

BID DOCUMENTS

2018 CITY-WIDE SEWER IMPROVEMENTS

CITY OF WHITE HOUSE, TENNESSEE



PREPARED BY:
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105 College Avenue
White House, Tennessee 37188



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ADVERTISEMENT FOR BIDS

Sealed Bids for the project entitled 2018 City-Wide Sewer Improvements will be received by the City of White House at 2:00 p.m. local time on May 7, 2018, at 105 College Street, White House, Tennessee 37188 and then publicly opened and read aloud.

The project includes the following work.

Granda Flora – This work includes approximately 380 linear feet of gravity sewer pipe replacement including service reconnections and valve vault including valves, by-pass quick connect, and flow meter at the existing Union Road pump station. The existing manholes in the gravity sewer shall be used, not replaced. The City of White House will supply the 8-inch SDR 26 pipe for this portion of the project.

Union Road at Highway 76 – This work includes approximately 7,600 linear feet of sewer force main including all appurtenances for a working system. Appurtenances may include air release valves, valves, and fittings.

North Palmer Chapel Force Main – This work includes approximately 450 linear feet of 12-inch force main and valve vault including valves, by-pass quick connect, and flow meter at the existing pump station.

The work will be contracted as one contract.

The Contract Documents may be examined at the following locations:

White House
105 College Street
White House, TN 37188

Builder's Exchange – Nashville: <http://www.bxtn.org>
Builder's Exchange – Kentucky: <http://www.bxkentucky.com>

Copies of the Contract Documents may be obtained from the City of White House by phoning Derek Watson, Purchasing Coordinator at 615-672-4350 ex 2130. There is no cost for electronically sent Contract Documents. Bidder will be responsible for printing official bid documents. Bidders must respond to Derek Watson to be added to the official bid list. No bids will be received by persons not on the official bid list after obtaining official Bid Documents.

A certified check or cashier's check payable to the City of White House or a satisfactory Bid Bond executed by a corporate surety licensed under the laws of Tennessee to execute such Bonds in the amount equal to five percent (5%) of the total of the Bid shall be submitted with each Bid.

ADVERTISEMENT FOR BIDS

Attention is called to the fact that the Contractor must ensure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, or national origin.

A Pre-Bid Conference will be held April 30, 2018 at 10:00 a.m. at City of White House, Public Services Building: 725 Industrial Drive, White House, Tennessee 37188.

The Bid deposit shall be retained by the City of White House if the successful Bidder fails to execute the Contract or fails to provide the required Bonds, as stated above, within ten (10) days after award of the Contract.

The successful Bidder shall be required to furnish separate one hundred percent (100%) Performance and Payment Bonds. The Performance Bond shall be in full force and effect for one (1) year after the date of final acceptance of the project by the City of White House.

Each Bidder must be appropriately licensed as a Contractor in the State of Tennessee as provided in T.C.A. 62-6-101. The Bidder's name, license number, expiration date, and that part of the contracting classification applying to the Bid shall appear on the sealed envelope containing the Bid; otherwise, the Bid shall not be opened.

The City of White House reserves the right to reject any or all Bid proposals and to waive all informalities. A conditional or qualified BID will not be accepted. Award will be made to the lowest responsible, responsive BIDDERS.

W. Joe Moss,
Director of Public Services
City of White House

SUGGESTED INSTRUCTIONS TO BIDDERS

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ARTICLE 1 – DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

City of White House – 105 College Street, White House, Tennessee 37188. Attn: Derek Watson

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with its Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:

A. Evidence of Bidder's authority to do business in the state where the Project is located.

B. Bidder's state or other contractor license number.

C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others," if applicable.

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 Existing Site Conditions

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
No data is available for subsurface and physical conditions, or hazardous environment. The City makes no recommendations or warranties. The Bidder may request site access to make determinations at the Bidder's expense prior to Bid.
- B. Geotechnical Baseline Report: No data is available for subsurface and physical conditions, or hazardous environment. The City makes no recommendations or warranties. The Bidder may request site access to make determinations at the Bidder's expense prior to Bid.
- C. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or adjacent to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.
- D. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 Site Visit and Testing by Bidders

- A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;
- E. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- F. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- G. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- H. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- I. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without

exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A pre-Bid conference will be held on April 30, 2018 at 10:00 a.m. at City of White House, Public Services Department: 725 Industrial Drive, White House, Tennessee 37188.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of five percent (5%) of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within ten days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be substantially completed, and completed and ready for final payment, are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain a Substantial Completion or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or “or-equal” items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or “or-equal” item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.
- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.
- 11.03 If an award is made, Contractor shall be allowed to submit proposed substitutes and “or-equals” in accordance with the General Conditions.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 If required by the bid documents, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for the Work.
- 12.02 If requested by Owner, a list of Subcontractors shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.
- 12.03 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.
- 12.04 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.
 - A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.
- 13.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The partnership's address for receiving notices shall be shown.
- 13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the firm's address for receiving notices shall be shown.
- 13.05 A Bid by an individual shall show the Bidder's name and address for receiving notices.
- 13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture's address for receiving notices shall be shown.
- 13.07 All names shall be printed in ink below the signatures.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Sectional Bids: Contracts A & B.*

- A. Bidders may submit a Bid on any individual section or any combination of sections, as set forth in the Bid Form.
- B. Submission of a Bid on any section signifies Bidder's willingness to enter into a Contract for that section alone at the price offered.
- C. If Bidder submits Bids on individual sections and a Bid based on a combination of those sections, such combined Bid need not be the sum of the Bids on the individual sections.
- D. Bidders offering a Bid on one or more sections shall be capable of completing the Work covered by those sections within the time period stated in the Agreement.

14.02 *Unit Price: Contract A*

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total

will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.
- 15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement for bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to Derek Watson, Purchasing Coordinator, City of White House, 105 College Street, White House, Tennessee 37188.
- 15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.03 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders a “Base Bid plus alternates” budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.
 - C. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner’s requirements as to performance and payment bonds and insurance.

When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 22 – SALES AND USE TAXES - NOT APPLICABLE

ARTICLE 23 – RETAINAGE

23.01 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

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ARTICLE 1 – BID RECIPIENT

1.01 *This Bid is submitted to:*

***City of White House, Tennessee
Attn: Derek Watson, Purchasing Coordinator
105 College Street
White House, Tennessee 37188***

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs.

E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data

are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

- F. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- G. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- I. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER’S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - 4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

2018 CITY-WIDE SEWER IMPROVMENTS

UNIT PRICE WORK					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization	LS	1	\$	\$
2	8-inch DR 26 PVC Gravity Sewer Line including excavation, stone bedding, backfill, reconnection of residential services, and all Incidentals	LF	500	\$	\$
3	12-inch SDR21 Sewer Force Main including excavation, stone bedding, fittings, backfill, and all Incidentals	LF	7600	\$	\$
4	12-inch DIP Class 350 with Protecto 401 lining including excavation, stone bedding, fittings, backfill, and all Incidentals	LF	450	\$	\$
5	Bore and Jack including 18-inch steel encasement pipe, spacers, end caps, fittings, backfill, and all incidentals.	LF	80	\$	\$
6	12-inch Gate Valve and Box	EA	8	\$	\$
7	12-inch Inserta Tee and Box	EA	1		
8	Combination Air/Vacuum Release Valve	EA	3	\$	\$
9	Asphalt Road/Drive Repair with full stone backfill	LF	90	\$	\$
10	Concrete Drive Repair with full stone backfill	LF	100	\$	\$
11	Connection to Existing Force Main	EA	3	\$	\$
12	Connection New Force Main to North Palmers Chapel Pump Station Building	LS	1	\$	\$
13	Manhole riser realignment including all labor, materials, backfill, and restoration of surface.	EA	1	\$	\$
14	Valve Vault Complete - Granda Flora	LS	1	\$	\$
15	Valve Vault Complete - No. Palmer's Chapel	LS	1	\$	\$

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
16	Flow Meter with Vault - Complete	LS	2	\$	\$
17	Chain-Link Fencing	LF	380	\$	\$
18	Chain-Link Gate including all materials, labor and incidentals for a function gate	EA	1	\$	\$
19	Erosion and Sediment Controls	LS	1	\$	\$
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					\$

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

4.02 Basis of Bid

- A. Bidder must submit a bid for all items of work listed. This shall include work at all three (3) locations.
- B. Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

ARTICLE 5 – TIME OF COMPLETION

5.01 Bidder agrees that the Work will be substantially complete within 150 calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions; and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 180 calendar days after the date when the Contract Times commence to run.

5.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 6 – ATTACHMENTS TO THIS BID

6.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;
- D. List of Project References;
- E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;
- F. Contractor's License No.: [or] Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;

- G. Required Bidder Qualification Statement with supporting data; and
- H. Drug-Free Workplace Affidavit
- I. Non-Discrimination Policy
- J. Statement of Compliance-Illegal Immigrants

ARTICLE 7 – DEFINED TERMS

7.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 8 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By: _____
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____
(where applicable)

BID BOND

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

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

City of White House
105 College Street
White House, Tennessee 37188

BID

Bid Due Date:
Description:

BOND

Bond Number:
Date:
Penal sum _____

\$

(Words)

(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

(Seal)

(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By:

Signature

By:

Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest:

Signature

Attest:

Signature

Title

Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

DRUG-FREE WORKPLACE AFFIDAVIT

The undersigned, principal officer of _____, an employer of five (5) or more employees contracting with the City of White House, Tennessee to provide construction services, hereby states under oath as follows:

1. The undersigned is a principal officer of _____ (hereinafter referred to as the "Company", and is duly authorized to execute this Affidavit on behalf of the Company.
2. The Company submits this Affidavit pursuant to T.C.A. § 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state of any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with title 50, Chapter 9, of the Tennessee Code Annotated.
3. The undersigned also attests that the requirements of the drug-free workplace program or drug and alcohol testing program operated by the bidder are at least as stringent as the program operated by the City of White House, Tennessee.
4. The Company is in compliance with T.C.A. § 50-9-113.

Further affiant saith not.

Name of Officer

Title of Officer

State of _____,
County of _____

Before me personally appeared _____, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purposes therein contained.

Witness my hand and seal at office this _____ day of _____, 20_____.

Notary Public

My commission expires: _____

NON-COLLUSION AFFIDAVIT

State of _____,
County of _____

_____, being first duly sworn, deposes and says that:

- (1) He/She is the _____ of _____, the firm that has submitted the attached Proposal;
- (2) He/She is fully informed respecting the preparation and contents of the attached Proposal and of all pertinent circumstances respecting such Proposal;
- (3) Such Proposal is genuine and is not a collusive or sham Proposal;
- (4) Neither the said firm nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly, with any other vendor, firm or person to submit collusive or sham proposal in connection with the contract or agreement for which the attached Proposal has been submitted or to refrain from making a proposal in connection with such contract or agreement, or collusion or communication or conference with any other firm, or, to fix any overhead, profit, or cost element of the proposal price or the proposal price of any other firm, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the Town of Farragut or any person interested in the proposed contract or agreement; and
- (5) The proposal of service outlined in the Proposal is fair and proper and is not tainted by collusion, conspiracy, connivance, or unlawful agreement on the part of the firm or any of its agents, representatives, owners, employees, or parties including this affiant.

(Signed): _____

Title: _____

Subscribed and sworn to before me this _____ day of _____, 20_____.

Title

My commission expires: _____

STATEMENT OF COMPLIANCE CERTIFICATE ILLEGAL IMMIGRANTS

EACH CONTRACTOR BIDDING SHALL FILL IN AND SIGN THE FOLLOWING

This is to certify that _____ have fully complied with all the requirements of Tennessee Code Annotated § 12-4-124.

- All Bidders for construction services on this project shall be required to submit an affidavit (by executing this compliance document) as part of their bid that attests that such Bidder shall comply with requirements T.C.A. § 12-4-124.

Signed:

State of _____,
County of _____

Personally appeared before me, _____ the undersigned Notary Public, _____, the within named bargainer, with whom I am personally acquainted, and known to me to be the President / Owner / Partner (as applicable) of the _____, Corporation, Partnership, Sole Proprietorship (as applicable) and acknowledged to me that he executed the foregoing document for the purposes recited therein.

Witness my hand, at office, this _____ day of _____, 20_____.

Notary Public

My commission expires: _____

NOTICE OF AWARD

Date of Issuance:

Owner: City of White House, TN

Owner's Contract No.:

Engineer:

Engineer's Project No.:

Project: 2018 City-Wide Sewer
Improvements

Contract Name: 2018 City-Wide Sewer
Improvements

Bidder:

Bidder's Address:

TO BIDDER:

You are notified that Owner has accepted your Bid dated [_____] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

_____ .
[describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is: \$ _____ *[note if subject to unit prices, or cost-plus]*

unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically. *[revise if multiple copies accompany the Notice of Award]*

a set of the Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of this Notice of Award:

1. Deliver to Owner [_____] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner:

Authorized Signature

By: _____

Title: _____

Copy: File

- 3.02 The Owner has retained CSR Engineering (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Days*

- A. The Work will be substantially completed within 120 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 150 days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. Substantial Completion: Contractor shall pay Owner \$700.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
 2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$500.00 for each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):

UNIT PRICE WORK					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization	LS	1	\$	\$
2	8-inch DR 26 PVC Gravity Sewer Line including excavation, stone bedding, backfill, and all Incidentals	LF	400	\$	\$
3	12-inch SDR21 Sewer Force Main including excavation, stone bedding, fittings, backfill, and all Incidentals	LF	7600	\$	\$
4	12-inch DIP Class 350 with Protecto 401 lining including excavation, stone bedding, fittings, backfill, and all Incidentals	LF	450	\$	\$
5	Bore and Jack including 18-inch steel encasement pipe, spacers, end caps, fittings, backfill, and all incidentals.	LF	80	\$	\$
6	12-inch Gate Valve and Box	EA	8	\$	\$
7	Combination Air/Vacuum Release Valve	EA	3	\$	\$
8	Asphalt Road/Drive Repair with full stone backfill	LF	40	\$	\$
9	Concrete Drive Repair with full stone backfill	LF	100	\$	\$
10	Connection to Existing Force Main	EA	3	\$	\$
11	Connection New Force Main to North Palmers Chapel Pump Station Building	LS	1	\$	\$
12	Valve Vault Complete - Granda Flora	LS	1	\$	\$
13	Valve Vault Complete - No. Palmer's Chapel	LS	1	\$	\$
14	Flow Meter with Vault - Complete	LS	2	\$	\$
15	Erosion and Sediment Controls	LS	1	\$	\$
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					\$

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 25th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

- 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract

- a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
- b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

- 7.01 All amounts not paid when due shall bear interest at the maximum legal rate.

ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
 - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor’s safety precautions and programs.
 - E. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
 - F. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
 - G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
 - H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
 - I. Contractor’s entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to ■■■, inclusive).
 - 2. Performance bond (pages ■■■ to ■■■, inclusive).
 - 3. Payment bond (pages ■■■ to ■■■, inclusive).
 - 4. Other bonds.
 - a. ■■■ (pages ■■■ to ■■■, inclusive).

NOTE(S) TO USER:

Such other bonds might include maintenance or warranty bonds intended to manage risk after completion of the Work.

5. General Conditions (pages [] to [], inclusive).
6. Supplementary Conditions (pages [] to [], inclusive).
7. Specifications as listed in the table of contents of the Project Manual.
8. Drawings (not attached but incorporated by reference) consisting of [] sheets with each sheet bearing the following general title: [] **[or]** the Drawings listed on the attached sheet index.
9. Addenda (numbers [] to [], inclusive).
10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages [] to [], inclusive).

NOTE(S) TO USER:

1. *As noted in the introduction to this Agreement, in the typical case bidding-related documents such as the Instructions to Bidders and Bid are not included as Contract Documents. Include Contractor's Bid as a Contract Document here only as a matter of necessity, for example if the Bid contains numerous line items and their prices, and rekeying such information would be burdensome and susceptible to error.*
 2. *List other required attachments (if any), such as documentation submitted by Contractor prior to Notice of Award and documents required by funding or lending agencies.*
 3. *If a Geotechnical Baseline Report or a Geotechnical Data Report is used, include them as lettered Items under Paragraph 9.01.A.10.a. For a further discussion of GBRs and GDRs see EJCDC C-001, Commentary on the 2013 EJCDC Construction Documents.*
11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
- a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 *Other Provisions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or “track changes” (redline/strikeout), or in the Supplementary Conditions.

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

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

OWNER:

CONTRACTOR:

By: _____

By: _____

Title: _____

Title: _____

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

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

License No.: _____

(where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

PERFORMANCE BOND

CONTRACTOR *(name and address):*

SURETY *(name and address of principal place of business):*

OWNER *(name and address):*

City of White House, TN
105 College Street
White House, Tennessee 37188

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract):*

Amount:

Modifications to this Bond Form: None See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence,

to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims

for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

City of White House, TN
105 College Street
White House, Tennessee 37188

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form: None See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

_____ *(seal)*

Contractor's Name and Corporate Seal

_____ *(seal)*

Surety's Name and Corporate Seal

By: _____

Signature

By: _____

Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____

Signature

Attest: _____

Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. **Definitions**
 - 16.1 **Claim:** A written statement by the Claimant including at a minimum:
 1. The name of the Claimant;
 2. The name of the person for whom the labor was done, or materials or equipment furnished;
 3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 4. A brief description of the labor, materials, or equipment furnished;
 5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 7. The total amount of previous payments received by the Claimant; and
 - 16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
 - 16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: City of White House	Owner's Contract No.: N/A
Contractor:	Contractor's Project No.:
Engineer: Cynthia Wheeler, P.E.	Engineer's Project No.: N/A
Project: 2018 City-Wide Sewer Improvements	Contract Name:

This [preliminary] [final] Certificate of Substantial Completion applies to:

- All Work The following specified portions of the Work:

Date of Substantial Completion

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

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

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's responsibilities: None
 As follows

Amendments to Contractor's responsibilities: None
 As follows:

The following documents are attached to and made a part of this Certificate: *[punch list; others]*

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

EXECUTED BY ENGINEER:	RECEIVED:	RECEIVED:
By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. 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, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 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. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document 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, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *Notice to Proceed*—A written notice 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.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *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.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *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.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *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, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *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.
40. *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.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *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 a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *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 but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *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; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs 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 Article 10 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 15.03 or 15.04).
- 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. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- 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. *Bonds*: 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 Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), 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;
 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.

2.04 *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 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, 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 and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *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 2.03.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 the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, 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.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, 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, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract 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, reference standard, 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 part of the Contract Documents prepared by or for Engineer. 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 part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
 - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or 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) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) 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 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
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 part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); 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 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers 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 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; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- 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.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *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 Contract 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 Contract. 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 Contract, whichever date is earlier.

4.02 *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 such date.

4.03 *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.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 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 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. 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, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. 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. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *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.
- 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 permanent improvements are to be made 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.

5.02 *Use of Site and Other Areas*

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

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, 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 any such claim, and against all 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 directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent 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 and adjacent areas 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 of 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 structures or land to stresses or pressures that will endanger them.

5.03 *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 adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on 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.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site 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 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, 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 fall within any one or more of the categories described in Paragraph 5.04.A;
 - 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 Paragraph 13.03; and,

- c. 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.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent 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 do not warrant or guarantee 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 information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then 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 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - 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 Paragraph 13.03;
 - c. 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; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on 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 removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) 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 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. 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, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. 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, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. 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 (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. 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 failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, 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. 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 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond 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 the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then 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 bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, 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.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. 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.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; 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 (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 - 5. be appropriate for the Work being performed and provide protection from claims that 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.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, 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.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable 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 Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 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; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; 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. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, 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 insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the 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 Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, 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 or Contractor as trustee or fiduciary, 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 occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.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, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, 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 builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *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.
- 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.

7.02 *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, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

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

7.04 "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 Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that 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, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, 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;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - 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.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. 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:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) 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
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. 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.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. 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 the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. 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.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. 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.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

- O. 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 money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *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.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *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.

7.10 *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 or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (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 or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

7.12 *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, other work in progress, 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 Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
 - 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 7.12.A.2 or 7.12.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 at its expense (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 protection 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 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *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.

7.14 *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.

7.15 *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.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the 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 and equipment 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 of that submittal, and that Contractor approves the 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 set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- 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 7.16.D.

2. *Samples:*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall 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 7.16.D.
3. 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. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- 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 or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample 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 7.16.A.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 will document any such approved variation from the requirements of the Contract Documents in a Field Order.
 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

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.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *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 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;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts 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 7.18.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 7.18.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.

7.19 *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 Laws and Regulations.
- 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, 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, 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 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. 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.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) 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 any such claims, and against all 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 damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *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.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *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 (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

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

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *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.

10.02 *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 10.08. 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.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. 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.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. 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, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- 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 15.06.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 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes 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. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. 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, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, 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 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.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 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - 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 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *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.

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work 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 13.01.C, 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, and 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 13.01.
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 6.05), 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 communication 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 that Contractor is required by the Contract Documents to purchase and maintain.

C. *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 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here 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 Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole 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, Change Proposal, Claim, set-off, or other 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 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, 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.

13.02 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*: Contractor agrees that:
 - 1. 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
 - 2. 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*: 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.

13.03 *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. Payments to Contractor for Unit Price Work will be based on actual quantities.
- 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. 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 the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price 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;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it 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 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction 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.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- 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, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. 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. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages 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. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then 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, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages 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 pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *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, then 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.

14.07 *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, 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, then 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 14.07, 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, 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 incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. 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 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 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 during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *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, a warehouse bond, 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.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, 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 13.03, 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; 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 money 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 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

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

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. 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;
 - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, 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, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

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 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

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

15.03 *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 and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. 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 preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. 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 punch list.

15.04 *Partial Use or Occupancy*

- 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. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be 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 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work 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 15.03 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 6.05 regarding builder's risk or other property insurance.

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

15.06 *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, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) 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, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

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 have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. 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 15.07. 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. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *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 Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 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 to 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. 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 repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- 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, 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 are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and 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);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.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 the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds 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.

- F. 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, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *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; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) 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 16.03.
- 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 are not intended to preclude Contractor from submitting a Change Proposal 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 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *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, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract 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.

18.03 *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. 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.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

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

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *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

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 *Defined Terms*

SC-101. *Add the following language at the end of the last sentence of Paragraph 1.01.A.8:*

The Change Order form to be used on this Project is EJCDC C-941. Agency approval is required before Change Orders are effective.

Add the following language at the end of the last sentence of Paragraph 1.01.A.48:

The Work Change Directive cannot change Contract Price or Contract Times without a subsequent Change Order.

Add the following new Paragraph after Paragraph 1.01.A.48:

A.49 *Abnormal Weather Conditions*—Conditions of extreme or unusual weather for a given region, elevation or season as determined by Engineer. Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered Abnormal Weather Conditions.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 *Delete Paragraphs 2.01 B. and C. in their entirety and insert the following in their place:*

- B. Evidence of Contractor's Insurance: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies of insurance (including all endorsements, and identification of applicable self-insured retentions and deductibles) required to be provided by Contractor in Article 6. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. Evidence of Owner's Insurance: After receipt from Contractor of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner under Article 6 (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

SC-2.02 Copies of Documents

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

- A. Owner shall furnish to Contractor [3] copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01. Commencement of Contract Times; Notice to Proceed

- A. Amend the last sentence of Paragraph 4.01A by striking out the following works:
The Contract Times will commence to run on the days 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.

SC-4.05 Delays in Contractor’s Progress

- C.2 Amend Paragraph 4.05.C.2 by striking out the following text: “abnormal weather conditions;” and inserting the following text:

Abnormal Weather Conditions as defined in 4.05.H.

Add the following new Paragraphs immediately after Paragraph 4.05.G:

- H. If a claim is made as provided in Article 12 for delay due to abnormal weather conditions, the time extension to be awarded to Contractor, if any, shall be calculated using the following standard baseline (Standard Baseline”) of monthly anticipated adverse weather delay days for the project location. Extensions shall only be granted for days lost in any given month in excess of the number of days shown in the Standard Baseline for the same given month. The Standard Baseline shall be regarded as the established normal and anticipatable number of calendar days for each month during which construction activity shall be 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 shall be included in the Contractor’s scheduling of weather-dependent activities and shall not be eligible for extension of Contract Time.

Standard Baseline – Monthly Contract Allowance (MCA) in days												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Days	8	6	6	7	5	8	7	5	6	3	5	7

1. Adverse Weather is defined as the occurrence of one or more of the following conditions which prevents exterior construction activity or access to the site within twenty-four (24) hours:
 - a. Precipitation (rain, snow, and/or ice) in excess of two-tenths inch (0.20”) liquid measure.
 - b. Sanding Snow in excess of one inch (1”)
2. Adverse Weather may include, as deemed by Engineer, “dry-out” or “mud” days:
 - a. For rain days above the Standard Baseline,

- b. Only if there is a hindrance to site access or site work such as earthwork; and,
 - c. At a rate no greater than one (1) make-up day for each day or consecutive days of rain beyond the Standard Baseline that specifically recommended otherwise by Engineer.
3. Actual adverse weather delay days must prevent work on critical exterior activities for fifty percent (50%) or more of Contractor’s scheduled workday. The number of actual adverse weather delay days shall be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather days exceeds the number of days anticipated by the Standard Baseline, and providing that all other contractually-required conditions are met, qualifying delays will be added to the Contract times for each qualifying delay in excess of Standard Baseline.
 4. Upon commencement of on-site activities and continuing throughout construction, Contractor shall be responsible for accurately measuring and recording the daily occurrence of adverse weather on-site.
 5. Within 30 days of the last day of any month (hereinafter referred to as the “Reporting Month”), Contractor shall submit a written Adverse Weather Report, including copies of Contractor’s daily weather reports and applicable climatological data from the National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location, unless Engineer allows an additional period of time for submission of said report. Notwithstanding any other provisions, failure to submit the required written report within the time specified above shall be deemed to be and shall constitute a waiver by Contractor of any occurring during said Reporting Month.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.03 Subsurface and Physical Conditions

SC 5.03 Delete Paragraphs 5.03.A and 5.03.B in their entirety and insert the following:

- A. No reports of explorations or tests of subsurface conditions at or adjacent to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

SC-5.06 Hazardous Environmental Conditions

SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.02 Insurance—General Provisions

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker’s compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is located, (b) is certified or authorized as a worker’s compensation insurance

provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

2. Satisfactory certificates of insurance shall be file with the Owner prior to starting any construction work on this contract. The Owner will be named as an additional insured on all policies of insurance and all certificates shall contain a 60-day Notice of Cancellation. In connection with the provisions set forth in the General Conditions, the Notice to Proceed will not be issued until satisfactory certificates of insurance are filed.

