability of public funding under its authority. In the event the Town fails to appropriate funds or make monies available for any fiscal year covered by the term of the Agreement for services to be provided, the Agreement shall be terminated on the last day of the fiscal year for which funds were appropriated or monies made available for such purposes without liability to the Town, and such termination shall not be a breach of the Agreement, and any unused payment made to Vendor shall be returned to the Town.

5. TAX EXEMPTION: As a tax-exempt entity, the Town shall not be responsible for sales or use taxes incurred for products or services. The Town shall supply Vendor with its Sales and Use Tax Exemption Certificate upon Vendor's request. Vendor shall bear the burden of providing its suppliers with a copy of the Town's tax

exemption certificate and Vendor shall assume all liability for such taxes, if any, that should be incurred.

6. NO ATTORNEY'S FEES: The parties hereto agree that The Town shall be in no event liable for any attorney's fees which Vendor may incur due to breach of the original agreement or this addendum agreement by either party; and further, The Town shall not acquiesce to any term of the original contract/agreement that indicates or infers The Town may or shall be responsible for the fees of another party or the Vendor's attorney fees.

7. MEDIATION; NO ARBITRATION: The Town may, at its option, require the attempted resolution of any dispute arising under the original contract or this addendum to agreement by mediation prior to the filing of any lawsuit or other claim. Should any dispute arise, Vendor shall provide the Town notice of any intent to file suit by certified mail. The Town shall notify the Vendor of its intent to exercise its right to mediation within thirty (30) days of receiving such notice. If the Town does not exercise its right to mediation, Vendor may file suit. Any mediator selected under this clause shall be agreed upon by the parties and the costs of such mediation shall be divided and paid equally between the parties. The parties hereby further agree that, except as provided for in this addendum or by applicable law, the parties shall not be required to participate in any alternative dispute resolution process or procedure, including but not limited to arbitration and med-arb, relating to disputes that arise between the parties to the Agreement.

8. FAILURE TO PERFORM: The parties agree, in the event Vendor fails to perform any obligation, other than with regards to the date of delivery, set out in the Agreement/Contract, the Town shall be reimbursed by Vendor for any and all expenses associated with having to obtain a new provider to finish out the contracted term, including, but in no way limited to, any charges/fees, which are above and beyond the amount the Town would have paid to Vendor to complete the same task; provided, however, that if the failure, by its nature, is one that can be cured, the Vendor shall have fifteen (15) business days after receipt of written notice from the Town to cure said failure to perform. The parties hereby agree, unless a specific date of delivery is

provided in the Agreement/Contract all deliveries shall be made to the Town no later than ninety (90) days from the date of the Agreement/Contract. The parties further agree that if Vendor, in good faith, is not able to meet this ninety (90) day deadline of delivery due to forces beyond his, her or its control, that were unforeseeable at the time of signing the Agreement/Contract, then the entire Agreement/Contract shall be voidable at the sole discretion of the Town. Should the Town elect to void the Agreement/Contract due to Vendor's good faith inability, due to forces beyond his, her or its control, and which were unforeseeable at the time of signing the Agreement/Contract to meet the delivery deadline, then neither party shall be deemed to have breached the Agreement/Contract, and Vendor shall return all monies, within seven (7) business days, paid by the Town for the products/items that could not be delivered in the allotted time. This provision shall take propriety over any Force Majeure Clause contained within the Agreement/Contract.

9. USE OF TOWN'S LOGO OR NAME: Vendor shall not use the Town's name or any logo in marketing or publicity materials or for marketing or publicity purposes without the prior written authorization from the Town. Vendor shall not issue, publish, or divulge any materials developed or used in the performance of this Agreement or make any statement to the media relating to this Agreement without the prior written consent of the Town.

10. WARRANTY: Vendor shall provide its services in accordance with the normal degree of care and skill that would be used by a reasonably careful engineer of good reputation providing similar services on similar projects of like size and nature at the same time and in the same locale as the project that is the subject of the Agreement.

11. SOFTWARE DEADLINE, TESTING AND ACCEPTANCE: If applicable to the Agreement, software provided by Vendor shall be installed for the purposes of testing, as stated herein below, no later than one hundred twenty (120) days from the effective date of the Agreement and this Addendum thereto, unless the Agreement states a specific date which is before or after said deadline. In Addition, software provided by Vendor to the Town is subject to inspection and testing to verify that the software conforms to its written specifications and to ensure it meets the Town's needs.

The Town shall have seven (7) business days after the software is installed to perform testing of the software using the Town's data. The Town shall provide Vendor with written notice of acceptance or rejection of the software five (5) business days or less after the end of the testing period. If the Town does not provide timely written notice of acceptance or rejection to Vendor, the software shall be deemed to be accepted by the Town. If the software is rejected, the Town may, at its sole discretion, either (1) return the software and receive a refund of all fees paid with respect thereto, or (2) allow Vendor to repair or replace the software, without charge, in a timely manner. In the event the Town elects to allow the Vendor to repair or replace the software, the Town shall have an additional (7) business days in which to accept or reject the software as laid out hereinabove.

12. NO AUTOMATIC RENEWAL: The term of the Agreement shall not be renewed or extended beyond the initial term and any provision providing for automatic or continuing renewal of the Agreement is not applicable.

13. UNILATERAL MODIFICATION OF AGREEMENT NOT PERMITTED: Vendor may make unilateral changes to its Privacy Policy, provided any such changes are subject to the provisions of this Addendum, shall not alter this Addendum, and shall not materially alter the use of the service or reduce the level of protection provided to the Town at the time of the execution of this Agreement. Except as provided in the preceding sentence, notwithstanding anything in the Agreement to the contrary, any change to the Agreement made by Vendor that is not in writing and that is not properly executed by the signatures of authorized representatives of the parties hereto, including attestation by the Town's Clerk and approved as to form by the Town Attorney are subject to the terms and conditions of this Addendum, and shall not alter this Addendum and shall not materially alter the use of the service or reduce the level of protection provided to the Town at the time of the execution of this Agreement.

14. CHANGES TO TERMS. Except as provided in Paragraph No. 13 above pertaining to Vendor's Privacy Policy, Vendor shall provide the Town written notice, sent in care of Town Attorney's Office, Smyrna, Tennessee, 315 South Lowry Street, Tennessee 37167, of any proposed change to the Agreement at least ninety (90) days

prior to being effective to the Town. The Town shall have thirty (30) days after receiving the written notice to terminate this Agreement, and such cancellation shall not be a breach of this Agreement. Vendor will refund to the Town any payment made by the Town to Vendor equal to the difference between the number of months the payment was intended for and the number of months remaining on Agreement that the fee was intended to cover.

15. PRICE ASSURANCE: Unless specifically stated in the Agreement, the price shall be valid for the full term of the Agreement. If Vendor, specifically states, in the Agreement that he, she or it cannot honor the price for the full term of the Agreement; the Agreement is voidable at the sole discretion of the Town, if at any time during the full term of the Agreement, Vendor requests to raise the contract price. If the Town elects to void the Agreement, at its sole discretion, it shall not be deemed to be a breach of the contract by either party.

16. CONFIDENTIALITY: The Town, as a Tennessee Municipal Corporation is subject to the Tennessee Open Records Act, set out in T.C.A. §10-7-503 et seq; therefore, this Addendum, the Agreement and all documents or materials, in any format, including, but not limited to paper, electronic or virtual, that are public records pursuant to law, are not confidential and are subject to disclosure, without regard to any provision contained in the Agreement declaring information confidential. The Town will respond to all proper Open Records Requests in the time allowed by law, without any requirement to disclose such request to Vendor or provide Vendor with notice or the time to obtain a protective order. The Town does not have the burden of establishing that information is not confidential information or that its release is authorized to release the records. This section 16 serves to meet such burden and authorization of disclosure.

17. BOYCOTT OF ISRAEL: The Vendor certifies that it is not currently engaged in, and covenants that it will not, for the duration of the Contract, engage in a Boycott of Israel, as that term is defined in Tenn. Code Ann. § 12-4-119.

18. NO PRESUMPTION AGAINST DRAFTER: The parties are both business entities having substantial experience with the subject matter of this

addendum, and each has fully participated in the negotiation and drafting of this addendum. Accordingly, this addendum shall be construed without regard to the rule that ambiguities in a document are to be construed against the draftsman. No inferences shall be drawn from the fact that the final, duly executed addendum differs in any respect from any previous draft hereof.

19. SURVIVAL: This entire addendum shall survive the completion of or any termination of the Agreement or other document which may accompany the Agreement or be incorporated by reference and shall remain in full force and effect until the expiration of any applicable statute of limitation.

20. EFFECTIVE DATE: This addendum shall be deemed to have the same effective date of the Agreement.

(execution page follows)

IN WITNESS WHEREOF, the parties hereto warrant and represent that the individual who has signed this addendum on behalf of such party is duly authorized by all necessary and appropriate corporate action to sign this addendum.

VENDOR OR AGENT

VENDOR OR AGENT

MAYOR OF SMYRNA,
TENNESSEE



SECTION 00611

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we, _____ a _____ hereinafter called "Principal," and _____ of _____, State of _____, hereinafter called the "Surety," are held and firmly bound unto the Town of Smyrna, Tennessee, hereinafter called "Owner," in the penal sum of _____

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain Contract with the Owner, dated the _____ day of _____, 20_____, a copy of which is hereto attached and made a part hereof for TOWN OF SMYRNA, TENNESSEE, **BASIN A SEWER REHABILITATION PHASE 1.**

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

PROVIDED, FURTHER, that the said Surety, for value received hereby, stipulates and agrees that no change, extension of time, or alteration or addition to the terms of the Contract, or to the work to be performed thereunder or to the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the specifications.

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

28299.0036

00611-1

IN WITNESS WHEREOF, this instrument is executed in four (4) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20 ____.

ATTEST:

By: _____

(Principal) Secretary

Witness as to Principal

Address

Surety

ATTEST:

By: _____

(Surety) Secretary

Attorney-in-Fact

SEAL

Witness as to Surety

Address

END OF SECTION

28299.0036

00611-2

SECTION 00621

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we, _____ a _____
_____, hereinafter called "Principal," and _____
_____ of _____, State of _____,
hereinafter called the "Surety," are held firmly bound unto the _____
Town of Smyrna, Tennessee, hereinafter called "Owner," in
the penal sum of _____
_____ (\$ _____) in lawful money of the United States,
for the payment of which sum well and truly to be made we bind
ourselves, our heirs, executors, administrators, and successors,
jointly and severally, firmly be these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the
Principal entered into a certain Contract with the Owner, dated
the _____ day of _____, 20_____, a copy of which
is hereto attached and made a part hereof for TOWN OF SMYRNA,
TENNESSEE, **BASIN A SEWER REHABILITATION PHASE 1.**

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

PROVIDED, FURTHER, that the said Surety, for value received
hereby, stipulates and agrees that no change, extension of time,
alteration or addition to the terms of the Contract or to the
work to be performed thereunder or the specifications
accompanying same shall in any wise affect its obligation or this
bond, and it does hereby waive notice of any such change,
extension of time, alteration, or addition to the terms of the
Contract or to the work or to the specifications.

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

28299.0036
00621-1

IN WITNESS WHEREOF, this instrument is executed in four (4) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20____.

Principal

ATTEST:

(Principal) Secretary

By _____

Address

SEAL

Witness as to Principal

Address

Surety

ATTEST:

(Surety) Secretary

By: _____
Attorney-in-Fact

SEAL

Address

Witness as to Surety

Address

END OF SECTION

28299.0036

00621-2

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STATE OF TENNESSEE

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING – REQUIRED FOR CONTRACTS OVER \$100,000 *Certification for Contracts, Grants, Loans, and Cooperative Agreements*

The undersigned certifies, to the best of his or her knowledge and belief, that:

- No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

| | |
|---|-------------------------------------|
| | |
| Signature of Authorized Representative | Date |
| | |
| Printed Name and Title | Phone Number / Email Address |



STATE OF TENNESSEE
CERTIFICATION REGARDING DEBARMENT, SUSPENSION
AND OTHER RESPONSIBILITY MATTERS

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- Have not within a three-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

| | |
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| | |
| Signature of Authorized Representative | Date |
| | |
| Printed Name | Phone Number / Email Address |

I am unable to certify to the above statements. Explanation is attached.



STATE OF TENNESSEE
IRAN DIVESTMENT ACT CERTIFICATION

| | |
|---|--|
| SUBJECT CONTRACT NUMBER(S): | |
| CONTRACTOR LEGAL ENTITY NAME: | |
| EDISON SUPPLIER IDENTIFICATION NUMBER: | |

The Iran Divestment Act, Tenn. Code Ann. § 12-12-101 et. seq. requires a person that attempts to contract with the state, including a contract renewal or assumption, to certify at the time the bid is submitted or the contract is entered into, renewed, or assigned, that the person or the assignee is not identified on a list created pursuant to § 12-12-106.

Currently, the list is available online at the following website: <https://www.tn.gov/generalservices/procurement/central-procurement-office--cpo-/library-/public-information-library.html>

The Contractor, identified above, certifies by signature below that it is not included on the list of persons created pursuant to Tenn. Code Ann. § 12-12-106 of the Iran Divestment Act.

CONTRACTOR SIGNATURE

NOTICE: This certification MUST be signed by an individual with legal capacity to contractually bind the Contractor.

PRINTED NAME AND TITLE OF SIGNATORY

DATE



STATE OF TENNESSEE
NON-BOYCOTT OF ISRAEL CERTIFICATION

The Bidder certifies that it is not currently engaged in, and will not for the duration of the contract engage in, a boycott of Israel as defined by Tenn. Code Ann. § 12-4-119. This provision shall not apply to contracts with a total value of less than two hundred fifty thousand dollars (\$250,000) or to contractors with less than ten (10) employees.

According to the law, a boycott of Israel means engaging in refusals to deal, terminating business activities, or other commercial actions that are intended to limit commercial relations with Israel, or companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel to do business, or persons or entities doing business in Israel, when such actions are taken:

- 1) In compliance with, or adherence to, calls for a boycott of Israel, or
- 2) In a manner that discriminates on the basis of nationality, national origin, religion, or other unreasonable basis, and is not based on a valid business reason. Tenn. Code Ann. § 12-4-119.

| | |
|---|-------------------------------------|
| | |
| Signature of Authorized Representative | Date |
| | |
| Printed Name | Phone Number / Email Address |

Required and Recommended State and Local Fiscal Recovery Funds (SLRF) Supplemental Conditions for Contracts

Below is a listing of required and recommended supplemental conditions for contracts, along with sample language. This is not an exhaustive list. It is recommended Grantees use this list to supplement typical contract provisions and notify potential bidders of these conditions in the advertisement for bids.

Required Clauses

Legal/contractual/administrative remedies for breach of contract

Contracts for more than the simplified acquisition threshold, currently set at \$250,000, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

Termination for cause or convenience

All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity, including the manner by which it will be affected and the basis for settlement.

Equal Employment Opportunity

Any contract that uses federal funds to pay for construction work is a “federally assisted construction contract” and must include the equal opportunity clause found in 2 C.F.R. Part 200, unless otherwise stated in 41 C.F.R. Part 60. This contract provision is required for all procurements that meet the definition of a “federally assisted construction contract.”

Required Language. The regulation at 41 C.F.R. Part 60-1.4(b) requires the insertion of the following contract clause.

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

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

- (2) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (5) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law. (8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through
- (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable

to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

[Davis-Bacon Act](#)

U.S. Treasury exercised its federal authority outlining the requirements for water infrastructure projects executed using ARP funds. Therefore, the requirements for prevailing wages and rates slightly differs from the standards of Davis-Bacon. Individual projects less than \$10 million dollars are not required to provide certification that prevailing wages and rates were followed. Individual projects of \$10 million dollars or more require certification similar to Davis-Bacon and are outlined below. Please note that any project using other funding sources, like Community Development Block Grants or SRF loans, are subject to requirements for those programs. When combining funding sources on a single and complete project or phase, other funding program requirements may trump the requirements for the use of ARP funds. We recommend Grantees and Project Owners discuss project requirements with TDEC when leveraging ARP funds with other funding programs to ensure all applicable rules and regulations are followed.

Individual Water Infrastructure Projects of \$10 million dollars or more

- (1) A recipient may provide a certification that, for the relevant project, all laborers and mechanics employed by contractors and subcontractors in the performance of such project are paid wages at rates not less than those prevailing, as determined by the U.S. Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code (commonly known as the "Davis-Bacon Act"), for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the civil subdivision of the State (or the District of Columbia) in which the work is to be performed, or by the appropriate State entity pursuant to a corollary State prevailing-wage-in-construction law (commonly known as "baby Davis-Bacon Acts"). If such certification is not provided, a recipient must provide a project employment and local impact report detailing:
 - a. The number of employees of contractors and sub-contractors working on the project;
 - b. The number of employees on the project hired directly and hired through a third party;
 - c. The wages and benefits of workers on the project by classification; and
 - d. Whether those wages are at rates less than those prevailing. 19 Recipients must maintain sufficient records to substantiate this information upon request.

- (2) A recipient may provide a certification that a project includes a project labor agreement, meaning a pre-hire collective bargaining agreement consistent with section 8(f) of the National Labor Relations Act (29 U.S.C. 158(f)). If the recipient does not provide such certification, the recipient must provide a project workforce continuity plan, detailing:
- a. How the recipient will ensure the project has ready access to a sufficient supply of appropriately skilled and unskilled labor to ensure high-quality construction throughout the life of the project, including a description of any required professional certifications and/or in-house training;
 - b. How the recipient will minimize risks of labor disputes and disruptions that would jeopardize timeliness and cost-effectiveness of the project;
 - c. How the recipient will provide a safe and healthy workplace that avoids delays and costs associated with workplace illnesses, injuries, and fatalities, including descriptions of safety training, certification, and/or licensure requirements for all relevant workers (e.g., OSHA 10, OSHA 30);
 - d. Whether workers on the project will receive wages and benefits that will secure an appropriately skilled workforce in the context of the local or regional labor market; and
 - e. Whether the project has completed a project labor agreement.
- (3) Whether the project prioritizes local hires.
- (4) Whether the project has a Community Benefit Agreement, with a description of any such agreement.

Suggested Language, if applicable. The following provides a sample contract clause:

- a. All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.
- b. b. Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.
- c. c. Additionally, contractors are required to pay wages not less than once a week.

Copeland Anti-Kickback Act

The Copeland "Anti-Kickback" Act prohibits workers on construction contracts from giving up wages that they are owed. This requirement applies to all contracts for construction or repair work above \$2,000 in situations where the Davis-Bacon Act also applies.

Suggested Language, if applicable. The following provides a sample contract clause:

- a. a. Contractor. The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.
- b. b. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
- c. c. Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12."

Contract Work Hours and Safety Standards Act

Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. §§ 3702 and 3704, as supplemented by Department of Labor regulations at 29 C.F.R. Part 5. See 2 C.F.R. Part 200, Appendix II(E). Each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours.

Required Language. The following provides a sample contract clause:

Compliance with the Contract Work Hours and Safety Standards Act.

- (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the t \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

Clean Air Act and Federal Water Pollution Control Act

For contracts over \$150,000, contracts must contain a provision requiring contractors to comply with the Clean Air Act and the Federal Water Pollution Control Act. If applicable, contracts must contain a provision that requires the contractor to agree to comply with all applicable standards, orders, or regulations issued pursuant

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

Suggested Language. The following provides a sample contract clause.

Clean Air Act

- (1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq
- (2) The contractor agrees to report each violation to the (name of subrecipient entering into the contract) and understands and agrees that the (name of the subrecipient entering into the contract) will, in turn, report each violation as required to assure notification to Treasury, and the appropriate Environmental Protection Agency Regional Office.
- (3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000

Federal Water Pollution Control Act

- (1) The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 ets eq.
- (2) The contractor agrees to report each violation to the (name of the subrecipient entering into the contract) and understands and agrees that the (name of the subrecipient entering into the contract) will, in turn, report each violation as required to assure notification to the Treasury, and the appropriate Environmental Protection Agency Regional Office.
- (3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000

Debarment and Suspension

Non-federal entities, contractors and subcontractors are subject to debarment and suspension regulations. These regulations restrict awards, subawards, and contracts with certain parties that are debarred, suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs and activities. In general, an “excluded” party cannot receive a Federal grant award or a contract within the meaning of a “covered transaction,” to include subawards and subcontracts. The debarment and suspension clause is required for all contracts and subcontracts for \$25,000 or more, all contracts that require the consent of an official of a federal agency, and all contracts for federally required audit services.

Suggested Language. The following provides a debarment and suspension clause. It incorporates an optional method of verifying that contractors are not excluded or disqualified.

Suspension and Debarment

- (1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor’s principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- (2) The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

- (3) This certification is a material representation of fact relied upon by (insert name of recipient/subrecipient/applicant). If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to (insert name of recipient/subrecipient/applicant), the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- (4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

Byrd Anti-Lobbying Amendment

Contractors that apply or bid for a contract of \$100,000 or more under a federal grant must file the required certification. This is also applicable to subcontractors of more than \$100,000, must include a contract provision prohibiting the use of federal appropriated funds to influence officers or employees of the federal government. Contractors that apply or bid for a contract for more than \$100,000 must also file the required certification regarding lobbying.

Suggested Language. The following provides a sample contract clause:

Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

Procurement of Recovered Materials

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Suggested Language. The following provides a sample contract clause:

“In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired competitively within a timeframe providing for compliance with the contract performance schedule; meeting contract performance requirements; or at a reasonable price.

Information about this requirement, along with the list of EPA-designated items, is available at [EPA's Comprehensive Procurement Guidelines webpage](#).

The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.”

Domestic Preference for Procurement

As appropriate, and to the extent consistent with law, NFEs should, to the greatest extent practicable under a federal award, provide a preference for the purchase, acquisition, or use of goods, products or materials produced in the United States. This includes, but is not limited to, iron, aluminum, steel, cement, and other manufactured products.

Suggested Language. The following provides a sample contract clause:

“Domestic Preference for Procurements

As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

For purposes of this clause:

Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.”

Recommended Clauses

Access to Records

NFEs and their contractors and subcontractors must give the Department of Treasury and other authorized representatives access to records associated with their awards during the federally required record retention period and as long as the records are retained.

Suggested Language. The following provides a sample contract clause:

The following access to records requirements apply to this contract:

(1) The Contractor agrees to provide (insert name of state agency or local or Indian tribal government), (insert name of recipient), Treasury, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

(2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

(3) The Contractor agrees to provide the Treasury or authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

Contract Changes or Modifications

To be eligible for ARP SLFRF assistance under the non-Federal entity’s Treasury grant or cooperative agreement, the cost of the change, modification, change order, or constructive change must be allowable, allocable, within the scope of its grant or cooperative agreement, and reasonable for the completion of project scope.

Compliance with Federal Law, Regulations and Executive Orders

The recipient and its contractors are required to comply with all Federal laws, regulations, and executive orders.

Suggested Language. The following provides a sample contract clause:

“This is an acknowledgement that Treasury ARP SLFRF financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable Federal law, regulations, executive orders, Treasury policies, procedures, and directives.”

Program Fraud and False or Fraudulent Statements or Related Acts

Recipients must comply with the requirements of The False Claims Act (31 U.S.C. §§ 3729-3733) which prohibits the submission of false or fraudulent claims for payment to the federal government. It is that the non-Federal entity include a provision in its contract that the contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to its actions pertaining to the contract.

Suggested Language. The following provides a sample contract clause:

“The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor’s actions pertaining to this contract.”

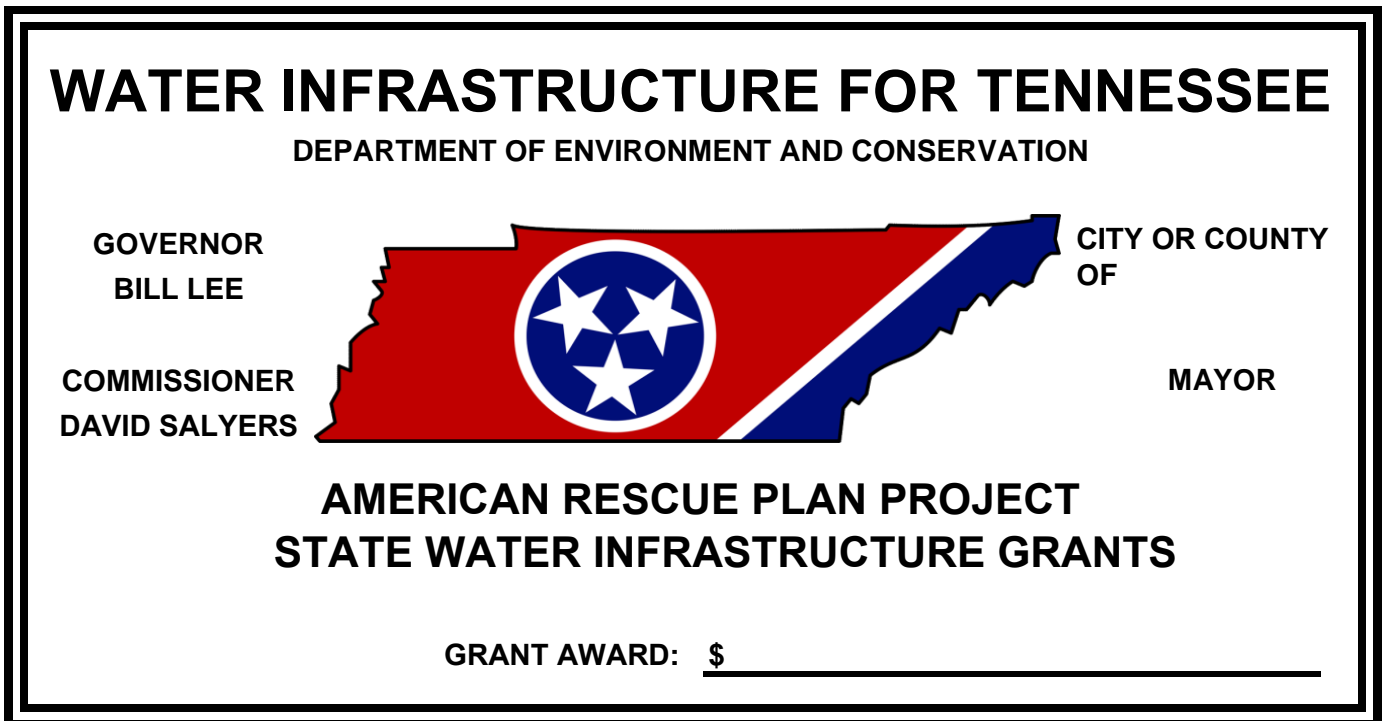
| | |
|---|-------------------------------------|
| | |
| Signature of Authorized Representative | Date |
| | |
| Printed Name | Phone Number / Email Address |

STATE WATER INFRASTRUCTURE GRANTS

IDENTIFICATION SIGN

All plans and specifications for each project approved shall contain provisions for requiring the general contractor to provide identification signs. The signs shall conform to the following basic features:

1. The following diagram shall be used as a design:



2. The sign shall be a 4'0" X 8'0" sheet of exterior grade plywood and shall be built so as to remain erected during the entire construction phase of the project.
3. The background of both sides shall be white. The lettering shall be black and shall be large enough to take advantage of the full size of the plywood. The stars shall be white set on a blue field and surrounded by a white ring placed inside a state map in red with a stripe of white and blue on the right side. The sign shall be bordered by a one-inch blue stripe.

**Reporting for projects greater than \$10 million of SLFRF
Davis-Bacon and Certification of Labor Agreements - Overview**



This report must be submitted for each approved project that will expend greater than \$10 million total of SLFRF on a single project. This information is required to assist TDEC in reporting directly to U.S. Treasury and will require quarterly updates over the life of the contract terms.

Purpose:

The purpose of this report is for you to provide TDEC with information on project(s) where Davis Bacon Act should be considered:

- 1) collect the data/information required for U.S. Treasury Reporting submissions
- 2) facilitate monitoring of your project(s)
- 3) understand performance of your project funded through your grant

Instructions:

Please complete all relevant questions on the Davis-Bacon and Labor Agreement tab each quarter.

Davis-Bacon Act Certification

Select "Yes" or "No" response to Certification question for Davis-Bacon Act:

PLEASE NOTE: Selecting "Yes" means that you intend to certify that all contractors and subcontractors are paying prevailing wages and fringe benefits to all laborers and mechanics on the project. Documentation to substantiate the certification may be requested to support inquiries from Treasury.

If "No", grantees are required to provide the data/information in section a.

Certification for Labor Agreements:

Select "Yes" or "No" response to Certification question for existence of project labor agreement:

PLEASE NOTE: Selecting "Yes" means that you intend to or are using an 8(f) pre-hire agreement on your project.

If "No", grantees are required to provide the data/information in section b.