SC-6.03 Contractor's Insurance

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. **Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:**

State:	Statutory
Federal, if applicable (e.g., Longshoreman's):	Statutory

Employer's Liability:

Bodily injury, each accident	\$ 500,000
Bodily injury by disease, each employee	\$ 500,000
Bodily injury/disease aggregate	\$ 500,000

2. **Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:**

General Aggregate	\$ 2,000,000
Products - Completed Operations Aggregate	\$ 1,000,000
Personal and Advertising Injury	\$ 1,000,000
Each Occurrence (Bodily Injury and Property Damage)	\$ 1,000,000

3. **Automobile Liability under Paragraph 6.03.D. of the General Conditions:**

Bodily Injury:

Each person	\$ 1,000,000
Each accident	\$ 1,000,000

Property Damage:

Each accident	\$ <u>1,000,000</u>
4. Excess or Umbrella Liability:	
Per Occurrence	\$ <u>5,000,000</u>
General Aggregate	\$ <u>5,000,000</u>
5. Contractor's Pollution Liability:	
Each Occurrence	\$ _____
General Aggregate	\$ _____
<input checked="" type="checkbox"/>	If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

SC-6.05 Property Insurance

SC-SC-6.05.A. Delete Paragraph 6.05.A of the General Conditions and substitute the following in its place:

- A. Contractor shall provide and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof. Contractor shall be responsible for any deductible or self-insured retention. This insurance shall:
1. Include the interests of Owner, Contractor, Subcontractors, Engineer, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or loss payee;
 2. Be written on a Builder's Risk "all-risk" policy form that shall at least included insurance for physical loss and 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 these 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. Included testing and startup;

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 certificated of insurance has been issued; and
8. Comply with the requirements of Paragraph 5.06.C if the General Conditions.

ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES

SC-7.02 Labor; Working Hours

SC-7.02.B. Add the following new subparagraphs immediately after Paragraph 7.02.B:

- 1. Regular working hours will be 7:00 a.m. – 5:00 p.m. Monday - Thursday.**
- 2. Owner's legal holidays are New Year’s Day, Martin Luther King, Jr. Day, President’s Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, Christmas Eve, Christmas Day.**

SC-7.02.C. Add the following new paragraph immediately after Paragraph 7.02.B:

Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer’s services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

If Contractor works more than 40 hours per week, Contractor shall reimburse Owner for the costs of overtime inspection. Engineer and Owner shall solely determine if overtime inspection is required. Owner will deduct the costs for overtime inspection hours from Contractor’s applications for progress payment.

SC-7.03.C Add the following new paragraphs immediately after Paragraph 7303.C of the General Conditions

- D. Until final completion of the Work is acknowledged by Owner, Contractor shall have responsible charge and care of the Work and of all equipment and materials to be used therein, including equipment or materials which have been furnished by Owner, and shall bear the risk of injury, loss, or damage to any part thereof by action of the elements or from any other cause, whether arising from the execution or from the non-execution of the Work
- E. Contractor shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the Work or the equipment or materials occasioned by any cause before completion and acceptance of the Work and shall bear the expense therefore. Contractor shall, at no additional cost to Owner, provide suitable drainage and suitable structures as necessary to protect the Work or any portion thereof from damage
- F. Suspension of the Work or the granting of an extension of time for any cause whatever shall not relieve Contractor of his responsibilities for the Work as specified herein.

SC-7.04 “Or Equals”

SC-7.04.A Amend the third sentence of Paragraph 7.04.A by striking out the following works:

Unless the specification or description contains or is followed by works reading that no like, equivalent, or "or-equal" item is permitted.

SC-7.06 Concerning Subcontractors, Suppliers, and Others

SC-7.06.A Amend Paragraph 7.06.A by adding the following text to the end of the Paragraph:

The Contractor shall not award work valued at more than fifty percent (50%) of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

SC-7.09 Taxes

SC-7.09 Add a new paragraph immediately after Paragraph 7.09.A:

- B. Owner is exempt from payment of sales and compensating use taxes of the State of Tennessee and of cities and counties thereof on all materials to be incorporated into the Work.
1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
 2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.A:

B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.

1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.
4. Liaison:
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

- c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
6. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
8. Review of Work and Rejection of Defective Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
9. 9. Inspections, Tests, and System Start-ups:
 - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
 - b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
10. Records:
 - a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.

- b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- c. Maintain records for use in preparing Project documentation.

11. Reports:

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.

12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, 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.

13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

14. Completion:

- a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.
- b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.
- c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.

C. The RPR shall not:

- 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
- 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
- 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
- 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.

5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.01 Cost of the Work

SC 13.01.B.5.c Delete Paragraph 13.01.B.5.c in its entirety and insert the following in its place:

- c. Construction Equipment and Machinery:
 - 1) Rentals of all construction equipment and machinery, and the parts thereof, 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.
 - 2) Costs for equipment and machinery owned by Contractor will be paid at a rate shown for such equipment in the [*cite the rate book appropriate for the Project*]. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs. Costs will include the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, shall cease to accrue when the use thereof is no longer necessary for the changed Work. Equipment or machinery with a value of less than \$1,000 will be considered small tools.

SC-13.03 Unit Price Work

SC-13.03.E Delete Paragraph 13.03.E in its entirety and insert the following in its place:

- E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:
 1. if the extended price of a particular item of Unit Price Work amounts to 5 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 10 percent from the estimated quantity of such item indicated in the Agreement; and
 2. if there is no corresponding adjustment with respect to any other item of Work; and
 3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation

entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.03 Substantial Completion

SC 15.03.B Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

SC-17.02 Arbitration

- A. All matters subject to final resolution under this Article will be decided by arbitration in accordance with the rules of *[insert name of selected arbitration agency]*, subject to the conditions and limitations of this paragraph. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.
- B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in this Article, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations. The demand for arbitration should include specific reference to Paragraph SC-17.02.D below.
- C. No arbitration arising out of or relating to the Contract shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
 2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.
- D. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include a concise breakdown of the award, and a written explanation of the award specifically citing the Contract provisions deemed applicable and relied on in making the award.

- E. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.
- F. The fees and expenses of the arbitrators and any arbitration service shall be shared equally by Owner and Contractor.

SC-17.03 Attorneys' Fees

SC-17.03 Attorneys' Fees: For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

Work Change Directive No.

Date of Issuance: _____ Effective Date: _____
 Owner: City of White House Owner's Contract No.: N/A
 Contractor: _____ Contractor's Project No.: _____
 Engineer: Cynthia Wheeler, P.E. Engineer's Project No.: N/A
 Project: 2018 City-Wide Sewer Improvements Contract Name: _____

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

Description:

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to: *[check one or both of the following]*

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

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

Contract Price \$ _____ [increase] [decrease].
 Contract Time _____ days [increase] [decrease].

Basis of estimated change in Contract Price:

- Lump Sum Unit Price
 Cost of the Work Other

RECOMMENDED:	AUTHORIZED BY:	RECEIVED:
By: _____ Engineer (Authorized Signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____
 Title: _____

Date of Issuance:	Effective Date:
Owner: City of White House	Owner's Contract No.: N/A
Contractor:	Contractor's Project No.:
Engineer: Cynthia Wheeler, P.E.	Engineer's Project No.: N/A
Project: 2018 City-Wide Sewer Improvements	Contract Name:

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

Description:

Attachments: *[List documents supporting change]*

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: \$ _____	[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: \$ _____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____ Engineer (if required)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____
Title: _____

Date of Issuance: _____ Effective Date: _____
Owner: City of White House Owner's Contract No.: N/A
Contractor: _____ Contractor's Project No.: _____
Engineer: Cynthia Wheeler, P.E. Engineer's Project No.: N/A
Project: 2018 City-Wide Sewer Improvements Contract Name: _____

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference: _____
Specification(s) _____ Drawing(s) / Detail(s) _____

Description:

Attachments:

ISSUED:	RECEIVED:
By: _____ Engineer (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____
Date: _____	Date: _____

Copy to: Owner

Stormwater Pollution
Prevention Plan
2018 City-Wide Sewer Improvements
White House, Tennessee



PREPARED BY:
Cynthia Wheeler, P.E.
Assistant Director of Public Services
City of White House
105 College Avenue
White House, Tennessee 37188



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General Information

This Stormwater Pollution Prevention Plan (SWPPP) is developed in accordance with Tennessee General Construction Permit (TNGCP) and the National Pollutant Discharge Elimination System (NPDES) (Permit No. TNR 1000000) for Storm Water Discharges Associated with Construction Activity and is prepared using sound engineering practices.

As instructed by the TNGCP, this plan and all attachments are hereby submitted to the local Environmental Assistance Center, along with a complete, signed Notice of Intent (NOI). Construction will not be initiated prior to receipt of a Notice of Coverage (NOC) from the Tennessee Department of Environment and Conservation (TDEC).

OWNER: City of White House

105 College Street

White House, Tennessee 37188

Contact Person: Cindy Wheeler, PE, Assistant Director of Public Services

Once the primary contractor is selected, an individual from that company will be assigned by the contractor to be responsible for installation, maintenance, and inspections of erosion and sediment control measures. The individual responsible for the inspections shall have completed the Division of Water Pollution Control's course *Fundamentals of Erosion Prevention and Sediment Control* within the last two years. Inspections will cover, at a minimum, all disturbed areas that have not undergone final stabilization, sediment control structure, outfall points, and receiving streams. Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified before the next rain event if possible, but in no case more than seven days after the need is identified. Documentation of all inspections shall be recorded, with records maintained onsite and made available upon request. The following records shall be documented and maintained on or near the site: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, the dates when stabilization measures are initiated, and daily rainfall records. The daily rainfall records shall be from an onsite rain gauge or from a representative reference site.

Current versions of the SWPPP, the NOI, and the NOC will be kept onsite for the duration of the project. These items will be available for the use of all operators and site personnel involved with erosion and sediment controls and will be available to TDEC personnel visiting the site. A notice will be posted near the upstream end of the project, containing a copy of the NOC with the tracking number assigned by the Environmental

Assistance Center (EAC), the name and telephone number of a contact person for the project, and a brief description of the project.

Any new contractor or subcontractor on the project that has any responsibility to install, inspect, or maintain erosion and sediment control measures will sign the contractor's certification on a copy of the NOI and will submit it to the local EAC. Any correspondence with TDEC or any EAC will reference the tracking number assigned by TDEC to the project.

It is the goal of the TNGCP and this SWPPP to ensure that stormwater discharges from the property or project site described in this document have no objectionable color contrast to the water body that receives it. The construction activity will be carried out in such a manner to prevent any discharge that would cause a condition in which visible solids, bottom deposits, or turbidity impairs the waters on the project site or downstream of the site.

This plan may be amended or revised at any time by the City if need or conditions require it. When the plan is revised, the contractor will implement the changes to erosion protection and sediment controls within 24 hours after the need for modification is identified.

Existing Site Conditions

The proposed work area is situated in Robertson County and will be constructed on dedicated utility easements or road right-of-ways. The work area resides primarily in an industrial park. The majority of the project will remain in the road right-of-ways with a portion lying across the back of lots in the industrial park. The soil in the area is primarily Dickson Silt Loam with some Mountview Silt Loam, Baxter Cherty Silty Clay Loam, Newark Silt Loam, Sango silt Loam, and Taft Silt Loam. USGS Soil Mapp is located in Appendix E

Project Description

The 2018 City-Wide Sewer Improvement project consists of three projects throughout the City. Two of the sites cover a small area of pipe replacement and valves added to adjacent pump stations. These areas do not require a SWPPP, however the contractor shall still incorporate the principles outlined in the Tennessee Erosion and Sediment Control Handbook.

The third site is approximately 7,600 linear feet of new force main to serve the west and south portion of the City. This SWPPP covers the new force main project. This project is linear in nature and will be stabilized as the project progresses.

Location	Disturbed Area		
	Total Length (FT)	Width (FT)	Disturbed Area (SF)
Union Road Force Main	7,600	10	76,000
Grand Total of Disturbed Area (Acres)			1.74

Inspection Requirements

Inspections will be performed by qualified personnel, employed by the contractor, and will be conducted at least twice every calendar week at least 72 hours apart. The training certificated for the erosion and sediment control inspector will be posted near the site entrance. Inspections will cover at a minimum, all disturbed areas that have not undergone final stabilization, sediment control structures, outfall points, and the streams. The inspections will be conducted with the purpose of determining whether erosion prevention and sediment control measures are effective in preventing impacts to receiving waters. If, during these inspections, it is discovered that repair or maintenance is required for any temporary or permanent control measures, the action taken to correct the problem will be documented. Maintenance needs and inadequate control measures identified during inspection shall be replaced or modified before the next anticipated rain event, but in no case more than seven (7) days after the need is identified. Based on the results of the inspection, the site description and pollution prevention measures identified in the SWPPP shall be revised as appropriate, but in no case later than seven (7) days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP in no case later than fourteen (14) days following the inspection.

Inspections shall be documented and include the scope of the inspection, name(s) and title of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan (including the location(s) of discharges of sediment or other pollutants from the site and of any control device that failed to operate as designed or proved inadequate for a particular location), and actions taken. Inspection documentation will be maintained on site and made available upon request. Inspection reports must be submitted to the division within 10 days of the request. The inspector will maintain a rain gage and a daily log of readings.

Spill and Non-Stormwater Contingencies

If sediment escapes and collects in areas outside of the construction site, the accumulations of sediment that have not reached a stream must be removed so that it is not subsequently washed into storm drains and streams before the next anticipated rain event and/or so that it does not pose a safety hazard. Permittees shall not initiate remediation/restoration of a stream without consulting the local EAC. This SWPPP does not authorize access to private properties.

All fueling of equipment and vehicles on site will be conducted at a location approved by the Owner. Any spillage shall be removed immediately. Contaminated soils will be placed on heavy plastic and covered or placed into approved containers to prevent contact with stormwater. No fuel tanks, oils, other vehicle fluids, paints, or solvents will be stored onsite. Any spill in excess of one gallon will be reported to a representative of the contractor.

If a release containing a hazardous substance in an amount equal to or in excess of a reporting quantity established under 40 CFR 117 or 40 CFR 302 occurs during a 24-hour period, the contractor shall immediately notify the permittee, who shall then notify the National Response Center (NRC) (800-424-8802) and the Tennessee Emergency Management Agency (TEMA) (emergencies: 800-262-3300; non-emergencies: 800-262-3400) as well as the local Environmental Assistance Center. The City will prepare a revision of this document to identify measures to prevent the recurrence of such releases.

Concrete trucks will only be allowed to wash out in areas approved by the City or local authority. Each contractor is responsible to provide litter control for trash and construction debris generated by his crew, in order to prevent any materials from becoming a pollutant source for stormwater discharges. Paint cans, oil cans, used oil, and filters shall be contained and disposed of by the contractor in accordance with all local, state, and federal regulations.

Phasing of Construction

Regardless of how the contractor proceeds with the construction of the project, no area may be disturbed more than 10 days prior to the construction proceeding. Areas that are disturbed must be stabilized no more than 15 days after the disturbance of the area commences. Areas not stabilized within 15 days will result in construction being stopped.

Daily Construction activities will take place in the following general sequence:

1. Installation of perimeter erosion and sediment controls in the areas to be disturbed that day.
2. Excavate trench to required width and depth.

3. Installation of pipe in accordance with Plans and Specifications.
4. Fill and compact trench material.
5. Finish grading.
6. Install permanent stabilization measures.
7. When activity is complete and the area is stabilized, remove erosion and sediment controls and re-seed any areas disturbed by their removal.

Soils and Runoff Estimates

The areas that will be disturbed by construction activities contain seven (7) major soil types. Descriptions for the soil types are (as described by the United States Department of Agriculture, soil Conservation Service Soil Survey for Carter County) included in Appendix E.

The determination of runoff quantities can be accomplished using several approved methods. In an effort to use an easily understandable methodology, as well as one that is readily available, the United States Department of Agriculture, Natural Resource Conservation Service, Technical Release 55 (TR-55) is typically employed. However, it has been determined that due to the arrangement of the proposed installation area, runoff estimates would not provide any relevant information and therefore have not been included.

Best Management Practices

- Erosion and sediment controls shall be designed to retain sediment on site for a 5-year 24-hours storm event for high quality waters.
- A 60-foot natural riparian buffer Zone shall be preserved to the maximum extent practicable during construction activities.
- All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices.
- Sediment should be removed from sediment traps, silt fences, sedimentation ponds, and other sediment controls as necessary, and must be removed when design capacity has been reduced by fifty (50%) percent.
- Litter, construction debris, and construction chemicals exposed to storm water shall be picked up and disposed of properly prior to anticipated storm events. Excavation, trenching, backfilling and grading operations to elevations as needed to meet the requirements for construction, shall be performed in such a manner as to cause the least amount of soil erosion and siltation.
- Construction debris may include, but is not limited to, waste soils, wood and paper packaging materials, building materials, etc. If these waste materials are stored on site, the material should be stored in areas outside of existing or proposed drainage ways and should be properly

disposed of or covered with a water resistant material before the next anticipated rainfall event.

- Waste materials should be stored with appropriate spill prevention measures in place (e.g. flat, stable, non-eroding surfaces with containment if available). In the event of a spill of waste materials, appropriate spill countermeasures should be enacted, including the deployment of booms or absorbent materials to prevent the spill from reaching drainage ways or streams and the notification of the appropriate authorities.
- Appropriate management practices and control structures shall be in place prior to clearing of vegetation for necessary construction activities near streams, rivers, lakes and storm sewer intakes.
- Provisions required to maintain uninterrupted surface water flow shall be maintained during the work. Storm water flow in existing gutters, surface drains and swales shall not be interrupted.
- All appropriate parties shall be notified of any unexpected subsurface or other unforeseen conditions, as soon as possible.
- Clearing and grubbing shall be held to the minimum required for grading and equipment operations.
- Whenever possible, construction activities shall proceed in such a way as to minimize the exposure time of any cleared area.
- Erosion and sediment control measures shall be in place and functioning properly before earth moving operations may begin.
- Erosion and sediment control measures shall be constructed and maintained throughout the construction period.
- If sediment escapes and collects in areas outside of the construction site, the accumulations of sediment that have not reached a stream must be removed so that it is not subsequently washed into storm drains and streams before the next anticipated rain event and/or so that it does not pose a safety hazard. Permittees shall not initiate remediation/restoration of a stream without consulting the local EAC. This SWPPP does not authorize access to private property.
- Erosion and sediment controls, as discussed in this SWPPP and shown on the Erosion and Sediment Control Plan shall remain in place for the installation of any waste disposal systems, sanitary sewer systems, or septic systems. Under no circumstances shall any wastewater discharges from these waste systems exit the site during construction activities.
- The Tennessee Department of Environment and Conservation Publication, Tennessee Erosion & Sediment Control Handbook, Current Edition, shall be utilized as a guide for construction of projects that require erosion and sediment controls to protect adjoining property and waters of the state.
- Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than twenty (20) calendar days prior to grading or earth moving.
- Whenever possible, a buffer strip of vegetative cover shall be maintained adjacent to grading

operations.

- To the extent feasible, appropriate cover shall be applied within seven (7) days on areas that will remain unfinished for more than fifteen (15) calendar days.
- Temporary or permanent soil stabilization shall be accomplished within fifteen (15) days after final grading or other earth work. Permanent stabilization with perennial vegetation (native grasses and/or herbaceous and woody plants) shall replace any temporary measures as soon as practicable.
- All surface water flowing toward the construction area shall be diverted around the area as much as possible to reduce erosion and siltation potential by using berms, channels and/or sediment traps as necessary.
- Erosion and sediment control measures shall be designed according to the size and slope of disturbed or drainage areas to detain runoff and trap sediment.
- If stabilization procedures are inhibited by snow cover or frozen ground, the procedures shall be initiated as soon as practical.
- If activities in areas that have been disturbed have stopped but will resume within fifteen (15) days, temporary stabilization measures will not be required on that portion of the site.
- Silt fence shall be installed along the base of all sloped cuts and fills, on the downhill sides of stockpiled soil, and along stream banks.
- Inspection and Maintenance of erosion and sediment control methods shall be performed on a regular basis throughout the construction period and until a good vegetative cover is established over the entire disturbed area.
- A rain gauge shall be maintained and monitored on site with a log of rainfall amounts kept.
- Storm water runoff that is to be pumped from excavation and work areas must be held in settling basins and/or treated by filtration (Dandy Dewatering Bag or equivalent) prior to its discharge into surface waters.
- There shall be no distinctly visible floating scum, oil or other matter contained in the storm water discharge.
- The storm water discharge must not cause an objectionable color contrast in the receiving stream.
- The storm water discharge must not contain concentrations of materials or substances that may be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.
- A vegetative buffer strip with an average width of sixty (60') feet shall be maintained between any impaired stream and the construction area.
- Trenches or pits shall be backfilled as soon as practical to reduce erosion potential.

- Erosion control measures shall be removed or replaced when they have served their useful purpose.



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Water Resources

William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-888-891-8332 (TDEC)

Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)

Form section for Site or Project Name, NPDES Tracking Number, Street Address, Site Description, County, MS4, Acres Disturbed, etc.

Form section for Site Owner/Developer (Primary Permittee), contact information, and Tennessee Secretary of State (SOS) Control Number.

Form section for Optional Contact, including name, title, address, and contact details.

Form section for Owner/Developer(s) Certification, including a declaration and signature lines.

Form section for Contractor Certification, including a declaration and signature lines.

OFFICIAL STATE USE ONLY

Form section for official state use, including Received Date, Reviewer, Field Office, Permit Tracking Number, etc.

CONSTRUCTION GENERAL PERMIT - NOTICE OF INTENT (NOI) - INSTRUCTIONS

A completed NOI must be submitted to obtain coverage under the CGP. **Requesting coverage under this permit means that an applicant has obtained and examined a copy of this permit, and thereby acknowledges applicant's claim of ability to be in compliance with permit terms and conditions.** CGP coverage is required for stormwater (SW) discharge(s) from construction activities including clearing, grading, filling and excavating (including borrow pits) of one or more acres of land. This form should be submitted at least 30 days prior to the commencement of land disturbing activities, or no later than 48 hours prior to when a new operator assumes operational control over site specifications or commences work at the site.

The application fee must accompany the NOI and is based on total acreage to be disturbed by an entire project, including any associated construction support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow or waste sites, etc.). A separate annual maintenance fee is also required for activities that exceed 1 year under CGP coverage. See TN Rules, Chapter 0400-40-11-.02(b)(12).

Acres Disturbed	= or > 150 acres	= or > 50 < 150 acres	= or > 20 < 50 acres	= or > 5 < 20 acres	= or > 1 < 5 acres	Subsequent coverage
Fee	\$10,000	\$6,000	\$3,000	\$1,000	\$250	\$100

Who must submit the NOI form? All site operators must submit an NOI form. "Operator" for the purpose of this permit and in the context of SW associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria: (1) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g., subsequent builder), or the person that is the current land owner of the construction site, and is considered the primary permittee; or (2) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

Owners, developers and all contractors that meet the definition of the operator in subsection 2.2 of the permit shall apply for permit coverage on the same NOI, insofar as possible. After permit coverage has been granted to the initial site-wide primary permittee, any subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The comprehensive site-specific SWPPP shall be prepared in accordance with the requirements of part 3 of the permit and must be submitted with the NOI unless the NOI being submitted is to add a subsequent permittee to an existing coverage. **Artificial entities (e.g., corporations or partnerships) must submit the correct Tennessee Secretary of State, Division of Business Services, control number. General partnerships. For general partnerships, the NOI must be signed by each general partner in the general partnership.**

The NOI will be considered incomplete without a correct control number, and the division reserves the right to deny coverage to artificial entities that are not properly registered and in good standing with the Tennessee Secretary of State (i.e., listed with an entity status of "active"). The division further reserves the right to issue permit coverage in the correct legal name of the individual or entity seeking coverage and to name each general partner of a general partnership in addition to the general partnership.

Complete the form: Type or print clearly. Answer each item or enter "NA," for not applicable. If you need additional space, attach a separate piece of paper to the NOI form. **The NOI will be considered incomplete without a permit fee and comprehensive site-specific SWPPP (if applicable).**

Describe and locate the project: Use the legal or official name of the construction site. If a construction site lacks street name or route number, give the most accurate information available to describe the location (reference to adjacent highways, roads and structures; eg., intersection of state highways 70 and 100). Latitude and longitude (in decimal degrees) can be found at numerous other web sites. Attach a copy of a map, showing location of site, with boundaries at least one mile outside the site boundaries. Provide estimated starting date of clearing activities and completion date of the project, and an estimate of the number of acres of the site on which soil will be disturbed, including borrow areas, fill areas, stockpiles and the total acres. For linear projects, give location at each end of the construction area.

Name of the receiving waters: Trace the route of stormwater runoff from the site and determine the name of the water course(s) into which the runoff drains. Note that the water course may or may not be located on the construction site. If the first water body receiving construction site runoff is unnamed ("unnamed tributary"), determine the name of the waterbody that the unnamed tributary enters.

An ARAP may be required: **If your work will disturb or cause alterations of a stream or wetland, you must obtain an appropriate Aquatic Resource Alteration Permit (ARAP).** If wetlands are located on-site and may be impacted, attach the wetland delineation report. If you have a question about the ARAP program, contact your local Field Office (EFO).

Submitting the form and obtaining more information: Note that this form must be signed by the company President, Vice-President, or a ranking elected official in the case of a municipality, for details see subpart 2.5. For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC). Submit the completed NOI form (keep a copy for your records) to the appropriate EFO for the county(ies) where the construction activity is located, addressed to **Attention: Stormwater NOI Processing.**

Notice of Coverage: The division will review NOIs for completeness and accuracy and issue an NOC to site-wide primary operators, authorizing SW discharge from the construction site as of the effective date of the NOC. New subsequent operators will not receive an NOC, but are considered covered under the permit when their permit record is published on TDEC's dataviewer as "active" and with an effective date. TDEC Permit Dataviewer can be found at: http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34001:0

EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305-4316	Chattanooga	1301 Riverfront Pkwy, Suite 206	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

Notice of Intent

Appendix A



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)

Division of Water Resources

William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-888-891-TDEC (8332)

Notice of Termination (NOT) for General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

This form is required to be submitted when requesting termination of coverage from the CGP. The purpose of this form is to notify the TDEC that either all stormwater discharges associated with construction activity from the portion of the identified facility where you, as an operator, have ceased or have been eliminated; or you are no longer an operator at the construction site. Submission of this form shall in no way relieve the permittee of permit obligations required prior to submission of this form. Please submit this form to the local DWR Environmental Field Office (EFO) address (see table below). For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC).

Type or print clearly, using ink.

Site or Project Name:	NPDES Tracking Number: TNR
Street Address or Location:	County(ies):

Name of Permittee Requesting Termination of Coverage:			
Permittee Contact Name:		Title or Position:	
Mailing Address:		City:	State: Zip:
Phone:		E-mail:	

Check the reason(s) for termination of permit coverage:

<input type="checkbox"/>	Stormwater discharge associated with construction activity is no longer occurring and the permitted area has a uniform 70% permanent vegetative cover OR has equivalent measures such as rip rap or geotextiles, in areas not covered with impervious surfaces.
<input type="checkbox"/>	You are no longer the operator at the construction site (i.e., termination of site-wide, primary or secondary permittee coverage).

Certification and Signature: (must be signed by president, vice-president or equivalent ranking elected official)

I certify under penalty of law that either: (a) all stormwater discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or (b) I am no longer an operator at the construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

For the purposes of this certification, elimination of stormwater discharges associated with construction activity means that all stormwater discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have been eliminated from the portion of the construction site where the operator had control. Specifically, this means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized, the temporary erosion and sediment control measures have been removed, and/or subsequent operators have obtained permit coverage for the site or portions of the site where the operator had control.