[Submit reports no later than the 10th day after the end of the quarter: tdec.arp@tn.gov](mailto:tdec.arp@tn.gov)

For assistance with this reporting requirement, please reach out to us at tdec.arp@tn.gov.

| Davis-Bacon Certification | Response | Comments |
|--|----------|--|
| Do you intend to certify that “all laborers and mechanics employed by contractors and subcontractors in the performance of the project are paid wages at rates not less than those prevailing, as determined by the U.S. Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code (commonly known as the “Davis-Bacon Act”), for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the civil subdivision of the State (or the District of Columbia) in which the work is to be performed, or by the appropriate state entity pursuant to a corollary state prevailing-wage-in-construction law (commonly known as “baby Davis-Bacon Acts”)? | | |
| a. A grantee must provide a project employment and local impact report detailing: | | |
| Number of employees of contractors and sub-contractors working on the project | | |
| Number of employees on the project hired directly | | |
| Number of employees on the project hired through a third party | | |
| Whether those wages are at rates less than those prevailing* | | |
| Provide a listing of wages and benefits of workers on the project by classification | | Attach listing of wages and benefits by classification |

| Certification for Labor Agreements | Response | Comments |
|--|----------|----------|
| Do you intend to certify that “the indicated project includes a project labor agreement, meaning a pre-hire collective bargaining agreement consistent with section 8(f) of the National Labor Relations Act (29 U.S.C. 158(f))?” | | |
| b. The grantee must also provide a project workforce continuity plan detailing: | | |
| How the grantee will ensure the project has ready access to a sufficient supply of appropriately skilled and unskilled labor to ensure high-quality construction throughout the life of the project, including a description of any required professional certifications and/or in-house training? | | |
| How the grantee will minimize risks of labor disputes and disruptions that would jeopardize timeliness and cost-effectiveness of the project? | | |
| How the grantee will provide a safe and healthy workplace that avoids delays and costs associated with workplace illnesses, injuries, and fatalities, including descriptions of safety training, certification, and/or licensure requirements for all relevant workers? | | |
| Will workers on the project will receive wages and benefits that will secure an appropriately skilled workforce in the context of the local or regional labor market? | | |
| Does the project have completed a project labor agreement? | | |

| | | |
|---|--|--|
| c. Does the project prioritizes local hires? And how is the prioritization accomplished? | | |
| d. Does the project have a Community Benefit Agreement? Please provide a description of any such agreement in the Comments. | | |

Grantee must maintain sufficient records to substantiate this information upon request

* As determined by the U.S. Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code (commonly known as the “Davis-Bacon Act”), for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the civil subdivision of the State (or the District of Columbia) in which the work is to be performed.

"General Decision Number: TN20240142 01/05/2024

Superseded General Decision Number: TN20230142

State: Tennessee

Construction Type: Heavy
Including Water and Sewer Line Construction

Counties: Cannon, Cheatham, Davidson, Dickson, Hickman,
Macon, Rutherford, Smith, Williamson and Wilson Counties in
Tennessee.

HEAVY CONSTRUCTION PROJECTS (including sewer/water
construction).

Note: Contracts subject to the Davis-Bacon Act are generally
required to pay at least the applicable minimum wage rate
required under Executive Order 14026 or Executive Order 13658.
Please note that these Executive Orders apply to covered
contracts entered into by the federal government that are
subject to the Davis-Bacon Act itself, but do not apply to
contracts subject only to the Davis-Bacon Related Acts,
including those set forth at 29 CFR 5.1(a)(1).

| | |
|---|---|
| If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: | . Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024. |
| If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: | . Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024. |

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number Publication Date
0 01/05/2024

ELEC0429-007 06/01/2022

| | Rates | Fringes |
|------------------|----------|---------|
| Electrician..... | \$ 31.55 | 14.08 |

ENGI0369-016 05/02/2013

Cheatham, Davidson, Dickson, Hickman, Rutherford, Williamson
and Wilson Counties

| | Rates | Fringes |
|--|----------|---------|
| Operating Engineers: Bulldozer, Crane, and Forklift..... | \$ 22.97 | 9.85 |

ENGI0917-024 05/01/2017

Cannon, Macon, and Smith Counties

| | Rates | Fringes |
|--|----------|---------|
| Operating Engineers: Bulldozer and Crane..... | \$ 28.26 | 10.10 |
| Forklift..... | \$ 25.97 | 10.10 |

SUTN2009-141 12/02/2009

| | Rates | Fringes |
|--|-------------|---------|
| LABORER: Common or General..... | \$ 10.25 ** | 0.00 |
| LABORER: Flagger..... | \$ 8.73 ** | 0.00 |
| LABORER: Pipelayer..... | \$ 11.71 ** | 0.00 |
| OPERATOR: Backhoe/Excavator/Trackhoe..... | \$ 17.35 | 0.00 |
| OPERATOR: Loader..... | \$ 13.50 ** | 0.00 |
| TRUCK DRIVER: Dump Truck..... | \$ 10.76 ** | 0.00 |

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

=====

** Workers in this classification may be entitled to a higher
minimum wage under Executive Order 14026 (\$17.20) or 13658
(\$12.90). Please see the Note at the top of the wage
determination for more information. Please also note that the
minimum wage requirements of Executive Order 14026 are not
currently being enforced as to any contract or subcontract to
which the states of Texas, Louisiana, or Mississippi, including
their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
NOT TO BE USED FOR BIDDING PURPOSES. CONTACT THOMAS & HUTTON TO PURCHASE SET OF BID DOCUMENTS

for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates

the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"

NOTICE

THIS ENTITY IS A RECIPIENT OF **STATE AND FEDERAL** FUNDS. IF YOU HAVE KNOWLEDGE OF ANY ACTIVITY WHICH YOU CONSIDER TO BE ILLEGAL, IMPROPER, OR WASTEFUL, PLEASE CALL THE STATE COMPTROLLER'S TOLL-FREE HOTLINE:

1-800-232-5454



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

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and

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CONSTRUCTION SPECIFICATIONS INSTITUTE

EJCDC C-700 Standard General Conditions of the Construction Contract
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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.

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SUPPLEMENTARY CONDITIONS

ARTICLE 1 - DEFINITIONS¹

The Owner, the Contractor, and the A/E are those mentioned as such in the Agreement. They are treated throughout the contract documents as if each were of the singular number and masculine gender.

Wherever in this Contract the word "A/E" is used, it shall be understood as referring to the A/E of the Owner, acting personally or through any assistants duly authorized by the A/E in writing to do so.

Written notice shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended or if delivered at or sent by registered mail to the last business address known to him who gives the notice.

The term "Subcontractor," as employed herein, includes only those having a direct contract with the Contractor; and it includes one who furnishes material worked to a special design according to the drawings and specifications of this work, but does not include one who merely furnishes material not so worked.

ARTICLE 2 - PRELIMINARY MATTERS

2.2.1 The Contract shall be signed in four(4) original copies by the Owner and the Contractor.

2.6.1.1 Progress Schedule

The Contractor shall, within twenty (20) days after date of

¹Since these Supplementary Conditions are to supplement the General Conditions, articles are numbered to conform with the numbering system of the General Conditions; where a numbered article is omitted from the Supplementary Conditions, the article of that number in the General Conditions is taken to be complete and in no need of supplementation.

award of work, prepare and submit to the A/E for approval a practical schedule showing the order in which the Contractor proposes to carry on the work, the date on which he will start the salient features, and the contemplated dates for completing same. The schedule shall be in the form of a signed and dated progress chart of suitable scale to indicate appropriately the percentage of work schedule for completion at any time. The Contractor shall enter on the chart the actual progress at the time he submits his request for partial payment and shall immediately deliver to the A/E four (4) copies thereof. If the Contractor fails to submit a progress chart at the time herein prescribed, the Owner may withhold approval of progress payment estimates until such time as the Contractor submits the required progress schedule. If, in the opinion of the A/E and Owner, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve his progress, and the Owner may require him to increase the number of shifts or overtime operations, days at work, or the amount of construction planned, or all of these, and to submit for approval such supplementary schedules or schedules in chart form as may be deemed necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Owner. Failure of the Contractor to comply with requirements of the Owner under this provision shall be grounds for determination by the Owner that the Contractor is not prosecuting the work with such diligence as will ensure the completion within the time specified.

The progress schedule shall be such that it can be relied upon by the Contractor and others to coordinate testing, inspection, etc., and the sequence and interrelationship of other contracts, if any, affecting the project.

2.6.3.1 Schedule of Values

The Contractor shall also submit such other information relating to the unit prices as may be required by the A/E and shall revise the bid breakdown as directed by the A/E. The breakdown will be used for checking the Contractor's applications for partial payment.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, AND REUSE

3.5.4 No oral agreement or conversation with any officer, agent, or employee of the Owner, either before or after execution of this

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Contract, shall affect or modify any of the terms of obligations contained in any of the documents comprising said Contract.

3.5.5 Dimensions and other details shown on the drawings suitable or unsuitable for a particular manufacturer are not to be construed as being restrictive. Any substitute material and/or equipment so offered for approval must be accompanied by complete and detailed specifications, data sheets, and performance record with fully dimensioned drawings. The A/E's decision concerning compliance with specifications will be final.

3.6.1 Reuse of Documents

With the exception of the signed Contract, sets are to be returned to the A/E upon request at the completion of the work. No reuse of documents is allowed without written consent of Thomas & Hutton.

ARTICLE 5 - BONDS AND INSURANCE

5.3 Contractor's Liability Insurance

5.3.8 Contractor's General Liability and Automobile Liability Insurance: The Contractor will furnish the Owner with proof of insurance coverage under a general liability insurance policy and an automobile liability insurance policy, both of which will be of the comprehensive form. The insurance shall protect the insured from claims for damages because of bodily injury (including accidental death) and from claims for property damage (including loss of use resulting therefrom). This insurance shall include the specific coverage and be written for not less than the limits set out below. In addition, the Contractor will furnish an Owner's protective policy similar to that specified herein.

General Liability:

| | |
|---|-------------|
| 1. Bodily injury or death - each occurrence | \$1,000,000 |
| 2. Bodily injury or death - aggregate | 1,000,000 |
| 3. Property damage - each occurrence | 500,000 |
| 4. Property damage - aggregate | 500,000 |
| 5. Personal injury - aggregate | 500,000 |

Automobile Liability (including owned, hired, and non-owned):

| | |
|---|-------------|
| 1. Bodily injury or death - each person | \$1,000,000 |
| 2. Bodily injury or death - each occurrence | 1,000,000 |
| 3. Property damage - each occurrence | 500,000 |

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5.3.9 Subcontractor's General Liability and Automobile Liability Insurance: The Contractor shall either (1) require each of his Subcontractors to procure and to maintain, during the life of their subagreement, insurance as specified in Article 5.3 of the Supplementary Conditions, or (2) insure the activities of his Subcontractor(s) in his own insurance policy.

5.3.10 Scope of Insurance and Special Hazards: The insurance required under Subparagraphs 5.3.8 and 5.3.9 hereof shall provide adequate protection for the Contractor and his Subcontractors against any or all damage claims that may arise out of or result from operations under the requirements of the contract documents whether such operations be by the insured or anyone directly or indirectly employed by him, and also against any of the special hazards (such as explosion and collapse of underground hazards) that may be encountered in the performance of the work called for by the contract documents.

5.3.11 Proof of Carriage of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates, and dates of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be cancelled or materially altered except after a thirty (30) day written notice has been received by the Owner."

5.3.13 Contractor's and Subcontractor's Insurance: The Contractor shall not commence work under this Contract until he has obtained all the insurance required under this section and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his subcontract until the insurance required of the Subcontractor has been so obtained and approved.

5.6.1 Property Insurance

Insurance listed under Section 5.6 of the Standard General Conditions of the Contract shall be purchased and maintained by the Contractor.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

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6.20.4 Protection of Lives and Health

In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for conditions at the job site, including the safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.

ARTICLE 7 - CONTRACTOR'S REFERENCES AND WORK EXPERIENCE

7.1 The contractor shall submit municipal references which the A/E and owner can verify that demonstrates the following:

1. The bidder has installed a minimum of 250,000 linear feet of sewer line rehabilitation by pipe bursting methods, of the same products and using the same methods as indicated in this project. The projects shall have been performed in the United States, with a minimum of 5,000 linear feet of sewer line diameters 15" or larger within the last 5-years.
2. The bidder has been actively involved in the direct field installation of the same products and using the same pipe bursting methods as indicated in this project for a minimum of five years.
3. The bidder's qualified superintendent shall have a minimum of five years supervisory field experience, completed at a minimum of three projects containing a total of 5,000 linear feet of 12" or larger pipe and completed a minimum of 150,000 linear feet of the same products and pipe bursting methods as indicated in this project.

7.2 All references shall pertain to actual work performed by the bidder (subcontractor references are not allowed) on sanitary sewer projects consisting of sewer system rehabilitation by pipe bursting methods. Referenced work and projects shall have been performed with the techniques and applications specified for this project. The references shall be submitted on a project by project basis with the project name, project location, project contact and reference, quantity and line size of pipe bursting rehabilitation installed and date of project completion.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.3.1 Project Representation

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General: Resident Project Representative (RPR) is the A/E's and Town's agent at the site, will act as directed by and under the supervision of the Town and A/E, and will confer with the A/E regarding RPR's actions. RPR's dealings in matters pertaining to the on-site work shall in general be with the A/E and Contractor, keeping the Owner advised as necessary. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of the Contractor. RPR shall generally communicate with the Owner with the knowledge of and under the directions of the A/E.

9.3.2 Duties and Responsibilities of RPR

The Resident Project Representative shall:

9.3.2.1 Schedules: Review the progress schedule, the schedule of shop drawing submittals and schedule of values prepared by the Contractor; and consult with the A/E concerning acceptability.

9.3.2.2 Conferences and Meetings: Attend meetings with the Contractor, such as preconstruction conferences, progress meetings, job conferences and other project related meetings and prepare and circulate copies of minutes thereof.

9.3.2.3 Liaison:

a. Serve as the A/E's liaison with the Contractor, working principally through the Contractor's superintendent; and assist in understanding the intent of the contract documents; and assist the A/E in serving as the Owner's liaison with the Contractor when the Contractor's operations affect the Owner's on-site operations.

b. Assist in obtaining from the Owner additional details or information, when required for proper execution of the work.

9.3.2.4 Shop Drawings and Samples:

a. Record date of receipt of shop drawings and samples.

b. Receive samples which are furnished at the site by the Contractor, and notify the A/E of availability of samples for examination.

c. Advise the A/E and Contractor of the commencement of any work requiring a shop drawing or sample if the submittal has not

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been approved by the A/E.

9.3.2.5 Review of Work, Rejection of Defective Work, Inspections, and Tests

a. Conduct on-site observations of the work in progress to assist the A/E in determining if the work is in general proceeding in accordance with the contract documents.

b. Report to the A/E whenever the RPR believes that any work is unsatisfactory, faulty, or defective or does not conform to the contract documents or has been damaged or does not meet the requirements of any inspections, test, or approval required to be made; and advise the A/E of work that the RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

c. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate personnel, and that the Contractor maintains adequate records thereof; observe, record, and report to the A/E appropriate details relative to the test procedures and start-ups.

d. Accompany visiting inspectors representing public or other agencies having jurisdiction over the project; record the outcome of these inspections; and report to the A/E.

9.3.2.6 Interpretation of Contract Documents: Report to the A/E when clarifications and interpretations of the contract documents are needed and transmit to the Contractor clarifications and interpretations as issued by the A/E.

9.3.2.7 Modifications: Consider and evaluate the Contractor's suggestions for modifications in the drawings or specifications and report with the RPR's recommendations to the A/E. Transmit to the Contractor decisions as issued by the A/E.

9.3.2.8 Records:

a. Maintain at the job site orderly files for correspondence, reports of job conferences, shop drawings and samples, reproductions of original contract documents including all work directive changes, addenda, change orders, field orders, and additional drawings issued subsequent to the execution of the Contract, A/E's clarifications and interpretations of the contract documents, progress reports, and other project related documents.

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b. Keep a diary or log book recording Contractor hours on the job site, weather conditions, data relative to questions of work directive changes, change orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail, as in the case of observing test procedures; and send copies to the A/E.

c. Record names, addresses and telephone numbers of all Contractors, Subcontractors, and major suppliers of materials and equipment.

9.3.2.9 Reports:

a. Furnish the A/E as required with periodic reports of the progress of the work and of the Contractor's compliance with the approved progress schedule, schedule of shop drawing and sample submittals.

b. Consult with the A/E in advance of scheduled major tests, inspections, or start of important phases of the work.

c. Draft proposed change orders and work directive changes, obtaining backup material from the Contractor and recommend to the A/E change orders, work directive changes, and field orders.

d. Report immediately to the A/E and Owner upon the occurrence of any accident.

9.3.2.10 Payment Requests: Review applications for payment with the Contractor for compliance with the established procedure for their submission and forward with recommendations to the A/E, noting particularly the relationship of the payment requested to the schedule of values, work completed and materials and equipment delivered at the site but not incorporated in the work.

9.3.2.11 Certificates, Maintenance and Operation Manuals: During the course of the work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by the Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to the A/E for review and forwarding to the Owner prior to the final payment for the work.

9.3.2.12 Completion:

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a. Before the A/E issues a Certificate of Substantial Completion, submit to the Contractor a list of items requiring completion or correction.

b. Conduct final inspection in the company of the A/E, Owner, and Contractor and prepare a final list of items to be completed or corrected.

c. Observe that all items on final list have been completed or corrected and make recommendations to the A/E concerning acceptance.

9.3.3 Limitations of Authority: The RPR shall not:

a. Authorize any deviation from the contract documents or substitution of materials or equipment, unless authorized by the A/E;

b. Exceed limitations of the A/E's authority as set forth in the Contract Documents;

c. Undertake any of the responsibilities of the Contractor, Subcontractors, or the Contractor's superintendent;

d. Advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the contract documents;

e. Advise on, issue directions regarding or assume control over safety precautions and programs in connection with the work;

f. Accept shop drawings or sample submittals from anyone other than the A/E;

g. Authorize the Owner to occupy the project in whole or in part;

h. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by the A/E.

ARTICLE 10 - CHANGES IN THE WORK

10.6 The Contractor, in connection with any proposal he makes,

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shall furnish a price breakdown, itemized as required by the Owner or A/E. Unless otherwise directed, the breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, and shall cover all work involved in the change order, whether such work was deleted, added, or changed. Any amount claimed for subcontracts shall be supported by a similar price breakdown. The proposal shall include a breakdown of all costs on behalf of the Contractor and his subcontractors and suppliers for all costs and markup directly or indirectly attributable to the change(s) ordered, for all delays related thereto, and for performance or the change within the time frame stated. In addition, if the proposal includes a time extension request, a justification therefore shall also be furnished. The proposal, together with price breakdown and time extension justification, shall be furnished by the date specified to the Owner or A/E.

ARTICLE 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

13.2.1 Access to the Work

Right of entry shall be guaranteed at all times on any project site(s) described in the contract documents. Entry shall be guaranteed to any representative of the Tennessee Department of Transportation, the Tennessee Department of Conservation and Environment, and any other Federal, State or local agency having jurisdiction.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.4.1 Review of Application for Progress Payments

The A/E will check the Contractor's estimate, and the Owner will make payment to the Contractor promptly and retain only such amounts as may be justified by specific circumstances and provisions of the federal grant or the construction Contract. The amount due will be determined by the completed work and material stored on site less previous payments.

Retained amounts shall be limited to the following:

1. Withholding of not more than 5% of the payment claimed is allowed by state law.

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2. When work is substantially complete (operational or beneficial occupancy), reduction of the withholding to less than 5% of the contract amount may be granted (but will be reviewed by the owner and A/E) provided the Contractor is making satisfactory progress and is performing all finished grading, seeding and straw and there is no specific cause for greater withholding;

3. The Owner may reinstate up to 5% withholding if the Owner determines, at his discretion, that the Contractor is not making satisfactory progress or that there is other specific cause for such withholding.

4. The Owner may consider accepting securities negotiable without recourse, condition, or restrictions; a release of retainage bond; or an irrevocable letter of credit provided by the Contractor in lieu of all or part of the cash retainage.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.6 Removal of Equipment

In the case of termination of this Contract for any cause whatever before completion, the Contractor, if notified to do so by the Owner, shall promptly remove any part or all of his equipment or supplies from the property of the Owner, failing which the Owner shall have the right to remove such equipment and supplies at the expense of the Contractor.

END OF SECTION

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SECTION 01031

SPECIAL PROJECT PROCEDURES

1. MAINTAINING TRAFFIC, PROPERTY ACCESS AND BUSINESS OPERATIONS

1.1 The operations performed under this Contract shall be closely coordinated, scheduled and conducted in such a manner and sequence as to cause the least practical interference with the traveling public, fire protection and police service and public utility service.

1.2 When it becomes necessary to make connections, cut-ins, or alterations or to perform any other work that temporarily interferes with normal operations, coordinate such work with the Owner and/or utility company at least one week in advance of interruptions and perform the work as directed in a prompt and orderly manner so as to minimize such interference.

1.3 Any interference work with the operations of the public use of roadways shall be coordinated by the contractor with the A/E, Public Works Director, Utilities Director, Town of Smyrna Police Department, Town of Smyrna Fire Department, all other emergency response providers, and any affected schools at least 2-weeks prior to the scheduled interferences.

1.4 If applicable, contractor is responsible for purchasing and placing door hangers at all homes and businesses in the area affected by the project before construction begins (verbiage to be provided by Town of Smyrna Utilities Department). Door hangers shall be placed prior to construction. Mailings vs. Door hangers are acceptable if the contractor chooses to do mailings. The contractor is to give assurance that mailings are done and sent to the proper addresses of streets being affected. The mailing language is to be coordinated with the Utilities Director. Cost to be considered incidental to the project. No additional pay will be allowed for this item.

1.5 Contractor shall conform to the time restrictions and other requirements set forth by the Town of Smyrna for construction hours and days.

2. ACCESS TO THE JOB SITE

2.1 The Engineer and Owner will designate, for the Contractor and his forces, the method of access to the job site, areas of related work, and the areas to be used for vehicle parking. The Contractor shall instruct his personnel, subcontractors and material suppliers accordingly.

2.2 Equipment and supplies shall be stored in approved areas obtained by the contractor and approved by the landowner, engineer, and owner.

3. SECURITY

3.1 The Owner will assume no responsibility for the safeguarding of materials, equipment or supplies that the Contractor uses or stores at the job site.

4. SAFETY

4.1 Keep all flammable liquids and explosive materials in the areas designated by the contractor, federal, state and local agencies for safe storage. Provide and maintain in working order standard UL labeled, water pressurized fire extinguishers as required.

5. SMOKING AND FIRE PRECAUTIONS

5.1 No smoking, fire, or use of any fire or explosion producing tools, or equipment will be permitted on the properties of oil companies or other concerns prohibiting same on their premises or at any locations where such may endanger said premises or the current operations thereon.

6. MANUFACTURERS' QUALIFICATIONS

6.1 The manufacturers of all materials and equipment used must be reputable and regularly engaged in the manufacture of the particular material or equipment for the use and service to which it will be subjected.

7. CONTRACTOR SHALL PAY FOR ALL LABORATORY INSPECTION SERVICE

7.1 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Contractor and approved by the Town of Smyrna Director of Utilities. The Contractor shall pay for all laboratory inspection services as a part of the required work. Submit all material test reports to the Director of Utilities in triplicate.

8. COMPLIANCE WITH STATE AND LOCAL LAWS

8.1 Comply with all applicable requirements of state and local laws and ordinances to the extent that such requirements do not conflict with federal laws or regulations.

9. COMPLIANCE WITH STATE AND LOCAL CONSTRUCTION SPECIFICATIONS

9.1 All sewer work is to be completed in accordance with the Town of Smyrna's Utility Department Standard Sewer Specifications.

9.2 All roadway work and materials shall be in accordance with the Standard Road and Bridge Specifications of the Tennessee Department of Transportation (March, 2006 edition).

9.3 The roadways shall also be repaired to the applicable standard drawings provided on the plan detail sheets or included in Town of Smyrna Standard Drawings and Specifications as outlined in the Town of Smyrna Subdivision Regulations.

9.4 All traffic control measures shall meet the requirements of the current Manual on Uniform Traffic Control Devices. During construction operations where applicable, two (2) flagmen will be present at all times during construction when machinery or personnel block one lane.

9.5 The Town of Smyrna Public Works Director must be contacted 7 days prior to any proposed lane closures. Each proposed lane closure must be approved by the Town of Smyrna Public Works Director. If a uniformed police officer is required, the cost for that service will be paid for under other items and shall be considered incidental to the listed work item quantities. No additional pay will be allowed for this service if required.

10. MARKERS

10.1 Preserve all Corps of Engineers, USGS, TVA, State of Tennessee, and private markers; do not remove or disturb any such markers without prior approval from the Director of Utilities. Any removal and replacement of such markers shall be at the expense of the Contractor.

11. PAVEMENT REPAIR AND/OR REPLACEMENT

11.1 Whenever pipe trenches are cut across or along existing pavement or shoulders, backfill the full trench depth with compacted crushed stone (98% standard proctor density) and restore traffic over cuts as quickly as possible. Class A, Grade D crushed stone shall be used to cap each cut to the depth indicated on the plans. Add material and otherwise maintain such surface until the asphalt binder has been installed. All permanent pavements shall consist of TDOT 307-BM binder mix installed within neatly saw cut trench lines. Temporary pavement installation may be required to be installed at the roadway trench crossings, by the contractor if the crushed stone is not maintained properly. This will be determined by the Utilities

Director and Public Works Director based on roughness and frequency of maintenance by the contractor prior to permanent repairs.

11.2 All asphalt milling and paving operations will be defined by the representative of the Utilities Department.

12. APPROVED CHEMICALS

12.1 All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either EPA or USDA. The use of all such chemicals and the disposal of residues shall be in strict conformance with all applicable instructions and federal, state and local regulations.

13. DEPARTMENT OF TRANSPORTATION PERMITS

13.1 The contractor will secure any permits and provide bond as required by the Tennessee Department of Transportation for the installation of permanent facilities on State Highway rights-of-way when applicable. The costs for such bonds and/or permits, if applicable, shall be paid by the contractor. All such work shall be coordinated with and be subject to the approval of the Tennessee Department of Transportation, in addition to the approval of the Town of Smyrna and the Director of Utilities.

13.2 The contractor will secure any permits as required by the local Public Works and the County Highway Department for the installation of sewer lines within the rights-of-way of local and county roads. The contractor shall be responsible for complying with the requirements of the local Public Works Department and County Highway Department, (when applicable), and all such work shall be coordinated with and be subject to their approval.

14. INSTALLATION, TESTING, AND GUARANTEE

14.1 The completely installed system shall be guaranteed against any and all defects of operations, manufacture, materials, workmanship, or installation for a period of one year from the date of written acceptance by the Town of Smyrna.

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15. DRAWINGS OF RECORD

15.1 The contractor shall provide and keep up-to-date a complete record set of blue line prints, which shall be corrected daily to show every change that has occurred with the project. Keep this set of prints at the job site, and use only as a record set. This shall not be construed as authorization for the contractor to make changes in the approved layout without definite instructions and approval by the Director of Utilities in each case. These record drawings shall be converted to digital format by the contractor's engineer and shall be submitted to the Town of Smyrna in a format compatible with the Town's Utilities Department software.

16. DETECTION WIRE

16.1 When applicable, for detection and location purposes of force mains, a 12-gage solid strand copper tracing wire (shielded) shall be installed as per the manufacturer's instructions. Connections between wires shall be soldered or connected with wire nut fasteners and wrapped. Also, metallic tape marked "sewer" shall be provided 12" below grade directly above the force main.

17. UTILITIES

17.1 The contractor shall contact the owner of all underground utilities before beginning construction in the area. Carefully protect from damage all utilities in the vicinity or the work at all times. If it is necessary to repair, remove, and/or replace any such utility in order to complete the work properly, do so in compliance with the rules and regulations of the particular utility involved. Any such work shall be considered incidental to the construction of the project. A Tennessee-One-Call shall be performed by the contractor prior to commencement of any work in the area of existing utilities.

18. INSURANCE

The Contractor shall procure, maintain, and furnish, and provide an Owner's protective policy with the Town of Smyrna named insured and as hereinafter specified:

Owner's General Public Liability and Property Damage Insurance including vehicle coverage issued to the Owner and protecting the Owner from all claims for personal injury, including death, and all

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claims for destruction of or damage to property, arising out of or in connection with any operations under the Contract Documents, whether such operations be by the Contractor or by any Subcontractor employed by the Contractor or anyone directly or indirectly employed by the Contractor or by a Subcontractor employed by the Contractor. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting there from, sustained by any one person in any one accident; and a limit of liability of not less than \$1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$500,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damage sustained by two or more persons in any one accident.

This requirement for an Owner's protective policy shall be in addition to any and all other insurance requirements as set forth in the Contract Documents, if applicable.

19. National Pollution Discharge Elimination System (NPDES) General Permit for Municipal Separate Storm Sewer System (MS4) Phase II Program requirements shall be adhered to by the contractor throughout the project.

19.1 All work shall be in accordance with the Town of Smyrna's National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II Program. Prior to any excavation activities commencing, the contractor shall apply for and receive an approved permit from the Town of Smyrna for such excavation activities. The application for permit will be reviewed by the Program Director and an approved permit shall be obtained prior to excavation activities. All erosion and sediment runoff control measures shall be installed in accordance with the approved permit and shall be maintained throughout the project cycle and until adequate and approved vegetative cover has been established.

19. PROPERTY REPAIR AND REPLACEMENT

The contractor shall be required to replace all property items damaged during construction such, but not limited to, mailboxes, landscaping, turf, drainage components, existing utilities, fencing, storage buildings, ornamental items, sidewalks, signs, etc. Certain mature trees along the utilities alignment and routing will be required to be removed by the contractor as part of the utility installation work. These trees will be part of the easement acquisition and replacement by the contractor will not be required.

20. BYPASS PUMPING

The contractor shall be required to maintain continued sewer flow around the work being performed. The bypass pumping shall be considered incidental to the project and the cost of this work shall be included within the lump sum bid price. No additional pay shall be allowed for this work. The contractor shall develop and submit a bypass pumping plan to the Engineer and Owner for review and approval prior to commencement of construction.

21. WEATHER DELAYS

21.1 EXTENSION OF CONTRACT TIME

If a Claim is made for an extension of time based upon weather delays in accordance with the General Conditions an extension may be granted only for the number of weather delay days in excess of the number of days listed for the applicable month on the standard baseline.

21.2 STANDARD BASELINE FOR ADVERSE WEATHER

The standard baseline is defined as the number of calendar days for each month during which construction activity exposed to weather conditions is expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the standard baseline is included in the Work and is not eligible for extension of Contract Time.

The Owner has established a standard baseline for the State of Tennessee as follows:

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 12 | 11 | 8 | 7 | 7 | 6 | 7 | 5 | 4 | 5 | 6 | 11 |

21.3 ADVERSE WEATHER AND WEATHER DELAY DAYS

A. Adverse weather is defined as the occurrence of one or more of the following conditions within a 24-hour day that prevents construction activity exposed to weather conditions or access to the site:

1. Precipitation (rain, snow, or ice) in excess of one-tenth inch liquid measure.
2. Temperatures that do not rise above the minimum required for the day's construction activity, if such temperature requirement is specified or accepted as standard industry practice.

3. Sustained wind speed in excess of the maximum for the day's construction activity, if such sustained wind speed maximum is specified or accepted as standard industry practice.

4. Dry out days under the following conditions:

a. more precipitation days occur than listed in the standard baseline;

b. there is a hindrance to site access or sitework and Contractor has taken all reasonable accommodations to avoid such hindrance; and,

c. no more than one dry out day is allocated for each additional day of precipitation more than the standard baseline that total one inch or more, liquid measure, unless specifically recommended by the Designer.

B. A weather delay day may be counted if adverse weather prevents work on the project for 50% or more of the contractor's scheduled work day and critical path construction activities were included in the day's schedule, including a weekend day or holiday if Contractor has scheduled construction activities that day.

21.4 DOCUMENTATION AND SUBMITTALS

A. Weather Delay Report:

1. Use a copy of the weather delay report provided in this section, indicating for each calendar month the days on which construction activity affecting the critical path of the Work was prevented by weather conditions.

2. In the column for the cause, indicate measurement of precipitation, temperature, wind, or other influencing factors.

3. Describe the construction activity that was scheduled, on the critical path, and delayed.

4. At the end of the month, add up the number of days delay, subtract the baseline number given in this Section, and show the resulting claimable days in excess of baseline.

5. Submit a copy of the completed report with the next application for payment. Reports submitted with applications for payment do not constitute a claim or preliminary claim for extension of time.

B. Claim for a time extension based on weather delay(s):

1. Submit a copy of all reports completed since the last month for which a time extension was previously claimed, or the commencement of Work if no previous claim, through the last month for which delay is being claimed. Claims for time extension based upon weather delays are unjustified if a submitted report does not corroborate the claim or if no report was submitted when it was required with an application for payment.
2. Submit daily jobsite work logs showing which and to what extent critical path construction activities have been affected by weather on a monthly basis.
3. Submit actual weather data to support claim for time extension obtained from nearest NOAA weather station or other independently verified source approved by Designer at beginning of project.
4. Organize claim documentation to facilitate evaluation on a basis of calendar month periods and the standard baseline.
5. Submit in accordance with the requirements of the Contract Documents.

Weather Delay Report

| Project Number and Project Name: | | Month and Year Reported Below: |
|----------------------------------|---------------------------------|--|
| | | |
| Date | Weather condition causing delay | Work scheduled on critical path for this day that was delayed. |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
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| 20 | | |
| 21 | | |
| 22 | | |
| 23 | | |
| 24 | | |
| 25 | | |
| 26 | | |
| 27 | | |
| 28 | | |
| 29 | | |
| 30 | | |
| 31 | | |
| | | Total number of days this month with delay due to weather |
| | | Baseline number from Section 01620 |
| | | Total - Baseline = claimable days |

END OF SECTION

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SECTION 01090

REFERENCE STANDARDS

PART 1. GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Applicability of Reference Standards.
- B. Provision of Reference Standards at site.
- C. Acronyms used in Contract Documents for Reference Standards. Source of Reference Standards.

1.2 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect as of the Bid date, or date of Owner-Contractor Agreement when there are bids, except when a specific date is specified.
- C. When required by individual Specifications section, obtain copy of standard. Maintain copy at job site during submittals, planning, and progress of the specific work, until Substantial Completion.

1.3 SCHEDULE OF REFERENCES

- | | |
|--------|---|
| AASHTO | American Association of State Highway and Transportation Officials 444 North Capitol Street NW, Suite 249 Washington, DC 20001 |
| ACI | American Concrete Institute 38800 Country Club Drive Farmington Hills, MI 48331 |
| AGC | Associated General Contractors of America 2300 Wilson Blvd., Suite 400 Arlington, VA 22201 |

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AI Asphalt Institute
2696 Research Park Drive
Lexington, KY 40511

AISC American Institute of Steel Construction
One East Wacker Drive, Suite 700
Chicago, IL 60601

AISI American Iron and Steel Institute
1140 Connecticut Ave. NW, Suite 705
Washington, DC 20036

AFPA American Forest Products Association
1111 Nineteenth Street NW, Suite 800
Washington, DC 20036

ANSI American National Standards Institute
1819 L Street, NW, 6th Floor
Washington, DC 20036

ASHRAE American Society of Heating, Refrigerating and
Air Conditioning Engineers
1791 Tullie Circle, NE
Atlanta, GA 30329

ASME American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016

ASTM American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

AWWA American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235

AWPA American Wood-Preservers Association
100 Chase Park South, Suite 116
Birmingham, AL 35244

AWS American Welding Society
550 NW LeJeune Road
Miami, FL 33126

CLFMI Chain Link Fence Manufacturers Institute
10015 Old Columbia Road, Suite B-215

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Columbia, MD 21046

CRSI Concrete Reinforcing Steel Institute
933 North Plum Grove Road
Schaumburg, IL 60173-4758

EJCDC Engineers Joint Contract Documents Committee
American Council of Engineering Companies
1050 15th Street, NW, 8TH Floor
Washington, DC 20005

EJMA Expansion Joint Manufacturers Association
25 North Broadway
Tarrytown, NY 10591

FM Factory Mutual System
1151 Boston-Providence Turnpike
Norwood, MA 02062

FS Federal Specification
General Services Administration
Federal Supply Service Product Acquisition
Center
Supply Standards Division (FLAS)
Arlington, VA 22202

GA Gypsum Association
6525 Belcrest Road, Suite 480
Hyattsville, MD 60201

IEEE Institute of Electrical and Electronics
Engineers
3 Park Avenue, 17th Floor
New York, NY 10016-5997

IGMA Insulating Glass Manufacturers Association
27 North Wacker Drive, Suite 365
Chicago, IL 60606

IMI International Masonry Institute
The James Brice House
42 East Street
Annapolis, MD 21401

MIL Military Specification

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Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120

ML/SFA Metal Lath/Steel Framing Association
600 S Federal Street, Suite 400
Chicago, IL 60605

NAAMM National Association of Architectural Metal
Manufacturers
800 Roosevelt Road, Bldg. C
Suite 312
Glen Ellen, IL 60137

NEBB National Environmental Balancing Bureau
8575 Grovemont Circle
Gaithersburg, MD 20877

NEMA National Electrical Manufacturers Association
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209

NSWMA National Solid Waste Management Association
4301 Connecticut Avenue, NW, Suite 300
Washington, DC 20036

NTMA National Terrazzo and Mosaic Association
201 North Maple, Suite 208
Purcellville, VA 20132

PCA Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077

PCI Prestressed Concrete Institute
209 West Jackson Blvd., #500
Chicago, IL 60606

PS Product Standard
U. S. Department of Commerce
1401 Constitution Ave., NW
Washington, DC 20230

SDI Steel Deck Institute

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P.O. Box 25
Fox River Grove, IL 60021

SIGMA Sealed Insulating Glass Manufacturers
Association
111 East Wacker Drive
Chicago, IL 60601

SJI Steel Joist Institute
Administrative Offices
1173 B Lyndon Links Drive
Forest, VA 24551

SMACNA Sheet Metal and Air Conditioning Contractors
National Association
4201 Lafayette Center Drive
Chantilly, VA 20151-1209

SSPC The Society for Protective Coatings
40 24th Street, 6th Floor
Pittsburgh, PA 15222-4656

TAS Technical Aid Series
Construction Specifications Institute
99 Canal Center Plaza, Suite 300
Alexandria, VA 22314

TCNA Tile Council of North America, Inc.
100 Clemson Research Blvd.
Anderson, SC 29625

UL Underwriters Laboratories, Inc.
333 Pfingston Road
Northbrook, IL 60062-2096

PART 2. PRODUCTS

2.1 Not Used.

PART 3. EXECUTION

3.1 Not Used.

END OF SECTION

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SECTION 01150

MEASUREMENTS AND PAYMENT

1. General

1.1 Measurement for payment on a unit price basis shall be as described below. Payment for each unit installed shall be made according to the unit price bid, as listed in the Bid Form. Only those items appearing in the Bid Form will be considered for payment on a unit price basis.

1.2 Even though an item of work is included in the technical specifications, if it is not both covered herein and specifically itemized in the Bid Form, payment for it shall not be separately made. Such work shall be considered a necessary part of or incidental to its related work.

2. Manhole Components

2.1 Payment for manholes shall be made at the contract unit price for each type of manhole rehabilitation and applicable depth. Manhole depth shall be measured from finished casting elevation to the average invert elevation (inlet pipe and outlet pipe) and shall include all other items of work necessary and incidental to completion of the work including testing. Manhole Rehabilitation **(Method 1)** shall include cleaning, sealing of any leaks, weepers, gushers, etc. prior to rehabilitation of the manhole by epoxy spray liner. Prior to the epoxy line a cementitious grout line shall be applied as recommended by the manufacturer to provide a smooth even surface for application of the epoxy liner.

2.2 Payment will be made for the application of each manhole epoxy liner per the depths indicated in the Bid Schedule. The unit price includes all work including cleaning, blasting, sealing, cementitious liner, epoxy liner, testing, cleanup, bypass pumping where required, traffic control, safety measures and all necessary work for a complete manhole rehabilitation system.

2.3 **(Method 2)** Inflow dish installation. Payment shall be made for each inflow dish installed within the existing manhole frame and cover, were indicated on the project Drawings. Contractor shall verify all dimensions prior to ordering the inflow dish for each installation to be installed per the manufacturer recommendations and tolerances for a sealed manhole frame and cover.

2.4 **(Method 3)** Replace frame and cover. Payment shall be made for each manhole frame and cover replacement, where indicated on the project drawings. Contractor shall remove the existing frame

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and cover and replace with a standard frame and cover per Smyrna standard details. Payment includes removal, disposal, replacement frame and cover, grade rings as required, labor, material, backfill, surface restoration in kind, and all necessary items for a complete installation.

3. Sanitary Sewer Rehabilitation Cured-in-Place Pipe (CIPP) Lining

3.1 The linear foot bid price shall be measured along the centerline of the pipe from manhole center to center rounded up to the nearest whole foot increment. Payment for this item shall include liner and installation, connections to existing manholes, inspection/testing, pre-television inspection and all labor, tools, materials, equipment, and incidentals and appurtenances necessary for the completion of these items to the complete satisfaction of the owner and project engineer.

3.2 Post-rehab television inspection (CCTV). A post rehabilitation inspection shall be provided to document and confirm the condition of the rehabilitated pipe segment, service connections, cleanliness and allow for view for acceptance of the work by the Owner/Engineer. Payment shall be measured along the centerline of the pipe from manhole center to center rounded up to the nearest whole foot increment. Payment for this item shall include cleaning of the rehabilitated line segment, camera inspection of the main line from manhole to manhole, documentation of all service locations, defects, special conditions and all necessary items for documents of the line per PACP requirements. Where defects are found and re-recording of the line is required to document repairs/replacements, no additional payment shall be allowed.

3.3 Heavy Cleaning. Heavy cleaning shall be considered for lines with heavy deposits, debris, and excessive root intrusion requiring additional cleaning. Cleaning shall only be considered heavy for lines where more than two full manhole to manhole passes have been performed and additional cleaning is required for the installation of the CIPP liner. Heavy cleaning shall only proceed with approval from the Owner and Engineer. The linear foot bid price shall be measured along the centerline of the pipe from manhole center to center rounded up to the nearest whole foot increment.

3.3 Internal preparatory trenchless repairs including removals of protruding taps, cutting of offset joints and dropped pipe sections. Where feasible trenchless mechanical measures shall be employed to remove any defects preventing the installation of the CIPP lining. Where necessary an isolated point repair by excavation shall be completed to correct the repair prior to

installation of the CIPP liner. Contractor shall verify with the Owner/Engineer prior to repair. Payment shall be for each repair and shall include all necessary measures to allow proper installation of the CIPP liner.

3.4 Sanitary sewer service renewals to be provided by non-excavation trenchless (CIPP) lining for active services on the various main sewer sizes the lateral is connecting to and to the lengths directed for renewal. The quantity paid for Bid Items will be for each complete and ready-to-use sanitary sewer renewal for the respective main diameter the lateral is connecting with to the length required as accepted by the Engineer including full wrap circumferential connection to the main.

3.4 The unit price paid for each sewer service renewal by non-excavation trenchless (CIPP) lining shall include all labor, materials, tools, equipment, supervision, other accessories or necessary incidentals including internal reinstatement, service diversion pumping or containment, full wrap circumferential connection to the main, trenchless lateral lining, testing, and post CCTV lateral inspection. Services stubbed out from manholes will be paid as if on an 8-inch diameter line for sanitary service renewals per lengths as set in the bid schedule.

4. Service Line Cleanout Assemblies

4.1 The service line cleanout assemblies will be installed in accordance with the standard drawings, specifications and approved methods and materials. Cleanout assemblies will be installed with a box in both unpaved and paved areas. The service line cleanout will be constructed out of SDR 26 PVC pipe with a cast iron push on cap with a bronze threaded plug. The cleanout assembly shall be installed at the right-of-way or easement boundary and/or as determined in the field by the owner and project engineer. These items shall be paid at the unit cost per each cleanout assembly installed as indicated in the Bid Form and only where required to allow for installation of the sanitary service renewal CIPP liner where an existing cleanout is not present at the property line.

4.2 Payment for these items shall be compensation in full for pipe materials; fittings, cleanout cap, hub, JCM Industries repair clamp or Fernco connectors (or an approved equal) to the existing service line as shown on the plan details, existing pipe removal and disposal, cleaning, pre-bursting television inspections (with logs) to identify locations of the service lines in relation to the main sewer line, excavation at service line locations (soil and rock), fittings, stainless steel straps, proper backfill including #67 stone bedding and 6" envelope, new pipe installation, jointing and testing, surface restoration

including final grading and seeding and straw; cleanout box, and all other work necessary for and incidental to the completion of the work and for the furnishing of all labor, tools, materials, equipment, and incidentals necessary for the completion of these items to the satisfaction of the owner and project engineer.

5. Sewer Cleanout Box within Pavement

5.1 The cast iron service cleanout box will be installed in accordance with the standard drawings, specifications and approved methods and materials. Cleanout box assemblies will be installed over all cleanouts located within pavement including driveways. They will be installed with a concrete collar. These items shall be paid at the unit cost per box installed as indicated in the Bid Form and only where required to allow for installation of the sanitary service renewal CIPP liner where an existing cleanout is not present at the property line.

5.2 Payment will include saw cutting neat lines, pipe materials; fittings, cleanout cap, hub, JCM Industries repair clamp or Fernco connectors (or an approved equal) to the existing service line as shown on the plan details, existing pipe removal and disposal, cleaning, pre-bursting television inspections (with logs) to identify locations of the service lines in relation to the main sewer line, excavation at service line locations (soil and rock), fittings, stainless steel straps, proper backfill including #67 stone bedding and 6" envelope, new pipe installation, jointing and testing, surface restoration excavation, #67 stone backfill, concrete base blocks, cast iron frame with lid and concrete box, and all other work necessary for and incidental to the completion of the work and for the furnishing of all labor, tools, materials, equipment, and incidentals necessary for the completion of these items. Sewer cleanout boxes within pavement shall include temporary and permanent pavement restoration including mineral aggregate base, prime coat, asphaltic concrete base(s), tack coat, 1 1/2" thick C-W asphaltic surface mix and temporary cold mix as required by the contract documents.

6. Trench Repair

6.1 Trench repair shall be completed where trenchless methods were not feasible and an excavation was required within a Town Street or easement. Refer to the plan details for trench category descriptions. Payment shall include backfill, stone, grading, surface restoration including seed and straw, temporary base stone, binder mix, surface mix, milling, striping, and all necessary items for complete restoration per the drawing details. Within Town streets the asphalt surface shall be milled back 40-foot parallel with the street traffic flow each side of the trench cut, full roadway pavement width and re-surfaced.

7. Erosion Control

7.1 Erosion Control shall be installed as required by federal, state and local permits and requirements. Special care should be taken along blue line streams which and may require silt fencing or rock check dams between the utility work and the creek or any existing drainage ditches, structures, or tributaries to Waters of the State. Sediment traps, rip-rap stone check dams, erosion control matting, temporary mulching, and associated items of work will be required with additional items being installed on an as-needed basis and/or as directed by the project engineer or owner. All erosion control shall be considered incidental to the project and no separate pay item shall be allowed.

8. Traffic Control

8.1 The traffic control work, flagmen, barricades, traffic control plan, etc. required to properly control traffic throughout the project time frame shall be considered incidental to the project and no separate pay item shall be allowed. A traffic control plan shall be submitted to the Engineer for review and approval.

9. Bypass Pumping

9.1 The contractor shall be required to maintain continued service to each business connected to the sewer line segments, as well as allowing continued sewer flow around the work being performed. The bypass pumping shall be considered incidental to the protect and cost of this work shall be included within the unit bid items shown in the bid form. No additional pay shall be allowed for this work. The contractor shall develop an submit a bypass pumping plan to the Engineer and Owner for review and approval prior to commencement of construction.

10. Allowance

10.1 The allowance established for the project as part of the bid price is \$25,000.00. This allowance shall be reserved to perform work in accordance with additional requests from the Owner, where a bid item is not already in place as listed in the Bid Schedule in Section 00330. The Contractor shall not start work to be performed under the allowance, until written authorization for an agreed upon price has been signed by the Owner. Any work completed prior to written authorization shall be performed at the Contractor's expense and no payment will be made for such work.

END OF SECTION

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SECTION 01301

SUBMITTALS

1. Deliver or mail all submittals to:

THOMAS & HUTTON
502 Hazelwood Drive
Smyrna, Tennessee 37167

Attention: RYAN CHAMBLEE, P.E. Project Engineer
Office: 629-900-4906; chamblee.r@tandh.com

2. Within thirty (30) days of notification of selection, submit:

2.1 Complete list of proposed subcontractors

2.2 Complete list of materials suppliers, including brand names (to be furnished as outlined in Instructions to Bidders)

3. Before beginning any on-site construction, submit insurance certificates.

4. Within ten (10) days after execution of contract, submit:

4.1 Complete construction schedule

4.2 Schedule of shop drawing submittals

4.3 Bid unit price breakdown (schedule of values)

5. Submit shop drawings to meet the schedule of shop drawing submittals. Submit three copies in addition to the number of copies to be returned by the A/E after approval.

6. Before issuance of Certificate of Payment for Final Payment, deliver to the A/E:

6.1 Waivers of lien

6.2 Written guarantees and warranties

6.3 Marked-up record set of drawings showing every alteration or change from the original drawings and specifications, including mechanical and electrical changes.

END OF SECTION

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SECTION 01400

QUALITY CONTROL

PART 1. GENERAL

1.1 REQUIREMENTS INCLUDED

- A. General Quality Control.
- B. Workmanship.
- C. Manufacturers' Instructions.
- D. Manufacturers' Certificates.
- E. Mockups.
- F. Manufacturers' Field Services.
- G. Testing Laboratory Services.

1.2 RELATED REQUIREMENTS

- A. Inspection and testing required by governing authorities.
- B. Section 01300 - Submittals: Submittal of Manufacturers' Instructions.
- C. Section 03303 - Concrete for Utility Lines: Tests required for concrete.

1.3 QUALITY CONTROL, GENERAL

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.4 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

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- B. Perform work by utilizing only persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.5 MANUFACTURERS' INSTRUCTIONS

- A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Standard Specifications, request clarification from Director of Utilities before beginning work.

1.6 MANUFACTURERS' CERTIFICATES

- A. When required by individual Specification Sections, submit manufacturers' certificate, in duplicate, that products meet or exceed specified requirements.

1.7 MOCKUPS

- A. When required by individual Specifications Section, erect complete, full-scale mockup of assembly at Project site. Tests will be performed in accordance with Section 01400, if applicable. Remove mockup at completion when approved by the Director of Utilities.

1.8 MANUFACTURER'S FIELD SERVICES

- A. When specified in respective Specification Sections, require supplier or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship; start-up of equipment; test, adjust, and balance of equipment, as applicable; and, to make appropriate recommendations.
- B. Representative shall submit written report to Director of Utilities listing observations and recommendations.

1.9 TESTING LABORATORY SERVICES

- A. Contractor shall employ and pay for services of an Independent Testing Laboratory to perform inspections,

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tests, and other services required by individual Specification Sections.

- B. Services will be performed in accordance with requirements of governing authorities or agencies and with specified standards.
- C. Reports will be submitted to the Director of Utilities in duplicate giving observations and results of tests, indicating compliance or non-compliance with specified standards, and with Standard Specification and Contract Documents.
- D. Contractor shall cooperate with Testing Laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.
 - 1. Notify Director of Utilities and Testing Laboratory at least 48 hours prior to expected time for operations requiring testing services.
 - 2. Make arrangements with Testing Laboratory and pay for additional samples and tests for Contractors' convenience.

END OF SECTION

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SECTION 01568

EROSION CONTROL

PART 1. GENERAL

This work shall consist of erosion control on all cut and fill operations, excavation, backfill, utilities installation or other construction activities within the limits of the construction site, within any temporary or permanent easements, and within any borrow site used during the period of construction. The protection of these sites shall continue throughout the construction period. During flood seasons, protect the sites by sand bagging, pumping of water, and any other means appropriate to restrain flooding of work site area and equipment. During dry weather, sprinkle the sites with water or use other means as necessary to provide dust control. In case of abnormally cold weather, any construction such as excavation work may be delayed until warmer weather or covered to prevent freezing.

All work shall be in accordance with the Town of Smyrna's National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II Program. Prior to any excavation activities commencing, the contractor shall apply for and receive an approved permit from the Town of Smyrna for such excavation activities. The application for permit will be reviewed by the Program Director and an approved permit shall be obtained prior to excavation activities. The contractor shall adhere to and follow all requirements within the Aquatic Resource Alteration Permit (ARAP), Notice of Coverage and/or Storm Water Pollution Prevention Plan as approved by the Tennessee Department of Environment and Conservation (TDEC) if applicable to this project.

All erosion and sediment runoff control measures shall be installed in accordance with the approved TDEC permit(s) and the Town of Smyrna Grading Permit and shall be maintained throughout the project cycle until adequate and approved vegetative cover or excavation coverage has been established. Erosion control measures such as berms, silt fencing, check dams, or other applicable measures.

PART 2. PRODUCTS

Temporarily stabilize areas from which excavation or topsoil has been removed. Excavated material and topsoil stockpiles shall be stabilized by seeding with fast growing annuals such as rye and annual ryegrass that provide quick protection. These annual grasses

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are to be seed certified by the State Department of Agriculture and can be worked into the soil when the site is prepared for final seeding of more permanent species. Use commercial lime and fertilizer on exposed areas, subject to severe erosion. Other measures such as berms or silt fencing will also be required for further assurance that sediment washout and runoff does not leave the stock piled areas.

PART 3. EXECUTION

3.1 Conduct construction so as to provide the site with maximum protection from erosion at all times.

3.2 Conduct excavation activities to provide erosion and sediment control as follows:

3.2.1 Do not start clearing and excavation until a firm construction schedule is submitted to and approved by the Town of Smyrna. Continuously coordinate the schedule with the clearing and excavation activity.

3.2.2 In streets and other paved areas, remove excavated material from the site as construction progresses to prevent any erosion of this material.

3.2.3 In other areas, place the excavated material so as not to block any drainage area. Replace this excavated material in the trench immediately after repairs have been completed and are approved by the Town of Smyrna.

3.2.4 Retain natural vegetation whenever feasible. Install sediment control measures where needed and maintain throughout the project.

3.2.5 Restore and cover exposed areas subject to erosion as quickly as possible by means of seeding and mulching. Use diversion ditches or other methods as appropriate to prevent storm water from running over the exposed area until seeding is established as specified.

3.2.6 Take particular care along streams and drainage ditches so that fallen trees, debris, and excavated material will not adversely affect the stream flow. Exercise care to minimize the destruction of stream banks. Wherever the stream banks are affected by construction, reduce the slope of the stream banks to provide a suitable condition for vegetation protection. Minimize land exposure in terms of area and time. All work along stream banks will require approved TDEC permits.

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- 3.2.7 Cover exposed excavated areas with mulch or vegetation.
- 3.2.8 Mechanically retard the rate of runoff water.
- 3.2.9 Trap the sediment contained in the runoff water utilizing approved sediment control measures.
- 3.2.10 Divert water from erosive areas.
- 3.2.11 Take care during the pouring of concrete, hauling of materials, etc., to keep vehicles from creating a severe erosion problem. Proper scheduling of operations and prompt repair of ruts created during this operation is necessary from this source.
- 3.2.12 Control dust by sprinkling or other means as necessary to keep it to a minimum.
- 3.2.13 Pave or otherwise stabilize roadways and driveways as soon as feasible.
- 3.2.14 Re-grade and reseed surfaces eroded or otherwise damaged during any and all construction operations as necessary.

END OF SECTION

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SECTION 01600

MATERIAL AND EQUIPMENT AND SUBSTITUTIONS

PART 1. GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Products.
- B. Transportation and Handling.
- C. Storage and Protection.
- D. Product Options.
- E. Products List.
- F. Substitutions.
- G. Systems Demonstration

1.2 RELATED REQUIREMENTS

- A. Section 00140 - Information for Bidders: Times for submittal of requests for substitutions during the bidding period.
- B. Section 00713 - General Conditions.
- C. Section 01031 - Special project procedures
- D. Section 01040 - Coordination: Coordination of Construction.
- E. Section 01090 - Reference standards.
- F. Section 01300 - Submittals: Product data submittals and shop drawings.
- G. Section 01400 - Quality Control: Submittal of manufacturer's certificates.
- H. Section 01700 - Contract Closeout: Operation and maintenance data; warranties and bonds; record documents.

1.3 QUALITY ASSURANCE

- A. Approval Required
 - 1. The contract is based on the standards of quality established in the contract documents.
 - 2. All products proposed for use, including those specified by required attributes and performance shall require approval by the A/E before being incorporated into the work.

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- B. "Or Equal"
 - 1. Where the phrase "or equal" or "or approved equal" occurs in the contract documents, do not assume that materials, equipment, or methods will be approved as equal unless the item has been specifically approved for this work by the A/E.
 - 2. The decision of the A/E shall be final.
 - 3. See pertinent portions of the contract documents for additional information relating to substitutions.

1.4 PRODUCTS

- A. Products include material, equipment, and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.

1.5 TRANSPORTATION AND HANDLING

- A. Transport products by such methods that will avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and that products are undamaged.

1.6 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions. Protect all equipment, electrical controls, and project components from adverse weather and water damage at all times throughout the project.
- B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

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- C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions. Schedule delivery of equipment and construction components to prevent outside storage for an extended period which may cause weathering or damage.

1.7 PRODUCT OPTIONS

- A. Products specified by reference standards or by description only: Supply products meeting those standards.
- B. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not specifically named. The A/E may reject or approve based on his review.
- C. Products specified by naming several manufacturers: Supply products of named manufacturers meeting specifications: No options, no substitutions allowed.
- D. Products specified by naming only one manufacturer: No options, no substitutions allowed.