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Permittee name (print or type):	Signature:	Date:
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EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett, TN	38133	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305	Chattanooga	1301 Riverfront Parkway, Ste. 206	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

Notice of Termination

Appendix B



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)

Division of Water Resources

William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-888-891-8332 (TDEC)

General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

Construction Stormwater Inspection Certification (Twice-Weekly Inspections)

Site or Project Name:		NPDES Tracking Number: TNR
Primary Permittee Name:		Date of Inspection:
Current approximate disturbed acreage:	Has rainfall been checked/documented daily? Yes No	Name of Inspector:
Current weather conditions:		Inspector's Training Certification Number:

Please check the box if the following items are on-site:

Notice of Coverage (NOC) Stormwater Pollution Prevention Plan (SWPPP) Twice-weekly inspection documentation
 Site contact information Rain Gage Off-site Reference Rain Gage Location: _____

Best Management Practices (BMPs):

Are the Erosion Prevention and Sediment Controls (EPSCs) functioning correctly: If "No," describe below in Comment Section

1. Are all applicable EPSCs installed and maintained per the SWPPP?	Yes	No
2. Are EPSCs functioning correctly at all disturbed areas/material storage areas per section 4.1.5?	Yes	No
3. Are EPSCs functioning correctly at outfall/discharge points such that there is no objectionable color contrast in the receiving stream, and no other water quality impacts per section 5.3.2?	Yes	No
4. Are EPSCs functioning correctly at ingress/egress points such that there is no evidence of track out?	Yes	No
5. If applicable, have discharges from dewatering activities been managed by appropriate controls per section 4.1.4? If "No," describe below the measures to be implemented to address deficiencies.	Yes	No
6. If construction activity at any location has temporarily/permanently ceased, was the area stabilized within 14 days per section 3.5.3.2? If "No," describe below each location and measures taken to stabilize the area(s)	Yes	No
7. Have pollution prevention measures been installed, implemented, and maintained to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters per section 4.1.5? If "No," describe below the measures to be implemented to address deficiencies.	Yes	No
8. If a concrete washout facility is located on site, is it clearly identified on the project and maintained? If "No," describe below the measures to be implemented to address deficiencies.	N/A	Yes No
9. Have all previous deficiencies been addressed? If "No," describe remaining deficiencies in Comment section. Check if deficiencies/corrective measures have been reported on a previous form.	Yes	No

Comment Section. If the answer is "No" for any of the above, please describe the problem and corrective actions to be taken. Otherwise, describe any pertinent observations:

Certification and Signature (must be signed by the certified inspector and the permittee per Sections 3.5.8.2 (g) and 7.7.2 of the CGP)

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Inspector Name and Title:	Signature:	Date:
Primary Permittee Name and Title:	Signature:	Date:

Construction Stormwater Inspection Certification Form (Twice-Weekly Inspections)

Purpose of this form/ Instructions

An inspection, as described in section 3.5.8.2. of the General Permit for Stormwater Discharges from Construction Activities ("Permit"), shall be performed at least twice every calendar week and documented on this form. Inspections shall be performed at least 72 hours apart. Where sites or portion(s) of construction sites have been temporarily stabilized, or runoff is unlikely due to winter conditions (e.g., site covered with snow or ice), such inspection only has to be conducted once per month until thawing results in runoff or construction activity resumes.

As described in section 3.5.8.1 of the Permit, inspectors performing the required twice weekly inspections must have an active certification by completing the "Fundamentals of Erosion Prevention and Sediment Control Level I" course (<http://www.tnepsc.org/>). Twice weekly inspections can also be performed by: a licensed professional engineer or landscape architect; a Certified Professional in Erosion and Sediment Control (CPESC) or a person who has successfully completed the "Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites" course. A copy of the certification or training record for inspector certification should be kept on site.

Qualified personnel, (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, locations where vehicles enter or exit the site, and each outfall.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the site's drainage system. Erosion prevention and sediment control measures shall be observed to ensure that they are operating correctly.

Outfall points (where discharges leave the site and/or enter waters of the state) shall be inspected to determine whether erosion prevention and sediment control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified, or repaired as necessary, before the next rain event if possible, but in no case more than 7 days after the need is identified.

Based on the results of the inspection, the site description identified in the SWPPP in accordance with section 3.5.1 of the Permit and pollution prevention measures identified in the SWPPP in accordance with section 3.5.2 of the Permit, shall be revised as appropriate, but in no case later than 7 days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP, but in no case later than 14 days following the inspection.

All inspections shall be documented on this Construction Stormwater Inspection Certification form. Alternative inspection forms may be used as long as the form contents and the inspection certification language are, at a minimum, equivalent to the division's form and the permittee has obtained a written approval from the division to use the alternative form. Inspection documentation will be maintained on site and made available to the division upon request. Inspection reports must be submitted to the division within 10 days of the request.

Trained certified inspectors shall complete inspection documentation to the best of their ability. Falsifying inspection records or other documentation or failure to complete inspection documentation shall result in a violation of this permit and any other applicable acts or rules.

Stabilization Plan

Appendix D

All erosion control measures are to be performed in strict accordance with requirements of the Tennessee Department of Environment and Conservation. The following construction sequence shall be complied with for all work.

1. Obtain Grading Permit if required by the state.
2. Install all erosion control measures as required by the Tennessee Department of Environment and Conservation.
3. Obtain certificate of compliance through on-site inspection by a representative of the Tennessee Department of Environment and Conservation if required by the state.
4. Proceed with grading, clearing and grubbing. All clearing and grubbing shall be performed within 10 days or less before commencement of grading.
5. Temporary or permanent stabilization shall be applied to denuded areas within 15 days of the cessation of construction activity, with permanent stabilization applied as soon as possible. Seed and soil amendments shall be placed on a prepared seedbed at the following rates per acre:

TEMPORARY PLANTS

Species	Rate (lb/acre)	Seeding Dates
Rye	120	Jan 1 – May 1
Oats	60	Aug 15 – Dec 15
Brown top millet	30	Aug 15 – Dec 15

Seeding Dates

Middle TN

Soil Amendments

Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool. Netting must be biodegradable.

Maintenance

Re-fertilize if growth is not fully adequate. Reseed, re-fertilize and mulch immediately following erosion or other damage.

Oats and Brown top millet: If necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre crimson clover in late February or early March

PERAMANENT PLANT MIXTURES

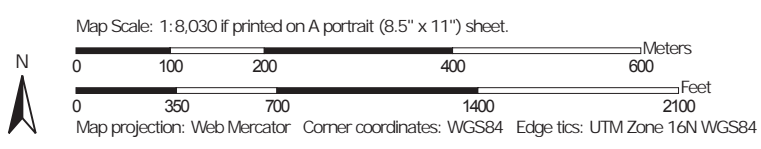
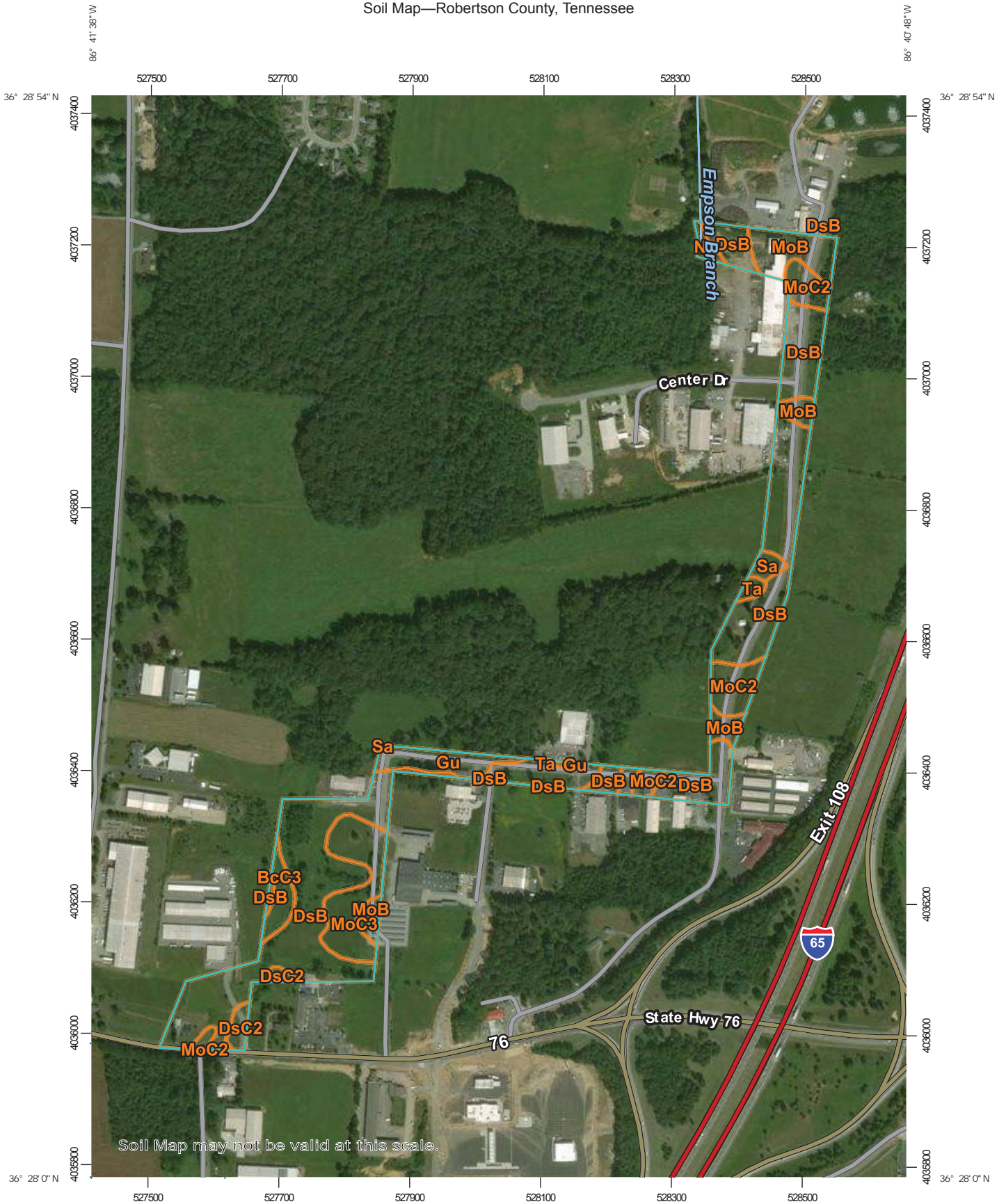
Zone		Best	Marginal	Preferred Rate/Mix (lb/ac PLS)
Region II	Low maintenance; Slopes and poor, shallow soils	Aug 25 - Sept 15 Feb15 - May 30	Sept 15 - Oct 25 Mar 21 - May 30	15 Browntop millet* (nurse crop) 5 Little Bluestem 2 switch grass 2 tall dropseed 5 sideoats gramma 2 black-eyed susan 2 partridge pea 1 greyheaded coneflower
	Low maintenance; Moderate slopes; soils > 6 in. Depth	Aug 25 - Sept 15 Feb15 - May 30	Sept 15 - Oct 25 Mar 21 - May 30	15 Browntop millet* (nurse crop) 5 purpletop 5 Little Bluestem 5 Virginia wild rye 2 black-eyed susan 2 partridge pea 1 greyheaded coneflower
	High maintenance	Aug 30 - Oct 15	Feb 15 -Apr 15	15 Browntop millet* (nurse crop) 2 partridge pea 45 Redfescue* 45 hard fescue* 25 chewing fescue*

ALLOWABLE SEED MIXES AND PLANTING DATES

Zone		Best	Marginal	Preferred Rate/Mix (lb/ac PLS)
Region II	Low maintenance; Slopes and poor, shallow soils	Feb 1-Mar 20 Sep 1-Sep 30	Mar 20-Apr 30 Sept 30- Oct 31	80 Pensacola bahiagrass 30 Bermudagrass (hulled) 20 Korean lespedeza** 15 Kobe lespedeza**
	Low maintenance; Moderate slopes; soils > 6 in. Depth	Apr 1-July 15		50 Pensacola bahiagrass 15 Bermudagrass (hulled) 30 Korean lespedeza** 15 foxtail millet**

- (a) Soil testing should be performed and evaluated by an agronomist to determine soil treatment requirements for parameters such as pH, nitrogen, phosphorous, potassium, and other factors.
 - (b) Seed should be irrigated during dry periods.
 - (c) Inoculate clover.
 - (d) Inoculate crownvetch with special inoculant. When seeded with hydroseeder, use 10 times the amount of inoculant stated for non-hydroseed application.
6. Maintain soil erosion control measures until permanent groundcover is established.
 7. Remove soil erosion control measures and stabilize these areas.
 8. Request final approval by the Tennessee Department of Environment and Conservation

Soil Map—Robertson County, Tennessee



MAP LEGEND

- Area of Interest (AOI)
- Area of Interest (AOI)
- Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points
- Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features
- Water Features**
- Streams and Canals
- Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads
- Background**
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Robertson County, Tennessee
 Survey Area Data: Version 15, Sep 25, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 30, 2012—Mar 24, 2017

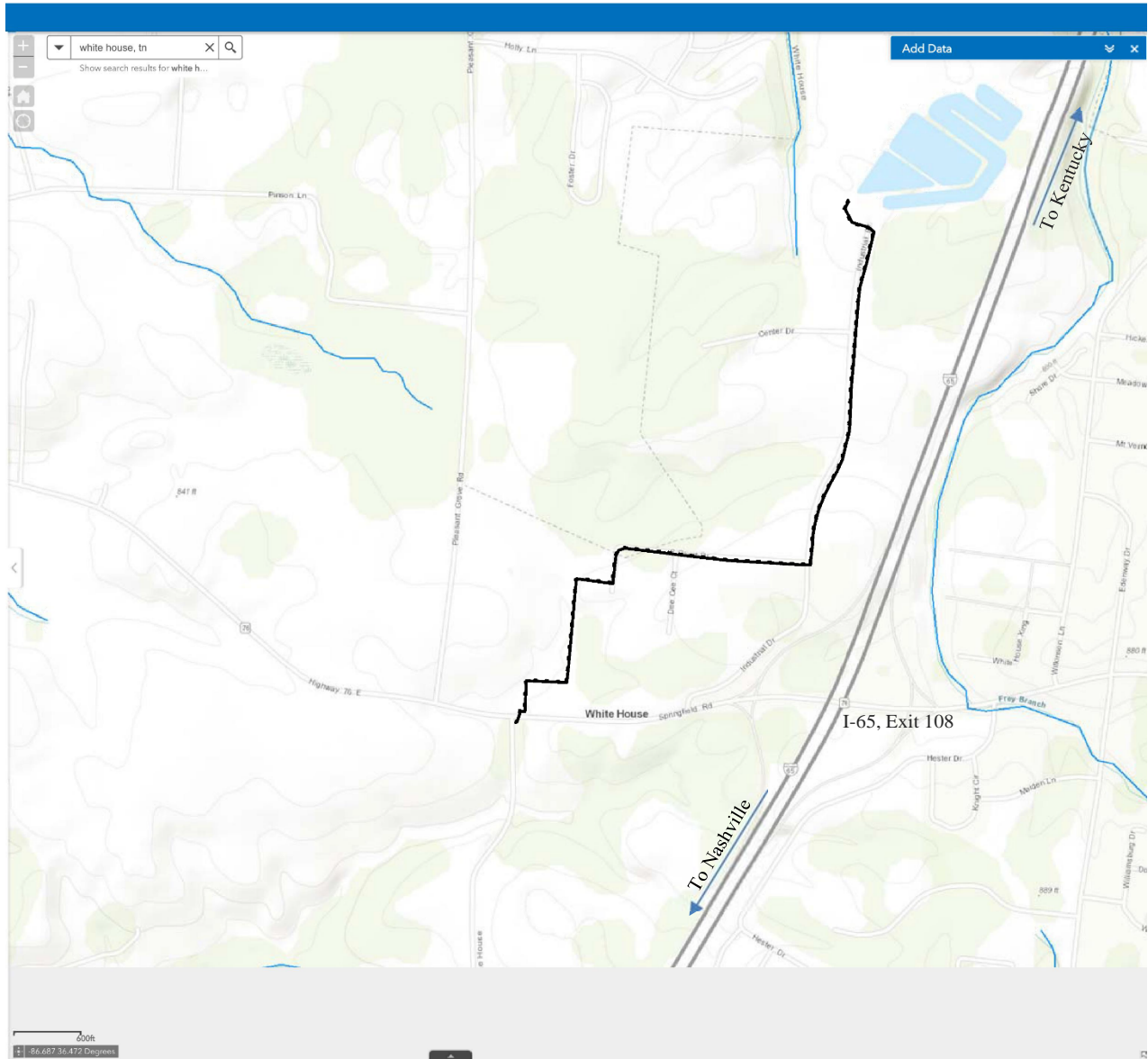
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BcC3	Baxter cherty silty clay loam, 5 to 12 percent slopes severely eroded	0.9	2.6%
DsB	Dickson silt loam, 2 to 5 percent slopes	20.4	57.6%
DsC2	Dickson silt loam, 5 to 12 percent slopes	0.6	1.7%
Gu	Guthrie silt loam, 0 to 2 percent slopes, frequently ponded	1.7	4.7%
MoB	Mountview silt loam, 2 to 5 percent slopes	3.7	10.3%
MoC2	Mountview silt loam, 5 to 12 percent slopes	2.6	7.2%
MoC3	Mountview silt loam, 5 to 12 percent slopes, severely eroded	3.2	9.1%
Ne	Newark silt loam	0.3	0.9%
Sa	Sango silt loam, 0 to 2 percent slopes	0.4	1.1%
Ta	Taft silt loam, 0 to 2 percent slopes	1.7	4.7%
Totals for Area of Interest		35.4	100.0%

Site Location Map

Appendix F



Drawings

Appendix G

See Plans under separate cover.

PART 1 GENERAL

The total Bid Price for each section of the contract shall cover all work required by the Contract Documents. All cost in connection with the proper and successful completion of the work including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plant, equipment and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the bid Form shall be considered a subsidiary obligation of the Contract and all costs in connection therewith shall be included in the prices bid.

1.1 SCOPE OF WORK

This section covers the method of measurement and payment for items of work under this contract.

1.2 ESTIMATED QUANTITIES

All estimated quantities stipulated in the Bid Form or other Contract Documents are approximate and are to be used only a) as a basis for estimating the probable cost of the work and b) for the purpose of comparing the bids submitted for the work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. In some cases, a unit price item has been added to the bid schedule for the purpose of establishing a cost basis in the event work associated with that item is required. No guarantee is expressed or implied that the quantities shown in the bid schedule shall be required to fulfill the Contract. The basis of payment for work and materials will be the actual amount of work done and materials furnished. The Contractor agrees that he will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts thereof.

1.3 WORK ITEMS

The following describes the method of measurement and payment for the bid items shown in the Bid Schedule.

BID ITEM 1: MOBILIZATION

Partial payments for the item "Mobilization" will be made with the first and second partial pay estimates paid on the contract and will be made at the rate of 50% of the lump sum price for "Mobilization" on each of these partial pay estimates. The amount for "Mobilization" shall include all costs for Contractor's bonds, insurance, temporary office facilities, sanitary and power, and all other miscellaneous costs.



BID ITEM 2: 8-INCH DR 26 PVC GRAVITY SEWER LINE

Payment shall constitute full compensation for furnishing all equipment, tools, labor, materials, incidentals, and performance of all work necessary to install the PVC Gravity Sewer Line.

Gravity sewer lines shall be paid for at the contract unit price per linear feet of 8-inch DR 26 PVC pipe as installed and verified. Quantities of pipe installed in accordance with the requirements of the Section shall be verified in the field by the Engineer or City representative. Linear foot measurements shall be actual pipe installed.

The unit price bid for gravity sewer line shall include all excavation, pavement cuts, sewer line installation including 6-inches of No. 57 stone bedding, fittings, full stone and/or select backfill, reconnection of residential services, compaction, clay/concrete collars, testing, cleanup and site restoration, excavation of all material encountered including rock, and backfill including borrow dirt or crushed stone for suitable material if required. The unit price bid shall include the placement of a 2-inch layer of sand on all pavement areas prior to stockpiling spoil material to facilitate cleanup.

Note that the unit price bid shall include all costs for cleanup and site restoration. The Owner reserves the right to withhold up to 30% of the unit price bid for this item if, in the opinion of the Engineer/City representative, adequate site cleanup, erosion control, and restoration is not being performed.

BID ITEM 3: 12-INCH SDR 21 SEWER FORCE MAIN

Payment shall constitute full compensation for furnishing all equipment, tools, labor, materials, incidentals, and performance of all work necessary to install the PVC Sewer Force Main.

Sewer force main shall be paid for at the contract unit price per linear feet of 12-inch SDR 21 PVC pipe as installed and verified. Quantities of pipe installed in accordance with the requirements of the Section shall be verified in the field by the Engineer or City representative. Linear foot measurements shall be actual pipe installed.

The unit price bid for sewer force main shall include all excavation, pavement cuts, sewer force main installation, fittings, tracer wire, thrust blocking, full stone and/or select backfill, compaction, clay/concrete collars, testing, cleanup and site restoration, excavation of all material encountered including rock, tracer wire, and backfill including borrow dirt or crushed stone for suitable material if required. The unit price bid shall include the placement of a 2-inch layer of sand on all pavement areas prior to stockpiling spoil material to facilitate cleanup.



Note that the unit price bid shall include all costs for cleanup and site restoration. The Owner reserves the right to withhold up to 30% of the unit price bid for this item if, in the opinion of the Engineer/City representative, adequate site cleanup, erosion control, and restoration is not being performed.

BID ITEM 4: 12- DIP CLASS 350

Payment shall constitute full compensation for furnishing all equipment, tools, labor, materials, incidentals, and performance of all work necessary to install the DIP Sewer Force Main.

Sewer force main shall be paid for at the contract unit price per linear feet of 12-inch Class 350 DI pipe as installed and verified. Quantities of pipe installed in accordance with the requirements of the Section shall be verified in the field by the Engineer or City representative. Linear foot measurements shall be actual pipe installed.

The unit price bid for sewer force main shall include all excavation, pavement cuts, sewer force main installation, fittings, tracer wire, thrust blocking, full stone and/or select backfill, compaction, clay/concrete collars, testing, cleanup and site restoration, excavation of all material encountered including rock, and backfill including borrow dirt or crushed stone for suitable material if required. The unit price bid shall include the placement of a 2-inch layer of sand on all pavement areas prior to stockpiling spoil material to facilitate cleanup.

Note that the unit price bid shall include all costs for cleanup and site restoration. The Owner reserves the right to withhold up to 30% of the unit price bid for this item if, in the opinion of the Engineer/City representative, adequate site cleanup, erosion control, and restoration is not being performed.

BID ITEM 5: BORE AND JACK

Payment shall constitute full compensation for furnishing all equipment, tools, labor, materials, incidentals and performance of all work necessary to bore and jack and place 18-inch steel encasement pipe.

Bore and jack shall be paid for at the contract unit price per linear feet of steel encasement as installed and verified. Quantities of steel encasement installed in accordance with the requirements of the Section shall be verified in the field by the Engineer or City representative. Linear foot measurements shall be actual pipe installed.

The unit price bid for bore and jack shall include all excavation, performance of bore and jack, steel encasement pipe, spacers, end caps, fittings, backfill (full stone backfill in roadway), compaction, testing, and clean up. Asphalt Repair shall be paid under Bid Item 8.



BID ITEM 6: 12-INCH GATE VALVE AND BOX

Work included under this line item of payment shall include furnishing and installing gate valves as indicated on the drawings. The unit price bid shall include all costs for excavation, valve support pads, materials, valve box, backfill and compaction, compaction, and site restoration. Payment will be made at the unit price bid for the actual number and type of valve installed.

BID ITEM 7: 12-INCH INSERTA TEE AND BOX

Work included under this line item of payment shall include furnishing and installing Inserta Tee (or approved equal) as indicated on the drawings. The unit price bid shall include all costs for excavation, valve, materials, valve box, backfill and compaction, compaction, and site restoration. Payment will be made at the unit price bid for the actual number and type of valve installed.

BID ITEM 8: COMBINATION AIR/VACUUM RELEASE VALVE

Work included under this line item of payment shall include furnishing and installing air/vacuum release valves as indicated on the drawings. The unit price bid shall include all costs for excavation, materials including, but not limited to, the air release valve, tapping saddle, corp stop or gate valve, copper tubing, precast concrete vault, backfill, compaction, and site restoration. Payment will be made at the unit price bid for the actual number of air/release valve installed.

BID ITEM 9: ASPHALT ROAD/DRIVE REPAIR

Work included under this line item of payment shall include the repair of pavement per the Contract Plans and Specifications. Typical pavement repair shall be paid for at the unit price per linear foot for pavement repair as measured by pipe lay length by five (5) feet. If contractor chooses to perform work with wider trench, contractor shall bear the additional cost except where noted on plans. Price shall include full stone backfill, saw cuts as needed, pug mix for temporary cap, tack coat, and asphalt in place. Quantities of pavement repair in accordance with the requirements of this section shall be verified in the field by the Engineer or City representative.

BID ITEM 10: CONCRETE DRIVE REPAIR

Work included under this line item of payment shall include the repair of concrete per the Concrete Plans and Specifications. Typical concrete repair shall be paid for at the unit price per square foot for concrete repairs. Price shall include saw cuts as needed, reinforcement, and concrete in place. Drives shall be cut at the nearest expansion joint to provide an aesthetic look. Quantities of concrete repair in accordance with the requirements of this section shall be verified in the field by the Engineer or City representative.



BID ITEM 11: CONNECTION TO EXISTING FORCE MAIN

Payment for making connections to existing force main where shown on the plans or directed by the Engineer will be made at the unit price for each such complete connection. Unit price shall include all necessary materials, labor, and equipment for a complete installation. No additional payment shall be made for items incidental with tie-ins; such as excavation, bypass pumping, etc.; which are not specifically shown on the Contract Plans or Details. Payment shall also include full stone backfill (in roadways), compaction, and site restoration.

BID ITEM 12 CONNECT NEW FORCE MAIN TO NPC PUMP STATION

Payment for this item shall be covered under the specific lump sum item associated with said work. The bid price shall include all items incidental to the removal of concrete cap encasing the existing pipe, removal and replacement of new 12-inch ductile iron pipe, and any boot/gasket for wall penetration if necessary.

All work, equipment, and materials necessary to complete the connection shall be included in the lump sum price. Pipe length and fittings shall be paid under Bid Item 4 of this contract.

BID ITEM 13: MANHOLE RISER REALIGNMENT

Payment for this item shall be covered under the specific lump sum items associated with said work. The bid price shall include all items incidental to the realignment and patching of the existing manhole at the pump station at the Granda Flora location including all labor, materials, equipment and incidentals to realign the risers and seal the joints using mastic and an outer coating of Anhydrous Cement. This Bid Item shall also include restoration of surface.