1.8 PRODUCTS LIST

- A. Within 7 days after date of Owner-Contractor Agreement, or as established in Notice-to-Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

1.9 SUBSTITUTIONS

- A. During bidding period, Instructions to Bidders govern times for submitting requests for substitutions under requirements specified in this Section.
- B. Only within twenty (20) days after date of Owner-Contractor Agreement or established in Notice-to-Proceed shall A/E consider requests from Contractor for substitutions. Subsequently, substitutions will be considered only when a product becomes unavailable due to no fault of Contractor. Confirmation of unavailable products must be in writing and certified by the manufacturer that the product is no longer available. No additional cost will be allowed for products that are requested to be substituted, based on the unavailability of the specified product and/or model.

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- C. Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. Request constitutes a representation that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
 - 2. Will provide the same warranty for substitution as for specified product.
 - 3. Will coordinate installation and make other changes that may be required for work to be complete in all respects.
 - 4. Waives claims for additional costs that may subsequently become apparent.
- E. Substitutions shall not be considered when they are indicated or implied on shop drawing or product data submittals. Separate written request must be submitted for any proposed substitutions or deviation from the Contract Documents.
- F. A/E shall determine acceptability of proposed substitution, and shall notify Contractor of acceptance or rejection in writing within a reasonable time.
- G. Substitute products shall not be ordered or installed without written acceptance.
- H. Only one request for substitution shall be considered for each product. When substitution is not accepted, provide specified product.
- I. A/E shall determine acceptability of substitutions.

1.10 SUBMITTAL PROCEDURES

- A. Submit two copies of request for substitution.
- B. A/E shall review Contractor's requests for substitutions with reasonable promptness.
- C. During the bidding period, A/E shall record acceptable substitutions, if any, in Addenda.
- D. After award of Contract, A/E shall notify Contractor, in writing, of decision to accept or reject requested substitution within 15 days.
- E. For accepted products, submit shop drawings, product data, and samples under provisions of Section 01300.

1.11 SYSTEMS DEMONSTRATION

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- A. Prior to final inspection, demonstrate operation of each system to the Owner.
- B. Instruct Owner's personnel in operation, adjustment, and maintenance of equipment and systems, using the operation and maintenance data as the basis of instruction.

PART 2. PRODUCTS
NOT USED

PART 3. EXECUTION
NOT USED

END OF SECTION

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SECTION 01620

STORAGE AND PROTECTION

PART 1. EXECUTION

1.1 STORAGE, GENERAL

- A. Store products, immediately on delivery, in accordance with manufacturer's instructions, with seals and labels intact. Protect until installed.
- B. Arrange storage in a manner to provide access for maintenance of stored items and for inspection.

1.2 EXTERIOR STORAGE

- A. Provide substantial platforms, blocking, or skids, to support fabricated products above ground; slope to provide drainage. Provide protection against ultraviolet (UV) light for polyvinylchloride (PVC) piping and products subject to damage by UV light. Protect products from soiling and staining.
- B. Store loose granular materials on clean, solid surfaces such as pavement, or on rigid sheet materials, to prevent mixing with foreign matter.
- C. Provide surface drainage to prevent erosion and ponding of water.

1.3 MAINTENANCE OF STORAGE

- A. Verify that surfaces of products exposed to the elements are not adversely affected; that any weathering of finishes is acceptable under requirements of Contract Documents.

END OF SECTION

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SECTION 02221

UNCLASSIFIED EXCAVATION FOR UTILITIES

PART 1. GENERAL

1.1 The work called for by this section shall consist of clearing and grubbing, loosening, excavating, removing, loading and disposing of, in the specified manner, all wet and dry materials (including rock) encountered that must be removed for construction purposes; furnishing, placing, and maintaining all sheeting, shoring, bracing, and timbering necessary for the proper protection and safety of the work; the workmen, the public, and adjacent property and improvements; the dewatering of trenches and other excavations; the preparation of satisfactory pipe beds; the backfilling and tamping of trenches, foundations, and other structures; the preparation of fills and embankments; the removal of unsuitable material from outside the normal limits of excavation and, where ordered by the Director of Utilities, their replacement with suitable materials; and all other grading or excavation work incidental to or necessary for the work. This work shall be performed as specified below. Excavation for utilities shall be unclassified and no additional payments shall be made for materials excavated during installation of utilities, this work will be paid for either under the lump sum or unit bid items cost as indicated in the bid form.

PART 2. PRODUCTS

2.1 Products only approved within the standard specifications and/or as approved by the Director of Utilities.

PART 3. EXECUTIONS

3.1 PREPARATION OF THE SITE

- A. Before starting construction, remove from the work site all vegetative growth (except as hereinafter excluded), debris, and/or other objectionable matter as well as any buildings and/or other structures that the drawings and/or the project engineer specifically indicate are to be removed. Dispose of this refuse material in a manner acceptable to the Town of Smyrna at an approved site secured by the contractor.
- B. In certain areas it may be desirable for existing trees, shrubs, or other vegetation on the site to be preserved for the permanent landscape. Such vegetation may or may not be shown on the drawings or specifically listed in the specifications, marked on the site, or identified by the Town of Smyrna Director of Utilities. In no case, the

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contractor shall not damage or remove such growth without written authorization from the Town of Smyrna or the A/E.

- C. If the area to be excavated is occupied by trees, brush, or other vegetative growth, clear such growth, grub the excavated area, and remove all large roots to a depth of not less than 2 feet below the bottom of the proposed construction. Dispose of the growth removed in a manner satisfactory to the Town of Smyrna. Fill all holes or cavities created during this work that extend below the sub grade elevation with suitable material, and compact to the same density as the surrounding material.
- D. Trees, cultivated shrubs, etc., that are situated within public rights-of-way and/or construction easements through private property but not directly within the excavation area shall remain undisturbed unless it is necessary to remove them so that the work can be performed safely and unless their removal is specifically ordered by the Town of Smyrna. Take special precautions to protect and preserve such growth throughout all stages of the construction. Any such vegetation, shrubs, trees or landscaping shall be replaced by the contractor at his expense as being incidental to the project scope and other items of work.
- E. Preparation of the site shall be considered an integral part of the excavation and one for which no separate payment shall be allowed.

3.2 UNSUITABLE MATERIALS

- A. Wherever muck, quicksand, soft clay, swampy ground, or other material unsuitable for foundations, sub grade, or backfilling is encountered, remove it and continue excavation until suitable material is encountered. The material removed shall be disposed of in the manner described below. Then refill the areas excavated for this reason with clean 6" surge stone for stabilization and then crushed stone in 6-inch lifts up to the level of the lines, grades, and/or cross sections shown on the drawings. The top 6 inches of this refill shall be No. 67 (TDOT) crushed stone for bedding of the pipe or utility being installed.

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3.3 ROCKS AND BOULDERS

- A. Any material that is encountered within the limits of the required excavation that cannot be removed except by drilling and/or blasting, including rock, boulders, masonry, hard pan, chert, shale, street and sidewalk pavements, and/or similar materials, shall be considered as unclassified excavation, and no separate payment will be made therefore.
- B. Should rock be encountered in the excavation, remove it by blasting or otherwise. Where blasts are made, cover the excavated area with enough excavated material and/or timber, steel, or rubber blast matting to prevent danger and damage to life and property. The Contractor shall secure, at his own expense, all permits required by law for blasting operations and the additional hazard insurance required. The contractor shall be licensed for such operations and shall observe all applicable laws and ordinances pertaining to blasting operations. A pre and post blast survey of structures located within 500-feet of the blasting area will be required to be performed by the contractor and shall be considered incidental to the project and other bid items of work.
- C. Excavate rock over the horizontal limits of excavation and to a depth of not less than 6 inches below the bottom of pipe up to 24 inches in diameter, not less than 8 inches below the bottom for 24 inch to 36 inch diameter pipes, and not less than 12 inches below the bottom for pipes larger than 36 inches in diameter, if rock extends to such depth. Then backfill the space below grade with No. 67 (TDOT) crushed stone or other approved material, tamp to the proper grade, and make ready for construction. For monolithic concrete sewers and for structures, excavate rock to the outside bottom of the structure or sewer. Where pipe lines are constructed on concrete cradles, rock shall be excavated to the bottom of the cradle.

3.4 DISPOSAL OF MATERIALS

- A. Whenever practicable, all materials removed by excavation that are suitable for backfilling pipe trenches or for other purposes shown on the drawings or directed by the Town of Smyrna shall be used for these purposes. Approval of these backfill materials shall be performed by the Director of Utilities and project A/E. Any materials not so used shall be considered waste materials and disposed of by the Contractor at no additional cost as specified below.

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- B. Waste materials may be deposited in spoil areas at locations approved by the Town of Smyrna. Do not leave in unsightly piles but instead spread in uniform layers, neatly level, and shape to drain. Seed as specified in Section 02485, Seeding.
- C. Once any part of the work is completed, properly dispose of all surplus or unused materials (including waste materials) left within the construction limits of that work. Leave the surface of the work in a neat and workman like condition, as described below.
- D. The disposal of waste materials shall be considered an integral part of the excavation work and one for which no separate payment shall be allowed.

3.5 EXCAVATION FOR TRENCHES, MANHOLES, AND STRUCTURES

- A. Unclassified excavation for pipelines shall consist of the excavation necessary for the construction of water, sewer, and other pipes and their appurtenances (including manholes, inlets, outlets, headwalls, collars, concrete saddles, and pipe protection) that are called for by the drawings. It shall include clearing and grubbing where necessary, backfilling and tamping pipe trenches and around structures, and disposing of waste materials, all of which shall conform to the applicable provisions set forth elsewhere in these specifications.
- B. The Contractor may, if approved by the Director of Utilities, use a motor powered trenching machine. If he does, however, he shall be fully responsible for the preservation or repair of existing utility service connections.
- C. Unless the construction of lines by tunneling, jacking, or boring is called for by the drawings or specifically required by the Director of Utilities, make excavation for pipelines in open cut and true to the lines and grades shown on the drawings or established by the design engineer on the ground. Cut the banks of trenches between vertical parallel planes equidistant from the pipe centerline. The horizontal distance between the vertical planes (or, if sheeting is used, between the inside faces

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of that sheeting) shall vary with the size of the pipe to be installed, but shall not be more than the distance determined by the following formula: $4/3d + 15$ inches, where "d" represents the internal diameter of the pipe in inches. When approved in writing by the design engineer and the Director of Utilities, the banks of trenches from the ground surface down to a depth not closer than 1 foot above the top of the pipe may be excavated to non-vertical and nonparallel planes, provided the excavation below that depth is made with vertical and parallel sides equidistant from the pipe centerline in accordance with the formula given above. Any cut made in excess of the formula $4/3d + 15$ inches shall be at the expense of the Contractor and may be cause for the Town of Smyrna to require that stronger pipe and/or a higher class of bedding be used at no cost. Should over excavation of trenches be performed by the contractor, he will be responsible for all costs associated with the additional stone that is required for bedding and backfilling the pipe trench.

- D. For rigid pipe, shape the bottom of all trenches to provide uniform bearing for the bottom of the pipe barrel. For plastic sewer lines, provide a minimum of 6 inches of No. 67 (TDOT) crushed stone for bedding.
- E. Excavate bell holes for bell and spigot pipe at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bell holes shall be large enough to permit proper jointing of the pipe. Do not excavate bell holes more than 2 joints ahead of pipe laying.
- F. Excavation for manholes, inlets, and other incidental structures shall not be greater in horizontal area than that required to allow a 2-foot clearance between the outer surface of the structure and the walls of the adjacent excavation or of the sheeting used to protect it. The bottom of the excavation shall be true to the required shape and elevation shown on the drawings. No earth backfilling will be permitted under manholes, inlets, headwalls, or similar structures. Should the Contractor excavate below the elevations shown or specified, he shall, at his own expense, fill the void with either concrete or granular material approved by the Town of Smyrna.

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- G. Do not excavate pipe trenches more than 200-feet ahead of the pipe laying, and perform all work so as to cause the least possible inconvenience to the public. Construct temporary bridges or crossings when and where the Director of Utilities deems necessary to maintain vehicular or pedestrian traffic.
- H. In all cases where materials are deposited along open trenches, place them so that in the event of rain no damage will result to the work and/or to adjacent property.
- I. Excavation for other structures may be performed with non-vertical banks except beneath pavements or adjoining existing improvements. Do not permit the horizontal area of the excavation to exceed that required to allow a 2-foot clearance between the outer surface of the structure and the banks of the excavation or the sheeting used to protect the embankments. The bottom of the excavation shall be true to the required shape and elevation shown on the drawings.

3.6 SHEETING, SHORING, AND BRACING

- A. Take special care to avoid damage wherever excavation is being done. Sufficiently sheet, shore, and brace the sides of all excavations to prevent slides, cave-ins, settlement, or movement of the banks and to maintain the specified trench widths. Use solid sheets in wet, saturated, or flowing ground. All sheeting, shoring, and bracing shall have enough strength and rigidity to withstand the pressures exerted, to keep the walls of the excavation properly in place, and to protect all persons and property from injury or damage. Separate payment will not be made for sheeting, shoring, and bracing, which are considered an incidental part of the excavation work.
- B. Wherever employees may be exposed to moving ground or cave-ins, shore and lay back exposed earth excavation surfaces more than 5-feet high to a stable slope, or else provide some equivalent means of protection. Effectively protect trenches less than 5-feet deep when examination of the ground indicates hazardous ground movement may be expected. Guard the walls and faces of all excavations in which employees are exposed to danger from moving ground by a shoring system, sloping of the ground, or some equivalent protection.

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- C. The contractor shall comply with all OSHA standards, and all other applicable standards of safety, in determining where and in what manner sheeting, shoring, and bracing are to be done. The sheeting, shoring, and bracing system shall be designed by a professional engineer licensed in the State of Tennessee, as secured and hired by the contractor, and shall be subject to approval by the design engineer for the project. However, such approval does not relieve the Contractor of the sole responsibility for the safety of all employees, damage to any property, the effectiveness of the system, and any damages or injuries resulting from the lack or inadequacy of sheeting, shoring, and bracing.
- D. Where excavations are made adjacent to existing buildings or structures or in paved streets or alleys, take particular care to sheet, shore, and brace the sides of the excavation so as to prevent any undermining of or settlement beneath such structures or pavement. Underpin adjacent structures wherever necessary, with the approval of the project engineer.
- E. Do not leave sheeting, shoring, or bracing materials in place unless called for by the drawings, ordered by the design engineer, or deemed necessary or advisable for the safety or protection of the new or existing work or features. Remove these materials in such a manner that the new structure or any existing structures or property, whether public or private, will not be endangered or damaged and that cave-ins and slides are avoided.
- F. Fill and compact all holes and voids left in the work by the removal of sheeting, shoring, or bracing as specified herein.
- G. The Contractor may use a trench box, which is a prefabricated movable trench shield composed of steel plates welded to a heavy steel frame. The trench box shall be designed to provide protection equal to or greater than that of an appropriate shoring system.

7 THE DEWATERING OF EXCAVATION

- A. Provide and keep in operation enough suitable pumping equipment whenever necessary or whenever directed to do so by the Town of Smyrna. Give special attention to

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excavations for those structures that, prior to proper backfilling, are subject to flotation from hydrostatic uplift.

3.8 BORROW EXCAVATION

- A. Whenever the backfill of excavated areas or the placement of embankments requires more material than is available from authorized excavations, or whenever the backfill material from such excavations is unsuitable as determined by the Director of Utilities or project engineer, obtain additional suitable/approved material from other sources at no additional cost to the owner. This may require the opening of borrow pits at points accessible to the work or at other locations secured from off site by the contractor. In such cases, make suitable arrangements with the property owner and pay all incidental costs, including any royalties, for the use of the borrowed material. Before a borrow pit is opened, the quality and suitability of its material shall be approved by the Town of Smyrna and the project engineer. All federal, state, and local regulations concerning borrow pits, drainage and erosion control shall be strictly followed.
- B. Excavate borrow pits in such a way that the remaining surfaces and slopes are reasonably smooth and that adequate drainage is provided over the entire area. Construct drainage ditches wherever necessary to provide outlets for water to the nearest natural channel, thus preventing the formation of pools in the pit area. Leave the sides of borrow pit cuts at a maximum slope of 2:1 unless otherwise directed by the Town of Smyrna.
- C. Properly clear and grub borrow pits, and remove all objectionable matter from the borrow pit material before placing it in the backfill.
- D. The taking of materials from borrow pits for use in the construction of backfill, fills, or embankments shall be considered an incidental part of the work; no separate payment shall be made for this.

3.9 BACKFILLING

- A. Begin backfilling after the line construction is completed and then inspected and approved by the Town of Smyrna. Trenches 10-feet deep or less shall contain a 6-inch stone envelope around the pipe. Trenches greater than 10-feet

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deep shall contain 6-inches of stone under the pipe and on each side with 12-inches of stone placed above the pipe.

- B. Backfill material above the pipe envelopes shall consist either of fine, loose earth like sandy soil or loam or of granular material that is free from clods, vegetable matter, debris, stone, and/or objectionable materials and that has a size of no more than 2-inches. Place this backfill simultaneously on either side of the trench in even layers that before compaction are no more than 6 inches deep. Thoroughly and completely tamp each layer into place before placing additional layers. This backfill shall at locations beneath or closely adjacent to pavement, consist of No. 67 (TDOT) crushed stone. Compaction of backfill material layers shall be at 98% by standard proctor test. Where adjacent to and within paved areas the top 10-inches of the trench at sub grade shall consist of pug mill stone compacted at 98% by standard proctor test. Compaction testing shall be at intervals directed by the Director of Utilities, project engineer or the project inspector. Compaction testing shall be performed by an approved licensed and certified (State of Tennessee) testing laboratory as proposed by the contractor and approved by the Director of utilities and project engineer. All costs associated with the compaction testing shall be considered incidental to the project and paid for within other bid items of work. Compaction tests shall be performed at no more than 500-foot intervals or as directed by the project inspector.
- C. In areas, outside of pavement, approved by the Town of Smyrna, from 1 foot above the pipe upward, the backfill material may contain broken stones that make up approximately 3/4 of the backfill's total volume. However, if this type of backfill is used, there must be enough spalls and earth materials to fill all voids completely. The maximum dimension of individual stones in such backfill shall not exceed 6 inches, and the backfill material shall be placed and spread in even layers not more than 12 inches deep. At the direction of the Director of Utilities, at locations beneath or closely adjacent to pavement (other than public roadways) or at locations of improvements subject to damage by displacement, tamp and thoroughly compact the backfill in layers that, before compaction, are 6 inches deep. Compaction test shall be required for the 6-inch lifts to meet 98% standard proctor density. In other areas, the backfill for the upper portion of the trenches may be placed without tamping but shall be compacted to a density equivalent to that of adjacent earth material as determined by laboratory tests. Use special care to prevent the operation of backfilling equipment from causing any damage to the pipe.

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- D. If earth material for backfill is, in the opinion of the Town of Smyrna, too dry to allow thorough compaction, then add enough water so that the backfill can be properly compacted. Do not place earth material that the Town considers too wet or otherwise unsuitable.
- E. Wherever excavation has been made within easements across private property, the top 1 foot of backfill material shall consist of fine loose earth free from large clods, vegetative matter, debris, stone, and/or other objectionable materials.
- F. Wherever trenches have been cut across or along existing pavement, temporarily pave the backfill of such trenches by placing Class A, Grade D, crushed stone to a depth as indicated on the pavement repair details. Maintain this temporary pavement either until the permanent pavement is restored or until the project is accepted by the Owner. On heavily traveled roadways and as required by the Town of Smyrna, cold mix or leveling course hot mix binder, minimum of 4-inches thick, shall be installed and maintained until permanent pavement is installed.
- G. Conduct backfilling around manholes, inlets, outfalls, and/or structures in the same manner as specified above for pipelines except that even greater care is necessary to prevent damage to the utility structure.
- H. Wherever pipes have diameters of 15 inches or less, do not use power operated tampers to tamp that portion of the backfill around the pipe within 1 foot above the pipe.
- I. Perform backfilling so as not to disturb or injure any pipe and/or structure against which the backfill is being placed. If any pipe or structure is damaged and/or displaced during backfilling, open up the backfill and make whatever repairs are necessary, whenever directed to do so by the Town of Smyrna.
- J. Backfilling and clean-up operations shall closely follow pipe laying; failure to comply with this provision will result in the Town of Smyrna requiring that the Contractor's other activities be suspended until backfilling and clean-up operations catch up with pipe laying.
- K. Compaction Requirements: Unless specified otherwise elsewhere, under buildings and 2 times the depth of pipe beyond, and under roads and 2 times the depth beyond the shoulder, compact to 98% maximum density in accordance with ASTM D698.

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L. In highways, streets, driveways, all areas subject to traffic, and certain areas as designated on the drawings, the backfill shall consist entirely of crushed stone which shall be placed in layers or lifts not exceeding twelve inches (12") in thickness and shall then be carefully compacted to maximum density or minimum volume. Number 57 crushed stone backfill shall be placed around the pipe six inches (6") below the bottom of the pipe and twelve inches (12") above the top of the pipe shall be placed by hand to avoid damage to or misalignment of the sewer. After the backfill has been placed to a depth of at least twelve inches (12") above the top of the pipe the additional crushed stone backfill may be placed by means of frontend loaders, bulldozers or other suitable mechanical equipment subject to the twelve-inch (12") limitation on maximum thickness of layers placed before compaction. Flowable fill mortar shall be placed in locations shown on the plans or as directed by Engineer. The flowable fill mortar shall be covered by necessary means i.e. steel plates or any other approved means while in the plastic state. Backfill shall not be placed on the flowable fill mortar prior to final set or hardening as determined by the engineer. Flowable fill mortar shall at no time come in direct contact with any utility lines. Flowable fill mortar shall commence 6-inch above top of pipe. Placement shall be in accordance with TDOT Standards for Road and Bridge Construction. For category two, the backfill up to a point twelve inches (12") above the top of the pipe shall be crushed stone and shall be placed by hand as specified in the preceding paragraph. The backfill for category two in areas not ordinarily subjected to traffic, may consist of suitable excavated material placed by machine after the backfill reaches a depth of twelve inches (12") over the top of the pipe, and the backfill shall be compacted by means of a suitable wheeled vehicle such as a tractor or front end loader running longitudinally along the trench. After the backfill has been compacted in this manner additional fill material shall be placed in the trench to restore the original grade and provide a slight mound over the trench. This material shall again be compacted by means of a suitable wheeled vehicle. No rock larger the 1/2" may be used in the top twelve inches (12") of the backfill. Top soil may be required on all lots or similar areas if suitable material is not available on site. Backfill up to the spring line of the pipe shall be placed as pipe laying progresses in order to maintain proper grade and alignment. Additional backfill shall not be placed until after the pipe has been inspected by the ENGINEERS and approved for backfill. In all instances

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sufficient care must be exercised to avoid leaving any holes or voids over, around or under stones, boulders, or other backfill material that may later be filled by leaching or settlement of surrounding material 57 thereby causing future trench settlement. Where the CONTRACTOR desires to use excavated rock for backfill material and such rock meets the dimensional requirements as specified herein, the CONTRACTOR shall provided additional backfill material of a suitable nature to fill the voids. In locations not subject to traffic where excavated material is permitted in the backfill such material shall be brought up to the original ground level as indicated above and shall then be mounded over to provide for additional settlement. The CONTRACTOR shall exercise care to confine the mound to the area immediately over the trench and shall be responsible from time to time during the one-year warranty period to fill in areas where excessive settlement has occurred. The CONTRACTOR shall be responsible for and shall protect all sewers, storm sewers, and electric, telephone, water or other pipes or conduits against danger or damage while the trenches are being backfilled and from future settlement of the backfill. Where such damage should occur as a result of the CONTRACTOR'S operations, he shall repair such damage promptly to the ENGINEER'S satisfaction. The CONTRACTOR'S attention is called to the fact that he will be held completely responsible for any damage to pavement, sidewalks, curbs, gutters, meter or valve boxes, street inlets, or other structure or appurtenances as a result of the CONTRACTOR'S operations. It should be specifically noted that the CONTRACTOR shall be responsible for damage even though the character or nature of the original pavement or structure was such that it was not capable of carrying the load of the construction equipment regardless of the construction methods used.

3.10 MAINTENANCE

- A. Seed and maintain in good condition all excavated areas, trenches, fills, embankments, and channels until final acceptance by the Town of Smyrna.
- B. Maintain trench backfill at the approximate level of the original ground surface by periodically adding backfill material wherever necessary and whenever directed to do so by the Town of Smyrna. Continue such maintenance until final acceptance of the project or until the Town of Smyrna issues a written release.

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3.11 SLOPES

- A. Neatly trim all open cut slopes, and finish to conform either to the slope lines shown on the drawings or the directions of the Town of Smyrna. Leave the finished surfaces of bottom and sides in reasonably smooth and uniform planes like those normally obtainable with hand tools, though the Contractor will not be required to use hand methods if he is able to obtain the required degree of evenness with mechanical equipment. Conduct grading operations so that material is not removed or loosened beyond the required slope.

END OF SECTION

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SECTION 02260

FINISH GRADING

PART 1. GENERAL

1.1 The work called for by this section shall include, but not necessarily be limited to, finish grading and the spreading any shaping of topsoil to the finished contour elevations indicated by the drawings and/or as existed prior to commencement of construction.

1.2 Refer to other sections for work related to that specified under this heading. Coordinate all work with that specified by other sections for timely execution.

PART 2. PRODUCTS

2.1 Topsoil: Use stripped topsoil that has been stockpiled as specified elsewhere. If the quantity of topsoil on the job is inadequate, furnish enough additional topsoil. Topsoil furnished shall be natural, fertile, friable soil possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally well drained areas. It shall not be excessively acid or alkaline nor contain toxic substances that may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall be cleaned and reasonably free from clay lumps, stones, stumps, roots, or similar substances two (2) inches or more in diameter, debris, or other objects that are a hindrance to planting operations. Such material shall be subject to testing.

PART 3. EXECUTION

3.1 Do not begin work until the earth is dry enough to be tillable.

3.2 Inspect sub-grades to see that they generally conform to the standards called for elsewhere in these specifications, particularly with regard to the approximate depths required for the work. After work is completed, inspect it to ensure that all finish grading complies with design requirements.

3.3 Place finished grade stakes wherever necessary to bring the

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work accurately to the elevations required by the drawings.

3.4 Finish grade all areas outside the building line to the depths required for the work as follows:

- A. Grade uniformly with rounded surfaces at the tops and bottom of abrupt changes of planes.
- B. Hand grade steep slopes and areas that are inaccessible for machine work.
- C. Protect graded areas from undue erosion, and repair and regrade areas where erosion does occur.
- D. Refill areas where noticeable settlement has occurred.
- E. Finish grade areas that are to receive topsoil up to six (6) inches below the finished contour elevations called for by the drawings or, over rock, to 12 inches below these elevations.

3.5 Place topsoil uniformly over disturbed areas that do not receive other work as follows:

- A. Obtain approval of the finish grading from the project engineer and the Town of Smyrna before starting to place topsoil.
- B. Scarify subgrade to a depth of three (3) inches.
- C. Place the topsoil to a depth of six (6) inches when lightly rolled or, on rock, to a depth of 12 inches.
- D. Level the topsoil so that it slopes uniformly and has no water pockets.
- E. Carefully rake the topsoil by hand to remove all clods, roots, sticks, stones over one (1) inch in diameter, and other foreign materials from the surface.

3.6 Dispose of excess excavated materials and debris away from the site at an approved location.

END OF SECTION

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SECTION 02485

SEEDING

PART 1. GENERAL

1.1 This work shall be performed in all disturbed areas not receiving such site improvements as buildings, roads, walks, sod, planting, etc., and shall include, but not necessarily be limited to, all seed bed preparation; the supplying and placing of soil additives, seed, and mulch wherever required by the drawings or directed by the Town of Smyrna; and maintenance.

1.2 Unless otherwise approved by the Town of Smyrna, seeding operations shall be limited to the following planting periods:

- A. Spring - March 1 through May 30
- B. Fall - August 15 through October 31

1.3 Refer to other sections for items affecting seeding. Coordinate this work with that specified by other sections for timely execution.

PART 2. PRODUCTS

2.1 GRASS SEED: Kentucky 31 Fescue (*Festuca elatior*) and/or annual rye meeting the requirements of the State Department of Agriculture and furnished in new bags or bags that are sound and not mended; no "below standard" seed will be accepted.

2.2 FERTILIZER: commercially manufactured; Grade 10-10-10; furnished in standard containers that are clearly marked with the name, weight, and guaranteed analysis of the contents and that ensure proper protection in transportation and handling; and in compliance with all local, state, and federal fertilizer laws.

2.3 AGRICULTURAL LIMESTONE: containing a minimum of 85% calcium carbonate and magnesium carbonate combined, 85% of which passes a No. 10 mesh sieve.

2.4 MULCH: stalks of rye, oats, wheat, or other approved grain crops properly cured prior to baling, air dried, and reasonably free of noxious weeds and weed seeds or other material detrimental to plant growth.

PART 3. EXECUTION

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3.1 Perform all seeding and related work as a continuous operation. Sow seed as soon as the seed bed has been prepared, and perform subsequent work in a continuous manner.

3.2 Before beginning seeding operations in any area, complete the placing of topsoil and final grading, and have the work approved by the A/E.

3.3 Scarify, disk, harrow, rake, or otherwise work each area to be seeded until the soil has been loosened and pulverized to a depth of not less than 2 inches. Perform this work only when the soil is in a tillable and workable condition.

3.4 Apply fertilizer and agricultural limestone uniformly over the seed bed, and lightly harrow, rake, or otherwise incorporate them into the soil for a depth of approximately 1 inch at the following rates:

Fertilizer: 15 pounds per 1,000 square feet

Agricultural Limestone: 40 pounds per 1,000 square feet

3.5 Sow seed uniformly with a rotary seeder, wheelbarrow seeder, hydraulic equipment or by other satisfactory means.

3.6 The seeding rate shall be 5 pounds per 1,000 square feet for Kentucky 31 Fescue (*Festuca elatior*).

3.7 When seeding during March 1 through April 1 and October 1 through November 20, add an additional 3 pounds per 1,000 square feet of annual rye grass.

3.8 Perform no seeding during windy weather or when the ground surface is frozen, wet, or otherwise untillable.

3.9 Spread mulch material evenly over the seeded areas immediately following the seeding operation.

3.10 Mulch Rate: 2 bales (100 pound minimum) per 1,000 square feet The mulch rate may be varied by the Town of Smyrna, depending on the texture and condition of the mulch material and the characteristics of the area seeded. Cover all portions of the seeded areas with a uniform layer of mulch so that approximately 25% of the ground is visible.

3.11 No equipment, material storage, construction traffic, etc., will be permitted on newly seeded ground.

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3.12 Dispose of all surplus materials.

PART 4. INSPECTIONS

The Town of Smyrna shall inspect the seeding within 60 days after planting and determine if it is acceptable.

PART 5. GUARANTEE

5.1 Secure an acceptable growth of grass in all areas designated for seeding.

5.2 An area is considered acceptable if it is represented by a minimum of 100 seedlings per square foot of the permanent species of grass representative of the seed mixture. If an acceptable growth is not obtained on the first planting, reseeding and remulching will be required.

5.3 If the planting is less than 50% successful, rework the ground, refertilize, reseed, and remulch.

END OF SECTION

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SECTION 02575

PAVEMENT REPAIR

PART 1. GENERAL

1.1 The work specified by this section shall consist of repairing or replacing all damaged pavement, whether public or private. Dirt shoulders, roads, streets, drives, and walks are to be restored to their original condition as an incidental part of the installation of utilities. Repair damaged base on either side of a trench wherever necessary. Trim the oxidation surface to neat lines outside of the trench wall, and repave the entire area as specified below and as shown on the drawings or on the standard drawings.

1.2 Both these specifications and the drawings make reference to the current edition of the standard specifications of the Tennessee Department of Transportation (TDOT). Even though the weather limitations, construction methods, and materials specifications contained in the TDOT specifications may not be explicitly repeated in these specifications, they shall, wherever applicable to the work called for by this section, be considered as implied and therefore adhered to. However, the various subsections "Basis for Payment" contained in the TDOT specifications shall not be considered applicable.

A. Refer to other sections for work related to that covered by this section.

PART 2. PRODUCTS

2.1 MINERAL AGGREGATE BASE: Class A, Grading D crushed stone (TDOT specifications, Section 303, subsection 903.05)

2.2 BITUMINOUS PRIME COATS: cutback asphalt, Grade RC-250, or emulsified asphalt, Grade AE-P (Section 402, Subsections 904.02 and 904.03)

2.3 CRUSHED STONE CHIPS: Size 6 or Size 7 (Subsection 903.14)

2.4 DOUBLE BITUMINOUS SURFACE: for both courses, either cutback asphalt, Grade RC-800 or RC-3000, or emulsified asphalt, Grade RS-2 (Subsections 904.02 and 904.03)

2.5 ASPHALTIC CONCRETE BINDER: Grading "BM" (Section 307), as directed by the Town of Smyrna.

2.6 BITUMINOUS TACK COAT: cutback asphalt, Grade RC-250, or

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emulsified asphalt, Grade SS-1 (Section 403, Subsections 904.02 and 904.03).

2.7 ASPHALTIC CONCRETE SURFACE: Grading "C-W" (Section 307) as approved by the Town of Smyrna.

2.8 PAVEMENT MARKINGS (WHITE AND YELLOW): Thermoplastic, Paint, Paint with Glass, Reflectors, Etc. Section 716.

PART 3. EXECUTION

3.1 SUBGRADE

- A. Before any base material is installed, compact the subgrade of the area to be paved to 98% of optimum density as determined by ASTM D698 (Standard Proctor).
- B. The backfill material shall contain no topsoil or organic matter. For all areas where subgrade has been prepared, test for uniformity of support by driving a loaded dump truck at a speed of 2 to 3 mph over the entire surface. Compaction testing by a certified laboratory, secured by the contractor at his expense, may be required when directed by the Director of Utilities or project engineer to further verify areas that are pumping. The contractor shall make further improvements on all areas that show a deflection by means of excavating the subgrade and installing clean 6" surge stone and compacted crushed stone to stabilize. This work shall be performed by the contractor at his expense. When completed, the finished subgrade shall be hard, smooth, stable, and constructed in reasonably close conformance with the lines and grades that existed prior to beginning construction.
- C. When a base course is compacted, cut back the surface course of the existing pavement a minimum of 1 foot beyond the limit of the joint between the old and new base course or as shown on the standard drawings. Take special care to ensure good compaction of the new base course at the joint. Apply and compact the surface to conform to the existing pavement so that it will have no surface irregularity.

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3.2 BASE

- A. Install a mineral aggregate base of the type specified above in accordance with Section 303 of the TDOT specifications. The maximum compacted thickness of any one layer shall be 5 inches and the total thickness of the base shall be that indicated by the standard drawings or as shown on the plans.

3.3 BITUMINOUS PRIME COAT SURFACE

- A. Uniformly apply a bituminous prime coat of either emulsified asphalt, Grade AE-P, or cutback asphalt, Grade RC-250, over the entire width of the area to be surfaced at a rate of 0.4 gallon per square yard.

3.4 ASPHALTIC CONCRETE BINDER

- A. Apply a bituminous prime coat of emulsified asphalt, Grade AE-P, or cutback asphalt, Grade RC-250, at a rate of 0.40 gallons per square yard. Take care to prevent the bituminous material from splashing on exposed faces of curbs and gutters, walls, walks, trees, etc; if such splashing does occur, remove it immediately. After the prime coat has been properly cured, apply an asphaltic concrete binder layer to the thickness shown on the standard drawings or as specified by the Town of Smyrna.
- B. Carefully place the material to avoid segregation of the mix. Broadcasting of the material will not be permitted. Remove any lumps that do not readily break down.

3.5 BITUMINOUS TACK COAT SURFACE

- A. Uniformly apply a bituminous tack coat of either emulsified asphalt, Grade SS-1, or cutback asphalt, Grade RC-250, over the entire width of the area to be surfaced at a rate of 0.1 gallon per square yard.

3.6 ASPHALTIC CONCRETE SURFACE

- A. When the surface course is to be placed on a binder course, then apply a bituminous tack coat of the sort specified above at a rate of 0.10 gallon per square yard. Take care to prevent the bituminous material from splashing on exposed faces of curbs, gutters, walls, walks, trees, etc.; if such splashing does occur, remove it immediately. After the tack coat has been properly cured, apply the asphaltic concrete surface layer to the

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thickness shown of the drawings or as specified by the Town of Smyrna. Apply the surface course as described above for the binder course.

3.7 SMOOTHNESS

- A. The finished surfaces shall conform to the lines and grades that existed prior to construction. No deviations, variations, or irregularities exceeding 1/4 inch in any direction when tested with a 12 foot straightedge will be permitted in the finished work, nor will any depressions that will not drain. Correct all such defects in a manner approved by the Town of Smyrna.

3.8 SAMPLING AND TESTING

- A. Submit to the Town of Smyrna test reports made by an independent testing laboratory on the crushed stone aggregate, bituminous materials, and asphaltic concrete design mixes, and obtain approval of these reports before starting paving operations.
- B. Tests shall be made of the completed elements of the pavement to ascertain the compacted thickness of the base and surface courses. If sections with deficient thicknesses are found, the full section for a reasonable distance on each side of the deficiency shall be refused. Remove and reinstall all such sections. Patch all test holes in connection with thickness tests.
- C. When making surface tests, furnish one man to mark all surface defects for corrections.

END OF SECTION

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SECTION 02596
MANHOLE REHABILITATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Restoration and corrosion barrier composite liner for concrete and brick structures - Manhole Rehabilitation (Method 1)
- B. Inflow dish installation (Method 2)
- C. Replace Frane and Cover (Method 3)

1.02 RELATED SECTIONS

- A. Section 02597 - Cured-in-Place Pipe (CIPP)
- B. Section 02600 - Manholes
- C. Section 03300 - Cast-in-Place Concrete.

1.03 REFERENCES

- A. ACI 305R - Hot Weather Concreting.
- B. ACI 503R - Use of Epoxy Compounds for Coating Concrete.
- C. ASTM C 78 - Flexural Strength of Concrete (Using Simple Beam With Third-Point Loading).
- D. ASTM C 109 - Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens).
- E. ASTM C 157 - Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
- F. ASTM C 876 - Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete.
- G. ASTM D 4138 - Measurement of Dry Film Thickness of Protective Coating Systems by Destructive Means.
- H. International Concrete Repair Institute (ICRI) Technical Guideline No. 03730 - Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting From Reinforcing Steel Corrosion.

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- I. National Association of Corrosion Engineers International, NACE RP 0188 - Discontinuity (Holiday) Testing of Protective Coatings.

1.04 SUBMITTALS

- A. Comply with Section 01301 - Submittals and Substitutions.
 - 1. Product substitutions to be submitted by Contractor and approved by Engineer at least 10 days before bid date.
- B. Product Data: Submit manufacturer's product data, including physical properties, surface preparation, application instructions, and curing instructions.
- C. Test Reports: Submit manufacturer's test reports of in-place testing performed by an independent testing agency.
- D. List of three Restoration and Corrosion Barrier Composite Liner projects, with at least three years of successful service history, including project name and location, names of owner and engineer, and description of products used, substrates, and application procedures. As a minimum, at least one of three projects must be accessible for physical inspection prior to acceptance of restoration mortar/corrosion barrier mortar system.

Written certification that both the Restoration Mortar and Corrosion Barrier Mortar were applied consecutively (essentially simultaneously) on each of the three projects submitted (both products applied within 4 hours of each other).

- E. Certification that all products (restoration mortar and corrosion barrier mortar) are from a single source. Single source being defined as a single entity (person or company) that owns all rights to both the restoration mortar and corrosion barrier mortar formulations and testing data.
- F. Applicator Qualifications: Submit qualifications of applicator.
 - 1. Certification by the manufacturer stating that the applicator is trained and approved in the application of the specified products.

1.05 QUALITY ASSURANCE

- A. Applicator Qualifications:
 - 1. Trained and approved by the manufacturer in the application of the specified products.

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2. Employs persons trained for the application of the specified products.

B. Pre-Application Meeting: Convene a pre-application meeting [2] weeks before the start of application of Restoration and Corrosion Barrier Composite Liner. Require attendance of parties directly affecting work of this section, including the Contractor, Engineer, applicator, and manufacturer's representative. Review surface preparation, application, curing, field quality control, and coordination with other work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage:

1. Store materials in accordance with manufacturer's instructions.
2. Keep containers sealed until ready for use.
3. Store materials in a cool dry environment.
4. Storage Temperature of Corrosion Barrier Mortar: 40 to 80 degrees F.

C. Handling: Protect materials during handling and application to prevent damage.

1.07 ENVIRONMENTAL CONDITIONS

A. Do not apply materials under the following conditions:

1. Temperatures exceeding the manufacturer's recommended maximum or minimum allowable.
2. Dusty or smoke-laden atmosphere.
3. Overflowing water.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Madewell Products Corporation, 7561A Industrial Court, Alpharetta, Georgia 30004. Phone (770) 475-8199. Fax (770) 475-8167. Internet: www.madewell.com., or Engineer approved equal.

2.02 RESTORATION AND CORROSION BARRIER COMPOSITE LINER

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A. General:

1. Restoration mortar, corrosion barrier coating and manhole frame seal from single manufacturer.
2. Materials compatible with substrate and with each other. A minimum of three years of successful service history in aggressive sewer environments where the restoration mortar and corrosion barrier coating were applied simultaneously (the same day).

B. Hydraulic Cement Mortar: Mainstay ML-10. Fast-setting mortar used to stop leaks through cracks and holes.

1. Composition: Blend of hydraulic cements and fillers.
2. Compressive Strength, ASTM C 109:
 - a. 1 Day: 3,500 psi.
 - b. 7 Days: 4,900 psi.
 - c. 28 Days: 5,500 psi.
3. Tensile Strength, ASTM C 190:
 - a. 7 Days: 290 psi.
 - b. 28 Days: 575 psi.
4. Working Time: 45 to 90 seconds at 77 degrees F.
5. Color: Dark gray.

C. Restoration Mortar: Mainstay ML-72 Sprayable Microsilica Cement Mortar. Low shrinkage, high strength, polymer modified, sprayable microsilica mortar.

1. Composition: Blend of cements, microsilica, thermoplastic fibers, densifiers, polymer admixtures, and modifiers. Mortar shall not contain calcium aluminate cements or aggregates.
2. Compressive Strength, ASTM C 109:
 - a. 2 Days: 3,875 psi.
 - b. 7 Days: 4,550 psi.
 - c. 14 Days: 5,640 psi.
 - d. 28 Days: 6,190 psi.
3. Flexural Strength, ASTM C 78:
 - a. 7 Days: 825 psi.
 - b. 28 Days: 985 psi.
4. Tensile Strength, ASTM C 190:
 - a. 7 Days: 290 psi.
 - b. 28 Days: 575 psi.
5. Shrinkage, ASTM C 157, Modified:
 - a. 28 Days: 0.04 percent.
6. Uniaxial Tensile Bond Strength, ACI 503R, Appendix A:
 - a. 28 Days: Greater than 500 psi over high strength concrete (5,000 psi compression strength concrete - bond

strength governed by substrate tensile strength).

Minimum acceptable bond = 145 psi.

7. Color: Dark gray.

D. Corrosion Barrier Coating: Mainstay DS-5 Ultra High Build Epoxy Coating.

1. Composition: 100 percent solids, modified epoxy coating.

2. Thickness: Minimum of [60] [100] mils in 1 or 2 coats.

3. Number of Components: 2.

4. Finish: Gloss.

E. Manhole Frame Seal: Madewell 806 Flexible Epoxy

1. Composition: 100% solids, flexible epoxy trowel-grade mastic

2. Thickness: Minimum of ¼"

3. Number of Components: 2

4. Finish: Semigloss.

5. Color: Light gray

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to receive restoration mortar. Notify the Engineer in writing if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

B. Provide the Engineer with a minimum of 3 days advance notice of completion of surface preparation and start of application.

C. Before application of each material, surfaces to be lined will be inspected by the Engineer. Correct defects or deficiencies before application of subsequent material.

D. Inspection by the Engineer or the waiver of inspection of any portion of the work shall not relieve the Contractor of responsibility to perform the work as specified.

3.02 SURFACE PREPARATION

A. Prepare surfaces in accordance with manufacturer's instructions.

B. Cleaning: Clean surfaces by water or abrasive blasting (minimum 3,500 psi water blast), or hand or power tools as required to remove all unsound concrete, contaminants, dirt, debris, and deteriorated reinforcing steel.

- C. Inspection:
 - 1. Inspect cleaned surfaces to identify and mark corroded reinforcing steel; and to locate cracks, leaks, and joints.
 - 2. If indicated, perform electrical potential testing in accordance with ASTM C 876.
- D. Replace or treat corroded reinforcing steel, repair cracks and leaks, and treat joints in accordance with manufacturer's instructions and as approved by the Engineer.
- E. Refer to ICRI Technical Guideline No. 03730 - Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion.
- F. Apply Madewell 1312P epoxy putty after cleaning reinforcing steel to protect the steel from contamination and re-rusting.
- G. Prepare surfaces to have a minimum profile of 1/16 inch, with aggregate exposed.
- H. Inspect surfaces for soundness.
- I. Saturate all surfaces thoroughly with clean water.
- J. Apply restoration mortar as soon as water sheen is no longer visible (saturated surface dry).
- K. Hydrostatic Leak Correction:
 - 1. Stop visible hydrostatic leaks by application of Mainstay ML-10 hydraulic cement mortar, after completion of surface preparation.
 - a. Mix only 1 to 2 pounds of Mainstay ML-10 at a time.
 - b. Add water to form a viscous mass with consistency of modeling clay.
 - c. Apply by hand or trowel.
 - d. Press mixed material firmly into place, starting at top of leak and working downward.
 - 2. Inject flowing leaks or cracks using a suitable polymer gel or foam approved by the Engineer. Remove excess or spilled material from concrete surface before application of restoration mortar.

3.03 APPLICATION OF RESTORATION MORTAR

- A. Apply restoration mortar in accordance with manufacturer's instructions.

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- B. Apply by one of the following methods:
1. Low pressure, low volume spray equipment (rotor/stator or piston pumps such as those manufactured by Putzmeister).
 2. Wet mix shotcrete equipment.
 3. Hand trowel into place.
 4. Centrifugal application by use of the Mainstay Mortar Applicator.
- C. Apply uniformly to substrate to the specified thickness. Do not apply to manhole frame.
- D. Do not trap air in corners, behind exposed reinforcing steel, or between lifts.
- E. Mortar Thickness: Apply a minimum thickness of 1/2 inch above peaks of existing profile after surface preparation.
- F. Finishing: Finish surface with wood float, sponge float, broom, or brush to produce a textured surface upon which to apply Corrosion Barrier Mortar.
- G. Hot Weather Application:
1. Follow manufacturer's instructions to reduce evaporation rate of surface moisture until Corrosion Barrier Mortar can be applied.
 2. If applying mortar under conditions such as high temperatures of mortar, substrate, or air; high winds; and low humidity; alone or in combination; rapid evaporation of surface moisture can occur and cause plastic shrinkage cracking. Apply Mainstay DS-4 Epoxy Corrosion Barrier Mortar or Madewell 927 primer/ sealer a maximum of 1 hour after placing Mainstay ML-72 Restoration Mortar.
 3. If conditions prevent application of Epoxy Corrosion Barrier Mortar or primer, refer to ACI 305R-91, Figure 2.1.5 to estimate the evaporation rate of surface moisture from the mortar, based on temperatures, relative humidity, and wind velocity. Cover with plastic film or wet burlap to limit evaporation rate to a maximum of 0.1 pounds per square foot per hour.
- H. Cold Weather Application:
1. Follow manufacturer's instructions for minimum application temperature and minimum number of days to protect from freezing.
 2. During cold weather (a period when for more than 3 successive days the average daily outdoor temperature drops below 40 degrees F) place Mainstay ML-72 mortar at a minimum

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temperature of 55 degrees F and protect mortar from freezing for a minimum period of 3 days at a temperature between 55- and 75-degrees F. Gradually reduce mortar temperature during the protection period so that the final 24 hours is held as close to 55 degrees F as practical.

3. During periods not defined as cold weather, but when freezing temperatures may occur, protect the mortar against freezing as specified for cold weather for the first 24 hours after application.

3.04 APPLICATION OF EPOXY CORROSION BARRIER COATING

- A. Apply Epoxy Corrosion Barrier Coating in accordance with manufacturer's instructions. Do not apply to manhole frame.
- B. Apply Epoxy Corrosion Barrier Coating as soon as possible after finishing of restoration mortar, but before it is allowed to cure for more than 4 hours. If the Epoxy Corrosion Barrier Coating cannot be applied within this time frame, the surface of the Restoration Mortar shall be primed within that time frame with Madewell 927 Penetrating Primer to hold the surface for up to 72 hours.
- C. Do not allow surface contamination to the finished restoration mortar before application of Epoxy Corrosion Barrier Coating. Remove any contamination of primed mortar before application of Epoxy Corrosion Barrier Coating by means of high pressure (min. 3,500 psi) water blast.
- D. Corrosion Barrier Coating Thickness: Apply a minimum thickness of 60 mils.

3.05 CURING OF CORROSION BARRIER COATING

- A. Foot Traffic: Allow a minimum cure time of 24 hours at 70 degrees F.
- B. Chemical Service: Allow a minimum cure time based on the manufacturer's recommendations and instructions.
- C. Curing Conditions:
 1. Continue to protect Composite Liner from freezing throughout protection periods specified for cold weather application.
 2. Shelter Composite Liner from direct impingement of water until 1 to 3 hours after application of Corrosion Barrier Coating, depending on substrate temperatures, after which cure sufficiently to be undamaged by water impingement or immersion at ordinary velocities.

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3. Sanitary Sewer Systems: It may be necessary to plug services or main lines temporarily in order to achieve these environmental conditions, but bypass pumping should seldom be required. The contractor shall be responsible for any bypass pumping at no additional cost.

D. Immersion Service: Reach a tack-free condition before being immersed.

3.6 APPLICATION OF MANHOLE FRAME SEAL

A. Surface Preparation

1. Epoxy Corrosion Barrier Coating: Clean/decontaminate epoxy corrosion barrier coating if required. If within recoat window of epoxy corrosion barrier coating (72 hours), no further surface preparation is necessary. If recoat window has been exceeded, sand, sandblast, or wire brush, followed by a solvent wipe off, the epoxy corrosion barrier coating surface after cleaning/decontamination.

2. Manhole Frame: Wire brush clean to SSPC SP-3 (Power Tool Cleaning) condition to remove all loose rust and any restoration mortar or epoxy corrosion barrier coating overspray. Surface shall be clean and dry before application of manhole frame seal material.

B. Apply Madewell 806 to a minimum thickness of ¼" to manhole, grade rings and manhole frame. Height of application depends on overall height of chimney, but minimum height will be 4" (2" above and below joint). Apply material with a putty knife to a uniform thickness and texture.

C. Allow Madewell 806 to cure at least 24 hours in load bearing applications. Do not apply below 50°F. Protect from freezing for at least 48 hours after application.

3.07 FIELD QUALITY CONTROL

A. Field Quality Control Testing: Performed by a NACE International Certified Coating Inspector at the Contractor's expense.

B. Field Mockup: For projects greater than 3000 ft², the contractor shall install a 5' x 5' field mockup to be tested in accordance with C, D and E below before additional application work can proceed.

C. Destructive Dry Film Thickness Tests, ASTM D 4138:

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1. Perform 1 test for every 500 square feet of surface lined. If the thickness is correct, no further testing is required for that area.
2. If the initial thickness test does not indicate correct film thickness, an additional 4 measurements will be made, the average of which must equal minimum specified thickness, although individual measurements may under run this amount by a maximum of 20 percent.
3. Any area that does not meet the specified thickness as tested in 1. and 2. above, shall receive additional Epoxy Corrosion Barrier Coating (depending on the time and environment, additional surface preparation may be required).
4. If the areas tested are of proper thickness, destructive test sites shall be repaired with the appropriate barrier mortar at the contractor's expense prior to placing the system into service.

D. Spot Adhesion Testing of Restoration and Corrosion Barrier Composite Liner to Substrate:

1. Perform minimum of 1 uniaxial pull-off adhesion test for every 500 square feet of surface lined.
2. Remove and replace areas not meeting required 145 psi at 28 days minimum adhesion requirement.
3. If the condition of the substrate is such that minimum pull-off adhesion requirement cannot be met by removal of the upper 1/4" of the substrate, work shall not proceed until a course of corrective action has been determined that will effectively produce the required adhesion results. When an effective course of remedial action has been determined, the owner's representative and the contractor shall negotiate a mutually agreeable settlement to cover the costs associated with the surface evaluation and remedial action.

E. Visual and Electrical Inspection for Holidays in Epoxy Corrosion Barrier Coating:

1. Visual Inspection: Perform visual inspection for holidays in Epoxy Corrosion Barrier Coating. Mark areas identified for repair and reapplication of Epoxy Corrosion Barrier Coating.
2. Electrical Inspection: Perform spark testing in accordance with NACE RP 0188 or as recommended by the manufacturer. Mark areas identified for repair and reapplication of Corrosion Barrier Coating.
3. Areas Marked for Repair or reapplication of Epoxy Corrosion Barrier Coating: Sand or grind down to substrate, clean, spray with Madewell 927 primer/sealer, and recoat with specified Mainstay Epoxy Corrosion Barrier Coating.

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Part 4

4.01 METHOD 2 - Inflow dish installation

- A. Install "Inflow Dish" by Cretex or Engineer approved equal where indicated on the drawings. Follow manufacturer's installation instructions.

Part 5

5.01 Method 3 - Replace Frame and Cover

- A. Remove existing manhole frame and cover and replace with a new standard frame and cover, per the Smyrna standard details, where indicated on the drawings.

END OF SECTION

SECTION 02957

CURED-IN-PLACE PIPE (CIPP)

1. GENERAL

1.1 SCOPE

- A. Approved methods and materials for the rehabilitation of deteriorated gravity sewer lines by the Cured-In-Place Pipe (CIPP) method. This specification covers all labor, materials, tools, equipment, and other necessary items to rehabilitate existing sanitary sewer lines at the line, grade, and size shown on the plans by the CIPP method. The CIPP shall extend the full length of the pipe reach being rehabilitated and shall provide a structurally sound, impermeable and watertight, joint-less, and close fitting pipe.

1.2 RELATED WORK

- A. Section 02221: Unclassified Excavation for Utilities
- B. Section 02600: Manholes
- C. Section 02722: Sanitary Sewers
- D. Section 02988: Sewer Service Lateral Lining
- E. Section 13514: Television Inspection

1.3 REFERENCES

- A. AASHTO Standard Specification for Highway Bridges.
- B. ASTM C 581 - Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass Fiber Reinforced Structures, Intended for Liquid Service.
- C. ASTM D 543 - Test Method for Resistance of Plastics to Chemical Reagents.
- D. ASTM D 790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- E. ASTM D 3567 - Standard Practice for Determining Dimensions of Reinforced Thermosetting Resin Pipe (RTRP) and Fittings.
- F. ASTM D 3574-11 - Standard Test Methods for Flexible Cellular Materials—Slab, Bonded, and Molded Urethane Foams
- G. ASTM D 3681 - Test Method for Chemical Resistance of Reinforced Thermosetting Resin Pipe in a Deflected

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Condition.

- H. ASTM D 5035 - Test Method for Breaking and Elongation of Textile Fabrics (Strip Method).
- I. ASTM D 5199 - Standard Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.
- J. ASTM D 5813- Standard Specification for Cured-In-Place Thermosetting Resin Sewer Pipe.
- K. ASTM E 1252 - Standard Practice for General Techniques for Qualitative Infrared Analysis.
- L. ASTM F 1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
- M. ASTM F 1743 - Standard Practice for the Rehabilitation of Existing Pipelines and Conduits by the Pulled-In-Place Installation of Cured-In-Place Thermosetting Resin Pipe (CIPP).
- N. ASTM F 2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
- O. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics
- P. APS Standard - Water-tightness standard for cured-in-place thermosetting resin pipe, porosity test protocol
- Q. NASSCO - National Association of Sewer Service Companies

1.4. QUALITY ASSURANCE

- A. The Contractor shall, as part of the bid submittal, provide evidence of its (or its proposed subcontractors) previous experience in successfully utilizing the proposed method of trenchless installation.
- B. The Contractor shall submit the following certifications:
 - 1. Certifications of training by the CIPP systems manufacturer stating that the operators have been fully trained in the use of the equipment by an authorized representative of the equipment manufacturer.

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2. Certifications from the manufacturer of training in the proper method for handling and installing the liner.
- C. The Contractor shall submit to the engineer for review and comment, prior to commencing any work, a detailed statement of the equipment and operating systems.
- D. Certifications and manufacturer's literature relevant to the proposed CIPP and other appurtenances shall be submitted to the engineer prior to commencing any work.
- E. Contractor (or Subcontractor) shall have a minimum of 5 years of experience in trenchless sewer installation and shall provide a list of 5 job references using the proposed method. The Contractor shall have a minimum of 250,000 LF of documented CIPP experience (felt tube with heat cure) or 200,000 LF CIPP experience (UV cure). The Superintendent, Foreman, and all key personnel shall have a minimum of 3 years of documented experience in CIPP trenchless sewer installation.
- F. The apparent low bidder shall provide proof of the bidder's ability to complete the proposed work in accordance with the contract documents. Such proof shall, as a minimum, include reference(s) for project(s) of a size and complexity equal to or greater than the size and complexity of the proposed project. The reference project(s) must have been completed within a five-year period prior to the date of the bid opening. Failure to submit this proof will be cause for the rejection of bid.