BID ITEM 14: VALVE VAULT COMPLETE – GRANDA FLORA

Payment for this item shall be covered under the specific lump sum items associated with said work. The bid price shall include all items incidental to the construction of the valve vault including pre-cast concrete vault, gate valves, check valve, air release valve, quick connect by-pass connection, piping spools, excavation, backfill, and restoration of surfaces. This Bid Item shall include cost for additional fencing to fully enclose both vaults.

BID ITEM 15: VALVE VAULT COMPLETE – No. PALMERS CHAPEL

Payment for this item shall be covered under the specific lump sum items associated with said work. The bid price shall include all items incidental to the construction of the valve vault including pre-cast concrete vault, gate valves, check valve, air release valve, quick connect by-pass connection, piping spools, excavation, backfill, and restoration of surfaces including asphalt pavement repairs.



BID ITEM 16: FLOW METER WITH VAULT

Payment for this item shall be covered under the specific lump sum items associated with said work. The bid price shall include all items incidental to the construction of the flow meter vault including pre-cast concrete vault, flow meter, piping spools, excavation, backfill, and restoration of surfaces including asphalt pavement repairs where necessary.

BID ITEM 17: CHAIN-LINK FENCING

Payment shall constitute full compensation for furnishing all equipment, tools, labor, incidentals, and performance of all work necessary to install chain-link fencing at both pump station locations as indicated on the Contract Drawings.

The unit price bid for chain-link fencing shall include all installation, labor, and materials including fencing fabric, framing, privacy slats, tension wire, barb wire, fittings, grout and anchoring cement, cleanup and site restoration. The unit price bid shall include the placement of a 2-inch layer of sand on all pavement areas prior to stockpiling spoil material to facilitate cleanup.

Quantities of fencing installed in accordance with the requirements of the Section shall be verified in the field by the Engineer or City representative. Linear foot measurements shall be actual fencing installed.

BID ITEM 18 CHAIN-LINK GATE

Payment shall constitute full compensation for furnishing all equipment, tools, labor, incidentals, and performance of all work necessary to install chain-link gate at the No Palmer's Chapel pump station location as indicated on the Contract Drawings.

The unit price bid for chain-link gate shall include all installation, labor, and materials including fencing fabric, framing, privacy slats, tension wire, barb wire, fittings, grout and anchoring cement, cleanup and site restoration. Number of gates installed in accordance with the requirements of the Section shall be verified in the field by the Engineer or City representative.

BID ITEM 19: EROSION AND SEDIMENT CONTROLS

Payment for this item shall be consist of the installation of all erosion control measures called for in the Stormwater Pollution Prevention Plan and on the Contract Plans including silt fence, diversion ditches, tubes and waddles, check dams, sediment traps, mud mats and other measures as may be found necessary to prevent sediment loss from the construction areas. During construction and until a complete ground cover is established, the maintenance of these measures is also required and included in this item.



1.05 ALL OTHER WORK ITEMS

All other work items not covered in 1.04 shall be considered incidental to other work items that have unit or lump sum prices. Therefore, no separate payment shall be made for these work items.

END OF SECTION



PART 1: GENERAL**1.1 SCOPE OF WORK****A. GENERAL**

The work covered by this Section shall consist of furnishing all materials, labor, equipment, and services for the excavation and backfill at all areas within the limits of the project. Work is limited to the areas of construction, and includes, but is not limited to, stockpiling of topsoil, site grading, excavation of footings and trenches, filling, backfilling, compaction, finish grading, spreading of topsoil, disposal of waste material, and proof rolling.

1. Perform all excavation, dewatering, sheeting, bracing, and backfilling in such a manner as to eliminate all possibility of undermining or disturbing the foundations of existing structures.
2. Provide all labor, materials, equipment, and services indicated on the Drawings, or specified herein, or reasonably necessary for or incidental to a complete job.
3. Excavations shall provide adequate working space and clearances for the work to be performed therein and for installation and removal of concrete forms. In no case shall excavation faces be undercut for extended footings.
4. Subgrade surfaces shall be clean and free of loose material of any kind when concrete is placed thereon.
5. Backfilling during freezing weather shall not be done except by permission of the City. No backfill, fill, or embankment materials shall be installed on frozen surfaces, nor shall frozen materials, snow, or ice be placed in any backfill, fill, or embankment.

1.2 SYSTEM DESCRIPTION

Excavation consists of the removal and disposal of all materials encountered for footings, foundations, pipework, and other construction as shown on the Drawings. Perform all excavation work in compliance with applicable requirements of governing authorities having jurisdiction.



1.3 QUALITY ASSURANCE

B. REFERENCED STANDARDS

Unless otherwise indicated, all referenced standards shall be the latest edition available at the time of bidding. Any requirements of these Specifications shall in no way invalidate the minimum requirements of the referenced standards. Comply with the provisions of the following codes and standards, except as otherwise shown or specified.

1. ASTM C33: "Standard Specifications for Concrete Aggregate";
2. ASTM D698: "Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. Rammer and 12" Drop";
3. ASTM D3282: "Standard Recommended Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes";
4. Standard Specifications for Road and Bridge Construction, Tennessee Department of Transportation, March 1, 1995 edition; and
5. Erosion and Sediment Control Planning and Design Manual.

C. UNAUTHORIZED EXCAVATION

Except where otherwise authorized, indicated, or specified, all materials excavated below the bottom of concrete walls, footings, slabs on grade, and foundations shall be replaced, by and at the expense of the Contractor, with concrete placed at the same time and monolithic with the concrete above.

D. EXISTING UTILITIES

1. Locate existing underground utilities in the area of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
2. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the City immediately for directions as to procedure. Cooperate with City and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of utility companies.



1.3 SITE CONDITIONS

No test borings or related subsurface information is available for the project area. Test borings and other exploratory operations may be undertaken by the Contractor at his own expense provided such operations are acceptable to the City.

PART 2: PRODUCTS

2.1 MATERIALS

A. CLASSIFICATION OF EXCAVATED MATERIALS

All materials excavated for this project, regardless of its nature or composition shall be classified as Unclassified Excavation.

B. CLASSIFICATION OF OTHER MATERIALS

1. Satisfactory Subgrade Soil Materials

Soils shall comply with ASTM D 3282, soil classification Groups A-1, A-2-4, A-2-5, and A-3.

2. Unsatisfactory Subgrade Soil Materials

Soils described in ASTM D 3282, soil classification groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7; also peat and other highly organic soils shall not be used, unless otherwise acceptable to the City.

3. Cohesionless Soil Materials:

Gravels, sand-gravel mixtures, sands, and gravelly-sands are classified as cohesionless soil materials.

4. Cohesive Soil Materials

Clayey and silty gravels, sand-clay mixtures, gravel-silt mixtures, clayey and silty sands, sand-silt mixtures, clays, silts, and very fine sands are classified as cohesive soil materials.

5. Backfill and Fill Materials

Provide satisfactory soil materials for backfill and fill, free of masonry, rock, or gravel larger than four inches (4") in any dimension, and free of metal, gypsum, lime, debris, waste, frozen materials, vegetable, and other deleterious matter. Use only excavated material that has been sampled, tested, and certified as satisfactory soil material.



6. Select Backfill

Select backfill is defined as backfill and fill material that is transported to the site from outside the project limits, and which meets the soil requirements specified above under “Backfill and Fill Materials.” Material excavated in conjunction with the construction of this project cannot be considered as “select backfill” for payment purposes.

7. Pipe Bedding

Crushed stone or crushed gravel used in pipe bedding shall meet the requirements of ASTM C 33, Gradation 67.

8. Inundated Sand:

Sand for inundated sand backfill shall be clean with not more than twenty-five percent (25%) retained on a No. 4 sieve and not more than seven percent (7%) passing a No. 200 sieve and shall have an effective size between 0.10 mm and 0.30 mm. Sand shall be deposited in, or placed simultaneously with application of, water so that the sand shall be compacted by a mechanical probe type vibrator. Inundated sand shall be compacted to seventy-percent (70%) relative density as determined by ASTM D4253 and D4254.

9. Graded Gravel

Gravel for compacted backfill shall conform to the following gradation:

Sieve Size	Percent Passing by Weight
1”	100
3/4”	85 - 100
3/8”	50 - 80
No. 4	35 - 60
No. 40	15 - 30
No. 200	05 - 10

The gravel mixture shall contain no clay lumps or organic matters. The fraction passing the No. 4 sieve shall have a liquid limit not greater than 25 and a plasticity index not greater than 5. Gravel backfill shall be deposited in uniform layers not exceeding twelve inches (12”) in uncompacted thickness. The backfill shall be compacted by a suitable vibratory roller or platform vibrator to not less than seventy percent (70%) relative density as determined by ASTM D4253 and D4254.



2.2 EQUIPMENT

A. MECHANICAL EXCAVATION

1. The use of mechanical equipment will not be permitted in locations where its operation would cause damage to trees, buildings, culverts, or other existing property, utilities, or structures above or below ground. In all such locations, hand excavating methods shall be used.
2. Mechanical equipment used for trench excavation shall be of a type, design, and construction and shall be controlled, that uniform trench widths and vertical sidewalls are obtained at least from an elevation one foot (1') above the top of the installed pipe to the bottom of the trench, and that trench alignment is such that pipe when accurately laid to specified alignment will be centered in the trench with adequate clearance between the pipe and sidewalls of the trench. Undercutting the trench sidewall to obtain clearance will not be permitted.

PART 3: EXECUTION

3.1 PREPARATION

A. DEWATERING

1. The Contractor shall provide and maintain adequate dewatering equipment to remove and dispose of all surface water and groundwater entering excavations, trenches, or other parts of the work. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe to be installed therein, is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result.
2. All excavations for concrete structures or trenches that extend down to or below groundwater shall be dewatered by lowering and keeping the groundwater level beneath such excavations twelve inches (12") or more below the bottom of the excavation.
3. Surface water shall be diverted or otherwise prevented from entering excavated areas or trenches to the greatest extent practicable without causing damage to adjacent property.
4. The Contractor shall be responsible for the condition of any pipe or conduit that he may use for drainage purposes, and all such pipes or conduits shall be left clean and free of sediment.



5. Where trench sheeting is left in place, such sheeting shall not be braced against the pipe, but shall be supported in a manner that will preclude concentrated loads or horizontal thrusts on the pipe. Cross braces installed above the pipe to support sheeting may be removed after pipe embedment has been completed.

B. STABILIZATION

1. Subgrades for concrete structures and trench bottoms shall be firm, dense, and thoroughly compacted and consolidated; free from mud and muck; and sufficiently stable to remain firm and intact under the feet of the workmen.
2. Subgrades for concrete structures or trench bottoms, which are otherwise solid but that become mucky on top due to construction operations, shall be reinforced with one (1) or more layers of crushed rock or gravel. The stabilizing material shall be spread and compacted to a depth of not more than four inches (4"); if the required depth exceeds four inches (4"), the material shall be furnished and installed as specified for granular fills. Not more than one-half inch (1/2") depth of mud or muck shall be allowed to remain on stabilized trench bottoms when the pipe bedding material is placed thereon. The finished elevation of stabilized subgrades for concrete structures shall not be above subgrade elevations indicated on the drawings.

C. CUTTING CONCRETE OR ASPHALT SURFACE CONSTRUCTION

1. All pavement cutting and repair shall be done in accordance with Local ordinances. Cuts in concrete and asphaltic concrete shall be no larger than necessary to provide adequate working space for proper installation of pipe and appurtenances. Cutting shall be performed with a concrete saw in a manner that will provide a clean groove the complete thickness of the surface material along each side of the trench and along the perimeter of cuts for structures.
2. Concrete and asphaltic concrete over trenches excavated for pipelines shall be removed so that a shoulder not less than twelve inches (12") in width at any point is left between the cut edge of the surface and the top edge of the trench. Trench width at the bottom shall not be greater than at the top, and no undercutting will be permitted. Cuts shall be made to and between straight or accurately marked curved lines that, unless otherwise required, shall be parallel to the center line of the trench.



3. Pavement or other surfaces removed for connections to existing lines or structures shall not be of greater extent than necessary for the installation.
4. Where the trench parallels the length of concrete walks and the trench location is all or partially under the walk, the entire walk shall be removed and replaced. Where the trench crosses drives, walks, curbs, or other surface construction, the surface construction shall be removed and replaced between existing joints or between saw cuts as specified for payment.

D. SITE GRADE

1. General

Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finish the surface within specified tolerances; compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

2. Ground Surface Preparation

Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface. Shape the subgrade as indicated on the Drawings by forking, furrowing, or plowing so that the first layer of new material placed thereon will be well bonded to it.

3.2 FIELD MEASUREMENTS

A. ALIGNMENT, GRADE, AND MINIMUM COVER

1. Vertical and horizontal alignment of pipes, and the maximum joint deflection used in connection therewith, shall be in conformity with requirements of the Section covering installation of pipe.



2. Where pipe grades or elevations are not definitely fixed by the Contract Drawings, trenches shall be excavated to a depth sufficient to provide a minimum depth of backfill cover over the top of the pipe cover depths may be necessary on vertical curves or to provide necessary clearance beneath existing pipes, conduits, drains, drainage structures, or other obstructions encountered at normal pipe grades. Measurement of pipe cover depth shall be made vertically from the outside top of pipe to finished ground or pavement surface elevation except where future surface elevations are indicated on the Drawings.

B. LIMITING TRENCH WIDTHS

Trenches shall be excavated to a width that will provide adequate working space and sidewall clearances for proper pipe installation, jointing, and embedment. Maximum trench widths shall be no greater than the pipe outside diameter plus twenty-four inches (24") (twelve inches (12") on either side of pipe).

3.3 PROTECTION

A. TEMPORARY PROTECTION

Protect structures, utilities, sidewalks, pavements, and other facilities from damages caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. SHEETING AND BRACING

Make all excavations in accordance with the rules and regulations promulgated by the Department of Labor, Occupational Safety and Health Regulations for Construction. Furnish, put in place, and maintain such sheeting, bracing, etc., as may be necessary to support the sides of the excavation and to prevent any movement of earth that could in any way diminish the width of the excavation to less than that necessary for proper construction, or could otherwise injure or delay the work, or endanger adjacent structures, roads, utilities, or other improvements.

C. BLASTING

1. The Contractor shall be responsible for all damage caused by blasting operations. Suitable methods shall be employed to confine all materials lifted by blasting within the limits of the excavation or trench.
2. All rock that cannot be handled and compacted as earth shall be kept separate from other excavated materials and shall not be mixed with backfill or embankment materials, except as specified or directed.



D. CARE AND RESTORATION OF PROPERTY

1. Enclose the trunks of trees that are to remain adjacent to the work with substantial wooden boxes of such height as may be necessary to protect them from piled material, equipment, or equipment
2. operation. Use excavating machinery and cranes of suitable type, and operate the equipment with care to prevent injury to remaining tree trunks, roots, branches, and limbs.
3. Do not cut branches, limbs, and roots except with permission of the City. Cut smoothly and neatly without splitting or crushing. In case of cutting or unavoidable injury to branches, limbs, and trunks of trees, neatly trim the cut or injured portions and cover with an application of grafting wax and tree healing paint as directed.
4. Protect by suitable means all cultivated hedges, shrubs, and plants that might be injured by the Contractor's operations. Promptly heel in any such trees or shrubbery necessary to be removed and replanted. Perform heeling in and replanting under the direction of a licensed and experienced nurseryman. Replant in their original position all removed shrubbery and trees after construction operations have been substantially completed and care for until growth is reestablished.
5. Replace cultivated hedges, shrubs, and plants injured to such a degree as to affect their growth or diminish their beauty or usefulness, by items of kind and quality at least equal to the kind and quality existing at the start of the work.
6. Do not operate tractors, bulldozers, or other power-operated equipment on paved surfaces if the treads or wheels of the equipment are so shaped as to cut or otherwise injure the surfaces.
7. Restore all surfaces, including lawns, grassed, and planted areas that have been injured by the Contractor's operations, to a condition at least equal to that in which they were found immediately before the work was begun. Use suitable materials and methods for such restoration. Maintain all restored plantings by cutting, trimming, fertilizing, etc., until acceptance. Restore existing property or structures as promptly as practicable and do not leave until the end of construction period.



E. PROTECTION OF STREAMS

Exercise reasonable precaution to prevent the silting of streams. Provide at Contractor's expense temporary erosion and sediment control measures to prevent the silting of streams and existing drainage facilities.

F. AIR POLLUTION

1. Comply with all pollution control rules, regulations, ordinances, and statutes that apply to any work performed under the Contract, including any air pollution control rules, regulations, ordinances and statutes, or any municipal regulations pertaining to air pollution.
2. During the progress of the work, maintain the area of activity, including sweeping and sprinkling of streets as necessary so as to minimize the creation and dispersion of dust. If the City decides that it is necessary to use calcium chloride or more effective dust control, furnish and spread the material as directed and without additional compensation.

3.4 TRENCH EXCAVATION

A. LENGTH OF TRENCH

1. No more trench shall be opened in advance of pipe laying than is necessary to expedite the work. One (1) block or four hundred (400) feet (whichever is the shorter) shall be the maximum length of open trench on any line under construction.
2. Except where tunneling is indicated on the Drawings, in the Specifications, or is permitted by the City, all trench excavation shall be open cut from the surface.

B. TRENCH EXCAVATION

1. General

Perform all excavation of every description and of whatever substance encountered so that the pipe can be laid to the alignment and depth shown on the Drawings.

Brace and shore all trenches, where required, in accordance with the rules and regulations promulgated by the Department of Labor, Occupation Safety and Health Administration, "Safety and Health Regulations for Construction."

Make all excavations by open cut unless otherwise indicated in the Specifications or on the Drawings.



2. Width of Trenches

Excavate trenches sufficiently wide to allow proper installation of pipe, fittings, and other materials and not more than twelve inches (12") clear of pipe on either side at any point. Do not widen trenches by scraping or loosening materials from the sides.

3. Trench Excavation in Earth

Earth excavation includes all excavation of whatever substance encountered. In locations where pipe is to be bedded in earth excavated trenches, fine grade the bottoms of such trenches to allow firm bearing for the bottom of the pipe on undisturbed earth. Where any part of the trench has been excavated below the grade of the pipe, fill the part excavated below such grade with pipe bedding material and compact at the Contractor's expense.

4. Trench Excavation in Fill

If pipe is to be laid in embankments or other recently filled material, first place the fill material to the finish grade or to a height of at least one foot (1') above the top of the pipe, whichever is the lesser. Take particular care to ensure maximum consolidation of material under the pipe location. Excavate the pipe trench as though in undisturbed material.

5. Trench Bottom in Poor Soil

Excavate and remove unstable or unsuitable soil to a width and depth as directed by the City, and refill with a thoroughly compacted gravel bedding.

6. Bell Holes

Provide bell holes at each joint to permit the joint to be made properly and to provide a continuous bearing and support for the pipe.

C. TRENCH BACKFILL

1. General

- a. Unless otherwise indicated in the Specifications or on the Drawings, use suitable material for backfill that was removed in the course of making the construction excavations.
- b. Do not use frozen material for the backfill, and do not place backfill on frozen material. Remove previously frozen material before new backfill is placed.



- c. Start backfilling as soon as practicable after the pipes have been laid or the structures have been built and are structurally adequate to support the loads, including construction loads to which they will be subjected, and proceed until its completion.

2. Material

- a. The nature of the materials will govern both their acceptability for backfill and the methods best suited for their placement and compaction in the backfill. Both are subject to the approval of the City.
- b. Do not place stone or rock fragments larger than four inches (4") in greatest dimension in the backfill.
- c. Do not drop large masses of backfill material into the trench in such a manner as to endanger the pipeline. Use a timber grillage to break the fall of material dropped from a height of more than five feet (5').
- d. Exclude pieces of bituminous pavement from the backfill unless their use is expressly permitted.

3. Zone Around Pipe

- a. Place bedding material to the level shown on the Drawings and work material carefully around the pipe to insure that all voids are filled, particularly in bell holes.
- b. For backfill up to a level of two feet (2') over the top of the pipe, use only selected materials containing no rock, clods, or organic materials.
- c. Place the backfill and compact thoroughly under the pipe haunches and up to the midline of the pipe in layers not exceeding six inches (6") in depth. Place each layer and tamp carefully and uniformly so as to eliminate the possibility of lateral displacement. Place and compact the remainder of the zone around the pipe and to a height of one foot (1')
- d. above the pipe in layers not exceeding six inches (6"), and compact to a maximum density of at least one hundred percent (100%) as determined by ASTM D0698.

4. Tamping

- a. Deposit and spread backfill materials in uniform, parallel layers not exceeding twelve inches (12") thick before compaction.



- b. Tamp each layer before the next layer is placed to obtain a thoroughly compacted mass.
- c. Furnish and use, if necessary, an adequate number of power driven tampers, each weighing at least twenty (20) pounds for this purpose.
- d. Take care that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted.
- e. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similarly powered equipment instead of by tamping.
- f. For compaction by tamping (or rolling), the rate at which backfilling material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting as furnished by the Contractor.
- g. Wet the material by sprinkling, if necessary, to insure proper compaction by tamping (or rolling). Perform no compaction by tamping (or rolling) when the material is too wet either from rain or applied water to be compacted properly.

5. Trench Compaction

Compact backfill in pipe trenches to the maximum density as shown on the Drawings, or as listed in Subsection entitled Compaction, with a moisture content within the range of values of maximum density as indicated by the moisture-density relationship curve.

3.5 SITE GRADE

A. PLACEMENT AND COMPACTION

- 1. Place backfill and fill material in layers not more than eight inches (8") in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content. Compact each layer to the required percentage of maximum density for each area classification. Do not place backfill or material on surfaces that are muddy, frozen, or contain frost or ice.



2. In areas not accessible to rollers or compactors, compact the fill with mechanical hand tampers. If the mixture is excessively moistened by rain, aerate the material by means of blade graders, harrows, or other approved equipment, until the moisture content of the mixture is satisfactory. Finish the surface of the layer by blading or rolling with a smooth roller, or a combination thereof, and leave the surface smooth and free from waves and inequalities.
3. Place backfill and fill materials evenly adjacent to structures, to the required elevations. Take care to prevent wedging action of backfill against structures. Carry the material uniformly around all parts of the structure to approximately the same elevation in each lift.
4. When existing ground surface has a density less than that specified under the subsection entitled Compaction for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

B. GRADING OUTSIDE BUILDING LINES

Grade to drain away from structures to prevent ponding of water. Finish surface free from irregular surface changes.

C. PLANTING AREAS

Finish areas to receive topsoil to within not more than one inch (1") above or below the required subgrade elevations, compacted as specified, and free from irregular surface changes.

D. WALKS

Shape the surface of areas under walks to line, grade, and cross-section, with the finish surface not more than zero inches (0") above or one inch (1") below the required subgrade elevation, compacted as specified, and graded to prevent ponding of water after rains.

E. PAVEMENTS

1. Shape the surface of the areas under pavement to line, grade and cross-section, with finish surface not more than one-half inch (1/2") above or below the required subgrade elevation, compacted as specified, and graded to prevent ponding of water after rains. Include such operations as plowing, discing, and any moisture or aerating required to provide the optimum moisture content for compaction.



2. Fill low areas resulting from removal of unsatisfactory oil materials, obstructions, and other deleterious materials, using satisfactory soil material.
3. Shape to line, grade, and cross-section as shown on the Drawings.

F. PROTECTION OF GRADED AREAS

Protect newly graded areas from traffic and erosion, and keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

G. RECONDITIONING COMPACTED AREAS

Where completed compacted areas are disturbed by subsequent construction operations or adverse weather prior to acceptance of work, scarify surface, reshape, and compact to required density prior to further construction.

H. UNAUTHORIZED EXCAVATION

1. Unauthorized excavation consists of the removal of materials beyond indicated elevations without the specific direction of the City. Under footings, foundations, bases, etc., fill unauthorized excavation by extending the indicated bottom elevation of the concrete to the bottom of the excavation, without altering the required top elevation. Lean concrete fill may be used to bring elevations to proper position only when acceptable to the City.
2. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of the same classification, unless otherwise directed by the City.

3.6 BACKFILL AROUND STRUCTURES

A. GENERAL

1. Unless otherwise indicated in the Specifications or on the Drawings, use suitable material for backfill that was removed in the course of making the backfill, and do not place backfill that was removed in the course of making the construction excavations.
2. Do not use frozen material for the backfill, and do not place backfill upon frozen material. Remove previously frozen material before new backfill is placed.

B. MATERIAL

1. Approved selected materials available from the excavations may be used for backfilling around structures.



2. Obtain material needed in addition to that of construction excavations from approved off-site borrow pits. Furnish all borrow material needed on the work.
3. Place and compact all material, whether from the excavation or borrow, to make a dense, stable fill.
4. Use fill material which contains no vegetation, masses of roots, individual roots over eighteen inches (18") long or more than one-half inch (1/2") in diameter, stones over four inches (4") in diameter, or porous matter. Organic matter must not exceed minor quantities.

C. PLACING BACKFILL

1. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage.
2. Make special leakage tests, if required, as soon as practicable after the structures are structurally adequate and other necessary work has been done.
3. Use the best of the excavated materials in backfilling within two feet (2') of the structure.
4. Avoid unequal soil pressures by depositing the material evenly around the structure.

3.7 COMPACTION

A. GENERAL

Control soil compaction during construction, providing at least the minimum percentage of density specified for each area classification.

B. PERCENTAGE OF MAXIMUM DENSITY REQUIREMENTS

1. After compaction, all fill will be tested in accordance with Method "C" of ASTM D-698, unless specified otherwise.
2. Except as noted otherwise for the zone around pipe, provide not less than the following percentages of maximum density of soil material compacted at optimum moisture content, for the actual density of each layer of soil material-in-place:



UNPAVED AREAS DRIVES AND PARKING TRENCH BACKFILL (PAVED AREAS) TRENCH BACKFILL (UNPAVED AREAS) ALL OTHER BACKFILL	Compact Full Depth to 92% Top 9" - 100% Compact full depth to 95% Compact full depth to 95% Compact full depth to 95%
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C. MOISTURE CONTROL

1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing, until moisture content is reduced to a satisfactory value, as determined by moisture-density relation tests.

3.8 FIELD QUALITY CONTROL

Compaction tests of all fill areas will be made by an independent testing laboratory. Such tests will be provided and paid for by the Developer, except that tests that reveal non-conformance with the Specifications and all succeeding tests for the same area shall be at the expense of the Contractor until conformance with the Specifications is established. The Developer will be responsible for paying for only the successful tests.

END OF SECTION



PART 1: GENERAL

1.01 SCOPE OF WORK

- A. The work under this section consists of furnishing all materials, labor, equipment, and services required for the complete installation of encasement pipe and carrier pipes under highways and railroads by boring and jacking as shown on the Drawings and specified herein.
- B. All work in connection with constructing encasement pipes under highways and railroads shall comply with all current requirements of governing highway and railroad agencies. The Contractor shall be familiar with these requirements.
- C. The Contractor shall inspect the locations at the proposed crossings and shall familiarize himself with the conditions under which the work will be performed, and with all necessary details and the suitability of his equipment and methods for the work required.