1.5 SYSTEM DESCRIPTION

- A. Resin-impregnated flexible tubes inserted into existing sewers, expanded against the existing sewer interior surfaces, and cured by circulating heated water, steam, or ultraviolet light throughout the tube from manhole to manhole.
- B. CIPP shall cure into a hard, impermeable, corrosion-resistant liner of specified thickness and physical properties, with a uniformly smooth interior surface.
- C. CIPP Material and Installation: Comply with the ASTM and other industry standards as modified by this specification. The Engineer reserves the right to approve materials or installation practices which differ from these standards.

1.6 SUBMITTALS

- A. Make submittals in accordance with Section 01301 - Submittals & Substitutions.
- B. Resin:
 - 1. Submit product data stating physical and chemical properties.
 - 2. Submit results of testing performed by resin manufacturer demonstrating compliance with specified chemical resistance requirements.
 - 3. Submit manufacturer-certified infrared spectrum analysis (chemical fingerprint) of proposed resin system in accordance with ASTM E 1252
- C. Flexible Tube:
 - 1. Submit product data stating physical properties meeting ASTM D 5035.
 - 2. Submit tabular summary by sewer segment noting required CIPP thickness specified. Provide certification that liner's "dry" thickness meets or exceeds the required cured laminate thickness. Measure thickness in accordance with ASTM D 5199.
- D. Cured-In-Place Pipe:
 - 1. Submit field measurements of cured liner thickness for determining payment.
 - 2. Submit representative sample(s) of the in-situ cured liner required for testing in accordance with ASTM D 790, ASTM D 638, and the porosity test protocol. Samples shall be provided to the Owner or Engineer. Failure to submit samples shall be cause for rejection. The Owner shall be responsible for testing.
 - 3. Submit post-installation television inspection videos as specified in Section 13514 - Television Inspection.
- E. During the course of the Work, make no substitutions of materials, design values or procedures for those specified without the prior written approval of the Engineer.

2. PRODUCTS

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2.1 APPROVED MANUFACTURERS

- A. Liner shall be ALPHALINER® by Reline America™, Insituform iPlus® Glass by Insituform Technologies Inc., Inliner STX by Inliner Technologies, or Engineer approved equal for UV cured liner
- B. Liner shall be Insituform® CIPP by Insituform Technologies Inc., Inliner CIPP by Inliner Technologies, National Liner, Applied Felts, Pipenology™ by SAK Construction or Engineer approved equal for heat cured liners.

2.2 MATERIALS

A. Flexible Felt Tube:

1. Provide flexible tube manufactured and fabricated under manufacturer's quality- controlled conditions. Use tube sized so as to snugly fit the internal circumference of the existing sewer without wrinkles and produce specified cured thickness and physical properties.
2. Tube Length: Fully and continuously span the distance between manholes, including sufficient material for sealing at manholes and product sampling.
3. Fabric tube minimum tensile strength in both longitudinal and transverse directions, when tested in accordance with ASTM D 5035: 750 psi.
4. Identify all tubes with manufactured thickness when tested in accordance with ASTM D 5199.

B. Fiberglass Tube (Ultraviolet Light Curing Application):

1. The fiberglass material shall be chemically resistant EC-R Glass.
2. The tube shall be homogeneous throughout, uniform in color, free of cracks, holes, foreign materials, blisters and other surface defects.
3. The glass fiber tubing shall include an exterior and interior film that protects and contains the resin in the liner. The exterior film shall be UV resistant.
4. The tube shall be properly sized to be fitted against and in contact with the wall of the host pipe throughout

its length or remnants thereof.

5. The tube shall be constructed to withstand stretching during the pull-in process and installation pressures as required by Manufacturer's recommendations.
 6. The impregnated tube shall have a uniform thickness, that when compressed at installation pressures will meet or exceed the required thickness.
 7. Use tube sized so as to snugly fit the internal circumference of the existing sewer and produce specified cured thickness and physical properties.
 8. The tube shall be sized to fit irregular pipe sections and negotiate bends of up to 20 degrees and shall have sufficient strength to bridge missing pipe sections with the use of preliner.
 9. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color.
 10. The pipe shall be seamless in its cured state to insure homogenous physical properties around the circumference of the cured liner.
- C. Resin for Tube Saturation: Liquid thermosetting polyester, vinyl ester, or epoxy resin meeting specified requirements.
1. Resin and catalyst must be approved for use with the liner and the liner manufacturers.
 2. PET resins are prohibited. Old resins and reworked resins are prohibited, regardless of whether or not they are mixed with new resins.
 3. Resins shall be shipped directly to the wet-out facility from the resin manufacturer.

2.3 TESTING REQUIREMENTS

- A. Manufacturer's Chemical Resistance Testing: Perform chemical resistance testing of resin in accordance with ASTM C 581, as modified herein. Perform testing to demonstrate chemical resistance to a solution with a pH of 0.5 and a solution with a pH of 10. Use reagents or solutions as required to establish and maintain the minimum and maximum pH values specified for the duration

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of the testing. Exposure to the minimum and maximum pH values shall produce an average loss of not more than 20 percent in the initial flexural properties for each test interval, and an average loss of not more than 15 percent for a period of one year, as determined according to ASTM D 790. Perform testing at a temperature of 73.4 F (plus or minus 3.6 F). Test specimens shall not have more than 1.5 percent gain or loss in weight over a period of one year. Test frequency and sample preparation: Follow ASTM C 581.

B. Test Results - Submit test results including at least the following:

1. Raw data for each test specimen for each test interval performed
2. Calculated average test results for each test interval
3. Using calculated averages for each test interval, calculate the average test result for the duration of testing.

2.4 PHYSICAL PROPERTIES FOR TRADITIONAL CIPP (FELT TUBE)

A. Minimum CIPP Thickness after Curing: As specified below, based on the liner material and the maximum sewer invert depth for the segment being rehabilitated. Thickness shall be designed to Class III loading conditions or according to the table below, whichever is greater.

| MINIMUM CIPP THICKNESS (IN MILLIMETERS) FELT | | | | |
|--|-----------------------------------|-----------------|-----------------|---------------|
| NOMINAL SEWER DIAMETER (INCHES) | MAXIMUM PIPE SEGMENT INVERT DEPTH | | | |
| | Up to 10 feet | 10 - 15 feet | 15 - 20 feet | 20-25 feet |
| 6 | 4.5 | 4.5 | 4.5 | 6.0 |
| 8 | 6.0 | 6.0 | 6.0 | 7.5 |
| 10 | 6.0 | 6.0 | 7.5 | 9.0 |
| 12 | 6.0 | 7.5 | 9.0 | 10.5 |
| 15 | 7.5 | 9.0 | 10.5 | 12.0 |
| 18 | 9.0 | 12.0 | 13.5 | 15.0 |
| 20-21 | 10.5 | 13.5 | 15.0 | 16.5 |
| 24 | 12.0 | 15.0 | 16.5 | 19.5 |

| | | | | |
|-------|------|------|------|------|
| 30 | 15.0 | 18.0 | 21.0 | 24.0 |
| 36 | 16.5 | 21.0 | 24.0 | 28.5 |
| 42 | 19.5 | 25.5 | 31.5 | 36.0 |
| 48 | 22.5 | 28.5 | 34.5 | 40.5 |
| 54 | 25.5 | 31.5 | 39.0 | 45.0 |
| 60 | 27.0 | 34.5 | 42.0 | 48.0 |
| 66 | 30.0 | 36.0 | 45.0 | 52.5 |
| 69-72 | 33.0 | 39.0 | 48.0 | 58.5 |

B. CIPP minimum flexural and tensile properties after curing using hot water or steam:

| PROPERTY | REFERENCE | MINIMUM |
|--|------------|-------------|
| Flexural Strength (Modulus of Rupture) | ASTM D 790 | 4,500 psi |
| Tensile Strength (Pressure Applications) | ASTM D 638 | 3,000 psi |
| Tangent Modulus of Elasticity | ASTM D 790 | 250,000 psi |

C. If different conditions are encountered in the field, design considerations may change, if required by the Engineer. Required thickness maybe increased or decreased based on specific design. The Contractor shall not be allowed to change any required thickness unilaterally, or offer credits after the fact as remedy for liners not meeting the required thickness. Engineer approval is required for any changes in CIPP thickness.

2.5 PHYSICAL PROPERTIES FOR UV CIPP (FIBERGLASS TUBE)

A. Minimum CIPP Thickness after Curing: As specified below, based on the liner material and the maximum sewer invert depth for the segment being rehabilitated. Thickness shall be designed to Class III loading conditions or according to the table below, whichever is greater.

| MINIMUM CIPP THICKNESS (IN MILLIMETERS) FIBERGLASS | | | | |
|--|-----------------------------------|-----------------|-----------------|---------------|
| NOMINAL SEWER DIAMETER (INCHES) | MAXIMUM PIPE SEGMENT INVERT DEPTH | | | |
| | Up to 10 feet | 10 - 15 feet | 15 - 20 feet | 20-25 feet |
| 6 | 2.0 | 2.0 | 2.0 | 2.0 |
| 8 | 2.5 | 2.5 | 2.5 | 3.0 |
| 10 | 3.0 | 3.0 | 3.5 | 3.5 |
| 12 | 3.5 | 3.5 | 4.0 | 4.0 |
| 15 | 4.5 | 4.5 | 5.0 | 5.5 |
| 18 | 5.0 | 5.5 | 6.0 | 6.5 |
| 20-21 | 6.0 | 6.5 | 7.0 | 7.5 |
| 24 | 7.0 | 7.0 | 8.0 | 8.5 |
| 30 | 8.5 | 9.0 | 10.0 | 10.5 |
| 36 | 10.5 | 11.0 | 12.0 | 12.5 |
| 42 | 12.5 | 13.0 | 14.0 | 14.5 |

B. CIPP minimum flexural and tensile properties after curing using ultraviolet light:

| PROPERTY | REFERENCE | MINIMUM |
|--|------------|----------------|
| Flexural Strength (Modulus of Rupture) | ASTM D 790 | 6,500 psi |
| Tensile Strength (Pressure Applications) | ASTM D 638 | 9,000 psi |
| Tangent Modulus of Elasticity | ASTM D 790 | 725,000 psi |

C. If different conditions are encountered in the field, design considerations may change, if required by the Engineer. Required thickness maybe increased or decreased based on specific design. The thickness may be changed in increments of 1.5 mm and payment shall be made or deducted at the rate of 2.50% of the bid item amount for each increment. However, the Contractor shall not be allowed to change any required thickness unilaterally, or offer credits after the fact as remedy for liners not meeting the required thickness. Engineer approval is required for

any changes in CIPP thickness.

3. EXECUTION

3.1 PRE-INSTALLATION CLEANING AND TELEVISION INSPECTION

- A. Perform a pre-installation television inspection in accordance with Section 13514 - Television Inspection. Verify that sewer is clean and pipe conditions are suitable for installation of the CIPP. Notify Engineer if conditions exist which will impact the installation.

3.2 OBSTRUCTION REMOVAL, POINT REPAIR AND SAG ELIMINATION

- A. If pre-installation video inspection reveals an obstruction in the line segment (such as heavy solids, dropped joints, protruding service connections or collapsed pipe) that cannot be removed by conventional sewer cleaning equipment and the obstruction will prevent completion of the insertion process, perform point repairs or obstruction removal prior to CIPP installation. Obtain approval of the Engineer before performing work.
- B. If pre-installation video inspection reveals a sag in the sewer that has a vertical displacement greater than one-half the pipe diameter, eliminate the sag by performing a point repair, or by removal and replacement of the sewer segment. Obtain approval of the Engineer before performing work.

3.3 SEWER FLOW CONTROL

- A. Install and operate bypass pumping equipment to maintain sewage flow around the segment of pipe being rehabilitated, and to prevent backup or overflow. Contractor shall submit a bypass pumping plan for review and approval.

3.4 INSTALLATION PROCEDURES

- A. Notification: Inform the Engineer of work schedules for CIPP installation. Provide 24-hour notice so that the Engineer may witness the "wet-out" procedure and inversion and curing of liner.
- B. Conduct operations in accordance with applicable OSHA standards, including safety requirements involving work on elevated platforms and entry into confined spaces. Take suitable precautions to eliminate hazards to personnel

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near construction activities when pressurized air is being used.

- C. Wet-out: Designate a location where the flexible tube will be impregnated with resin. Thoroughly saturate flexible tube prior to installation. Use catalyst systems or additives compatible with resins and flexible tubes complying with manufacturer's recommendations. Handle resin-impregnated flexible tubes to retard or prevent resin setting until ready for curing. Owner's representative shall have the right to inspect the proposed wet-out facility.
- D. Maintain resin-impregnated tubes in refrigerated truck trailers at the temperature recommended by the manufacturer to prevent premature curing. Prior to beginning inversion, no portion of the resin-impregnated liner shall be subjected to sunlight or ultraviolet radiation. Resin-impregnated tubes with signs of premature curing shall not be used.
- E. Insertion: Insert flexible tubes through existing manholes or access structures by inversion, pull-in or other approved procedure in accordance with manufacturer's recommendations.
- F. Curing using Hot Water or Steam.
 - 1. Follow manufacturer's recommended cure schedule in curing of liner.
 - 2. After insertion is completed, apply a suitable recirculation system capable of delivering hot water or steam uniformly throughout the section to achieve consistent cure of the resin. Maintain curing temperature as recommended by the resin/catalyst system manufacturer.
 - 3. Provide suitable monitors near the heat source to gauge temperatures of incoming and outgoing water or steam supply. Place additional temperature sensors between the impregnated tube and invert of the original pipe at each manhole to monitor the outside temperature of the liner while curing.
 - 4. Continue uninterrupted heating until the required curing temperature is achieved. Accurately measure temperatures at both ends of the CIPP. Initial cure is considered complete when exposed portions of the flexible tube pipe

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appear to be cured and the remote temperature sensors have achieved the external temperature recommended by the resin/catalyst system manufacturer.

5. Cool Down: Initiate controlled cool-down of the hardened pipe to a temperature below 100° F, in accordance with the manufacturer's recommended cure schedule. Take care in releasing the water column so that a vacuum does not develop that could damage newly-installed pipe. Do not discharge water hotter than 100° F into the sanitary sewer system

G. Curing using Ultraviolet Light:

1. Curing shall be in accordance with ASTM F2019 and/or manufacturers specifications.
2. The UV light source shall be assembled in accordance with the manufacturer's specification for the liner diameter.
3. The ultraviolet curing lamps shall operate in a sufficient frequency range to insure proper curing of the resin.
4. A camera shall be located on the ultraviolet light assembly to enable the video inspection of the liner and to insure that the liner has been properly inflated and any liner problems can be identified before curing begins.
5. During the curing process, sensors shall be used to record curing data that shall be submitted to the Engineer upon request. The recording shall include rate of travel of the ultraviolet light assembly, curing speed, internal temperatures and pressures during the curing process.

H. Finished Pipe: Provide a finished CIPP which is continuous and as free as commercially practicable from visual defects such as foreign inclusions, dry spots, and pinholes.

I. If point repair is required after the liner has cured, use a tube segment to splice across the point repair. Overlap on each end shall be twice the diameter, or 12 inches, whichever is greater. Cure the segment using the same process specified for the original liner.

3.5 SERVICE RECONNECTIONS

- A. Complete service reconnections within 24 hours after completion of the cured-in-place process.
- B. Service connections shall be reinstated mechanically from within the mainline.
- C. Refer to Section 02988 Sewer Service Lateral Lining

3.6 SEALING AT MANHOLES

- A. CIPP shall make a tight fitting seal with existing pipe(s) in manhole. For CIPP that is installed continuous through manhole, the top half of the pipe shall be neatly cut off and not broken or sheared off at least 2 inches away from wall. The channel in the manhole shall be a smooth continuation of the pipe(s) and shall be merged with other pipes or channels, if any. Channel cross-section shall be U-shaped.
- B. At each pipe opening into manhole, hydrophilic rubber joint seal shall be bonded with adhesive to the host sewer pipe or to the opening in the manhole barrel to hold it in place during inversion.
- C. Seal CIPP and existing pipe in manhole as stated above before proceeding on to next manhole section. Manholes shall be individually inspected for liner cut-offs, benches, and sealing of liner annular space.

3.7 POST-INSTALLATION TELEVISION INSPECTION

- A. Make and submit video(s) showing completed work, including condition of restored connections. Refer to Section 13514 Television Inspection.
- B. All manhole bench/invert work and annular seal shall be completed at time of Post-TV, with Post-TV being verification of completion.
- C. All defects in the CIPP liner shall be noted using PACP notations.

3.8 FINAL CLEANUP

- A. Upon completion of rehabilitation work and testing, clean and restore project area affected by the Work in accordance with Sections 02575 - Pavement Repair and 02485

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- Seeding.

3.9 NON-CONFORMING WORK

- A. If the thickness, flexural strength, flexural modulus of elasticity, or tensile strength of the installed CIPP is less than 90% of the specified values, the product is considered unacceptable and shall be replaced. Work required to remedy non-conforming work shall be at no additional cost to the Owner.
- B. A 20% unit price reduction shall be incurred with any of the following test results: 95.0% to 99.9% of the minimum flexural strength, 95.0% to 99.9% of the minimum flexural modulus, 95.0% to 99.9% of the minimum tensile strength and 95.0% to 98.0% of the minimum liner thickness.
- C. A 40% unit price reduction shall be incurred with any of the following test results: 90.1% to 94.9% of the minimum flexural strength, 90.1% to 94.9% of the minimum flexural modulus, 90.1% to 94.9% of the minimum tensile strength, and 90.1% to 94.9% of the minimum liner thickness.
- D. If it is determined that the resin utilized did not match the submitted and approved resin via the Infrared Spectrum Analysis, the product is considered unacceptable and non-conforming. Submit proof that the resin actually utilized meets the requirements of the specification or submit a method for replacement of the sewer segment liner for review and approval by the Engineer. Work required to remedy non-conforming work shall be at no additional cost to the Owner.
- E. For all instances where CIPP is deemed unacceptable, other than thickness, flexural strength, and flexural modulus of elasticity, as described in this specification section, submit a proposed method of repair or replacement for review and approval by the Engineer. Work required to remedy non-conforming work shall be at no additional cost to the Owner.

3.10 TESTING

- A. Flexible Tube Thickness - Prior to wet-out; provide access to all flexible tubes intended for the use on the project. Clearly identify flexible tubes with their manufactured thickness. Do not use flexible tubes which fail to meet the specified thickness. Testing will be performed in accordance with ASTM D 5199. Thickness shall be measured

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by an ultrasonic thickness gauge.

- B. Infrared Spectrum Analysis (Chemical Fingerprinting) - Provide access to the resin intended for the use on the project for sampling and chemical fingerprint testing. All testing will be performed in accordance with ASTM E 1252. If sample fails test, work is non-conforming. See paragraph 3.9.
- C. Physical Property Testing - Post installation physical property testing of the in situ cured composite tube will be performed in accordance with ASTM D 790 and ASTM D 638. Provide sufficient samples for conducting the testing required under ASTM D 790 and ASTM D 638. If sample fails test, work is non-conforming. See paragraph 3.9. Samples shall be provided to the Owner or Engineer.
- D. Porosity testing shall be performed. A result of tight or non-porous must be achieved.
- E. The Contractor shall provide samples for testing from the actual installed CIPP liner. Samples shall be provided from one location per 500 linear feet of CIPP installed or per line section, whichever is greater. The sample shall be cut from a section of CIPP that has been inverted or pulled through a like diameter pipe, which has been held in place by a suitable heat sink, such as sandbags. The sample shall be marked with the date the liner was installed, the date the sample was removed, and the upstream and downstream manholes. The cutting of the sample shall be witnessed by the Owner or Engineer. On pipelines greater than 15 inches in diameter, the Owner may, at its discretion, require plate samples cured with the CIPP. All independent laboratory testing shall be performed by Owner at his expense.
- E. Leakage testing shall be performed on all segments after liner has been installed in existing sewer pipe and service lateral connections, service lateral lines, and service lateral clean-outs have been completed. Testing shall include service connections up to the property line as well as any private lateral lines replaced. Copies of all test results shall be provided to the Engineer. Testing shall conform to Smyrna standard specifications for sewer lines.

END OF SECTION

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SECTION 02600

MANHOLES

PART 1. GENERAL

1.1 MANHOLE FRAMES & COVERS

A. General: Manhole frames and covers shall be gray cast iron conforming to ASTM A48-64, Class 20, unless shown otherwise below, and shall be first quality castings free from blow-holes, shrinkage, distortion or other defects. After cleaning, casting shall be painted with a bituminous coating, giving tough, smooth surface not tacky or having tendency to scale or "alligator". Frames and covers shall be as shown on Detail Drawings. Unless shown otherwise on Plans, covers to be solid with words "SANITARY SEWER" cast in cover, with pick hole cast in cover. Frames and covers for traffic conditions shall have machined contact surfaces to prevent rocking.

B. Standard Manhole Frames and Covers: Manhole frames shall be furnished and set in a bed of mastic and grouted into the concrete manhole. The standard frame and cover shall be traffic type of gray cast iron ASTM Designation A 48-64 with a 24-inch diameter opening weighing not less than 400 pounds as shown on the Plans and unless otherwise specified shall be a John Bouchard & Sons Co. No. 1150 or approved equal. The covers shall be the solid self-sealing type with no holes except watertight pick notches or a heavy lifting ring. The surface between the cover and frame shall fit smoothly without rocking and shall be thoroughly 33 cleaned. Special attention shall be given to insure the proper installation of the rubber gasket in the self-sealing cover. The gasket shall have at least 1/4-inch diameter cross-section. The frame shall be grouted in and fixed directly to the manhole barrel by so as to constitute a watertight seal between the barrel and the frame.

C. Watertight Manhole Frames & Covers: The manhole frames shall be set in the same manner prescribed for standard frames except special attention shall be paid to securing a watertight connection to the manhole barrel. The watertight manhole frame and cover shall be a traffic type of gray cast iron ASTM Designation A 48-64 with a twenty-four inch (24") diameter minimum clear opening weighing not less than 450 pounds and shall be a John Bouchard & Sons Co. No. 1123 or approved equal unless otherwise specified on the plans. The surface cover shall be the solid type with no holes except watertight pick notches or a heavy lifting ring. The surface between this cover and frame shall fit without rocking. The inner cover shall be of the solid type with no holes, shall have not less than two (2) lifting handles and shall have a neoprene sealing gasket at least 7/16-inch diameter cross-section with a hollow center. The inner cover shall be mechanically sealed by means of a removable metal bar

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located over the inner cover with a centrally located bronze or stainless-steel tightening bolt. This bolt shall have a tee-handle or bent-handle for turning. The bolt shall have appropriate reinforcing ribs to prevent cracking or distortion when tightened. The inner cover shall have sufficient clearance to allow easy removal from the frame. The frame shall be attached to the manhole barrel by means of four (4) 5/8-inch anchor bolts and shall be set in a bed of mastic so as to constitute a watertight seal between the barrel and frame. Watertight manholes shall be vented at 1000-foot intervals.

1.2 MANHOLE STEPS: Manhole steps shall be made of copolymer polypropylene plastic meeting the latest revision of ASTM 2146-68, Type II, Grade 16906 and shall have a 1/2-inch diameter Grade 60 reinforcing rod meeting the latest revision of ASTM Designation A-615 through its center. Each step shall be twelve inches (12") in width and capable of carrying a load of 1,000 pounds in the center of the step when projected six inches (6") from the wall. Each step shall be equipped with non-skid grooves.

1.3 All new manholes shall be precast or monolithically poured (only as approved by the Director of Utilities at locations where precast cannot be installed) using eccentric cones. The concrete mix shall incorporate Xypex Admix C-1000 admixture which shall be added during batching.

1.4 Refer to other sections for items affecting manholes. Coordinate this work with that specified by other sections for timely execution.

1.5 Shop drawings are required for castings, plastic gaskets, manhole steps, and precast manholes specified in this section.

PART 2. PRODUCTS

2.1 CONCRETE MASONRY: reinforced or plain, meeting the applicable industry standards and requirements of Section 03303 (Concrete for Utility Lines). Manholes shall be precast reinforced concrete pipe manhole sections with tongue and groove joints. Manholes shall conform to the requirements of ASTM Specification C-478, except as modified herein. Concrete used in the manufacturing shall have a 28-day compressive strength of not less than 5,000 psi and the absorption shall not exceed 6%. The minimum wall thickness of the manhole riser sections shall be 5" for 4-foot diameter manholes, 6" for 5-foot diameter manholes and 7" for 6-foot diameter manholes. Cone sections shall have a minimum wall thickness of 8" at their top. Base riser sections shall be made with bottoms cast monolithically. Bottoms cast into already made pipe sections are not acceptable. The minimum thickness of the bottom shall be 6" for manholes 4, 5 and 6 feet in diameter. Suitable openings for inlet and outlet sewer pipe shall be cast into the base sections and into riser sections for drop connections

2.2 The length of tongue and groove joints on manhole sections

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shall be not less than the wall thickness of the sections. The nominal clearance between tongue and groove pieces shall be 1/16". The manhole sections shall be joined with a flexible plastic joint sealant. The sealant shall be a factory extruded formulation of 100% solids with top quality partially vulcanized butyl rubber which provides shape retention in combination with adhesion and cohesion. The sealant shall conform to the requirements Federal Specification SS-S-210A. It shall be applied to clean, dry surfaces only. A butyl exterior joint wrap shall be applied around the full circumference of the joint. The external wrap seal shall consist of a polyethylene backed flat butyl rubber sheet no less than 1/16-inch thick and 6-inches wide applied to the outside perimeter of the joint.

2.3 Flexible manhole sleeves or flexible manhole entrance joints shall be installed on all pipe entering and leaving manholes. Flexible manhole sleeves shall be installed on all pipe 21" in size and smaller. Flexible manhole sleeves shall be Type I or Type 11. Type I sleeves shall be of high-quality synthetic rubber terminating in a substantial serrated flange of the same material. The flange shall be cast into the wall of the manhole base to form a tight water stop. Minimum thickness of the sleeve material shall be 3/8". Sleeve material shall comply with the requirements of ASTM Specification C-923. Sleeves shall be secured to the sewer pipe to make a water-tight union with stainless steel strap clamps, draw bolts and nuts. Type II sleeves shall be of high-quality synthetic rubber having a minimum thickness of 3/8" which complies with the requirements of ASTM Specification C-923. Manhole openings shall be accurately core drilled. The sleeve shall be secured to the manhole by a stainless-steel band with self-locking toggle to make a watertight union. The sleeve shall be secured to the sewer pipe to make a watertight union with stainless steel strap clamps, draw bolts and nuts. Flexible manhole entrance joints shall be installed in all manhole pipe openings 24" to 42" in size. Joint material shall be cast into the wall of the manhole base to form a tight water-stop. Joint material shall be of high-quality synthetic rubber which complies with the requirements of ASTM Specification C-923. Joints shall be water-tight under a 30-foot head of water. Flexible manhole entrance joints shall be A-Lok joints as manufactured by the A-Lok Products Corporation, Press Wedge II as manufactured by the Press Seal Gasket Corporation, or equal. Flexible manhole sleeves and flexible manhole entrance joints shall be installed in accordance with instructions of their manufacturer. Kor-N-Seal boot connectors (or an approved equal) may be used based upon approval by the Town.

2.4 CASTING ADJUSTMENT: Only concrete grade rings will be allowed to adjust the casting elevation.

2.5 MORTAR: composed of one (1) part portland cement and two (2) parts sand (volumetric measure) thoroughly mixed in a tight box, with water added gradually and mixed continually until mortar has attained the proper consistency for use in brick masonry; prepared

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only in such quantities as needed for immediate use; mortar mixed for more than 30 minutes, retempered, or previously set will not be allowed.

2.6 GRAY IRON CASTINGS: Manhole frames and covers shall be made of cast iron conforming to the minimum requirements of ASTM Specification A48-76, Class 35 or ductile iron conforming to the requirements of ASTM Specification A536-80, Grade 65-45-12. All castings shall be made accurately to the required dimensions and shall be sound, smooth, clean, and free from blisters and other defects. Defective castings which have been plugged or otherwise treated shall be rejected. Frames and covers shall be as detailed on the plans. The contact surfaces between the cover and its corresponding supporting ring in the frame shall be machined so that the cover will rest on the ring for the full perimeter of the contact surfaces with no rocking. The frames and covers shall be thoroughly cleaned subsequent to machining and, before rusting begins, painted with a bituminous coating so as to present a smooth finish; tough and tenacious when cold, but not tacky and with no tendency to scale; and with the actual weight in pounds stenciled or printed by the manufacturer on each casting in white paint. There shall be no holes or perforations in the covers.