PART 2: PRODUCTS

2.01 MATERIALS

- A. Encasement pipe shall be smooth wall welded steel conforming to ASTM Designation A139, Grade B. Minimum pipe diameter and wall thickness for casing installation under roadways shall be as follows:

Pipe - Nominal Diameter Inches	Casing - Nominal Diameter Inches	Wall Thickness - Inches
6	12	0.250
8 -10	16	0.375
12	18	0.375
14	22	0.375
16	24	0.375
18 - 20	30	0.375
24	36	0.375



B. CASING SPACERS

Casing spacers shall meet one (1) of the following requirements and shall be installed no more than seven feet (7') apart:

1. Casing spacers shall be flanged, bolt-on style with a two-section stainless steel shell lined with a PVC liner, minimum 0.09-inch (.09") thick and 85-90 durometer hardness. Runners shall be attached to stainless steel risers, which shall be properly welded to the shell. The height of the runners and risers shall be manufactured such that the pipe does not float within the casing. Casing spacers shall be Cascade Waterworks Manufacturing Company or Advanced Products Systems, Inc.
2. Casing spacers shall be a two-section, flanged, bolt-on style constructed of heat-fused, PVC-coated steel, minimum 14-gauge band and 10-gauge risers, with two inch (2") wide glass reinforced polyester insulating skirts, heavy duty PVC inner liner, minimum 0.09-inch thick and 85-90 durometer hardness, and all stainless steel or cadmium plated hardware shall be Pipeline Seal and Insulator, Inc.

C. GROUT

Grout and brick shall be used for filling the void between the end of the casing pipe and the carrier pipe. Cement shall conform to ASTM C 150, Type I or Type II. Grout shall have a minimum compressive strength of one hundred (100) psi attained within twenty-four (24) hours.



PART 3: EXECUTION

3.01 INSTALLATION

- A. Encasements shall be installed by boring and jacking unless field conditions require otherwise. It shall be the Contractor's responsibility to notify the City immediately if conditions do not permit a jack and bore installation.
- B. Installation of encasement pipe shall include all related work and services such as mobilization of equipment, constructing and maintaining working pits, right-of-way maintenance and restoration, traffic maintenance, mining, excavations, dewatering, sheeting, shoring and bracing for embankments, and operating pits, and, as elsewhere required, shall be placed and maintained in order that work may proceed safely and expeditiously.
- C. Installation of the casing pipe shall be carried out without disturbance of the embankment, pavement, tracks, or other railroad or highway facilities and without obstructing the passage of traffic at any time.
- D. The driven portions of the casing shall be advanced from the lower end of the casing unless specific permission to do otherwise is obtained by the Contractor from the City.
- E. The alignment and grade shall be carefully maintained and the encasement pipe installed in a straight line.
- F. The space outside the encasement and the ground shall be filled with grout, sand or pea gravel, as directed by the City. The City will direct that this space be filled if the space is large enough to cause any earth settling.

END OF SECTION



PART 1: GENERAL**1.1 DESCRIPTION**

1.1.1 The following specification covers the design, installation, inspection, testing, and acceptance of gravity wastewater systems. Construction consists of furnishing all labor, equipment, tools, appliances and materials for performing all operations necessary for the construction and installation of gravity wastewater sewers and service lines, including all manholes, casings, and appurtenances, complete and ready for operation as shown on the construction drawings and described herein. All requirements of the Tennessee Department of Environmental Conservation (TDEC) shall be complied with in addition to the criteria contained within.

1.1.2 The Developer/Contractor shall furnish to the City a two-year warranty on the materials, fabrication, and workmanship of any and all polyvinyl chloride pipe and fittings furnished and installed. Warranty period shall commence upon written acceptance of particular component or appurtenance by City for ownership and operation.

1.1.3 All Construction plans, project submittals and record drawings shall comply with the requirements of Section 1 and Section 2 of the City of White House Wastewater Department (COWHWW) Standard Sewer Specifications.

1.2 REFERENCE DOCUMENTS

- American Association of State Highway & Transportation Officials (AASHTO)
- American Concrete Institute (ACI)
- American National Standard Institute (ANSI)
- American Society of Mechanical Engineers (ASME)
- American Society of Sanitary Engineers (ASSE)
- American Society for Testing and Materials (ASTM)
- American Water Works Association (AWWA)
- Florida Department of Transportation (FDOT)
- Portland Cement Association (PCA)
- TDEC Design Criteria for Sewage Works
- Uni-Bell Plastic Pipe Association

As particular Specifications are cited, the designation shall be construed to refer to the latest revision under the same specification number, title or to superseding Specifications under a new number except provisions in revised Specification that are clearly inapplicable.



1.3 SHOP DRAWINGS AND SUBMITTALS

1.3.1 For City projects, shop drawings and related manufacturer's product certifications shall be made in accordance with the General and Special Conditions of the Contract for approval prior to purchase or fabrication of the material by the manufacturer. The following items require Shop Drawings. This list may not include all items for which shop drawing submittals are required to meet the requirements of the project:

1.3.1.1 Detail Drawings of all classes of pipe, joints and fittings.

1.3.1.2 Pipeline laying schedule tabulated and referenced to construction line and grade controls shown on plans, with station, offset, and elevations. References shall be provided for pipe fittings and other important features of the pipeline.

1.3.1.3 Service Connections.

1.3.1.4 Manholes.

1.3.1.5 Manhole frames and covers.

1.3.1.6 All appurtenant items.

1.3.1.7 Contractor's cleaning and testing plans for all gravity system piping and manholes.

1.3.2 Certification and test reports for the materials, manufacturing, and testing of the types of pipe supplied shall be performed and furnished by the pipe manufacturer in accordance with the latest standards of the industry as described in Part 1.2 herein.

1.4 DESIGN EXCEPTIONS

Submit a request for any design exception prior to installation. Design exceptions are issued by the City of White House Wastewater Department (COWHWW) Department. Any deviation from the specifications requires a design exception.

1.5 RELATED SPECIFICATIONS

COWHWW Standard Sewer Specifications

PART 2: DESIGN

2.1 FLOW CRITERIA

2.1.1 Flow estimates for design shall be calculated based on full or projected ultimate development. The average daily flow (ADF) for single family shall be 100 gallons/capita/day or master-metered residences shall be the per unit demand factors



contained in the most current White House City Ordinance. Industrial and commercial design flows for sanitary wastewater shall be in accordance with TDEC Design Criteria for Sewerage Works Appendix 2-A.

2.1.2 Wastewater gravity collection systems, pumping stations, and force mains shall be designed for average daily flow times the appropriate peaking factor. Peaking factors shall be applied per TDEC Design Criteria for Sewerage Works Section 2.2.2.1 to ADF. For Laterals and Submains minimum peak is 400% of the ADF; Mains, Trunk Lines and Interceptor sewers minimum peak is 250% ADF as defined by TDEC (same section).

2.2 GRAVITY MINIMUM LINE SIZE

2.2.1 Gravity Mains: Gravity mains shall be sized to accommodate peak flow (ref. Section 2.1) when flowing 1/2 full. Flow calculations shall apply a Mannings n of 0.013 for PVC pipe and minimum velocity of 2.0 feet/sec (fps). No gravity sewer main shall be less than eight inches in diameter.

2.2.2 Services: Minimum diameter shall be six inches for residential and commercial services.

2.3 ALIGNMENT

2.3.1 All gravity mains shall be laid with straight alignment between manholes.

2.3.2 Wastewater collection systems are to be constructed within City right-of-way.

2.4 DEPTH OF COVER

2.4.1 The depth of cover over all mains, within City right-of-way or easement, shall be not less than 48 inches (except for services).

2.4.2 The depth of the services at the property line (measured from the crown of pipe) shall be no less than 36 inches and no greater than 48 inches below design grade.



2.5 SLOPE

2.5.1 Gravity mains shall be designed with the following minimum grades:

Gravity Main	Minimum Grade
8"	0.40%
10"	0.28%
12"	0.22%
15"	0.15%
18"	0.12%
21"	0.10%
24"	0.08%
30"	0.058%

2.52 Mains with diameters greater than 12 inches shall be designed to have mean velocities when flowing half full of not less than 2.0 feet per second. For velocity determinations, Manning's Formula "N" value shall be 0.013 for PVC pipe.

2.6 HORIZONTAL SEPARATION

2.6.1 Wastewater gravity sewers shall be laid at least 10 feet horizontally from any existing or proposed potable water main.

2.6.2 A five (5) foot horizontal separation shall be maintained between a wastewater gravity/force main and all other pipelines. The distance shall be measured face to face. If this distance cannot be met, then the pipe will have to be incased in concrete.

2.6.3 In cases where it is not practical to maintain the specified separation a design exception must be granted from COWHWW Department, and, any other affected utility prior to construction.

2.7 CROSSINGS

2.7.1 Vertical separation between wastewater gravity sewers crossing potable water mains, and other pipelines/utility lines shall be a minimum vertical distance of 18 inches between the outside of the other utility line(s) and the outside of the gravity sewers.

2.7.2 Potable water main crossings below the gravity sewer should be avoided whenever possible. If the potable water main must cross under a gravity sewer, the crossing shall have a vertical clearance of 18 inches (min.), and be arranged so that the gravity sewer joints will be equidistant and as far as possible from the potable water main joints. Further requirements may be imposed by the potable water district.



2.7.3 If the above vertical separation is not possible, a design exception must be granted from COWHWW Department and other affected utility prior to construction.

2.8 GRAVITY SERVICES

2.8.1 Each lateral shall be supplied with a WYE fitting and 22.5° bend (or 11.25° bend with prior approval from COWHWW Department) at the main and laid at a minimum slope of 1/4-inch per foot to one foot past the right-of-way line, where a clean out will be installed in accordance with City of White House Standard Drawing STD-WW-12A & 12B.

2.8.2 Residential double services are allowed, but the service pipe diameter must be six inches, City of White House Standard Drawing STD-WW-12B.

2.8.3 Services shall be straight from the clean-out to the WYE fitting at the main, or the connection at a terminal manhole.

2.8.4 Services that connect into terminal manholes shall be considered a “secondary” line. The manhole shall not be cored. Rather the Manhole shall be formed and poured with the service line connection as a lateral would. The flow line or trough shall be established for flow through the manhole.

2.8.5 Services in new subdivision shall be marked in the field with **white PVC pipe with green paint on the top** to denote location until finish grade is established and meter box with cast iron lid labeled “Sewer” is in place.

2.9 WASTEWATER MANHOLES

2.9.1 Manholes shall be installed at the end of each line, at all changes in grade, size or alignment, and at all gravity line collection intersections.

The distance between manholes shall not be greater than **400 feet**, unless prior approval is obtained from the COWHWW Department. Cleanouts may be used only for special conditions with COWHWW Department approval prior to installation. Cleanouts shall not be substituted for manholes.

2.9.2 Manholes shall be minimum 48 inches inside diameter where incoming lines are 16 inches or less in diameter, or 60 inches minimum inside diameter where incoming lines are larger than 16 inches diameter or depth of manhole exceeds 15 feet. A minimum access diameter of 24 inches shall be provided.

2.9.3 The minimum manhole depth is five feet from the top of the manhole cover to the bottom invert.

2.9.4 All manholes shall have a manhole lid insert installed (water infiltration “dish”).



2.9.5 A drop manhole connection shall be provided for any gravity main entering at a vertical distance of **2.0 feet, or more, above** the outgoing channel invert. In cases where the vertical distance is **less than 2.0 feet**, a drop pipe is not required, but a channel shall be constructed to guide the flow into the outgoing channel. The bottom drop section shall be monolithically cast with the bottom manhole section.

PART 3.0 PRODUCTS

3.1 MATERIALS

Alternative materials may be considered by the COWHWW Department if proper testing documentation, performed by recognized industry authorities, is submitted for review to the COWHWW engineer prior to commencement of design. Tests on alternative materials should be at least as rigorous as testing conducted by ASTM, AWWA and ANSI. A letter of variance must be issued by COWHWW Department prior to design approval.

All materials shall be first quality with smooth interior and exterior surfaces, free from cracks, blisters, honeycombs, and other imperfections, and true to theoretical shapes and forms throughout.

All materials shall be subject to the inspection of the COWHWW at the plant, upon delivery on-site, trench or other point of delivery, for the purpose of culling and rejecting materials that do not conform to the requirements of these specifications. Such material shall be marked by the City and the Contractor shall remove it from the project site upon notice of its rejection.

The entire product of any plant may be rejected when, in the opinion of the City, the methods of manufacture fail to secure uniform results, or where the materials used produce an inferior final product.

3.2 PVC PIPE AND FITTINGS

3.2.1 Wastewater Gravity Pipe and Fittings: The following table lists the allowable pipe and fitting material for the various size wastewater gravity mains and services:

Diameter	Material	General Specifications
4" to 15"	PVC	ASTM D3034, DR 26
16" and greater	PVC	C905, DR 26

3.2.2 All pipe, fittings and appurtenances shall be supplied in accordance with the approved material list.

3.2.3 PVC pipe and fittings, including laterals, shall be made of PVC material having a cell classification of 12454 B, 12454 C or 13354 B as defined in ASTM D1784.



3.2.4 Provisions must be made for contraction and expansion at each joint with an elastomeric gasket.

3.2.5 The last run of PVC gravity line from the receiving manhole to the pump station shall be C905 DR 25.

3.2.6 The bell shall consist of an integral wall section with solid cross-section elastomeric gasket ring, factory assembled and securely locked in place to prevent displacement and meeting requirements.

3.2.7 Gaskets: All pipe gaskets shall conform to AWWA C111, and be made of Viton, EPDM, or SBR depending upon the service/soil conditions.

3.2.8 Standard minimum laying lengths shall be 20.0 feet and 1-inch. Pipe shall be tested in accordance with ASTM D3212.

3.2.9 Each length of PVC pipe shall be marked with the following information: size, manufacturer, PVC sewer pipe, ASTM designation, manufacturer's code, and cell classification that will remain legible during normal handling, storage, and installation.

3.2.10 Where PVC enters a manhole, a suitable manhole coupling or flexible manhole connector designed to produce a positive watertight connection shall be installed in the wall section of the manhole. See Section 3.3.6 for approved products.

3.3 MANHOLES

3.3.1 All manholes shall be concentric in design. **Eccentric manholes are not allowed.**

3.3.2 Manhole base, steps and ladders, barrel sections, and concentric top section shall conform to the design requirements of ASTM C478 & TDOT D-MH-4, except as modified herein. Steps shall be 12" spacing.

3.3.3 Cement shall meet the requirements of ASTM C150, Specification for Portland cement, Type II. All precast manhole sections shall have admixture XYPEX C-1000 Red or approved equal incorporated into the concrete mix to provide waterproofing and corrosion protection.

3.3.4 Vertical barrel sections shall be custom-made with openings to meet indicated pipe alignment conditions and invert elevations.

3.3.5 Manholes shall consist of a base with a monolithically cast bottom barrel section, vertical pipe barrel sections, concentric top section, adjustment section or grade ring(s), and a frame and cover.

3.3.6 Joint contact surfaces shall be formed with mechanical castings; they shall be parallel with two degrees slope, single offset, and nominal 1/16 inch clearance. Gaskets



shall conform to ASTM C-443, "Joints for Circular Concrete Sewer and Culvert Pipe Using Rubber Gasket."

3.3.6.1 Joint contact surfaces shall be sealed using a rubber gasket per the manufacturer's recommendations. Butyl and mastic sealants are not acceptable.

3.3.6.2 An alternate joint contact seal may be used when the joint surface is manufactured with the tongue equipped with a proper recess (confined groove) for the installation of an "O"-ring, conforming to ASTM C443.

3.3.7 Connector components for connections into manholes shall be flexible connectors meeting the requirements of ASTM C923. COWHWW approved flexible manhole connectors shall be Fernco, Kor-N-Seal, A-Lok or approved equal. For new manholes the connectors shall be integrally cast into the manhole.

3.3.8 The interior of the adjustment section (ie. grade rings) shall be concrete, **or approved equal (ie HDPE plastic as defined in ASTM D-4976)**. Grade rings shall meet the requirements of ASTM C-150, Specification for Portland cement, Type II and shall have admixture XYPEX C-1000 Red or approved equal incorporated into the concrete mix to provide waterproofing and corrosion protection.

3.3.9 The manhole adjustment section (grade rings) shall be a minimum of three inches and shall not exceed 18 inches in height. The adjustment section for new construction shall not exceed 12 inches in height.

3.3.10 Rain Guard or Rain Sentry waterproofing devices shall be installed in locations indicated in the COWHWW Department review.

3.3.11 Flow channel(s) in the manhole base shall be formed of 4,000 psi concrete, Type II Portland cement.

3.3.11.1 The first upstream manhole in each line shall have the flow channel extended full width of the manhole to accommodate a CCTV camera.

3.3.11.2 Cut off pipes at inside face of the manhole within two inches of the manhole sidewall and construct flow channel(s) to invert of the pipe entering the manholes.

3.3.11.3 Changes in direction of the gravity main and entering branch(s) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipelines.

3.3.12 Minimum wall thickness shall be five (5) inches.



3.4 WATERPROOF AND PROTECTIVE COATINGS

Protective coating(s) shall be applied to all interior surfaces of manholes and lift station wet wells when specified by the City of White House.

3.5 MANHOLE FRAMES AND COVERS

3.5.1 Manhole frames and covers, for structures and for manholes, shall be heavy duty cast iron frames and covers designed for traffic loads. Manhole frame and cover shall be designed to withstand an HS20-44 loading defined in the AASHTO Specifications. The minimum inside access diameter shall be 24 inches.

3.5.2 The cover and frame castings shall meet the requirements of ASTM A48, Specifications for Gray Iron Castings, Class No. 35, or Grade 65-45-12 ductile iron meeting the requirements of ASTM A536

3.5.3 Frames and covers shall be machined or ground at touching surfaces so as to seat firmly and prevent rocking. Any set not matching perfectly shall be removed and replaced.

3.5.4 "CITY OF WHITE HOUSE TN / SANITARY SEWER" shall be embossed in the cover.

3.5.5 Adjusting rings for adjusting existing manhole covers to new grade shall be heavy duty cast iron manhole adjusting rings for two-inch or greater adjustment, and for one-inch adjustment shall be steel adjusting rings. Rings shall be coated with an acid resistant coating.

PART 4.0 INSTALLATION

Any field changes to signed approved plans will require COWHWW Department approval prior to installation.

4.1 GENERAL INFORMATION

4.1.1 The provisions set forth herein shall be applicable to all underground wastewater piping installations.

4.1.2 All connections to pipe, fittings, or apparatus shall be made plumb, so to ensure no negative pressure is placed, or potentially placed, against the joint, or connection, thereby causing a malfunction or failure of the mechanical joint, or connection.

4.1.3 It shall be the Contractor's and Developer's responsibility to verify all existing conditions and to locate all structures and utilities along the proposed utility alignment in order to avoid conflicts. Where conflicts exist, work shall be coordinated with the COWHWW and affected facility owner and performed so as to cause minimum interference with the service rendered by the facility disturbed.



4.1.4 Facilities or structures damaged shall be repaired and/or replaced immediately at the Contractor's and/or developer's expense according to the direction of the owner of such facility.

4.1.5 For Bore and Encasement specifications see the City of White House Standard Sewer Specifications and Details for Sanitary Sewer System, Section 02601.

4.1.6 No pipe shall be laid when the trench conditions or the weather is unsuitable for such work. Trenches must be dry enough for side and bottom of excavations to be stable. COWHWW reserves the right to determine when trench conditions have become unsuitable.

4.1.7 PVC pipe may be damaged by prolonged exposure to direct sunlight. The Contractor shall take necessary precautions during storage and installation to avoid prolonged exposure to sunlight. Pipe shall be stored under cover and sufficient backfill shall be placed to shield it from the sun as the pipe is installed. Pipe cannot be used if the manufacture date that is stamped on the pipe is more than one (1) year prior to installation date.

4.1.8 Excavation, trenching and backfilling shall be in accordance with the requirements of the applicable portions of these specifications. Pipe installation shall conform to Uni-Bell Plastic Pipe Association Standard Uni-B-5 and ASTM 2321.

4.2 WORK AT TDOT HIGHWAY

Construction work to be performed at any City/TDOT highway shall not commence until all right-of-way permits for the pipeline occupancy have been obtained.

4.3 PRECONSTRUCTION SEWER APPURTENANCES INSPECTION/CERTIFICATION

4.3.1 The Contractor shall obtain from the pipe manufacturer a certificate of inspection to the effect that the pipe and fittings supplied for the project have been inspected at the plant and that they meet the requirements of these specifications.

4.3.1.1 For City Contracted projects, the Contractor shall submit these certificates to the COWHWW Engineer prior to installation of the pipe materials.

4.3.1.2 For developer projects, the Contractor shall submit these certificates to the COWHWW Inspector prior to the installation of the pipe materials.

4.4 TRENCH EXCAVATION

4.4.1 All excavations shall be open cut, wide enough to allow approximately **eight (8) inches** of clearance on each side of the pipe and comply with OSHA and TOSHA Standards.



4.4.2 The trench floor shall provide a uniform bearing for each full length of pipe section. Excavate bell holes after trench has been graded. **Pipe bedding material shall be 67 stone with a minimum depth of 6” when laying pipe in stable clay based soils, and a minimum depth of 12” when laying pipe in unstable, loose soils.**

4.4.3 In the event unsuitable or unstable soil is encountered, remove it to a depth of six (6”) inches (minimum) below the bottom elevation of the pipe (12 inches if rock or boulders are encountered) and replace with material meeting AASHTO Soil Classification A-1, A-2, or A-3, as approved by the COWHWW Inspector or Engineer. Reference TDOT Standard Specifications for Road and Bridge Construction Section 203.04.D.

4.4.4 Dewatering: Remove all water from excavations and maintain the excavations free of water while construction therein is in progress. Provide dewatering equipment as necessary to conform to this requirement. Dewatering procedure must meet all regulatory requirements.

4.4.5 Protection of Trees: Trenching shall not take place within the root zone of trees with a trunk diameter six-inches or larger. The root zone shall be defined as the greater of one) the drip line of the tree or two) a circular zone extending outward from the base of the tree a distance equivalent to 1/2-foot for every inch of trunk diameter as measured 4-1/2 feet above natural grade.

4.5 HANDLING AND CUTTING PIPE

4.5.1 Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe, scratching or marring machined surfaces, and abrasion of the pipe coating.

4.5.2 Any fitting showing a crack, and any fitting or pipe which has received a severe blow that may have caused an incipient fracture (even though no such fracture can be seen) shall be marked as rejected and removed at once from the work.

4.5.3 In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portion, if so approved by COWHWW, may be cut off before the pipe is laid. The cut shall be made in the sound barrel at a point of at least 12 inches from the visible limits of the crack. All cutting shall be done with a machine adapted to the purpose. All cut ends shall be examined for possible cracks caused by cutting.

4.5.4 Cutting Pipe: The Contractor shall cut pipe by means of an approved mechanical cutter. The cut shall be perpendicular to the longitudinal axis of the pipe and rough ends or spurs will be satisfactorily removed prior to installation and seating.

4.6 PIPE LAYING

4.6.1 Pipe shall be constructed of the materials specified and as shown on the drawings.



4.6.2 Installation of PVC pipe and fittings shall be in accordance with the installation requirements established by the manufacturer and ASTM D2321.

4.6.3 Pipe shall be laid with bell ends facing in the upstream direction, in the direction of pipe laying (opposite the direction of flow), unless directed otherwise by the COWHWW Inspector. In all cases, pipe is to be installed in strict accordance with the Manufacturer's recommendations and the contract material specifications. The City may augment any Manufacturer's installation recommendations if it will best serve the interest of the City.

4.6.4 Cradle: Upon satisfactory excavation of the pipe trench and completion of the pipe bedding, a trough recess for the pipe bells and joints (or couplings) shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure will be exerted on the pipe joints from the trench bottom.

4.6.5 Cleanliness: The interior of the pipes shall be thoroughly cleaned of all foreign matter before being gently lowered into the trench and shall be kept clean during laying operations by means of plugs or other approved methods. During suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe.

4.6.6 Gradient

4.6.6.1 Lines shall be laid straight, and depth of cover shall be maintained uniform with respect to finish grade, whether final grading is completed or proposed at time of pipe installation. When a grade or slope is shown on the Construction Drawings, means shall be used by the Contractor to assure conformance to required grade.

4.6.6.2 Any pipe which has its grade or joint disturbed after lying shall be taken up and re-laid.

4.6.7 Pipe/Joint Deflection: Whenever it is desirable to deflect PVC pipe/joints, the amount of deflection shall not exceed 5%.

4.6.8 Any section of pipe already laid which is found to be defective or damaged shall be replaced with new pipe prior to acceptance by the COWHWW Department or placed into use.

4.6.9 The joints of all pipelines shall be assembled in straight alignment and made tight. The particular joint used shall comply with the requirements of Section 3.2. For City contracted projects, the particular joint used shall be reviewed and approved by the COWHWW Inspector or Engineer prior to installation.

4.6.10 Bell and Gasket: Bell and Gasket joints shall be made in strict compliance with the manufacturer's recommendations.



4.6.10.1 Lubricant shall be an inert, non-toxic, water soluble compound.

4.6.10.2 Insert the spigot end into the bell so that it is in uniform contact with the gasket. Push the spigot until the reference mark on the spigot end is flush with the end of the bell. If the reference mark is not visible after assembly, the joint is to be cut out.

4.6.11 Joint Compounds: Sulfur based joint compounds shall not be used.

4.7 INSTALLING MANHOLES

4.7.1 The base section shall be set in the leveling course of crushed stone sub-base compacted to not less than 98% of maximum dry density as determined by the Modified Proctor Test ASTM D1557. Base Foundation to be constructed level with a minimum of 12" #67 stone. See Part **4.9** for backfill and compaction requirements.

4.7.2 Manhole Riser Sections

4.7.2.1 Sewer manhole risers shall be watertight.

4.7.2.2 Assemble cone section of manhole as detailed on the Construction Drawings. Make watertight connection between the cone section and the riser sections.

4.7.2.3 Riser adjusting rings shall be a minimum of three inches to a maximum of 12-inches in height.

4.7.3 Manhole Frames and Covers

4.7.3.1 Install a cast iron frame and cover for each manhole and adjust the frame and cover to proper grade. All castings shall be set flush in paved areas and flush with finished grade in unpaved areas unless shown otherwise on plans. Frame and cover shall be neatly grouted with non-shrink grout.

4.7.3.2 Frames on manhole cones shall be set concentric with the precast cone in mastic. A full bed of mortar shall be placed so that the space between the top of the manhole masonry and the bottom flanges of the frame shall be completely filled and made water tight.

4.7.3.3 For off-site manholes a ring of mortar at least one-inch thick and pitched to shed water away from the frame shall be placed around the outside of the bottom flange. Mortar shall extend up to the outer edge of the masonry and shall be finished smooth and flush with the top of the flange. **For roadway manholes, the mortar shall cover the entire frame casting base and pitch down to the top of the corbel or manhole ring.**



4.8 GRAVITY SERVICES

4.8.1 Open ends of laterals shall be securely sealed with appropriate stoppers as recommended by the pipe manufacturer.

4.8.2 Each service/cleanout location shall be marked with an “S” pressed into the face of curb during the installation of the concrete.