2.7 PLASTIC GASKET FOR PRECAST MANHOLES: Preformed plastic gasket shall meet or exceed all requirements of FS SS-S-00210, "Sealing Compound, Preformed Plastic for Pipe Joints," Type I, rope form. The sealing compound shall be produced from blends of refined hydrocarbon resins and plasticizing compounds reinforced with inert mineral filler and shall contain no solvents, irritating fumes, or obnoxious odors. The compound shall not depend on oxidizing, evaporating, or chemical action for its adhesive or cohesive strength. It shall be supplied in extruded rope form of suitable cross section and in such sizes as to seal the joint space when the pipes are laid. Use two (2) complete ropes at each joint. The sealing compound shall be protected by a suitable removable two (2) piece wrapper, which shall be designed so that half may be removed longitudinally without disturbing the other half in order to facilitate application of the sealing compound. The flexible plastic gasket shall also meet the requirements of the following table:

| Composition | Test Method | Minimum | Maximum |
|--|-------------|---------|---------|
| Bitumen (Petroleum Plastic) | ASTM D4 | 50 | 70 |
| Ash Inert Mineral Matter | AASHO T111 | 30 | 50 |
| Volatile Matter | ASTM D6 | --- | 2.0 |
| Property | Test Method | Minimum | Maximum |
| S.G. at 77 degrees F | ASTM D71 | 1.20 | 1.30 |
| Ductility at 77 degrees F | ASTM D113 | 5.0 | --- |
| Softening Point | ASTM D36 | 320°F | --- |
| Penetration at 77 degrees F 150 gms) 5 sec. | ASTM D217 | 50 | 120 |

2.8 LADDER BARS: Manhole steps shall be constructed of aluminum or

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steel, covered with rubber or plastic. Aluminum steps shall be made of aluminum alloy conforming to the requirements of ASTM Specification B-221 having a minimum tensile strength of 38,000 psi. The minimum tread width shall be 10". The steps shall incorporate two non-skid grooves and shall be of the drop-front design. Rubber or plastic covered steel steps shall consist of a 1/2" diameter steel reinforcing rod covered by a corrosion resistant rubber or copolymer polypropylene plastic. The minimum tread width shall be 12". The steps shall incorporate traction cleats and foot guide lugs. All manhole steps shall comply with the requirements of OSHA.

2.9 MATERIAL TESTING: All precast reinforced concrete manhole risers and tops specified herein shall be tested and inspected by a commercial testing laboratory approved by the Town of Smyrna prior to delivery to the site, and all materials that fail to conform to these specifications shall be rejected. After delivery to the site, any materials that have been damaged in transit or are otherwise unsuitable for use in the work shall be rejected and removed from the site. Supply certified copies in duplicate of the inspection and acceptance reports of the testing laboratory to the Town of Smyrna before using the materials. The commercial testing laboratory shall be engaged and paid for by the Contractor. Submit a certificate from the manufacturer of the castings indicating that they meet all applicable requirements of these specifications.

PART 3. EXECUTION

3.1 Dewater sufficiently to maintain the ground water level at or below the bottom of the manhole foundation prior to and during placement of the foundation.

3.2 Obtain an adequate foundation for all manhole structures by removing and replacing unsuitable material with well graded granular material, by tightening with coarse rock, or by such other means as provided for foundation preparation of the connected sewers or as directed by the Town of Smyrna. Wherever water is encountered at the site, place all cast-in-place bases or monolithic structures on a one-piece waterproof membrane to prevent any movement of water into the fresh concrete.

3.3 When the foundation subgrade has been prepared and is approved by the Town, carefully construct the concrete foundation for monolithic manholes to the line and grade required by the drawings. Construct the manholes after the concrete foundation has been allowed to set for a period of not less than 24 hours. Monolithic manholes shall only be installed when specifically approved by the Director of Utilities.

3.4 For precast manholes, carefully block the base section above the prepared surface so that it is fully and uniformly supported in true alignment; make sure that all entering pipes can be inserted at proper grade. Then place the concrete foundation and invert under and upon this base section as shown in the standard drawings. A base section with monolithic foundation (bottom) may be used only

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when approved by the Director of Utilities.

3.5 Thoroughly wet and then completely fill all lift holes.

3.6 Construct monolithic concrete manholes and bases of 4,000 psi concrete in accordance with the provisions of this section, industry standards, and applicable provisions of Section 03303, Concrete for Utility Lines. The ladder bars shall be cast in place only. No coring and epoxying of ladder bars will be allowed unless approved by the Director of Utilities during special circumstances of installation.

3.7 Carefully set the cast iron frame for the cover at the required elevation, and properly bond it to the masonry with cement grout and mastic seal. The required elevation is defined as the top of casting elevation on the approved construction plans. Whenever manholes are constructed in paved areas, tilt the top surface of the frame and cover so as to conform to the exact slope, crown, and grade of the existing adjacent pavement. When sewers are proposed along drains, lie within or adjacent to a potential area of flooding, lie within a designated floodplain, lie within or adjacent to an area that may cause the casting to be flooded, then the Town will require that a watertight frame and cover be installed (with brass bolts) on manholes.

3.8 Manhole inverts shall be constructed of concrete or Portland Cement, mortared masonry fill, and may, at the Contractor's option, be covered with cement mortar to the approximate cross section of the sewers connected to them. Make any necessary changes in cross sections gradually from side to side of the manhole; make changes in direction of flow of the sewers to a true curve of as large a radius as is permitted by the size of the manhole.

3.9 All rigid unreinforced pipe entering or leaving the manhole shall be provided with flexible joints within 12 inches of the manhole structure, or encase the full joint in concrete. Place such pipe on firmly compacted bedding, particularly in the area of the manhole excavation, which is normally deeper than excavation for sewer trenches. Take special care to see that the openings through which pipes enter the structures are completely and firmly rammed full of shrink-proof mortar or otherwise constructed to ensure water-tightness.

3.10 Where the difference in the invert elevation of two or more lines intersecting in one manhole is 24 inches or more, construct a drop manhole. Drop manholes shall be similar in construction to standard manholes except that a drop connection of pipe and fittings (upper tee connection and lower 90-degree bend connection) shall both be machined cored or preformed for installation at the factory with proper connectors as described above. The drop manhole connections shall be of the proper sizes and materials and shall be constructed outside the manhole and supported by 3,000 psi concrete as indicated by the standard drawings.

3.11 Place backfill by hand around the manhole and to a distance

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of at least one (1) pipe length into each trench, and tamp with selected material up to an elevation of 12 inches above the crown of all entering pipes. Continue backfilling in accordance with the requirements for trench backfilling.

3.12 Each manhole shall be vacuum tested immediately after installation or rehabilitation and prior to backfilling. No standing water shall be allowed in the manhole excavation which may affect the accuracy of the test. All lifting holes and exterior joints shall be filled and pointed with an approved non-shrink mortar. All pipes and other openings into the manhole shall be suitably plugged in such a manner as to prevent displacement of the plugs while the vacuum is drawn. Installation and operation of the vacuum equipment and indicating devices shall be in accordance with equipment specification and instructions provided by the manufacturer. A vacuum of 10 inches shall be drawn. The time for the vacuum to drop to 9.0 inches for one minute shall be recorded. Acceptance for four (4) feet diameter manholes shall be defined as when the time to drop one (1) inch is less than 75 seconds for 10 feet in depth or less, 90 seconds where 10-15 feet in depth and 105 seconds for 15-25 feet in depth. For manholes five (5) feet in diameter, add an additional 15 seconds. For manholes six (6) feet in diameter, add an additional 30 seconds. If the manhole fails the test, necessary repairs shall be made and the vacuum test repeated until the manhole passes the test. If the manhole joint mastic or gasket is displaced during the vacuum test, the manhole shall be disassembled, the seal replaced, and the manhole re-tested.

END OF SECTION

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SECTION 02722 SANITARY

SEWERS (GRAVITY)

PART 1. GENERAL

1.1 Pipe material for new gravity sewers, other than pipe bursting applications, less than 18 inches shall be SDR 26 PVC. Ductile iron pipe may be used when indicated on the drawings by the design engineer and/or when required by the Town of Smyrna.

1.2 Pipe material for sewer lines 18 inches, 21 inches, and 24 inches shall be SDR 26 PVC. Ductile iron pipe shall be used when indicated on the drawings by the design engineer and/or when required by the Town of Smyrna.

1.3 Pipe material for sewer lines larger than 24 inches shall be ductile iron. Other materials not specified herein, may be considered for use on large diameter applications (larger than 24 inches) only after reviewed and approved by the Town of Smyrna.

1.3 Shop drawings are required for all products specified in this section.

1.4 Refer to other sections for items affecting gravity sewers. Coordinate this work with that specified by others sections for timely execution.

PART 2. PRODUCTS

2.1 PIPE

A. Ductile Iron Pipe: Ductile iron pipe shall contain push-on joints conforming to ANSI/AWWA Specification C151/A21.51, latest revisions, for ductile iron pipe centrifugally cast in metal or sand lined molds. Lining for the ductile iron pipe (DiP) shall be Protecto 401™ Ceramic Epoxy. Pipe shall be made with 60-42-10 grade ductile iron, or stronger, and pressure Class 350 shall be used unless noted otherwise on the plans.

Pipe shall be furnished in lengths of 18' to 20' and unless otherwise indicated shall be provided with a compression type slip joint equal to the Fastite joint as manufactured by American. Gaskets and lubricant shall be furnished with the pipe. Pipe shall be furnished with standard thickness cement lining on the inside with a bituminous seal coat (unless noted otherwise on the plans) and a bituminous coating on the outside. Cement lining shall conform to ASA Standard A21.4. The exterior of the pipe

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shall be clearly marked to indicate the manufacturer, date of manufacture, the pipe class and weight. Exterior markings shall also positively identify the pipe as being Ductile Iron. Where noted on the plans ductile iron pipe shall be epoxy lined, Protecto™ 401 or approved equal. Epoxy lining shall be installed per manufacturer's recommendations.

B. DUCTILE IRON FITTINGS: All ductile iron fittings shall be epoxy lined, Protecto™ 401 or approved equal. Epoxy lining shall be installed per manufacturer's recommendations. Fittings shall be furnished with mechanical joints conforming to ASA A21.11-1964, unless otherwise indicated or directed.

C. SEWER FITTINGS AND ADAPTERS: Fittings and adapters for use with sewer pipe shall be manufactured to be compatible with piping and pipe joints. Fitting and adapter engineering data shall be submitted to the ENGINEER for approval.

D. POLYVINYL CHLORIDE (PVC) SEWER PIPE: PVC pipe shall meet and/or exceed the requirements of ASTM D3034, SDR 26; suitable for use as a gravity sewer conduit with provisions for contraction and expansion at each joint; with a rubber ring and standard length 12.5 feet plus or minus one (1) inch; designed to pass all tests at 73 degrees F (plus or minus 3 degrees F); six (6) inches long sections of pipe to be subjected to impact from a free falling type (20 pounds, Type A) in accordance with ASTM D2444 with no evident splitting or shattering (denting not considered a failure); and with a minimum envelope of four (4) inches of granular material around the pipe, but with all other bedding and backfilling requirements remaining the same as for other pipe material.

PVC sewer pipe shall be manufactured of Polyvinyl chloride material as defined and described in ASTM D-1784 and shall be solid wall conforming to ASTM D3034. For depths 0-3 feet PVC pipe is not allowed. For depths 3-15' PVC pipe shall be SDR 26. For depths over 15' PVC will not be allowed and ductile iron will be required. Joints shall be of bell and spigot type. The bell shall contain an elastomeric gasket which is firmly retained. Solvent weld joints will not be permitted except in an emergency situation when approved by the ENGINEER. Fittings and plugs shall be supplied by pipe suppliers with equivalent joints. Plugs shall be suitable to withstand test pressures. Pipe laying lengths shall not exceed twenty (20) feet in length. Shorter lengths will be required if the CONTRACTOR experiences difficulty in maintaining proper pipe alignment.

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- E. All sewer pipe shall be stored at the project site in strict accordance with the manufacturer's recommendations and at all times prior to actual installation of the pipe the CONTRACTOR shall be responsible for providing uniform support for each length of pipe stored at the site. PVC pipe that has been bowed by the sun shall not be laid until it has straightened and lies flat without restraint.
- F. A suitable designed water stop shall be utilized with sewer pipe, one length of pipe upstream of each manhole and each side of drainage and creek crossings.
- G. Lateral Branches: to be wyes or tees of the same material as the main sewer and have a six (6) inch inside diameter unless otherwise specified by the Town or noted by the design engineer; and able to withstand all test pressures involved without leakage. Service riser pipe shall be six (6) inch diameter to the cleanout (located at the right-of-way/property line) and then may be four (4) inch diameter pipe from the cleanout to the house.

2.2 JOINTS AND JOINTING MATERIALS

- A. All rubber end rings shall be extruded or molded and cured such that any cross section will be dense, homogenous and free of parasites, blisters, pitting, and other imperfections. The basic rubber material, EPDM, shall meet ASTM C443 with the exception of 40-60 duro hardness. The resilient interlocked end seals shall be duro A-40-70, plus or minus 2.
- B. Polyvinyl Chloride (PVC) Pipe Joints: Joints for sewer plastic pipe shall meet all requirements of ASTM D3212 standard specifications. Joint design shall be tested and certified to result in no leakage under prescribed laboratory test conditions of joint alignment, load conditions, pressure and vacuum, and deflection. Pipe and fittings shall have integral bell with elastomeric seal joint.
- C. Ductile Iron Pipe Joints: gasket type joints for bell and spigot ductile iron pipe designed to meet the infiltration requirements of these specifications; jointing to comply with the applicable provisions of ANSI A21.11.

2.3 COMPRESSION COUPLINGS

- A. When dissimilar pipe materials like PVC are joined, use compression couplings with stainless steel shielding that are resistant to the corrosive action of soils and sewage and

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that will provide a permanent watertight joint. The compression couplings shall be of natural or synthetic rubber or rubber-like material and shall comply with the requirements and test methods specified in Table 2 of ASTM C425. The coupling shall meet the leak requirements specified in ASTM C425, and the bands for attaching the couplings to the dissimilar pipes shall be of stainless-steel meeting ASTM A167 or A240. Each coupling shall bear the manufacturer's identifying mark and an indication of its size.

PART 3.

EXECUTION 3.1 PIPE

LAYING

- A. Lay no pipe except in the presence of an inspector representing the Town.
- B. Before placing sewer pipe in position in the trench, carefully prepare the bottom and sides of the trench, and install any necessary bracing and sheeting as provided in Section 02221, Unclassified Excavation for Utilities.
- C. Wherever necessary to provide satisfactory bearing surface, place concrete cradles as shown on the drawings or as directed by the Town. Cradles shall be of concrete and conform to the dimensions shown on the drawings. Concrete placed outside the dimensions shown shall be at the Contractor's expense.
- D. When lasers are used, set reference points for both line and grade at each manhole. Where grades are 0.6% or less, check the elevation of the beam each 100 feet with an offset point or engineer's level. Lasers being utilized for installation of sewer lines shall have been calibrated within the last year (12-months). Certification of the calibration (by an authorized manufacturer's representative) shall be submitted to the Town upon request.
- E. Do not allow water to run or stand in the trench while pipe laying is in progress or before the trench has been backfilled. Do not at any time open up more trench than the available pumping facilities are able to dewater.
- F. Correct trench bottoms found to be unsuitable for foundations after pipe laying operations have started, bringing them to exact line and grade with compacted earth as necessary.

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- G. Carefully inspect each piece of pipe and special fitting before it is placed, and lay no defective pipe in the trench. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells upgrade. When pipe laying is not in progress, keep the ends of the pipe tightly closed with an approved temporary plug.
- H. Bell holes shall be large enough to allow ample room for the pipe joints to be properly made. Cut out bell holes no more than two (2) joints ahead of the pipe laying. Carefully grade the bottom of the trench between bell holes so that each pipe barrel rests on a solid foundation for its entire length. Lay each pipe joint so as to form a close concentric joint with adjoining pipe and to avoid sudden offsets or inequalities in the flow line.
- I. Before constructing or placing any joints, demonstrate to the Town, by completing at least one sample joint, that the methods to be used conform to the specifications and will provide a watertight joint and further that the workmen to be involved in this phase of work are thoroughly familiar and experienced with the type of joint proposed and type of pipe being installed.
- J. No other type of joint may be used unless authorized in writing by the Town.
- K. Install wye or tee branches in sewer lines to serve properly each lot facing or abutting on the street or alley in which sewer is being laid and at such other locations as may be designated by the Town. If wye and tee branches are not to be used immediately, close them with approved stoppers that are held in place to prevent infiltration and withstand all test requirements.
- L. For all wyes and tees that are plugged and laid in rock, blast a minimum of six (6) linear feet of ditch line in the direction and to the approximate grade of the future lateral connection as directed by the Town, but do not excavate the material. This work will be considered incidental to the installation of the wye and tee. Furnish the Town with a record of the exact location, depth, and distance from the downstream manhole of each tee installed in an approved format acceptable to the Town.
- M. If the work consists of constructing a new sewer to replace an existing one, connect existing service lines to the new line.
- N. New service laterals shall conform to the standard specifications and/or standard drawings.

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- O. The Contractor shall provide above-ground markers at the property line to indicate the termination of new service laterals. These markers shall be a green metal fence post or 2-inch PVC pipe.
- P. As the work progresses, thoroughly clean the interior of the pipe in place. After each line of pipe has been laid, carefully inspect it, and remove all earth, trash, rags, and other foreign matter from its interior.
- Q. After the joints have been completed, they shall be inspected, tested, and accepted by the Town of Smyrna before being covered. The pipe shall meet the test requirements for water tightness; immediately repair any leak or defect discovered at any time after completion of the work. Any pipe that has been disturbed after joints were formed shall be taken up, the joints cleaned and remade, and the pipe re-laid at the Contractor's expense. Carefully protect all pipes in place from damage until backfilling operations are completed.
- R. Do not begin the backfilling of trenches until the pipe in place has been inspected and approved by a representative of the Town.
- S. Lay sewers at least ten (10) feet horizontally from any existing or proposed water main. If this is not practical, the sewer may be laid closer than ten (10) feet to a water main provided it is laid in a separate trench and the elevation of the top of the sewer is at least 18 inches below the bottom of the water main.
- T. Where a sewer crosses under water mains, the top of the sewer shall be at least 18 inches below the bottom of the water main. If the elevation of the sewer cannot be varied to meet the above requirements, relocate the water main to provide this separation, or else reconstruct it with mechanical joint ductile iron pipe for a distance of ten (10) feet on each side of the sewer with a full joint of the water main centered over the sewer.
- U. If it is impossible to obtain proper horizontal and vertical separation as stipulated above, construct both the water main and the sewer of mechanical joint ductile iron pipe, and pressure test each.
- V. Perform boring by means of auguring to the size, line, and grade shown on the drawings. Jack the steel casing pipe into place as the boring proceeds. Weld sections of casing pipe together to provide a watertight joint.

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- W. Make connections to all existing sewer lines as shown on the drawings or as directed by the Town. Make service connections either by removing a section of the sewer from the existing line and inserting a wye or tee branch of the proper size or by constructing a manhole (if approved by the Town), junction box, regulator chamber, or other structure as approved by the Town.
- X. Make connections to existing manholes or inlets by machine coring a hole in the wall of the existing structure and installing a Kor-N-Seal boot connector (or an approved equal), and then inserting a length of sewer pipe into the connector. The connector shall be secured to the pipe with stainless steel tightening bands. The void area between the pipe and structure shall be filled with non-shrink grout, concrete, or mortar. Trowel the inside and outside surfaces of the joint to a neat finish. Shape or reshape the bottom of the manholes as necessary to fit the invert of the sewer pipe.
- Y. Joint dissimilar pipe by using suitable compression couplings. If compression couplings are not available, make jointing with a special fabricated coupling approved by the Town.
- Z. Provide concrete protection or concrete cap as shown on the drawings for pipe sewers that, when completed, have less than 2.5 feet of covering in non-traffic areas and four (4) feet of cover in traffic areas.
- AA. Carefully protect from damage all existing sewers, water lines, gas lines, sidewalks, curbs, gutters, pavements, electrical lines, and other utilities or structures in the vicinity of the work at all times. If it is necessary to repair, remove, and/or replace any such utility or structure in order to complete the work properly, do so in compliance with the provisions set forth in other sections of these specifications. Any such work shall be considered incidental to the construction of sewers, and no additional payment will be allowed.
- BB. Water service connections will be repaired or replaced by the Contractor at his expense as an incidental part of the work.
- CC. Service or house connections to existing sewers that are damaged or removed shall be repaired or replaced by the Contractor at his own expense as an incidental part of the work.
- DD. For PVC and ductile iron pipe, furnish a certificate from the pipe manufacturer indicating that the pipe meets all

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applicable requirements of these specifications.

- EE. The minimum pipe stiffness for PVC pipe at 5% deflection shall be 46 for all sizes when tested in accordance with ASTM D2412; external loading properties of plastic pipe shall be by parallel plate loading.
- FF. A specimen of PVC pipe six (6) inches long shall be flattened between parallel plates in a suitable press until the distance between the plates is 40% of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is complete in two (2) to five (5) minutes.
- GG. After being immersed for two (2) hours in a sealed container of anhydrous acetone (99.5% pure), a sample ring of PVC pipe shall show no visible spalling or cracking when tested in accordance with ASTM D2152 (swelling or softening is not considered a failure).
- HH. The Contractor shall construct a concrete check dam in accordance with the Tennessee Department of Environment and Conservation (TDEC) Department of Water Pollution Control (WPC) in the trench for the gravity sewer lines. The wall shall be constructed as to key into the trench wall and extend high enough in the trench to dam water from flowing freely through the trench gravel and along the exterior of the sewer pipe and applying hydrostatic pressure on the manhole connection. The cutoff wall shall be provided for all gravity sewer lines. The maximum spacing of the walls shall be 400 feet, with at least one (1) cut-off wall between manholes and one (1) cut-off wall at each side of a drainage way or creek crossing.

3.2 TESTING OF GRAVITY SEWERS A.

Visual Tests

1. Upon completion of the construction or earlier if

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the Town deems advisable, the Town will make a visual inspection of the sewer and construction site. Immediately repair all leaks and defects found by such inspection.

2. In addition to general cleanup and leakage, the following standards shall be used to determine failure or defects of this project.
3. Sewers shall be built so as to remain true to line and grade. The inclining grade of the bottom of the sewer after completion shall be such that, after flooding, the flood water drains off so that no remaining puddle of water is deeper than 1/2 inch on pipe 36 inches internal diameter or smaller and 3/4 inch on pipe larger than 36 inches internal diameter. Any section of pipe that does not comply with the specifications at any time previous to final acceptance of the work shall be replaced or re-laid at the Contractor's expense.
4. The Contractor will be held strictly responsible that all parts of the work bear the load of the backfill. If any cracks develop in the pipe within one (1) year from the date of final acceptance of the work, the Contractor will be required to replace, at his expense, all such cracked pipe. To this end, the Contractor is advised to purchase pipe under a guarantee from the manufacturer, guaranteeing proper service of sewer pipe under conditions established by the drawings, specifications, and local conditioning at the site of the work.

B. Air Testing for Sewers 24 Inches and Smaller

1. Perform low pressure air testing as follows:
 - a. Furnish all equipment, facilities, and personnel necessary to conduct the test. The test shall be observed by a representative of the A/E.
 - b. Make the air test after all services have been installed and backfilling has been completed and compacted.

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- c. Perform the first series of air tests after 2,000 linear feet but before 4,000 linear feet of sewer has been laid. The purpose of this first series of tests is to assure both the Contractor and the Town that the materials and methods of installation meet the intent of these specifications. Conduct the remainder of the tests after approximately each 10,000 linear feet has been laid.
- d. Plug all tees and ends of sewer services with flexible joint plugs or caps securely fastened to withstand the internal test pressures. Such plugs or caps shall be readily removable, and their removal shall provide a socket suitable for making a flexible jointed lateral connection or extension.
- e. Prior to testing, check the pipe to see that it is clean. If not, clean it by passing a full-gauge squeegee through the pipe. It shall be the Contractor's responsibility to have the pipe cleaned prior to testing.
- f. Immediately following this check or cleaning, test the pipe installation with low pressure air. Supply the air slowly to the plugged pipe installation until the internal air pressure reaches 5.0 psi more than the average back pressure of any ground water that may submerge the pipe. Back pressure on the pipe due to groundwater is considered to be 1 psi per 2.31 feet of ground water depth (measured from the invert of the pipe). Allow at least two (2) minutes for temperature stabilization.
- g. The pipeline shall be considered acceptable when tested at an average pressure of 3.0 psi more than the average back pressure of any ground water that may submerge the pipe and if the section under test does not lose air at a rate greater than 0.0015 cfm per square foot of internal pipe surface area. Air pressure cannot drop from a stabilized pressure of 5 to 4 psi (more than the average back pressure of any groundwater that may submerge the pipe) in less than the below specified time.

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- h. The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 5.0 to 4.0 psi (more than the average back pressure of any ground water that may submerge the pipe) is not less than that shown in the following table:

ALLOWABLE AIR LOSS VALUES PER 100 LF

| <u>Time (Seconds)</u> | <u>Pipe Size (Inches)</u> |
|-----------------------|---------------------------|
| 45 | 6 |
| 3 min | 8 |
| 3 min & 45 sec | 10 |
| 4 min & 45 sec | 12 |
| 6 | 15 |
| 7 min & 30 sec | 18 |
| 9 min & 30 sec | 21 |
| 12 min | 24 |
| 15 min | 30 |

- i. If the pipe installation fails to meet these requirements, the Contractor shall determine (at his own expense) the source or sources of leakage and repair or replace all defective materials or workmanship. The completed pipe installation shall meet the requirements of this test before being considered acceptable.
2. The recommended procedures for conducting acceptance tests are as follows:
- a. Clean pipe that is to be tested.
 - b. Plug all pipe outlets with suitable test plugs, and brace each plug securely.

- c. Increase gauge pressure in the test by the amount of ground water pressure from the invert of the pipe.
 - d. Add air slowly to the portion of the pipe installation being tested until the internal air pressure is raised to 4.0 psi more than the average back pressure above the crown of the pipe.
 - e. After the above internal pressure is obtained, allow at least two (2) minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
 - f. After two (2) minutes, disconnect the air supply.
 - g. When pressure decreases to 4.0 psig (above the pressure added for groundwater submergence) either by leaking down or by bleeding down with a release valve, start the stopwatch, and determine the time in seconds that is required for the internal air pressure to reach 3.0 psig (above the pressure added for groundwater submergence). Compare this time interval as calculated above. If the time shown above is more than that calculated, the test shall be assumed to be acceptable.
3. Plugs used to close the sewer pipe for the air test must be securely braced to prevent the unintentional release of a plug, which can become a dangerous high velocity projectile. Locate gauges, air piping manifolds, and valves at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure. Four pounds air pressure (gauge) develops a force against the plug in a 12 inch pipe of approximately 450 pounds. Pipes larger than 24 inches in diameter shall not be air tested because of the difficulty of adequately blocking the plugs. Provide a safety release device set to release at ten (10) psi between the air supply and the sewer under test.

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4. Regardless of the outcome of the tests, repair any noticeable leak.

C. Testing for Sewers Larger than 24 Inches

Sewer lines larger than 24 Inches in diameter may be tested by one of the three methods listed below as directed by the Director of Utilities.

1. Using Existing High Ground Water

- a. Where the natural ground water is 24 inches or more above the top of a section of pipe, measure the flow of water in the pipe and the rates of seepage and infiltration. Measure the flow rate by using a calibrated weir. Leave the weir in the line until the flow rate has stabilized. The Contractor is responsible for verifying the ground water level by providing sight gauges in manholes or digging test holes at suitable locations.
- b. The total seepage and infiltration of ground water as determined by the test shall in no case exceed 25 gallons per 24 hours per inch-mile of pipe. Make infiltration tests on all sewer construction before placing the lines in service and before making any connections to other sewers. If the amount of infiltration into the sewer(s) is in excess of the maximum quantity specified above, then recaulk or remake the joints, relay the sewer (if necessary), or perform other remedial construction, at the Contractor's expense, in order to reduce ground water infiltration to within the specified limits.
- c. In making infiltration tests, furnish the required equipment and labor and do the necessary pumping under the direction of the A/E. Tests must be repeated until each sewer individually meets the specifications for infiltration amounts as set out above.

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2. Exfiltration Test

- a. Where the ground water is not 24 inches or more above the top of the pipe section being tested, then perform an exfiltration test (if approved by the Director of Utilities). Bulkhead the pipe below the lower manhole of the section being tested with a pneumatic plug or other device. Insert a vent pipe 48 inches long in the stopper of the upper end of that section. Then fill the lower manhole with water, or add water until there is a minimum of four (4) feet over the upper end; make certain that all air is forced out through the vent tube. Measure the drop in the level of the water in the manhole due to exfiltration over a specific time, and calculate the water loss due to exfiltration. The total exfiltration shall not exceed that specified above for infiltration. Conditions encountered in construction may vary this procedure slightly, but essentially this is the method to be used.