4.8.3 The cleanout(s) shall be extended 30–40 inches above design grade and shall be attached to a green painted wood two-inch by four-inch stake, to avoid damage by equipment during construction. On both single and double service cleanouts the final grade shall be marked on each cleanout two (2) inches from the top of the cleanout. After connection to the building, the lateral cleanout shall be cut down to design grade and a cast iron valve box cover installed as shown Standard Drawing STD-WW-12A & B.

4.9 BACKFILL/COMPACTION

4.9.1 Backfilling and compaction shall be conducted in a manner as to preclude subsequent settlement and provide adequate support for the surface treatment, pavement, pipelines, or structures to be placed thereon. See COWHWW Standard Sewer Detail STD-WW-02 for manhole requirements. All trenches shall be prepared per the requirements of Part 4.4.

4.9.2 Backfill and bedding material shall be common fill material free from organic matter, muck or marl, and rock exceeding 2-1/2 inches in diameter, and shall not contain broken concrete, masonry, rubble or other similar materials. When unstable or unsuitable material is encountered replace with AASHTO soil classification A-1, A-2, or A-3.

4.9.3 Method of Compaction: The Contractor shall adopt compaction methods which will produce the degree of compaction specified herein without damage to the new or existing facilities. The degree of compaction specified in Section 4.9.5 shall be considered the minimum allowable.

4.9.4 Backfilling Procedures: The backfilling procedures outlined in the following shall be for gravity mains and related structures.

4.9.4.1 Gravity Mains:

a) In the first stage, the Contractor shall provide adequate compacted fill beneath the haunches of the pipe, using mechanical tampers suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding material. Fill compacted by mechanical compactors shall be placed in six-inch layers and thoroughly tamped over the entire surface.



b) In the second stage, the Contractor shall obtain a well-compacted bed and fill along the sides of the pipe and to a point of at least one foot above the top of the pipe. The width of backfill and compaction to be done under this second stage shall be the width of the portion of the trench having vertical sides; or, when no portion of the trench has vertical sides, it shall be to a width at least equal to three times the outside diameter of the pipe. **Material to be placed in six (6") inch layers (loose thickness).**

c) In the third stage, the remainder of the trench shall be backfilled with suitable material in layers not to exceed twelve (12") inch loose thickness and compacted. **All gravity mains installed in roadways or 3-feet from the edge of pavement, including new construction, shall have a full stone backfill (#57 or #67).**

If under existing road, **the last twelve (12") inches to meet existing top of pavement shall be filled with crusher run (pug mix)** until such time the asphalt can be replaced.

4.9.4.2 Manholes:

a) The Contractor shall provide well-compacted sub-base under the manhole per Part 4.9.1 and COWHWW Standard Sewer Detail STD-WW-02.

b) From the bedding up to grade the Contractor shall backfill around the manhole **with ASTM 67 stone (nominal size 3/4"- No 4)**. The width of the backfill and compaction shall be the width of the excavation, or to a width equal to three times the manhole diameter whichever is less.

4.9.5 Compaction Density: The excavation backfill density for all stages shall be provided as follows:

4.9.5.1 From right-of-way line to right-of-way line, and including all structures: Compaction shall be 98% of the maximum density as determined by AASHTO T-180 (ASTM D1557 - Modified Proctor) **with no tolerance.**

4.9.5.2 For outside of the right-of-way (but within maintenance easements): Compaction shall be 95% of the maximum density as determined by AASHTO T-180 (ASTM D1557 - Modified Proctor) **with no tolerance.**

4.9.6 Compaction Test Requirements

4.9.6.1 Compaction test results shall be submitted for all work.

4.9.6.2 Results of compaction tests must meet minimum requirements prior to proceeding with the next stage of the work.



4.9.6.3 For developer projects, one complete set of all test reports shall be submitted with the as-built package to the COWHWW Department prior to proof rolling for roadway subgrade.

4.9.6.4 For City run projects, one complete set of all test reports shall be submitted with the as-built package to the Project Manager upon project completion.

4.9.6.5 The Contractor shall employ an independent testing laboratory, acceptable to the City and pay for all required tests.

4.9.6.6 The laboratory shall submit one copy of the certified test reports, after testing in each phase, to the COWHWW Inspector, for approval.

4.9.6.7 In the second and third stage of backfilling, density tests shall be made every one foot vertically, staggered every 200 feet (minimum) horizontally. There shall be a minimum of one test (per vertical foot) between structures, and a minimum of one test per day.

4.9.6.8 For manholes, density tests shall be every two feet vertically, staggered spirally around the manhole, and a minimum of one test per day.

4.10 CONNECTIONS TO GRAVITY SYSTEMS

4.10.1 Connections to the existing sanitary sewer system shall be made as shown in the Construction Drawings. Coordination between the City and the Contractor shall be required in order to accomplish this task. The Contractor shall supply a connection schedule to the City two weeks prior to the proposed connections. Connections of 6" shall be made through a lateral connection into the existing gravity line whenever possible. Connections 8" and greater shall connect into an existing manhole.

4.10.2 After approval of the schedule, the City shall be responsible for shutting down any City owned pump stations or valves as applicable. The Contractor will then make the required connection as quickly as possible. The Contractor shall be responsible for the coordination of any/all of the existing private pump stations shut-down. The Contractor is responsible to coordinate and provide any and all pumping, bypass pumping and/or removal of effluent at connection points to existing mains and at affected pump/lift stations (City owned or private) during wastewater connection operations. Contractor is also responsible for any trucking of effluent and the proper disposal of wastewater, and any other work required to maintain existing services until and during transfer to the new service.

4.10.3 Connections to an existing manhole shall be made after complete flushing of the new system and shall be made under the direction of the COWHWW Inspector.

4.10.4 The Contractor shall cut suitable openings into the existing manholes or remove the existing pipe to accommodate the pipelines as indicated on the Construction Drawings



and as herein specified. The portion of each existing structure removed for new installation shall be confined to the smallest opening possible, consistent with the work to be done.

4.10.5 The manhole shall be properly prepared to receive the connection by carefully coring drilling the wall of the existing manhole through the use of mechanical drilling equipment. The perimeter of the penetration shall not be closer than 12 inches to a barrel section joint.

4.10.6 A Fernco, Kor-N-Seal, A-Lok, or approved equal connector shall be installed prior to pipe insertion into the manhole.

4.10.7 Any penetration to a manhole liner, or coating, must be properly sealed to restore the integrity of the liner/coating.

4.10.8 After the pipe is installed the Contractor shall carefully repair the existing manhole invert in accordance with manufacturer recommendations and in a manner satisfactory to White House City COWHWW Project Manager, or Inspector, as applicable. Manhole inverts shall be reshaped as required by the new connection to provide a smooth flowing channel of the exact shape of the gravity main to which it connects.

4.11 TAKING EXISTING WASTEWATER SYSTEMS OUT OF SERVICE

4.11.1 Existing wastewater gravity pipelines shall be taken out of service when indicated on the Construction Drawings. When lines are taken out of service, backfill the line with flowable fill (TDOT Standard Specifications for Road and Bridge Construction) or grout if the line is not removed.

4.11.2 Existing wastewater systems to be taken out of service shall be plugged after the relief interceptor and appurtenances downstream have been constructed, successfully tested, and approved by the Engineer, and after the City permits the existing wastewater system to be taken out of service.

4.11.3 The upper portion of manholes to be taken out of service shall be removed to not less than 36 inches below the proposed finish grade. The remaining portion of the structure shall be filled with sand or other approved granular fill material. The material used to fill the abandoned structure shall be clean, granular, well graded and free of any organic matter or deleterious material. Before filling, the bottom shall be punctured with a hole of 6-inch (minimum) diameter.

4.12 INSPECTION AND TESTING

4.12.1 General

4.12.1.1 All construction within existing or proposed public right-of-way or within an easement dedicated to the City shall be inspected by a representative of



COWHWW for compliance with approved construction plans and requirements of the COWHWW Technical Specifications. The level of inspection will be based on the size and complexity of the project.

4.12.1.2 The City Project Manager, Engineer, or COWHWW Inspector shall designate the locations of tests, the extent of the system to be tested, approve the methods of testing, and the requirements for recording test results. All manhole risers and gravity lines, including laterals, shall at a minimum be tested for leakage upon completion of installation. **It is highly recommended that pavement, sidewalks, and curbs over newly installed COWHWW utilities not be constructed until the COWHWW utilities have been tested and have passed inspection.**

4.12.1.3 Prior to acceptance of developer-projects, the developer shall have all testing performed, repairs (as required) completed, and shall supply to the COWHWW Inspector a report Certified by the Engineer of Record that the construction, test, and inspection results are in compliance with City and State standards. **At the discretion of the City, any system that is not accepted and not in service within nine months of being inspected shall be re-inspected and re-Certified before project acceptance and subsequent release of performance bonds.**

4.12.1.4 For City-run projects and prior to Substantial Completion, it is the responsibility of the Contractor to perform all testing, repair all defects, and submit a report to the Project Manager or Engineer certifying completion and compliance with City and State standards. The report shall include all test and inspection results.

4.12.1.5 The Contractor shall at their expense supply all materials and equipment necessary to perform the required inspections and tests. All tests shall be witnessed by the Engineer of Record, or a responsible person under their charge. Contractor shall notify the Engineer of Record a minimum of seven days in advance of all tests.

4.12.1.6 All testing equipment shall be calibrated annually by an independent testing agency. Upon request, a copy of the calibration report shall be submitted to the City Project Manager, Engineer or COWHWW Inspector.

4.12.1.7 All equipment used in testing shall be suitable to the application and shall be subject to the approval of the COWHWW Department.

4.12.1.8 Piping shall be properly backfilled and compacted before testing.

4.12.1.9 **Prior to tests, all gravity lines shall be cleaned and flushed with an appropriately sized cleaning ball. Pre-cleaning by high velocity jet or other methods may also be necessary.**



4.12.1.10 Contractor shall adequately brace and support all piping during testing so that no movement, displacement, or damage shall result from the application of test procedures.

4.12.1.11 All associated strength-specified concrete shall be tested and results submitted to the Engineer of Record and COWHWW Inspector for acceptance.

4.12.1.12 If any manhole or section of the sewer fails to pass the tests, the Contractor shall perform an inspection of the faulty section, locate the defects, and repair or replace all defective materials, or correct workmanship issues, at their own expense.

- a) Repairs shall be made using new materials.
- b) No caulking of threaded joints, cracks, or holes, will be acceptable.
- c) Where it becomes necessary to replace pieces of pipe, the replacement shall be the same material and thickness as the defective piece.
- d) The Contractor shall obtain approval in advance for all materials and methods used for repairs from either the COWHWW Project Manager, or Engineer. Tests or inspections after correction of defects shall be repeated until the work is completed to the satisfaction of the City Project Manager or Engineer of Record, and the COWHWW Inspector.

4.12.1.13 Anomalies detected or suspected as a result of the visual inspection may prompt additional testing requirements.

4.12.2 Vacuum Testing Gravity Systems

4.12.2.1 The Contractor may desire to make a **vacuum** test prior to backfill for his own purposes, but the line acceptance test shall be conducted after backfilling has been completed in accordance with other portions of these specifications.

4.12.2.2 All wyes, tees, or ends of lateral stubs shall be suitably capped to withstand the internal test pressures. Such caps shall be easily removed for future lateral connections or extensions.

4.12.2.3 TESTING MANHOLES

- a) General: Test using **vacuum** whenever possible prior to backfilling to assist in locating leaks. Make joint repairs on both outside and inside of joint to ensure permanent seal. All lifting holes shall be plugged with an approved non-shrink grout inside and out. Manhole joints shall be grouted from the outside only. All pipes entering the



manhole shall be plugged. The Contractor shall securely brace the plugs in order to keep them from being drawn into the manhole. The test head shall be placed at the inside of the top of the cone section of the manhole and the seal inflated in accordance with the manufacturer's recommendations. Test manholes with manhole frame set in place.

b) Vacuum test in accordance with ASTM C1244 and as follows:

1. Plug pipe openings; securely brace plugs and pipe.
2. Inflate compression band to affect seal between vacuum base and structure; connect vacuum pump to outlet port with valve open; draw vacuum to 10 inches of Hg; close valve; start test.
3. Determine test duration for manhole from the following table:

Manhole Diameter	Test Period
4 feet	60 seconds
5 feet	75 seconds
6 feet	90 seconds

4. Record vacuum drop during test period; when vacuum drop is greater than 1 inch of Hg during test period, repair and retest manhole; when vacuum drop of 1 inch of Hg does not occur during test period, discontinue test and accept manhole.
5. When vacuum test fails to meet 1 inch Hg drop in specified time after repair, repair and retest manhole.

4.12.2.4 Vacuum Testing for Gravity Sewer Pipe

a) A vacuum of five (5) inches Hg shall be drawn on the manhole, the pump shut off, and the appropriate valves closed. The following table shows times for the test to be held according to pipe depth.

NO LEAKAGE IS PERMITTED

Size Pipe (inches)	Test Period Duration (minutes)
8	4.0
10	5.0
12	6.0
15	7.0



18	8.5
21	10.0
24	11.5
27	13.0
30	14.0
36	17.0
42	20.0
48	23.0
54	25.5
60	28.5

Depth of Main (feet)	Minimum Test Time (minutes)
0 – 8	1:00
8 – 10	1:15
10 – 12	1:30
12 – 14	1:45
14 – 16	2:00
Each additional 2 feet	Add 0:15

4.12.2.5 If the test fails, the Contractor will be required to locate the cause of the failure, make necessary repairs, and repeat all testing of the line until the test is passed. If required by the City, the Contractor shall repeat video inspection of any sections of the pipeline that have failed a portion of the testing.

4.12.3 Water Infiltration/Exfiltration Testing

4.12.3.1 Wastewater Manhole Risers

- a) Air testing is not acceptable for use on Manhole Risers.
- b) All wastewater manhole risers shall be tested for leakage by plugging pipelines and filling the manhole with water to the top of the manhole.
- c) The test period shall be for 24 hours and during the test period, the water level shall not drop.
- d) The COWHWW Inspector is required to sign off all manhole leakage tests.



4.12.3.2 Infiltration Testing of Wastewater Systems

- a) Where the groundwater elevation is four feet or higher than the crown of the pipeline throughout the section being tested the Contractor may desire to test the wastewater system for infiltration rather than air testing.
- b) The allowable rate of infiltration shall be zero for the entire section being tested, when the hydrostatic pressure at the centerline of the pipe doesn't exceed 25 feet. No visible leakage shall be allowed.
- c) If any section of the wastewater system fails to meet this requirement, the Contractor shall perform an inspection of the faulty section and repair or replace at his own expense all defective materials or workmanship. The test procedure shall be repeated until the results are acceptable.

4.12.3.3 Exfiltration Testing of Wastewater System

- a) Where the groundwater elevation is less than four feet above the crown of the pipeline, the Contractor may desire to test the wastewater system for exfiltration rather than **vacuum** testing.
- b) Plug the pipeline to be tested at the downstream manhole and fill the line with water. The test shall run for 24-hours minimum. The water level inside the manhole should be two feet higher than the top of the pipe or two feet higher than ground water level, whichever is greater. The maximum internal pipe pressure at the lowest end should not exceed 25 feet of water or 10.8 psi.
- c) The allowable rate of exfiltration shall be zero for the entire section being tested.
- d) If any section of the wastewater system fails to meet this requirement, the Contractor shall repair or replace at his own expense all defective materials or workmanship. The test procedure shall be repeated until the results are acceptable.

4.12.4 Deflection Tests: PVC

4.12.4.1 Pipe Maximum allowable pipe deflection (reduction in vertical inside diameter) shall not exceed 5% as determined using a mandrel. **The mandrel shall be pulled through the pipe, not blown.**

4.12.4.1.1 The Contractor shall perform deflection testing on flexible and semi-rigid pipe to confirm pipe has no more than 5 percent deflection. Mandrel testing shall conform to ASTM D 3034. Perform testing no sooner



than 30 days after backfilling of line segment, but prior to final acceptance testing of the line segment.

4.12.4.1.2 Mandrel Sizing. The rigid mandrel shall have an outside diameter (O.D.) equal to 95 percent of the inside diameter (I.D.) of the pipe. The inside diameter of the pipe, for the purpose of determining the outside diameter of the mandrel, shall be the average outside diameter minus two minimum wall thicknesses for O.D. controlled pipe and the average inside diameter for I.D. controlled pipe. Dimensions shall be per appropriate standard. Statistical or other "tolerance package" shall not be considered in mandrel sizing.

4.12.4.1.3 Proving Ring. Furnish a "proving ring" with each mandrel. Fabricate the ring of 2- inch-thick, 3-inch-wide bar steel to a diameter 0.02-inches larger than approved mandrel diameter.

4.12.4.2 The Project Manager, Engineer or COWHWW Inspector (as applicable), may determine that deflection testing is unnecessary when using proper construction practices and inspection during pipe installation and when using embedment material which has been properly selected, placed and compacted. However, random deflection testing of pipe may be required at locations where construction encountered unstable trench walls or bottoms, heavy rainfall, high ground water levels, deep lines, difficulty in obtaining compaction, or where other problems are indicated.

4.12.4.3 Locations with excessive deflection shall be excavated and repaired by re-bedding or by replacing pipe. Optional devices for testing include a deflectometer, a properly sized "go, no go" mandrel or sewer ball.

4.12.4.4 The Contractor shall furnish the mandrel, labor, materials, and equipment necessary to perform the tests as approved by the Project Manager, Engineer or COWHWW Inspector (as applicable).

A) Prior to performing the deflection tests, the Contractor shall submit certification that the 9-arm mandrels are preset as previously stated.

B) Each mandrel shall be engraved with the following:

- 1) Serial Number
- 2) Nominal pipe diameter
- 3) "ASTM D 3034" and either "SDR-26"
- 4) % deflection as previously stated



4.12.4.5 If the mandrel fails to pass any section of pipe, the Contractor shall excavate to the point of excess deflection and carefully compact around the point where excess deflection was found. After the permanent pavement base has been compacted and resealed, the line shall be retested. If the mandrel fails to pass a second time, the section shall be replaced. Re-rounding is not permitted.

PART 5.0 TELEVISION OF LINES

5.1 PROCEDURES FOR TELEVISION SANITARY SEWER MAINS

5.1.1 The following procedures shall be followed on all sanitary sewer mains which are to be accepted by the City.

5.1.2 The City of White House requires a closed-circuit television (CCTV) inspection of the interior of the installed pipe prior to final acceptance. This inspection will be performed by the Contractor. All CCTV inspections must be monitored by the City inspector and the original video must be signed by the inspector. Reports and tapes shall be supplied to the COWHWW Inspector.

5.1.3 All gravity sewer mains shall be CCTV'd utilizing a 360-degree pan and tilt color camera. The camera shall be of the self-propelled tractor type, with a measuring device mounted to the front capable of being read as the tractor moves and capable of accurately measuring depth of standing water up to and including one inch. **A pull type camera may be used only as a system backup.**

5.1.4 **All gravity sewer mains shall require the base to be placed and compacted prior to CCTV inspection.** All mains not filled to subgrade shall have at least 10-foot of compacted backfill.

5.1.5 **All gravity sewer mains shall be CCTV'd in a downstream direction wherever possible.**

5.1.6 **Inverts will be constructed in manholes prior to CCTV inspection.**

5.1.7 CCTV inspection for the Contractor's own use may be done at any time; however, the City inspector shall be present during all televising for acceptance and the procedures listed herein shall be followed.

5.1.8 Mains shall be flushed and cleaned thoroughly prior to CCTV inspection

5.1.9 At least 24 hours prior to, and no more than 48 hours prior to televising, sufficient water shall be run through each section of main until water runs through each downstream manhole. No lines shall be televised which are dry or that enough water has not run through to reach the end of each section.



5.1.10 Mains which are dirty (dirty walls and/or debris in the inverts) shall be re-flushed and cleaned before rescheduling another CCTV inspection with the COWHWW inspector. The City inspector may require pigging of specific sections, if necessary.

5.1.11 There shall be no dips in the mains. Any dips which are found shall be reviewed and a decision made by the COWHWW Engineer as to whether to accept the main as is or to have the dip removed. Decisions will be made on a case-by-case basis; however, **normally any dip one-inch, or greater, will be required to be removed.**

5.1.12 The Contractor shall be entitled to a second inspection on lines requiring repairs. Second inspections for dirty lines and additional inspections for repairs after the second free inspection shall be billed by the City for each section of main televised.

5.1.13 The COWHWW inspector will initial each video tape utilized in CCTV inspection and that tape will be submitted to the City for its records. **Copies of the original tape will not be accepted.** The original tape and the CCTV reports shall be submitted to the City prior to the inspector signing-off on the project.



PART 1: GENERAL**1.01 SCOPE OF WORK**

The work covered under this section shall consist of furnishing all materials, labor, equipment, and services for the complete installation of a sanitary sewer service connection from the sanitary sewer (gravity) main line to the edge of the property to be served as shown on the project Drawings.

PART 2: PRODUCTS**2.01 MATERIALS**

- A. Main line connections shall use a wye branch constructed by the same material as the main line.
- B. Sewer service lines shall be constructed of either PVC (Schedule 35) or ductile iron (CL350) as shown on the Plans. Ductile iron shall be lined with epoxy or Protecto 401.
- C. When joining pipes of different materials, a flexible, watertight, rubber transition coupling shall be used.

PART 3: EXECUTION**3.01 INSTALLATION**

- A. CONNECTION TO MAIN
 - 1. The standard sewer service connection shall be six inches (6") in diameter unless shown otherwise on the Drawings and shall connect to the main at a wye branch connection installed with the pipe line as it is being laid. The wye branch shall be of the same material as the main pipe line.
 - 2. Direct taps into the sewer main will not be acceptable unless approved by the City prior to the laying of the main line.



B. CONNECTION TO MANHOLE

Unless specifically approved by the City, no sewer service connections shall be made into a manhole.

C. SERVICE LINES

1. The service line shall be installed from the wye branch connection to the edge of the public or utility right-of-way as shown on the Drawings.
2. Less than three feet (3'-0") of cover shall require the use of ductile iron pipe.

D. FERNCO COUPLING AND PLUG

At the edge of the public or utility right-of-way, a Fernco coupling shall be installed. A watertight plug shall be installed at the end of this line until such time as the City directs the Contractor to connect his facilities to the Sewer System.

END OF SECTION



SECTION 02740

LOW PRESSURE SEWER SYSTEM

PART 1 GENERAL

1.1 SCOPE OF WORK

The work covered by this Section shall consist of furnishing all materials, labor, equipment, and services for the installation of a low pressure sewer system. The Contractor shall be responsible for the satisfactory operation of the entire system.

1.2 SUBMITTALS

The Contractor shall provide a minimum of five (5) sets of shop drawings detailing the equipment to be furnished, including dimensional data and materials of construction. The City shall endeavor to promptly review this data and shall return two (2) copies as accepted or pending requested modifications.

1.3 MANUFACTURER

Grinder pump stations, complete with all appurtenances, form an integral system, and as such, shall be supplied by one (1) grinder pump station Manufacturer.

- A. All Manufacturers proposing equipment for this project shall have at least ten (10) years of experience in the design and manufacture of grinder pumps for specific use in low pressure sewage systems and of identical size(s) and performance to the specified units.
- B. All Manufacturers proposing equipment for this project must have no fewer than five hundred (500) successful installations of low pressure sewer systems utilizing grinder pumps such as those specified herein. An installation is defined as a minimum of twenty- five (25) pumps discharging into a common force main, which forms a low pressure sewer system.
- C. The Manufacturer shall:
 - 1. Provide detailed installation and user instructions for its product;
 - 2. Submit evidence of an established service program, including complete parts and service manuals;
 - 3. Maintain a continuing inventory of grinder pump replacement parts; and
 - 4. Provide a reference and contact list of ten (10) of its largest contiguous grinder pump installations of the type specified herein that have been in operation for at least ten (10) years.



1.4 OPERATING CONDITIONS

The pumps shall be capable of delivering fifteen (15) gpm against a rated total dynamic head of zero (0) feet (0 psig) and nine gpm against a rated total dynamic head of one hundred thirty-eight (138) feet (60 psig). The pump(s) must also be capable of operating at negative total dynamic head without overloading the motor(s). Under no conditions shall in-line piping or valving be allowed to create a false apparent head.

1.5 WARRANTY

The grinder pump Manufacturer shall provide a part(s) and labor warranty on the complete station and accessories, including, but not limited to, panel and redundant check valve for a period of sixty (60) months after notice of City acceptance, but no greater than sixty-three (63) months after receipt of shipment. Any manufacturing defects found during the warranty period will be reported to the Manufacturer by the City and shall be corrected by the Manufacturer at no cost to the City.

PART 2 PRODUCTS

2.1 COMMERCIAL PUMP

- A. The pump shall be a custom-designed, integral, vertical rotor, motor-driven, solids-handling pump of the progressing-cavity type with a single mechanical seal.
- B. The rotor shall be constructed of stainless steel. Plating on the rotor will not be acceptable due to its tendency to delaminate.
- C. The stator shall be of a specifically compounded ethylene- propylene synthetic elastomer. The material shall be suitable for domestic wastewater service. Its physical properties shall include high tear and abrasion resistance, grease resistance, water and detergent resistance, temperature stability, excellent aging properties, and outstanding wear resistance. Buna-N is not acceptable as a stator material because it does not exhibit the properties as outlined above and required for wastewater service.



2.2 GRINDERS

- A. The grinder shall be placed immediately below the pumping elements and shall be direct-driven by a single, one-piece motor shaft.
- B. The grinder impeller assembly shall be securely fastened to the pump motor shaft by means of a threaded connection attaching the grinder impeller to the motor shaft. Attachment by means of pins or keys will not be acceptable.
- C. The grinder shall be of the rotating type with a stationary hardened and ground stainless steel shredding ring spaced in close annular alignment with the driven impeller assembly, which shall carry two (2) hardened-type 400 series stainless steel cutter bars. This assembly shall be dynamically balanced and operate without objectionable noise or vibration over the entire range of recommended operating pressures.
- D. The grinder shall be constructed so as to eliminate clogging and jamming under all normal operating conditions, including starting.
- E. Sufficient vortex action shall be created to scour the tank free of deposits or sludge banks that would impair the operation of the pump.
- F. The grinder shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of "foreign objects," such as paper, wood, plastic, glass, rubber, and the like, to finely divided particles that will pass freely through the passages of the pump and the one and one quarter inch (1- $\frac{1}{4}$ ") diameter discharge. These requirements shall be accomplished by the following, in conjunction with the pump:
 - 1. The grinder shall be positioned in such a way that solids are fed in an upward flow direction.
 - 2. The maximum flow rate through the cutting mechanism must not exceed four feet (4') per second; this critical design element will prevent jamming.
 - 3. The inlet shroud shall have a diameter of no less than five inches (5"). Inlet shrouds that are less than five inches (5") in diameter will not be accepted due to their inability to maintain the specified four feet (4') per second maximum inlet velocity.
 - 4. The impeller mechanism must rotate at a nominal speed of no greater than 1,800 rpm.



2.3 ELECTRIC MOTOR

- A. As a maximum, the motor shall be a one (1) horsepower (hp), 1,725 rpm, 240 volt (V), 60 hertz (Hz), single-phase, capacitor start, ball bearing, air-cooled induction type with a low starting current not to exceed 30 amperes (A) and a high starting torque of 8.4.
- B. Conditions for the pump motor shall be provided by the use of an automatic-reset, integral thermal overload protector incorporated into the motor. This motor protector combination shall have been specifically investigated and listed by Underwriters Laboratories, Inc., (UL) for the application.
- C. Non-capacitor start motors or permanent split capacitor motors will not be accepted because of their reduced starting torque and consequent diminished grinding capability.

2.4 MECHANICAL SEAL

The pump core shall be provided with a mechanical shaft seal to prevent leakage between the motor and pump. The seal shall have a stationary ceramic seat and carbon rotating surface with precision-lapped and held in position by a stainless steel spring.

2.5 TANK

- A. The tank shall consist of a single wall of laminated fiberglass construction.
- B. The resin used shall be of a commercial grade suitable for the environment.
- C. The reinforcing material shall be a commercial grade of glass fiber capable of bonding with the selected resin.
- D. The inner surface shall have a smooth finish and be free of cracks and crazing.
- E. The exterior tank surface shall be relatively smooth with no exposed fiber or sharp projections present.
- F. The tank wall and bottom shall be of sufficient thickness and construction to withstand the imposed loading due to saturated soil at the specified burial depth for each available tank height.
- G. All station components must function normally when exposed to the external soil and hydrostatic pressures developed at the specified burial depth.



- H. The tank bottom shall be reinforced with a fiberglass plate extending beyond the tank walls to support concrete anchoring, as required, to prevent flotation.
- I. The tank shall include a solid fiberglass cover, secured with threaded stainless steel fasteners, providing low profile mounting.
- J. The tank shall also be vented to prevent sewage gases from accumulating in the tank.
- K. The tank dimensions shall be twenty-four inches (24") in diameter and sixty inches (60") tall per the City Standard Sewer Details.
- L. DISCHARGE HOSE AND DISCONNECT/VALVE
- M. All discharge fittings and piping shall be constructed of 304 Series stainless steel, polypropylene, ethylene propylene diene monomer (EPDM), or PVC.
- N. The discharge hose assembly shall include a shut-off valve rated for two hundred (200) psi water, oil, or gas (WOG) and a quick disconnect feature to simplify installation and pump removal.
- O. The bulkhead penetration shall be factory-installed and warranted by the Manufacturer to be watertight.

2.6 ELECTRICAL QUICK DISCONNECT

- A. The grinder pump unit shall include a single NEMA 6P EQD for all power and control functions. J-box type disconnects will not be accepted due to their tendency to leak and inherent issues associated with J-box serviceability.
- B. An integral tube shall allow venting of the control compartment to ensure proper operation of the pressure switch level system.
- C. The grinder pump will be furnished with a length of 6-conductor, 14- gauge, type-SJOW cable, pre-wired and watertight to meet UL requirements.

2.7 ANTI-SIPHON VALVE

The pump discharge shall be equipped with a factory-installed, gravity-operated, flapper-type integral anti-siphon valve built into the discharge assembly.

- A. Moving parts will be made of 300 series stainless steel and fabric- reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength.



- B. A nonmetallic hinge shall be an integral part of the flapper assembly, providing a maximum degree of freedom to ensure proper operation even at a very low pressure.
- C. The valve body shall be injection-molded from a glass-filled thermoplastic resin.
- D. Holes or ports in the discharge piping are not acceptable anti-siphon devices, due to their tendency to clog from the solids in the slurry being pumped.

2.8 CHECK VALVE

The pump discharge shall be equipped with a factory installed, gravity operated, flapper-type integral check valve built into the discharge assembly.

- A. The check valve will provide a full-ported passageway when open, and shall introduce a friction loss of less than six inches (6") of water at maximum rated flow.
- B. Moving parts will be made of a 300 series stainless steel and fabric reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength.
- C. A nonmetallic hinge shall be an integral part of the flapper assembly, providing a maximum degree of freedom to ensure seating even at a very low back pressure.
- D. The valve body shall be an injection molded part made of glass-filled PVC.
- E. Ball-type check valves are unacceptable due to their limited sealing capacity in slurry applications.
- F. Each grinder pump installation shall also include one (1) separate check valve of the type detailed in this section for installation in the one and one quarter-inch (1¼") service lateral between the grinder pump station and the sewer main, preferably next to the curb stop. The separate check valve shall be provided as a separate line item in the bid schedule.



2.9 CORE UNIT

- A. The grinder pump station shall have an easily removable core assembly containing pump, motor, grinder, all motor controls, check valve, anti-siphon valve, EQD, and wiring.
- B. The pump core shall be suitably mounted on an integral stand of stainless steel.
- C. The watertight integrity of the core unit shall be established by one hundred percent (100%) factory test at a minimum of five (5) pounds per square inch, gauge (psig).

2.10 CONTROLS

- A. All necessary controls, including motor and level controls, shall be located in the top housing of the core unit. The top housing will be attached with stainless steel fasteners.
- B. Non-fouling wastewater level controls for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral air column connected to a pressure switch. High-level sensing will be accomplished in the manner detailed above by a separate air-bell sensor and pressure switch of the same type.
- C. The level detection device shall have no moving parts in direct contact with the wastewater.
- D. Closure of the high-level sensing device will energize an alarm circuit as well as a redundant pump-on circuit.
- E. For increased reliability, pump power and high-level alarm functions shall not be controlled by the same switch. Float switches of any kind, including float trees, will not be accepted due to the periodic need to maintain (rinsing, cleaning) such devices.
- F. To ensure reliable operation of the pressure switches, each core shall be equipped with a breather assembly, complete with a suitable means to prevent accidental entry of water into the motor compartment.
- G. The grinder pump will be furnished with a 6-conductor, 14-gauge, type SJOW cable, pre-wired and watertight to meet UL requirements with a factory-installed NEMA 6P EQD half attached to it.

2.11 ALARM PANEL

Each grinder pump station shall include a NEMA 4X, UL-listed alarm panel suitable for wall mounting.



- A. The NEMA 4X enclosure shall be manufactured of thermoplastic to assure corrosion resistance. The enclosure shall include a hinged, lockable cover, pad lock, and secured dead front. The enclosure shall not exceed 11.38" wide x 13.5" high x 5.63" deep.
- B. For each core, the panel shall contain one (1) 15-A, double-pole circuit breaker for the power circuit and one (1) 15-A, single-pole circuit breaker for the alarm circuit. The panel shall contain terminal blocks, integral power bus, and a complete alarm circuit.
- C. The alarm panel shall include the following features: audio and visual alarm, push-to-run switch, and high level (redundant) pump starting control. The visual alarm lamp shall be inside a red fluted lens at least 2-5/8" in diameter and 1-11/16" in height. Visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 4X rating.
- D. The audio alarm shall be a printed circuit board in conjunction with an eighty-six (86) decibel (dB) buzzer with quick mounting terminal strip mounted in the interior of the enclosure. The audio alarm shall be capable of being deactivated by depressing a push-type switch encapsulated in a weatherproof silicone boot and mounted on the bottom of the enclosure.
- E. The entire alarm panel shall be UL-listed.
- F. The alarm sequence is to be as follows:
 - 1. When liquid level in the sewage wetwell rises above the alarm level, visual and audio alarms will be activated. The contacts on the alarm pressure switch will close. The redundant pump starting system will be energized.
 - 2. The audio alarm may be silenced by means of the externally mounted, push-to-silence button.
 - 3. Visual alarm remains illuminated until the sewage level in the wetwell drops below the "off" setting of the alarm pressure switch.



2.12 SERVICEABILITY

- A. The grinder pump core unit shall have two (2) lifting hooks, complete with nylon lift-out harness, to facilitate easy core removal when necessary.
- B. All mechanical and electrical connections must provide easy disconnect capability for core unit removal and installation.
- C. A push-to-run feature will be provided for field trouble shooting.
- D. All motor control components shall be mounted on a readily replaceable bracket for ease of field service.

2.14 OSHA CONFINED SPACE

All maintenance tasks for the grinder pump station must be possible without entry into the grinder pump station as per OSHA 1910.146, "Permit-Required Confined Spaces."

2.15 SAFETY

- A. The grinder pump shall be free from electrical and fire hazards as required in a residential environment. As evidence of compliance with this requirement, the completely assembled and wired grinder pump station in its tank shall be UL-listed to be safe and appropriate for the intended use. UL listing of components of the station or third-party testing to UL standards will not be accepted.
- B. The grinder pump shall meet accepted standards for plumbing equipment for use in or near residences; shall be free from objectionable noise, odor, or health hazards; and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the National Sanitation Foundation (NSF) seal. Third-party testing to NSF standards will not be accepted.



PART 3 EXECUTION

3.1 FACTORY TESTING

- A. Each grinder pump shall be submerged and operated for a minimum of five (5) minutes. Included in this procedure will be the testing of all ancillary components such as the anti-siphon valve, check valve, discharge line, and each unit's dedicated level and motor controls. All factory tests shall incorporate each of the above listed items.
- B. Actual appurtenances and controls that will be installed in the field shall be particular to the tested pump only. A common set of appurtenances and controls for all pumps will not be acceptable.
- C. The Manufacturer shall provide the City with certified test results showing the operation of each grinder pump at two (2) different points on its curve, with the maximum pressure no less than sixty(60) psi. The City reserves the right to inspect such testing procedures at the grinder pump Manufacturer's facility.
- D. Completed basins shall be factory leak tested to assure the integrity of all joints, seams, and penetrations.

3.2 DELIVERY

- A. All grinder pump units shall be delivered to the job site one hundred percent (100%) completely assembled, tested, and ready for installation.
- B. Grinder pump stations will be individually mounted on wooden pallets.
- C. Grinder pump cores will be shipped in a separate container and are only required to be installed in the basin.

3.3 INSTALLATION

- A. The Contractor shall be responsible for handling groundwater to provide a firm, dry subgrade for the structure and shall guard against flotation or other damage resulting from general groundwater or flooding.
- B. The grinder pump stations shall not be set into the excavation until the installation procedures and excavation have been approved by the City.
- C. Remove packing material. User's instructions shall be given to the City. Hardware supplied with the unit, if required, shall be used at installation. The basin will be supplied with a standard field-installed four-inch (4") inlet grommet (fiberglass tank) or flange (for high- density polyethylene tank); both will accept a 4.50" outside diameter drain, waste, and vent (DWV) pipe for connecting the



incoming sewer line. Appropriate inlet piping must be used. The basin may not be dropped, rolled, or laid on its side for any reason.

- D. Installation shall be accomplished so that one to four inches (1"-4") of access way, below the bottom of the lid, extends above the finished grade line. The finished grade shall slope away from the unit. The diameter of the hole must be large enough to allow for the concrete anchor.
- E. A six-inch (6") inch (minimum) layer of TDOT #67 stone shall be used as bedding material under each unit.
- F. A concrete anti-flotation collar, as detailed on the drawings, and sized according to the Manufacturer's instructions, shall be required and shall be precast to the grinder pump or poured in place. Each grinder pump station with its precast anti-flotation collar shall have a minimum of three (3) lifting eyes for loading and unloading purposes.
- G. The unit shall be leveled and filled with water to the bottom of the inlet to help prevent the unit from shifting while the concrete is being poured and set. The concrete must be manually vibrated to ensure there are no voids. If it is necessary to pour the concrete to a level higher than the inlet piping, an eight-inch (8") sleeve is required over the inlet prior to pouring the concrete.
- H. The Contractor will provide and install a four-foot (4') piece of four-inch (4") SCH 40 PVC pipe with cap, to stub-out the inlet as depicted on the Contract Drawings.
- I. The electrical enclosure shall be furnished, installed, and wired to the grinder pump station by the Contractor. An alarm device is required on every installation; there shall be no exceptions.
- J. It will be the responsibility of the Contractor and the City to coordinate with the individual property owner(s) to determine the optimum location for the alarm panel. The Contractor shall mount the alarm device in a conspicuous location, as per Federal and Local codes.
- K. The alarm panel will be connected to the grinder pump station by a length of 6-conductor, 12-gauge, TC-type cable as shown on the Contract Drawings. The power and alarm circuits must be on separate power circuits. The grinder pumps station will be provided with a minimum of thirty-two feet (32') total, twenty-five feet (25') of usable electrical supply cable outside the station, to connect to the alarm panel. This cable shall be provided with a factory-installed EQD half to connect to the mating EQD half on the core.



3.4 BACKFILL REQUIREMENTS

- A. Backfill of clean, native earth, free of rocks, roots, and foreign objects, shall be thoroughly compacted in lifts not exceeding twelve inches (12") to a final Proctor Density of not less than eighty-five percent (85%).
- B. The grinder pump station shall be installed at a minimum depth from grade to the top of the one and one quarter inch 1-1/4" discharge line to ensure maximum frost protection.
- C. The finish grade line shall be one to four inches (1"-4") below the bottom of the lid, and final grade shall slope away from the grinder pump station.

3.5 START-UP AND FIELD TESTING

- A. The Manufacturer shall provide the services of qualified factory trained technician(s) who shall inspect the placement and wiring of each station, perform field tests as specified herein, and instruct the City's personnel in the operation and maintenance of the equipment before the stations are accepted by the City.
- B. All equipment and materials necessary to perform testing shall be the responsibility of the Contractor. This will include, as a minimum, a portable generator (if temporary power is required) and water in each basin.
- C. The services of a trained factory-authorized technician shall be provided at a rate of two (2) days for each two hundred (200) grinder pump stations supplied. Projects with fewer than two hundred (200) units shall provide a trained factory-authorized technician for a minimum of one (1) day. Each day shall be ten (10) person hours in duration.
- D. Upon completion of the installation, the authorized factory technicians will perform the following test on each station:
 - 1. Make certain the discharge shut-off valve is fully open. This valve must not be closed when the pump is operating. In some installations, there may be a valve(s) at the street main that must also be open.
 - 2. Turn on the alarm power circuit.
 - 3. Fill the wetwell with water to a depth sufficient to verify the high-level alarm is operating. Shut off water.
- E. Turn on pump power circuit. Initiate pump operation to verify automatic power controls are operative. Pump should immediately turn on. Within one (1) minute, alarm light will turn off. Within three (3) minutes, the pump will turn off.



- F. Upon completion of the start-up and testing, the Manufacturer shall submit to the City the start-up authorization form describing the results of the tests performed for each grinder pump station. Final acceptance of the system will not occur until authorization forms have been received for each pump station installed and any installation deficiencies corrected.

PART 4 OPERATION AND MAINTENANCE

4.1 SPARE CORE

The manufacturer will supply one (1) spare grinder pump core for every fifty (50) grinder pump stations installed, complete with all operational controls, level sensors, check valve, anti-siphon valve, pump/motor unit, and grinder.

4.2 MANUALS

The manufacturer shall supply four (4) copies of Operation and Maintenance Manuals to the City.

END OF SECTION

(Recommended form follows.)



PART 5 WARRANTY CERTIFICATION

I, _____, by and through my duly authorized signature below as its most senior operating executive, certify that _____ will provide a five (5) year warranty on grinder pump equipment manufactured and supplied by _____ for the _____ project. I further certify that, other than failure to install equipment in accordance with manufacturer's instructions, no exclusions and/or cost items to maintain said equipment in warrantable condition, including labor, travel and shipping fees, exist.

Signature

Title

Date



PART 1: GENERAL

1.01 SCOPE OF WORK

- A. This Section covers the furnishing of all labor, equipment, and materials necessary for the proper restoration of existing surfaces disturbed or damaged as a result of construction operations that are not specifically scheduled or specified for topsoil and seeding, paving, landscaping, or other surfacing.
- B. In general, the types of replacement included in this section are seeding along pipelines, concrete sidewalks, driveways, roadways, ditches, lawns and landscaped areas, and curb and gutter.
- C. Any damage to existing structures shall be repaired using materials and workmanship equal to those of original construction.

PART 2: NOT USED

PART 3: EXECUTION

3.01 RESTORATION OF SURFACES

- A. SEEDING ALONG PIPELINES
 - 1. All ground surfaces along pipelines that are not classified as lawns, landscaped areas, or pavement areas, but would be classified as open fields, shall be raked smooth and seeded in accordance with Section 02931. Large rocks, clumps of earth, and excessive spoil material shall be removed from the area prior to seeding.
 - 2. Shoulders of all roads shall be restored as specific for lawns and landscaped areas.
 - 3. Wooded areas not classified as lawns shall be restored to as near their original condition as possible.



B. CONCRETE SIDEWALKS

1. Concrete walks removed in connection with, or damaged as a result of, construction operations under the Contract shall be replaced with new construction. Such walks shall be constructed of Class A concrete on a thoroughly compacted subgrade or mineral aggregate base as shown. Concrete walks shall have a vertical thickness of not less than four inches (4") or not less than the thickness of the replaced walk where greater than four inches (4").
2. Walks shall be float finished, edged with an edging tool, and grooved at intermediate intervals not in excess of the width of the walk, uniform throughout the length of the walk in any one direction.

C. DRIVEWAYS

1. Unpaved driveways shall be surfaced with not less than three inches (3") of mineral aggregate base, topped with three inches (3") of stone, gravel, or other materials equal to that found in the original driveway. Driveways shall be left in a condition better than their original condition.
2. Unless otherwise specified, concrete drives shall be replaced with Class A concrete and shall have equal thickness and reinforcing steel to that of the original drive. Prior to placing the concrete, a six-inch (6") layer of compacted mineral aggregate base shall be placed in the drive area.
3. Bituminous or asphaltic concrete drives shall be restored with a six-inch (6") layer of compacted mineral aggregate base and a two-inch (2") layer of compacted asphaltic concrete surface (hot mix), grading E.

D. ROADWAY REPLACEMENT

1. Bituminous or asphaltic pavements shall include all areas paved with blacktop, built-up pavements of oil and stone or tar and stone, and similar pavements constructed with bituminous or asphaltic and stone materials.
2. Immediately upon completion of installation of underground piping and structures, the trench shall be backfilled and the roadway shall be repaired. Unless otherwise noted, in the excavated area, the repair shall consist of a six-inch (6") aggregate base course, a four-



inch (4") HB Binder Course, and a two-inch (2") surface course. If, in the opinion of the City, the area adjacent to the excavation has not been damaged to the extent that the base course need to be replaced, restoration may consist of a surface course of sufficient thickness to meet the existing pavement.

3. Portland cement concrete roadways shall be replaced with Class A concrete and shall have equal thickness and reinforcing steel as the original roadway. A mineral aggregate base layer of six inches (6") compacted thickness shall be placed prior to the placing of concrete.
4. Differential settlement of restored pavements shall be corrected immediately.
5. The Contractor shall repair and restripe any traffic markings that were damaged, removed, or covered during construction. All work shall be done in accordance with TDOT requirements and specifications.
6. All existing manhole and valve covers shall be raised as required by the Contractor prior to paving. The cost of this work shall be included in the unit bid prices for other related work and no additional payment shall be made, unless otherwise noted.

E. DITCHES

Ditches shall be regraded to the original grade and line. The surface of all ditches shall be returned to the same condition as found before commencing work and provide positive drainage.

F. LAWNS AND LANDSCAPED AREAS

1. Lawns and landscaped areas shall be regraded and replaced as follows:
 - a. Grading shall be to the grade existing before construction of the work under this Contract.
 - b. Lawn replacement shall be in accordance with the Section 02931. Topsoiled areas shall be replaced with topsoil of equal quality and quantity.



- 2. Landscaped areas shall be replaced with shrubs, hedges, ornamental trees, flowers, or other items to original condition.

G. CURB AND GUTTER

Curb and gutter removed with, or damaged as a result of, construction operations or injured or disturbed by the Contractor, his agents, or employees shall be replaced with new construction to a condition equal to that existing before damage was incurred. Class A Concrete shall be used in curb and gutter replacement.

H. DAMAGE TO STRUCTURES

Any damage to existing structures shall be repaired of materials and workmanship equal to those of original construction. Extensively damaged structures, where the structural stability has been affected or that cannot be repaired in a suitable fashion shall be replaced entirely. Replacement shall not commence until approval of the plan of replacement has been given by the City. Replacement costs shall be responsibility of the Contractor.

END OF SECTION



PART 1: GENERAL**1.01 SCOPE OF WORK**

- A. This section covers the furnishing of all labor, equipment, and materials necessary for the landscaping of all areas of the site disturbed by construction operations and all earth surfaces of embankments, including rough and fine grading, topsoil if required, fertilizer, lime, seeding, and mulching. The Contractor shall adapt his operations to variations in weather or soil conditions as necessary for the successful establishment and growth of the grasses or legumes.

PART 2: PRODUCTS**2.01 MATERIALS****A. FERTILIZER**

1. The quality of fertilizer and all operations in connection with the furnishing of this material shall comply with regulations adopted by the Tennessee Department of Agriculture.
2. Fertilizer shall be 10-10-10 grade. Upon written approval of the City, a different grade of fertilizer may be used, provided the rate of application is adjusted to provide the same amounts of plant food.
3. During handling and storing, the fertilizer shall be cared for in such a manner that it will be protected against hardening, caking, or loss of plant food values. Any hardened or caked fertilizer shall be pulverized to its original condition before being used.

B. LIME

1. The quality of lime and all operations in connection with the furnishing of this material shall comply with the requirements of the Tennessee Department of Agriculture.
2. During the handling and storing, the lime shall be cared for in such a manner that it will be protected against hardening and caking. Any hardened or caked lime shall be pulverized to its original condition before being used.



3. Lime shall be agriculture grade ground dolomitic limestone. It shall contain not less than eighty-five percent (85%) of the calcium and magnesium carbonates and shall be of such fineness that at least ninety percent (90%) will pass a No. 10 sieve and at least fifty percent (50%) will pass a No. 100 sieve.

C. SEED

1. The quality of seed and all operations in connection with the furnishing of this material shall comply with the regulations adopted by the Tennessee Department of Agriculture.
2. Seed shall have been approved by the Tennessee Department of Agriculture or any agency approved by the City before being sown, and no seed will be accepted with a date of test more than nine (9) months prior to the date of sowing. Such testing however, will not relieve the Contractor from responsibility for furnishing and sowing seed that meets these specifications at the time of sowing. When a low percentage of germination causes the quality of the seed to fall below the minimum pure live seed specified, the Contractor may elect, subject to the approval of the City, to increase the rate of seeding sufficiently to obtain the minimum pure live seed contents specified, provided that such an increase in seeding does not cause the quantity of noxious weed seed per square yard to exceed the quantity that would be allowable at the regular rate of seed.
3. During handling and storing, the seed shall be cared for in such a manner that it will be protected from damage by heat, moisture, rodents, or other causes.
4. Seed shall be entirely free from bulblets or seed of Johnson Grass, Nutgrass, Sandbur, Wild Onion, Wild Garlic, and Bermuda Grass. The specifications for restricted noxious weed seed refers to the number per pound, singly or collectively, of Blessed Thistle, Wild Radish, Canada Thistle, Corncockle, Field Bindweed, Quackgrass, Didders, Dock, Horsenettle, Bracted Plantain, Buckhorn, or Wild Mustard; but in no case shall the number of Blessed Thistle or Wild Radish exceed twenty-seven (27) seeds of each per pound. No tolerance on weed seed will be allowed.



D. MULCH

Straw mulch shall be threshed straw of Oats, Rye, or Wheat free from matured seed of obnoxious weeds or other species that would grow and be detrimental to the specified grass.

E. TACKIFIER

Emulsified asphalt or organic tackifier such as Reclamare R2400 shall be sprayed uniformly on mulch as it is ejected from blower or immediately thereafter. Tackifier shall be applied evenly over area creating uniform appearance. Rates of application will vary with conditions. Asphalt shall not be used in freezing weather.

PART 3: EXECUTION

3.01 PREPARATION

A. PROTECTION OF EXISTING TREES AND VEGETATION

1. Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking, or skinning of roots; skinning and bruising of bark; smothering of trees by stockpiling construction materials or excavated materials within drip line; excess foot or vehicular traffic; or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.
2. Provide protection for roots over one and a half inch (1-1/2") diameter cut during construction operations. Coat cut faces with an emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out and cover with earth as soon as possible.
3. The Contractor shall not remove or damage trees and shrubs that are outside the Clearing Limits established by the Owner or those within the Clearing Limits designated to remain.
4. Repair trees scheduled to remain and damaged by construction operations in a manner acceptable to the City. Repair damaged trees promptly to prevent progressive deterioration caused by damage.



5. Replace trees scheduled to remain and damaged beyond repair by construction operations, as determined by the City with trees of similar size and species. Repair and replacement of trees scheduled to remain and damaged by construction operations or lack of adequate protection during construction operations shall be at the Contractor's expense.

B. GRADING

1. Rough grading shall be done as soon as all excavation required in the area has been backfilled. The necessary earthwork shall be accomplished to bring the existing ground to the desired finish elevations as shown on the Contract Drawings or otherwise directed.
2. Fine grading shall consist of shaping the final contours for drainage and removing all large rock, clumps of earth, roots, and waste construction materials. It shall also include thorough loosening of the soil to a depth of six inches (6") by plowing, discing, harrowing, or other approved methods until the area is acceptable as suitable for subsequent landscaping operations. The work of landscaping shall be performed on a section by section basis immediately upon completion of earthwork.
3. Upon failure or neglect on the part of the Contractor to coordinate his grading with seeding and mulching operations and diligently pursue the control of erosion and siltation, the City may suspend the Contractor's grading operations until such time as the work is coordinated in a manner acceptable to the City.

C. SEEDBED PREPARATION

1. The Contractor shall cut and satisfactorily dispose of weeds or other unacceptable growth on the areas to be seeded. Uneven and rough areas outside of the graded section, such as crop rows, farm contours, ditches and ditch spoil banks, fence line and hedgerow soil accumulations, and other minor irregularities that cannot be obliterated by normal seedbed preparation operations, shall be shaped and smoothed as directed by the City to provide for more effective seeding and for ease of subsequent mowing operations.
2. The soil shall then be scarified or otherwise loosened to a depth of not less than 6" except as otherwise provided below or otherwise directed by the City. Clods shall be broken and the top two to three inches (2"-3") of soil shall be worked into an acceptable seedbed by



the use of soil pulverizers, drags, or harrows; or by other methods approved by the City.

3. On 2:1 slopes, a seedbed preparation will be required that is the same depth as that required on flatter areas, although the degree of smoothness may be reduced from that required on the flatter areas if so permitted by the City.
4. On cut slopes that are steeper than 2:1, both the depth of preparation and the degree of smoothness of the seedbed may be reduced as permitted by the City, but in all cases the slope surface shall be scarified, grooved, trenched, or punctured so as to provide pockets, ridges, or trenches in which the seeding materials can lodge.
5. On cut slopes that are either 2:1 or steeper, the City may permit the preparation of a partial or complete seedbed during the grading of the slope. If at the time of seeding and mulching operations such preparation is still in a condition acceptable to the City, additional seedbed preparation may be reduced or eliminated.
6. The preparation of seedbeds shall not be done when the soil is frozen, extremely wet, or when the City determines that it is in an otherwise unfavorable working condition.

D. APPLICATION RATES

Seed shall be applied by means of a hydro-seeder or other approved methods. The rates of application of seed, fertilizer, and limestone shall be as stated below.