3. Using Pipe Joint Test Equipment

- a. Sewer pipe larger than 24 inches in diameter shall be tested by means of an internal testing machine such as Cherney (or an approved equal if approved by the Director of Utilities). The testing equipment shall be mounted on rolling skids sized for the internal diameter of the pipe. The equipment shall consist of dual rubber bladder which straddles the joint and shall inflate on each side of the joint. The dual bladder will be inflated to a pressure sufficient not to move or allow internal test air to exit. The void area between the bladders shall then be pressurized to at least 4.0 psig. The internal air pressure over the joint shall be allowed to stabilize for approximately 2 minutes due to temperature. Add more air/internal pressure if required until stabilization is reached. The internal air pressure shall maintain the 4.0 psig pressure for a minimum of one minute. Should the pressure fall below 3.0 psig within one minute then the joint is considered to have failed. The

pipe joint will then be required to be removed and repaired with an acceptable method as approved by the Town. The test shall be conducted as described above or by a recommended method of the testing equipment manufacturer as reviewed and approved by the Town.

4. Repairs

- a. Regardless of the outcome of any tests, repair any noticeable leak.

5. Sewer Test Plug and Strainer Policy

- a. Prior to any sanitary sewer main testing or internal inspection beginning, the Town of Smyrna Inspector shall provide the Contractor with the appropriate size and number of strainers to perform the proposed sanitary sewer work. The Contractor shall provide all test plugs to be used for the proposed work. The Inspector shall receive and approve all test plugs prior to use. Once approved, the Inspector shall physically attach a serialized ID tags to each strainer and test plug for the proposed work. Each ID tag shall be logged by the Town of Smyrna Inspector and signed for by an authorized representative of the Contractor. After all testing and inspection has been completed, each ID tag shall be returned to the Inspector while still attached the associated test plug or strainer. The Inspector shall physically remove each ID tag from the returned test plugs and strainers. The Inspector shall log and sign that all ID tags that have been returned.

3.3 VISUAL INSPECTION OF MISCELLANEOUS MATERIALS

- A. All material used on this project will be visually inspected by the Town's representative at the site for conformance to the required specifications. When reasonable doubt exists that said material meets the specifications, the Town may require certified mill tests, samples, and/or tests by an independent laboratory or other suitable form of verification that the material meets the required specifications.

3.4 DEFLECTION TESTING FOR PVC PIPE

- A. At the Contractor's expense and before the road is paved, test deflection of the pipe by passing a 9-arm

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pin go/no-go mandrel sized to 95% of the pipe diameter of the actual pipe used with the pipe in place and covered. Make this acceptance test after backfill consolidation has occurred.

3.6 CLEANUP

- A. After completing each section of the sewer line, remove all debris, construction materials, and equipment from the site of the work, grade and smooth over the surface on both sides of the line, and leave the entire area in a clean, neat, and serviceable condition.

3.7 RECORDING OF SEWER LINES

- A. Pre-recording of sewer lines:
At the CONTRACTOR'S expense and before the any road paving or issuance of building permits, all sections of the sewer line shall be CCTV drone camera inspected and given to the Town by way of CD and/or USB memory drive. If any possible leaky areas (gaps in the line) and/or sagging that is over 5% that is recognized by the Town's utilities engineer (by the engineer's discretion), the section of the sewer line in question shall be repaired or replaced. After the repairs or replacement of the piping, the new **section shall be CCTV drone camera inspected and re-submitted** to the Town's utilities engineer for review.
- B. Post-recording of sewer lines:
At the CONTRACTOR'S expense and prior to the first bond review, all sections of the sewer line shall be CCTV drone camera inspected and giving to the Town by way of CD and/or USB memory drive.

END OF SECTION

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SECTION 02988

SEWER SERVICE LATERAL LINING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish all labor, materials, equipment, and incidentals required to install cured-in-place pipe (CIPP) lining to rehabilitate existing active service laterals as shown on the Drawings or as directed by the Engineer. Service laterals shall be lined from the connection with the main sewer to the property line or easement edge, unless otherwise noted or approved by the Engineer. A full-wrap style lining shall be used to address the connection between the main sewer and the service lateral.
- B. Furnish all labor, materials, equipment, and incidentals required to conduct air testing, post-rehabilitation CCTV inspections, and other requirements described herein for final service lateral lining acceptance.
- C. This specification shall also apply to installing CIPP lining for service laterals discharging directly into manholes, if the pipe diameter is 6 inches or less.
- D. Service laterals may be a combination of tees, wyes, or break-in taps of varying sizes (4-inch to 8-inch) with angles generally ranging up to 90 degrees. In most cases, a cleanout will be installed at the property line or easement edge if not already in place.
- E. If any active service laterals are identified as defective and the Contractor is unable to line the lateral from the main sewer to the property line or easement edge, the Contractor shall inform the Engineer about the service lateral's condition and shall propose a rehabilitation method that maximizes the service lateral's rehabilitated length while minimizing the extent of surface disruption. The Engineer will direct the Contractor as to the acceptable approach for rehabilitating or replacing the service lateral in question.

1.02 SUBMITTALS

A. Submit the following in accordance with Section 01301:

1. Shop drawings and schedules for all service lateral lining and appurtenances required
2. Design data and specification data sheets listing all parameters used in the lining design
3. Thickness calculations based on ASTM F1216-09, Appendix XI.1.2 for fully deteriorated pipe
 - a. All service lateral lining design calculations shall be sealed and signed by a Tennessee registered professional engineer.
4. Detailed procedure for installing the service lateral lining
5. The service lateral lining manufacturer's name and the facility location where the service lateral lining will be manufactured
6. A licensed and certified trainer and representative from the lining system manufacturer shall be on-site to assist in the work for a minimum of 2 weeks.
7. The Contractor shall be an approved installer as certified and/or licensed by the lining manufacturer.
8. Material Certifications. Written certification is required from the manufacturer stating all materials used in the work were manufactured and tested in accordance with ASTM F1216 and is being used or installed in conformance with the manufacturer's recommendations.
9. Customer Notifications. Submit a copy of the initial customer notification as described in Section 1.08.
10. Storage and Delivery Procedures. Provide the lining manufacturer's recommended storage and delivery procedures. This shall include storage and delivery temperatures, maximum time from wet-out to installation, and other pertinent information.
11. Material Safety Data Sheets. Submit Material Safety Data Sheets (MSDS) for each component of the service lateral lining system.

12. Test Results. Prior to using any materials, furnish the proposed material's test results from an independent laboratory in conformance with these specifications. All submitted test data shall have been performed on field installed samples within the last 12 months. Testing by an independent laboratory shall verify the products to be used meet all minimum strength standards as set forth in ASTM F1216, Table 1. Testing shall also verify any product to be used on the project meets the minimum chemical resistance requirements as established in ASTM F1743, Table 2, where the testing is in accordance with Section 7.2.1 of ASTM F1743.
13. Pipe Cleaning Narrative. Submit a narrative describing in sufficient detail the proposed methods for root cutting and cleaning the existing service laterals. Prepare such narrative to include the degree of cleaning as recommended by the lining manufacturer. Such narrative shall indicate the lining manufacturer's technical representative's approval for the proposed cleaning methods.
14. Lining Thickness Calculations. Perform lining thickness calculations for each set of service laterals for each manhole-to-manhole section and furnish them to the Engineer with supporting assumptions. Calculations shall be done after cleaning, televising, and other field inspections have been accomplished. Design parameters shall be used in calculations.
15. Curing Cycle and Cooling Rate. If the service lateral lining is heat-cured, submit the resin manufacturer's recommended curing cycle and the recommended cooling rate. Submit a copy of the cure logs for each service lateral installation.
16. Detrimental Lateral Lining Pipe Conditions. Submit reports to the Engineer identifying detrimental conditions or physical pipe configurations that may interfere with or prohibit CIPP lateral lining from the main or maintenance, in compliance with the pre-rehabilitation CCTV tasks as delineated in the Contract Documents.
17. Post-lining Inspection Data. Submit the final television inspection in a Granite XP compatible database that shows the rehabilitated service lateral per Section 13514.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
2. ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
3. ASTM F2561 - Standard Practice for Rehabilitation of a Sewer Service Lateral and its Connection to the Main Using a One Piece Main and Lateral Cured-in-Place Liner
4. ASTM F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)
5. ASTM D2990 - Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

B. Where reference is made to one of the above standards, the revision in effect at the time of the bid opening shall apply.

1.04 QUALITY ASSURANCE

- A. The Contractor performing the service lateral lining work shall be experienced and equipped to complete this work expeditiously and in a satisfactory manner.
- B. Be able to provide crews as needed to complete the work without undue delay and within the contract time allotted.
- C. The service lateral lining shall be provided by a single manufacturer. The supplier shall be responsible for providing all test requirements specified herein as applicable.
- D. The Engineer may inspect the service lateral lining after delivery. The service lateral lining shall be subject to rejection at any time if it fails to meet any requirements specified, even though sample lining may have been accepted as satisfactory at the manufacturer. Lining rejected after delivery shall be marked for identification and removed from the job site at once.

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- E. Final Installed Lining Thickness. The final installed lining thickness shall not be less than or more than 10 percent greater than the required thickness. The final installed lining thickness measurement shall be determined from lining sample coupons retrieved from the sewer, plate samples or as deemed necessary by the Engineer. It shall be the Contractor's responsibility to consider site conditions and their installation process to determine the proper lining thickness to install.
- F. Non-Compliance. If the flat plate samples do not meet the required 4,500 psi flexural strength and 250,000 psi flexural elasticity modulus as outlined, actual installed samples must be taken. The installed samples shall be taken as directed by the Engineer and in accordance with all applicable ASTM requirements. From these samples, the installed thickness shall be determined by taking an average of at least 10 thickness measurements. Installed samples shall then be prepared for re-testing in accordance with these specifications.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken in shipping, handling, and storing to avoid damaging the service lateral lining. Extra care shall be taken during cold weather construction. Any lining damaged in shipment shall be replaced as directed by the Engineer.
- B. Any lining showing a split or tear, or which has received a blow that may have caused damage, even though damage may not be visible, shall be marked as rejected and removed at once from the job site.
- C. At all times, the lining materials, including the wet-out lining, shall be maintained at a proper temperature, such as in refrigerated facilities, to prevent premature curing prior to installation. The lining shall be protected from UV light prior to installation. Any lining showing evidence of premature curing will be rejected for use and will be removed from the site immediately.

1.06 PUBLIC NOTIFICATION

- A. Notify the owners and residents of any homes or businesses whose service lateral will be affected by the lining work. Also, deliver written notification to each such resident or business 3 days prior to such lining work, further advising of the work. Include in the

notifications any restrictions on using the sewage system facilities. Describe exact days and hours when the sewer system cannot be used. CONTACT ANY HOME OR BUSINESS THAT CANNOT BE RECONNECTED WITHIN TIME STATED IN THE WRITTEN NOTICE.

- B. THE MAXIMUM TIME ANY HOME OR BUSINESS SHALL BE WITHOUT SANITARY SEWER SERVICE IS 10 HOURS and NOT BETWEEN 6:00 PM AND 8:00 A.M. ANY SERVICE OUT LONGER THAN 10 HOURS WILL HAVE SERVICE RESTORED AT CONTRACTOR'S EXPENSE OR TEMPORARY MEASURES TAKEN.

1.07 GUARANTEE

- A. All lining work shall be fully guaranteed by the Contractor and manufacturer for 3 years from the acceptance date. A written warranty shall be submitted. During this period, all serious defects, including failure of the seal between the service lateral lining and the main sewer, discovered by the Town of Smryna shall be removed and replaced by the Contractor in a satisfactory manner at no additional cost to Town. At their own expense, the Town may conduct an independent television inspection of the lining work prior to the guarantee period's completion. Any defects replaced at that time shall be fully guaranteed by the Contractor and manufacturer for one year from the date the defect was repaired. Wrinkles, blisters, dry spots in resin, or other defects in the finished service lateral, which in the Engineer's opinion, negatively affect the service lateral's integrity or strength or the pipe's flow capacity or performance of solids passage are unacceptable. Contractor will be responsible to remove and repair, at Contractor's expense, all such defects in a manner satisfactory to the Engineer. Defects also include but are not limited to the following:

1. Leakage through the lining or between lining and pipe
2. More than 10 percent reduction in the lining thickness
3. Lining separating from the pipe
4. Excessive wrinkles inhibiting flow

- B. The lining shall be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes, and delamination. The lining shall have a smooth surface free from leaks, cracks, and crazing. Some minor waviness that, in the Engineer's

opinion, will not appreciably decrease the flow cross-section or affect the flow characteristics shall be permissible.

1.08 WATER

- A. Water for all construction operations shall be available from identified Town of Smyrna fire hydrants at normal commercial rates.
- B. Water usage shall be in accordance with Town of Smyrna backflow and metering polices.

1.09 AVAILABLE SEWER VIDEOS

- A. The Contractor shall be responsible for performing all pre- and post-television inspections to verify locations, conditions, whether active or inactive, special conditions for lining, obstructions, post-lining documentation and verification.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The service lateral lining shall be a seamless, corrosion-resistant, cured-in-place pipe lining product that seals the service lateral pipe and the junction between the service lateral pipe and main sewer. The portion of the service lateral lining system that connects to the main/lateral interface shall be a full-wrap connection type for pipe sizes 18 inches in diameter and smaller. The liner shall be compatible with the proposed mainline CIPP lining system and meets all warranty requirements of both systems both independently and together as a whole.
- B. The service lateral lining shall be 1) a resin-impregnated, flexible polyester felt, non-woven textile tube, needle punched felt, circular knit or circular braid, glass fiber reinforced plastic, or 2) equivalent material tube which is cured -in-place by an acceptable curing method. The tube shall be able to conform to bends, offset joints, bells, and disfigured pipe sections.

C. The service lateral shall provide a 50-year service life and shall have the minimum structural properties listed below:

| Minimum Structural Properties | |
|--|-------------------------|
| Physical Properties | Minimum Standard |
| Flexural Strength (ASTM D790) | 4,500 psi |
| Flexural Modulus of Elasticity (ASTM D790) | 250,000 psi |

D. The service lateral shall be designed, fabricated, and installed for the actual conditions encountered for this application including the host pipe material, in accordance with the applicable ASTM F1216, ASTM D2990 provisions, and shall meet the following minimum design conditions:

1. AASHTO H-20 live load with two trucks passing
2. Soil Weight 120 pounds per cubic foot
3. Friction coefficient $Ku' = 0.130$
4. Estimated maximum groundwater level at ground surface
5. Fully deteriorated pipe with 2 percent (min.) ovality. If existing pipe's ovality is found to be worse, use actual percent up to 5 percent (max.).
6. Soil Modulus 1,000 psi
7. Safety factor = 2
8. Soil Depth: The cover depth will be determined by field measurements.

E. The finished lining shall have a 3 mm minimum thickness for 4-inch diameter service laterals and 4.5 mm for 6-inch diameter service laterals.

F. The service lateral lining shall have sufficient wall thickness to withstand all anticipated external pressures and loads that may be imposed after installation. The design shall be performed and certified by a Tennessee registered professional engineer.

G. The service lateral lining shall be manufactured and installed by T-Liner by LMK Technologies; SCS+L by BLD Services, LLC; epros DrainMtH System by Trelleborg Pipe Seals Milford, Inc.; or approved equal.

- H. When cured, the service lateral lining shall extend from the mainline into the service lateral connection in a continuous tight fitting, watertight pipe-within-a-pipe to eliminate any visible groundwater leakage and future root growth at the service lateral to mainline connection and along the service lateral. The service lateral product system shall be compatible with the mainline and/or service lateral pipe or lining. The lining portion within the mainline pipe shall be a full-wrap connection or style.
- I. When cured, the finished service lateral product shall be chemically resistant to domestic sewage over the rehabilitated pipe's expected lifetime. The lining material and resin shall be completely compatible.
- J. The service lateral lining shall extend 6-inches minimum from the service lateral connection in either direction along the entire circumference of the main sewer.
- K. A leak-free seal must be created to form a sealing bond between the service lateral product and the host service lateral and mainline pipe walls. The Contractor should use either a hydrophilic) material or an epoxy-sealing component at each lining tube end to provide a leak-free seal.
- L. When cured, the lining shall form a hard, impermeable lining which is chemically resistant to chemicals found in domestic sewage.

2.02 RESIN

- A. The resin system shall meet the requirements of ASTM F1216, Section 5.2. The resin installed service lateral lining system shall produce a service lateral that will comply with the structural requirements specified herein and shall provide chemical resistance for the flow media in the gravity pipe. The resin shall be compatible with the rehabilitation process, shall be able to cure in water's presence or absence and shall have an initiation temperature for cure as recommended by the resin manufacturer. Unless otherwise specified, provide a general purpose or enhanced strength unsaturated, thermosetting, polyester, vinyl ester, epoxy or silicate resin and a catalyst system compatible with the installation process. The resin shall be vacuum impregnated into the lining.
- B. Submit documentation from the resin manufacturer specifically describing the resin system's chemical

characteristics including allowable mixing, impregnation, and handling time, transportation, and storage time, and recommended curing cycle including temperatures, pressures, and times. The resin manufacturer's documentation must also include maximum allowable time for handling the impregnated tube prior to insertion and the maximum allowable elapsed time from insertion to exotherm. If remedial measures are available to extend either of the maximum allowable times indicated above, without affecting the resin's physical properties, the resin manufacturer should describe these measures and the time limits beyond which even these measures will not prevent altering the resin's physical properties.

PART 3 - EXECUTION

3.01 PRE-INSTALLATION

- A. A digital CCTV video inspection must be done on the mainline pipe with a pan and tilt camera and the service lateral to confirm the proposed repair falls within the limitation parameters set by the manufacturer on the following aspects:
1. The location and clock reference of the service lateral junctions to be lined
 2. Any offsets, any intrusions from the service lateral into the main
 3. Angle at which the connection comes in
 4. Any changes in the service lateral's approach angle for the repair length
 5. Potential flows coming throughout the service lateral pipe
 6. Potential flows going through the main pipe
 7. Diametric connection size for the lining length
 8. Main pipe's size at the service lateral point
 9. Service lateral's condition including the presence of debris, turns, bends, changes in diameter, or other observations
 10. Active infiltration present within the work area vicinity

11. Any defects noted in the mainline pipe or service lateral should be documented using NASSCO PACP/LACP Standards.
- B. Inform the Engineer about service laterals in which a service lateral lining cannot be installed from the main sewer to the cleanout established at the property line or easement line. The Contractor shall identify these service laterals and provide the Engineer with documentation about the conditions encountered including the CCTV inspection. If a full-length service lateral lining cannot be installed or a point repair on the service cannot be performed, the Engineer may direct the Contractor to install a transition liner or a short service lateral lining with no cleanout required extending up the service lateral from the main. The length is to be field determined to the maximum length possible, but should extend 3 feet minimum up the service lateral from the main.
- C. Inform the Engineer about service laterals in which a short length service lateral product cannot be installed. The Contractor shall identify, document, and video record these services and inform the Engineer about the conditions encountered. If a short length service lateral lining cannot be installed, the service connection will be "cut and buffed" to restore a 95% minimum service opening.

3.02 LINE PREPARATION

- A. Prior to installing the service lateral product, the area around the service lateral sealing surface in the main and the service lateral shall be inspected. Waste product build-up, hard scale, roots, service lateral cutting debris, or resin slugs must be removed using high-pressure water jetting or in-line cutters. All service laterals to be lined shall be cleaned as required prior to lining. The term "cleaned" shall mean removing all sand, dirt, roots, grease, and other solids or semisolid materials from the interior face of the sewer mainlines and the service laterals.
- B. Built-up deposits on the main and service lateral pipe walls shall be removed. The removal shall reach at least 1 foot beyond the scheduled service lateral installation length to allow the bladder to inflate tightly against the pipe walls ensuring a smooth transition from service lateral product to the existing pipe wall.

- C. Televise the service lateral to provide a detailed record of existing conditions and service lateral connections. Have a copy of the pre-lining inspections in the field. Immediately prior to lining insertion, the camera shall traverse the service lateral to inspect for debris which may have entered the line after the existing condition inspection.
- D. Where active infiltration is present and when it is recommended by the service lateral lining manufacturer, the infiltration must be stopped in advance by grouting.
- E. Additional precautions need to be taken when applying the sleeve to a main pipe lined with a CIPP lining with a polyolefin coating. The coating is to be lightly scarified, scraping off the coating in the main CIPP in the service lateral lining's vicinity. This scuffing is mandated for service lateral linings required to adhere to the pipe wall. Service lateral linings with hydrophilic material are not required to have the existing lining scarified.
- F. The Contractor shall be responsible, if needed, for bypassing sewage while installing the service lateral lining product. In cases where the temporary sewage backup is accepted as a replacement for bypassing, the Contractor shall be responsible for all damage caused by sewage backing up into properties or sanitary sewer overflows.

3.03 INSTALLATION

- A. The service lateral lining shall be vacuum-impregnated with resin (wet-out) under controlled conditions. The resin volume used shall be sufficient to fill all voids in the textile lining material at nominal thickness and diameter. The volume shall be adjusted by adding 5% to 10% excess resin for the change in resin volume due to polymerization and to allow for any resin migration into the cracks and joints in the original pipe. All resin shall be contained within the translucent bladder during vacuum impregnations. No dry or unsaturated area in the service lateral tube shall be acceptable upon visual inspection.
- B. The service lateral product shall be loaded on the applicator apparatus, attached to a robotic manipulator device, and positioned at the cleanout or pipe opening of the service connection that is to be rehabilitated. For service lateral full-wrap style linings with compression gaskets, the mainline lining and bladder

shall be wrapped around the "T" launching device and held firmly by placing 4 hydrophilic material bands around the main lining. For service lateral full-wrap linings that do not use hydrophilic material, a 300 ml volume adhesive sealant shall be applied to the main/service lateral interface and shall be applied as a 2-inch wide band on the main lining. The robotic device with a television camera shall be used to align the repair product with the service connection opening. The insertion pressure shall be adjusted to fully deploy the service lateral product into the service lateral connection and hold the service lateral product tight to the main and service lateral pipe walls.

- C. The pressure apparatus shall include a bladder with sufficient length in the main and service lateral lines so the inflated bladder extends beyond the ends of the service lateral product's service lateral tube and main line tube, pressing the end edges flat against the internal pipe wall, thus forming a smooth transition from service lateral product to pipe diameters without a step, ridge, or gap between the service lateral product and the service lateral and mainline pipes' inner diameters.
- D. For service lateral linings with hydrophilic materials, the main bladder shall be inflated causing the main sheet to unwrap and expand, embedding the hydrophilic material between the main lining and the main pipe as the main lining is pressed tight against the main pipe.
- E. After insertion is completed, recommended pressure must be maintained on the impregnated service lateral product according to ASTM F1216-09, Sections 7.4.2 and 7.4.3, pressing the lining firmly against the inner pipe wall during the entire curing process. The lining shall be cured at ambient temperatures or by a suitable heat source. In no instance will sewage be used to invert or cure linings or calibration tubes.
- F. The finished service lateral lining shall be free from dry spots, lifts, and delamination. The installed service lateral lining should not inhibit the CCTV post installation video inspection for the mainline and service lateral pipes or future pipe cleaning operations. For service lateral linings with compression gaskets, the CIPP shall taper at each end providing a smooth transition to accommodate video equipment and maintain proper flow in the mainline. In all cases, the finished product must provide an airtight/watertight verifiable non-leaking connection

between the main sewer and sewer service lateral. During the warranty period, any defects with the service lateral that affect the service lateral connection's performance, cleaning, or water tightness shall be repaired at the Contractor's expense in a manner acceptable to the Engineer.

- G. Following the lining installation, provide the Engineer with an electronic picture and recorded data identifying the location and showing the completed work and restored condition for all the rehabilitated service laterals from the sewer main to the service reconnection point. The Contractor shall televise the rehabilitated service lateral to provide a detailed record of finished conditions using NASCCO PACP/LACP guidelines. When complete, the Contractor shall submit the rehabilitated service lateral inspections in a Granite XP-compatible database and the accompanying logs on an external USB hard drive.

3.04 FIELD TESTING AND ACCEPTANCE

- A. The lining's field acceptance shall be based on the Engineer's evaluation of the installation including post-lined digital CCTV inspection and reviewing certified test data for the installed pipe samples. The CCTV inspection for each service lateral shall extend 10 feet minimum past the end of the rehabilitation work on the service lateral. For service laterals where a cleanout was installed, the CCTV inspection shall include the cleanout and the connection to the existing, undisturbed service lateral.
- B. The lining shall have zero groundwater infiltration, and each service lateral must pass a 2-minute 4 psi air test conducted by the Contractor. Service laterals with a pipe size transition in the run of the service lateral or done as a "blind shot" with no cleanout are not required to be air tested for the service lateral length. The connection area with the main shall be air tested.
- C. A flat plate sample shall be collected at the direction of the Engineer for approximately every 50 service lateral installations, and the sample shall be submitted to a third party testing laboratory to confirm strength properties (flexural strength and flexural modulus) in accordance with ASTM F1216. The test results must meet or exceed the design strengths and thickness, or the Contractor must provide a 10% credit for up to 50 of the service laterals the sample represents.

- D. All service connections shall be open, clear, and watertight.
- E. The lining shall have no evidence of splits, cracks, breaks, lifts, kinks, delaminations, or crazing.
- F. If any defective lining is discovered after it has been installed, it shall be removed and replaced by the Contractor with a new lining, a new pipe, or other measures with the Engineer's approval at no additional cost to the Town of Smyrna. Any lining installation not meeting specified strengths or thickness shall provide other acceptable remediation measures or credit as approved by the Engineer. The re-inspection requirements as listed above shall apply to this re-installed section of line.

3.05 CLEANUP

- A. After the installation work and testing have been accepted, restore the project area affected by the operations to a condition at least equal to what existed prior to the work.

END OF SECTION

SECTION 03303

CONCRETE FOR UTILITY LINES

PART 1. GENERAL

1.1 This item shall include furnishing and installing concrete manholes, blocking, cradles, anchors, caps, pipe protection, and/or encasement at the locations shown on the drawings and/or directed by the Town of Smyrna's representative.

PART 2. PRODUCTS

Not used.

PART 3. EXECUTION

3.1 Concrete work shall conform to ACI 301-72 (as revised), as modified by the supplemental requirements below:

A. Strength

1. The strength of concrete shall be 3,000 psi unless otherwise shown on the drawings. Manholes shall have a 28-day compressive strength of minimum 5,000 psi.

B. Durability

1. All concrete exposed to weather shall be air entrained.

C. Slump

1. Concrete shall be proportional and produced to have a slump of 3-inches with a 1-inch tolerance.

D. Admixtures

1. Air entrainment, mandatory for concrete exposed to weather, may be used. A water reducing admixture (retarding, normal, or accelerating, depending on placing temperature), may be used if approved by the Town of Smyrna's representative.

E. Reinforcing Steel

1. Yield strength of reinforcing steel shall be 60,000 psi.

END OF SECTION

SECTION 13514

TELEVISION INSPECTION

1. GENERAL

Perform the inspection in one line-segment at a time and control the flow into the line segment being inspected as necessary.

2. EQUIPMENT

2.1 The television camera used for the inspection shall be one specifically designed and constructed for such inspections. It shall be operative in conditions of 100% humidity. The lighting and camera quality shall be suitable to allow a clear, in-focus, color, picture of a minimum of 6 LF of the entire inside periphery of the sewer pipe. Picture quality and definition shall be to the satisfaction of the A/E; otherwise, the equipment shall be removed from the line, and no payment made for the unsatisfactory inspection.

2.2 Locate the camera monitor within a temperature-controlled television unit that will accommodate 3 people to watch the sewer line inspection. The A/E and Owner shall have access to view the television monitor at all times.

2.3 A skilled technician shall control the operation of the equipment from a control panel located in the television unit and shall have control of the movement of the television camera at all times. This may be accomplished by remote control winches or by telephone or other suitable means of communication between the winches at either end of the line segment being inspected.

2.4 A camera with proper lens and mountings to frame the monitor exactly shall be available for making photographs. Pictures that include less than the total screen or extend beyond the screen dimensions shall not be accepted. Take photographs at the request of the A/E to record conditions of interest during the television inspection.

2.5 A compact disk recorder using a DVD player format shall be available for making video and audio recordings. The video recordings shall be in color. The recorder shall be suitable for recording directly from the television inspection camera. Video recording shall be of all lines televised or information of interest during the television inspection.

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3. EXECUTION

3.1 Pull the closed-circuit television camera slowly through the pipe in order to record defects, leaking joints, and leaking service lines. Keep a log of the television inspection on a form acceptable to the A/E, and note identification of the line segment, manhole-to-manhole direction of travel, line size, pipe construction material, point of entry of service connections (using a clock system), running leaks, continuously running service lines, bad joints, dips in the pipe, structural defects. Record each of the above items on the inspection log, along with the distance from the manhole of reference. Observe running service line for 5 minutes to determine if the service line is actually leaking or if the flow is the result of water use. Observe and quantify all leaks in the sewer line or service lines in gallons per minute (gpm) and record on the inspection log. Submit any photographs or videos taken during the inspection to the A/E along with one typewritten copy of the television inspection log. The television inspection logs will be submitted weekly within 5 working days after completion of the television inspection. Any video compact disks required shall be DVD paler compatible and include reference distances of the television logs in a format acceptable to the A/E.

3.2 If a unit becomes lodged in the line during televising, remove the unit from the line, and replace or repair any damages that occur as a result of removing the unit.

END OF SECTION

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