1. Lime and Fertilizer

In the absence of a soil test, the following rates of application of limestone and fertilizer shall be:

- a. 4,000 pounds limestone per acre;
- b. 1,000 pounds 10-10-10 (N-P₂O₅-K₂O) fertilizer per acre and the remaining quantity applied when vegetation is three inches (3") in height or forty-five (45) days after seeding, whichever comes first.



2. Mulch

Mulch shall be applied at the following rates per acre:

- a. 3,000-4,000 pounds straw mulch;
- b. 1,500-2,000 pounds wood cellulose fiber;
- c. 35-40 cubic yards of shredded or hammermilled hardwood bark; or
- d. 1,200-1,400 pounds of fiberglass roving.

3. Seed

The kinds of seed and the rates of application shall be as contained in this table. All rates are in pounds per acre. See Notes 1 and 2.

- a. Fall and Winter (Normally September 1 to May 1)
80 pounds of Ky-31 Tall Fescue and 15 pounds of Rye Grain
- b. Summer (Normally May 1 to September 1)
100 pounds of Ky-31 Tall Fescue

NOTE:

- 1. On cut and fill slopes having 2:1 or steeper slopes, add forty (40) pounds of Sericea lespedeza per acre to the planned seeding (hulled in spring and summer unhulled in fall and winter) plus fifteen (15) pounds of Sudangrass in summer seeding or twenty-five (25) pounds of Rye Cereal per acre in fall and winter seeding, if seeded September to February.
- 2. These seeding rates are prescribed for all sites with less than fifty percent (50%) ground cover and for sites with more than fifty percent (50%) ground cover where complete seeding is necessary to establish effective erosion control vegetative cover. On sites having fifty to eighty percent (50%-80%) ground cover where complete seeding is not necessary to establish vegetative cover, reduce the seeding rate at least one-half the normal rate.

E. APPLICATION

- 1. Equipment to be used for the application, covering, or compaction of limestone, fertilizer, and seed shall have been approved by the City before being used on the project. Approval may be revoked at any time if equipment is not maintained in satisfactory working condition or if the equipment operation damages the seed.



2. Limestone, fertilizer, and seed shall be applied within twenty-four (24) hours after completion of seedbed preparation unless otherwise permitted by the City, but no limestone or fertilizer shall be distributed and no seed shall be sown when the City determines that weather and soil conditions are unfavorable for such operations.
3. Limestone may be applied as a part of the seedbed preparation, provided it is immediately worked into the soil. If not so applied, limestone and fertilizer shall be distributed uniformly over the prepared seedbed at the specific rate of application and then harrowed, raked, or otherwise thoroughly worked or mixed into the seedbed.
4. Seed shall be distributed uniformly over the seedbed at the required rate of application, and immediately harrowed, dragged, raked, or otherwise worked so as to cover the seed with a layer of soil. The depth of covering shall be as directed by the City. If two (2) kinds of seed are to be used that require different depths of covering, they shall be sown separately.
5. When a combination seed and fertilizer drill is used, fertilizer may be drilled in with the seed after limestone has been applied and worked into the soil. If two (2) kinds of seed are being used that require different depths of covering, the seed requiring the lighter covering may be sown broadcast or with a special attachment to the drill, or drilled lightly following the initial drilling operation.
6. When a hydraulic seeder is used for application of seed and fertilizer, the seed shall not remain in water containing fertilizer for more than thirty (30) minutes prior to application unless otherwise permitted by the City.
7. Immediately after seed has been properly covered the seedbed shall be compacted in the manner and degree approved by the Engineer.
8. When adverse seeding conditions are encountered due to steepness of slope, height of slope, or soil conditions, the City may direct or permit that modifications be made in the above requirements that pertain to incorporating limestone into the seedbed; covering limestone, seed, and fertilizer; and compaction of the seedbed.



9. Such modifications may include but not be limited to the following:
 - a. The incorporation of limestone into the seedbed may be omitted on:
 - i. cut slopes steeper than 2:1;
 - ii. 2:1 cut slopes when a seedbed has been prepared during the excavation of the cut and is still in an acceptable condition; or
 - iii. areas of slopes where the surface of the area is too rocky to permit the incorporation of the limestone.
 - b. The rates of application of limestone, fertilizer, and seed on slopes 2:1 or steeper or on rocky surfaces may be reduced or eliminated.
 - c. Compaction after seeding may be reduced or eliminated on slopes 2:1 or steeper, on rocky surfaces, or on other areas where soil conditions would make compaction undesirable.

F. MULCHING

1. All seeded areas shall be mulched unless otherwise indicated in the special provisions or directed by the Engineer.
2. It shall be spread uniformly at a rate of two (2) tons per acre in a continuous blanket over the areas specified.
3. Before mulch is applied on cut or fill slopes that are 3:1 or flatter and ditch slopes, the Contractor shall remove and dispose of all exposed stones in excess of three inches (3") in diameter and all roots or other debris that will prevent proper contact of the mulch with the soil.
4. Mulch shall be applied within twenty-four (24) hours after the completion of the seeding unless otherwise permitted by the City. Care shall be exercised to prevent displacement of soil or seed or other damage to the seeded area during the mulching operations.
5. Mulch shall be uniformly spread by hand or by approved mechanical spreaders or blowers which will provide an acceptable application. An acceptable application will be that that will allow



some sunlight to penetrate and air to circulate but also partially shade the ground, reduce erosion, and conserve soil moisture.

6. Mulch shall be held in place by applying a sufficient amount of asphalt or other approved binding material to assure that the mulch is properly held in place. The rate and method of application of binding material shall meet the approval of the City. Where the binding material is not applied directly with the mulch, it shall be applied immediately following the mulch operation.
7. The Contractor shall take sufficient precautions to prevent mulch from entering drainage structures through displacement by wind, water, or other causes and shall promptly remove any blockage to drainage facilities that may occur.

G. MAINTENANCE

1. The Contractor shall keep all seeded areas in good condition, reseeded and mowing if and when necessary as directed by the City, until a good lawn is established over the entire area seeded and shall maintain these areas in an approved condition until final acceptance of the Contract.
2. Grassed areas will be accepted when a ninety-five percent (95%) cover by permanent grasses is obtained and weeds are not dominant. On slopes, the Contractor shall provide against washouts by an approved method. Any washouts that occur shall be regraded and reseeded until a good sod is established.
3. Areas of damage or failure due to any cause shall be corrected by being repaired or by being completely redone as may be directed by the City. Areas of damage or failure resulting either from negligence on the part of the Contractor in performing subsequent construction operations or from not taking adequate precautions to control erosion and siltation as required throughout the various sections of the Specifications, shall be repaired by the Contractor at his cost and as directed by the City.

END OF SECTION



SECTION 031000

CONCRETE FORMWORK

PART1: GENERAL

1.01 DESCRIPTION OF WORK

Extent of formwork is indicated by the concrete structure shown on the Drawings. Work shall include, except as specified elsewhere in the Contract Documents, providing formwork and shoring for all cast-in-place concrete; and installation into the formwork items furnished by others, such as anchors, plates, inserts, frames, nosings, and any other items embedded in concrete

1.02 STANDARDS

A. REFERENCES

Some products and execution are specified in this Section by reference to published specifications or standards of the following with respective abbreviations used:

- 1. American Concrete Institute.....ACI
- 2. The American Society for Testing and MaterialsASTM
- 3. U. S. Products Standards.....PS

B. STANDARD SPECIFICATIONS AND CODES

The following publications of the American Concrete Institute form a part of the Specification

- 1. ACI 347-78, Recommended Practice for Concrete Formwork;
- 2. ACI 301-72, Specifications for Structural Concrete.

PART 2: PRODUCTS

2.01 MATERIALS

Materials used for formwork shall be selected by the Contractor and shall be subject to approval by the Engineer. All materials shall be high quality and standard for the industry.



PART 3: EXECUTION

3.01 FORMWORK DESIGN

A. GENERAL

The Contractor shall be responsible for the design of all concrete formwork. Formwork shall be designed in accordance with ACI 347, unless otherwise noted. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Fit forms placed in successive units for continuous surfaces to accurate alignment, free from irregularities and with allowable tolerances.

Formwork shall be sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly abut joints and provide back-up material at joints as required to prevent leakage and fins. At construction joints, contact surface of the form for sheeting for flush surfaces exposed to view shall overlap the hardened concrete in the previous placement by more than one foot (1'). The forms shall be held against the hardened concrete to prevent offsets or loss of mortar at the construction joint and to maintain a true surface.

Formwork shall be so anchored to shores or other supporting surfaces or members that upward or lateral movement of any parts of the formwork system during concrete placement will be prevented. Wedges used for final adjustment of the forms prior to concrete placement shall be fastened in position after the final check.

Runways for moving equipment or pump lines shall be provided with struts or legs and shall be supported directly on the formwork or structural member without resting on the reinforcing steel.

B. LOADS

Design, erect, support, brace, and maintain formwork so that it will safely support vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Carry vertical and lateral loads to ground by formwork system and in-place construction that has attained adequate strength for the purpose.

Support form facing materials by structural members spaced sufficiently close to prevent deflection. Provide camber in formwork as required for anticipated deflection due to weight and pressures of fresh concrete.



C. **FORM ACCESSORIES**

Form accessories to be partially or wholly embedded in the concrete, such as ties and hangers, shall be a commercially manufactured type. Form ties shall be constructed so that the end fasteners can be removed without causing appreciable spalling at the faces of the concrete.

After the ends or end fasteners of form ties have been removed the embedded portion of the ties shall terminate not less than two (2) diameters or twice the minimum dimensions of the tie from the formed faces of concrete to be permanently exposed to view except that in no case shall this distance be less than three-quarters of an inch (3/4").

When the formed face of the concrete is not to be permanently exposed to view, form ties may be cut off flush with the formed surfaces.

3.02 **TOLERANCES**

- A. Unless otherwise specified by the Engineer, formwork shall be constructed so that the concrete surfaces will conform to the tolerances limits listed in Table 4.3.1 of ACI 301-72.
- B. The Contractor shall establish and maintain in an undisturbed condition until final completion and acceptance of the project sufficient control points and benchmarks to be used for reference purposes to check tolerances.

3.03 **PREPARATION OF FORM SURFACES AND FORM COATINGS**

A. **SURFACE PREPARATION**

All surfaces of forms and embedded materials shall be cleaned of any accumulated mortar or grout from previous concreting and of all other foreign materials before concrete is placed in the forms.

B. **FORM COATING**

1. Coat form contact surfaces with form-coating compound before reinforcement is placed.
2. Provide form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion or impede the wetting of surfaces to be cured with water or curing compounds.
3. Do not allow excess form coating material to accumulate in the forms or to come into contact with surfaces against which fresh concrete will be placed. Apply in accordance with manufacturer's instruction.

3.04 **REMOVAL OF FORMS**



- A. Formwork for columns, walls, sides of beams, and other parts not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operation provided surfaces are cured and protected from cold weather as specified in other Sections of this Specification.
- B. Forms and shoring in the formwork used to support the weight of concrete in beams, slabs, and other structural members shall remain in place until the concrete has reached the minimum strength specified of seventy-five percent (75%) of the specified twenty-eight (28)-day design strength.
 - 1. Strength of concrete must be verified by concrete test cylinders molded and cured in the field under the same conditions that the concrete represented by these cylinders are cured and/or maturity meters connected to thermos-couples embedded in the concrete.
 - 2. It shall be the responsibility of the concrete technician, employed by the Owner, to inform the General Contractor when the strength of concrete cured in the field has attained the minimum specified strength required for removal of the forms.
- C. Bottom forms of slabs shall not be removed in less time than is indicated below unless otherwise approved by the Engineer.

Above 60° F	50° F	*40°-50° F
8 days	10 days	18 days

*When temperature is below 40° F, the shores shall remain in place for an additional time equal to the lower temperature.

- D. When shores and other vertical supports are so arranged that the non-load-carrying form-facing material may be removed without loosening or disturbing the shores and supports, the facing material may be removed at an earlier age as specified or permitted. Wood forms for wall openings shall be loosened as soon as this can be accomplished without damage to the concrete.
- E. When repair of surface defects or finishing is required at an early age, forms shall be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations.

3.05 RESHORING

- A. When reshoring is permitted or required, the operations shall be planned in advance and shall be subject to approval by Engineer. While reshoring is under way, no live load shall be permitted on the new construction.



- B. In no case during reshoring shall concrete in beam, slabs, column, or any other structural member be subjected to combined dead and construction loads in excess of the loads permitted by the Engineer for the developed concrete strength at the time of reshoring.
- C. Reshores shall be placed as soon as practicable after stripping operations are complete but in no case later than the end of the working day on which stripping occurs.

3.06

RECORDS

The Contractor shall maintain an accurate log showing the following information:

- a. Date of pour
- b. Area poured
- c. Average ambient temperature during curing period
- d. Date forms scheduled for removal
- e. Date form removal completed
- f. Method of reshoring (number of floor, etc.)
- g. Test cylinder serial numbers
- h. Strength of test cylinders at 7 and 28 days.

END OF SECTION



SECTION 032000

CONCRETE REINFORCEMENT

PART1: GENERAL

1.01 DESCRIPTION OF WORK

The extent of concrete reinforcement is shown on the Drawings. The work includes fabrication and placement of reinforcement for cast-in-place concrete, including bar, ties, and supports.

1.02 STANDARDS

A. REFERENCES

Some products and execution are specified in this Section by reference to published specifications or standards of the following with respective abbreviations used:

1. American Concrete Institute.....ACI
2. The American Society for Testing and MaterialsASTM
3. American Welding Society.....AWS

B. STANDARD SPECIFICATIONS AND CODES

1. The following publications of the American Concrete Institute form a part of the Specification
 - a. ACI 315-74, Manual of Standard Practice for Detailing Reinforced Concrete Structures;
 - b. ACI 318-77, Building Code Requirements for Reinforced Concrete.
2. American Welding Society (AWS), AWS D12.10-61, Recommended Practice for Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction.
3. Concrete Reinforcing Steel Institute, Manual of Standard Practice.
4. American Society for Testing and Materials (ASTM)
 - a. ASTM A 82-76, Specification for Cold Drawn Steel Wire for Concrete Reinforcement;
 - b. ASTM A 185-73, Specification for Welded Steel Wire Fabric for Concrete Reinforcement;
 - c. ASTM A 615-78, Specification for Deformed Billet-Steel Bars for Concrete Reinforcement; and



- d. ASTM A 617-76, Specification for Axle-Steel Deformed and Plan Bars for Concrete Reinforcement.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Reinforcing steel shall be delivered to the project site properly tagged, bundled, and ready to place.
- B. Reinforcing steel delivered to the project site, and not immediately placed in forms shall be protected from mud, excessive rust producing conditions, oil, grease, or distortion.
- C. Reinforcing steel shall be stored off the ground.

PART 2: PRODUCTS

2.01 MATERIALS

- A. All reinforcing steel shall conform to one of the following ASTM Standards, latest edition:
 - 1. ASTM A-615, Station Specification for Deformed Billet-Steel Bars for Concrete Reinforcement, Grade 60; and
 - 2. ASTM A-617, Standard Specification for Axle Steel Deformed Bars for Concrete Reinforcement, Grade 60.
- B. Weld wire fabric shall be electrically welded wire fabric of cold drawn wire of gauge and mesh shown on the Drawings or required and shall conform to ASTM A-185, Specifications for Welded Steel Wire Fabric for Concrete Reinforcement.
- C. Tie wire shall be 16-guage or heavier, black annealed wire. Reinforcing shall be free from scale, rust, or coatings. Stainless steel or plastic coated bar chairs and spacers shall be furnished where concrete will be exposed.



PART 3: EXECUTION

3.01 FABRICATING AND WELDING TOLERANCE

- A. Bars used for concrete reinforcement shall meet the following requirements for fabrication tolerance.

Sheared Length	+1"
Overall Dimension of Stirrups	+1/2"
All Other Bends	+1"

- B. Bars shall be placed to the following tolerances:

Concrete Cover to Formed Surfaces	+1/4"
Top Bars in Slabs	+1/4"
Top Bars In Beams	+1/2"
Horizontal Tolerance from Vertical Surfaces	+1/4"
Vertical Bars in Columns	+1/4"
Vertical and Horizontal Bars in Walls	+1/2"
Lengthwise in Member	+2"
Wire Fabric	+1/2" from center of slab or location called for on Drawings

- C. Bars may be moved one (1) bar diameter as necessary to avoid interference with other reinforcing steel, conduits, or embedded items. If the bars are moved more than one (1) bar diameter, the resulting arrangement of bars shall be subject to approval.



3.02 WELDING

- A. When required or approved by Engineer, welding of reinforcing steel shall conform to AWS D12.1, Recommended Practice for Welding Reinforcing Steel Metal Inserts, and Connections in Reinforced Concrete Construction.
- B. No welding shall be done at the bend in a bar.
- C. Welding of cross bars (tack welding) shall not be permitted except as authorized or directed by the Engineer.

3.03 PLACING

- A. Minimum concrete protective covering for reinforcement except for extremely corrosive atmosphere or other severe exposures shall be as follows:

Concrete deposited against the ground	3"
Formed surfaces exposed to weather or in contact with the ground	2"
Interior surfaces	1-1/2" for beams and column ties; 3/4" for slabs and walls; Beam and column bars shall be anchored against the ties.

- B. All reinforcement at the time concrete is placed shall be free of mud, oil, or other materials that may adversely affect or reduce the bond. Reinforcement with rust, mill scale, or tooth will be accepted as being satisfactory without cleaning or brushing, provided the dimensions and weights, including heights of deformations, of a cleaned sample shall not be less than required by applicable ASTM Standards. Reinforcing shall be free from scale, loose rust, or coatings that will reduce the bond to the concrete.
- C. All reinforcing bars shall be supported and wired together to prevent displacements by construction loads or the placing of concrete beyond the tolerances as previously set forth.
- D. Over formwork, metal, plastic, or other approved bar chairs and spacers shall be furnished. When the concrete surface will be exposed to weather in the finished structure or where rust would impair architectural finishes, the portions of all accessories in contact with the formwork shall be stainless steel or plastic.



- E. Welded wire fabric shall be lapped at least on-half (1/2) mesh plus end extension of wires but not less than six inches (6"). Wire mesh shall be so placed as to positively secure its position one-third (1/3) of the slab thickness below the top of the slab for slabs on grade.
- F. **SPLICES**
1. Splices and offsets in reinforcements at points of maximum stress shall not be made.
 2. All splices shall be approved by the Engineer and shall provide sufficient lap to transfer the stress between the bars by the required development length of the bars.
 3. The character of design of each splice shall conform to the requirements of ACI 318-77.
 4. All reinforcing steel shall be cut and shop fabricated and delivered according to Section of Delivery, Handling, and Storage above.
- G. The Contractor shall securely maintain the metal reinforcement accurately in place until the concrete is placed. Any and all disturbances of reinforcing from any cause whatsoever shall be fully corrected prior to placing of concrete, and all damaged bar supports and spaces shall be repaired or removed and replaced.

3.04 **INSPECTION**

The Engineer or his representative shall always be notified of the pouring schedule in advance and in ample time prior to placement of concrete to inspect the reinforcement. Inspection of reinforcement will be made only after each section to be poured is complete.

END OF SECTION



SECTION 033000

CAST-IN-PLACE CONCRETE

PART1: GENERAL

1.01 DESCRIPTION OF WORK

This Section includes cast-in-place concrete as shown on Drawings, and as specified herein. In general, this work includes providing cast-in-place concrete consisting of Portland cement, fine and course aggregate, selected admixtures, mixing, transporting, placing, finishing, and curing as herein specified.

1.02 STANDARDS

A. REFERENCES

Some products and execution are specified in this Section by reference to published specifications or standards of the following with respective abbreviations used:

1. American Concrete Institute.....ACI
2. The American Society for Testing and MaterialsASTM

B. STANDARD SPECIFICATIONS AND CODES

The following publications of the American Concrete Institute form a part of the Specification

1. ACI 301, Specification for Structural Concrete;
2. ACI 304, Recommended Practice for Measuring, Mixing Transporting, and Placing Concrete;
3. ACI 305, Recommended Practice for Hot Weather Concreting;
4. ACI 306, Recommended Practice for Cold Weather Concreting;
5. ACI 308, Recommended Practice for Curing Concrete;
6. ACI 309, Recommended Practice for Consolidation of Concrete;
7. ACI 311, Recommended Practice for Concrete Inspection;
8. ACI 214, Recommended Practice for Evaluation of Compressive Test Results of Field Concrete
9. ACI 211.1, Recommended Practice for Selecting Proportions 70 for Normal Weight Concrete;
10. ACI 212 Guide for Use of Admixtures in Concrete.



1.03 QUALITY ASSURANCE

- A. If the average strength of the laboratory control cylinders shows the concrete to be below the specified design strength, the aggregate proportions and water content may be changed by the Engineer, who, in addition to such changes, may require core tests. Tests confirming concrete strengths on hardened concrete that was poured without testing shall be paid for by the Contractor.
- B. Prepare design mixes for each class of concrete used in accordance with ACI 311.1. The Contractor shall pay for all design mix costs. Submit written reports, as specified in subsection 1.04, Submittals, to the Engineer for each proposed mix for each class of concrete prior to start of work. Do not begin concrete production until mixes have been reviewed by the Engineer.
- C. Strength data for establishing standard deviation and required over-strength factor will be considered suitable if the concrete production facility has certified records consisting of at least thirty (30) consecutive tests in one group or the statistical average for two groups totaling thirty (30) or more tests representing similar materials and project conditions. Records of these tests shall be submitted with the proposed design mix.
- D. If standard deviation exceeds eight hundred (800) psi or, if no suitable records are available, selected proportions to produce an average strength of at least one thousand, two hundred (1,200) psi greater than the required compressive strength of concrete. If standard deviations are less than six hundred (600) psi, the minimum over-strength factor required in the design mix shall be in accordance with ACI 318, Section 4.3.1.
- E. Design mixes shall be proportioned using the maximum specified slump and temperature. Laboratory test data for revised mix designs and strength results must be submitted to and accepted by the Engineer before using in the work. Admixtures shall be used in strict accordance with the manufacturer's written instructions. Design mix shall be proportioned using the proposed admixtures at optimum recommended dosages. The manufacturer of the mixture shall prepare and submit test data used to determine the optimum dosage.

1.04 SUBMITTALS

- A. The Contractor shall submit the proposed design mix for each class of concrete specified herein in accordance with the requirement herein.
- B. Design mixes shall be submitted two (2) weeks prior to placement of concrete. The cost of the design mix shall be paid for by the contractor.



- C. Submit records of all concrete pours showing exact location of pour, date of pour, quantity of pour, class of concrete poured, and temperature at time of pour to the Engineer each week.
- D. Submit to the Engineer chemical and physical analysis of all cement and fly ash delivered to the batch plant seven (7) days prior to use of the cement or fly ash.

PART 2: PRODUCTS

2.01 MATERIALS

A. PORTLAND CEMENT

1. Portland cement shall be fresh stock of an approved standard brand meeting the requirements of ASTM C-150, of Type II.
2. Only one (1) brand of cement shall be used, except when otherwise approved by the Engineer, and the Contractor shall inform the Engineer of the brand name of the cement proposed for use.
3. The Contractor shall submit a copy of mill test reports on all cement delivered to the job seven (7) days prior to use of the cement.
4. Cube strength from mill tests shall have a tolerance of plus or minus six hundred (± 600) psi.
5. The fineness of cement used shall not have more than ten percent (10%) retained on a #325 mesh screen when tested in accordance with ASTM C-430.

B. FLY ASH

1. Fly ash shall have a high fineness and low carbon content and shall exceed the requirements of ASTM C-618.
2. Specifications for fly ash and raw or calcined natural for use in Portland cement concretes for Class 7, except that the loss of ignition shall be less than three percent (3%), and all fly ash shall be classified processed material.
3. Fly ash shall be obtained from one (1) source for the concrete delivered to the project.
4. Complete chemical and physical analysis of each carload of fly ash shall be submitted to the Engineer ten (10) days prior to use of each car load delivered.



5. Concrete mixes proportioned with fly ash shall contain not less than ten Percent (10%) nor more than twenty percent (20%) by weight of cement of fly ash.

C. CONCRETE AGGREGATE

1. Concrete aggregate for stone concrete shall consist of clean crushed stone or gravel having hard, strong, uncoated particles free from injurious amounts of soft, thin, elongated, or laminated pieces, alkali, organic, or other deleterious matter.
2. Maximum aggregate size shall be three quarter inch (3/4") for slabs columns, etc.
3. The maximum permissible percentage of elongated particles shall not exceed five percent (5%) by weight. Elongated particles are those defined as having a length equal to or greater than five (5) times the width.
4. Samples of coarse aggregate shall be submitted to the testing laboratory for testing and approval prior to use.
5. The fineness modulus of the coarse aggregate shall not vary for more than $\pm 0.3\%$.
6. Aggregate shall conform to ASTM C33

D. FINE AGGREGATE

1. Fine aggregate shall consist of sand, stone screening, or other inert materials with similar characteristics having clean, strong, durable, uncoated grains and free from lump, soft or flaky particles, clay, shale, alkali, organic matter, or other deleterious substances.
2. Fine aggregate shall be submitted for testing and approval to the testing laboratory. The laboratory shall verify that fine aggregate conforms to ASTM standards by making standard colormetric, sediment, and comparative tensile tests, and by sieve analysis.
3. The fineness modules of the sand shall not vary by more than $\pm 0.2\%$.
4. Color shall be standard as determined from colormetric tests.
5. Aggregate shall conform to ASTM C33.

E. CONCRETE ADMIXTURES

1. Concrete admixtures, when required or permitted, shall conform to the appropriate Specification listed.



2. Do not use admixtures that have not been incorporated and tested in the accepted mixes, unless otherwise authorized in writing by the Engineer.
3. Air-entraining admixtures shall exceed the requirements of ASTM C-260, Specifications for Air-Entraining Admixtures for Concrete.
4. Water reducing admixtures shall be hydroxolated polymer type, exceeding the requirements of ASTM C-494, Type A.

F. PREMOLDED EXPANSION JOINT FILLERS

Premolded expansion joint fillers shall conform to ASTM D1751.

G. LIQUID CURING MATERIAL

1. Liquid curing material for concrete shall exceed the requirements of ASTM C-309, Type I.
2. Products acceptable shall provide water retention not exceeding a loss of 0.020 grams per square centimeter when tested at a coverage of 200 square feet per gallon and tested in accordance with ASTM c-156. Submit test data verifying these requirements for approval.

H. BURLAP

1. Burlap shall be free of sizing and any substance that is injurious to cement or can cause discoloration.
2. Burlap shall be rinsed in water prior to use.
3. Burlap shall be sufficient thickness to retain water without requiring wetting.

I. CRUSHED STONE FILL

1. Four inches (4") of crushed stone fill shall be placed under all concrete in contact with the ground.
2. Stone shall be uniform one-inch (1") stone, no fines, compacted as thoroughly as possible by tamping and rolling.
3. Stone fill shall conform to ASTM C-33

J. VAPOR BARRIER

Vapor barrier shall be Moistop as manufactured by the St. Regis Co., or an approved equal.



K. WATERSTOPS

1. Waterstops shall be Sealtight PVC waterstrips as manufactured by the W.R. Meadows Co., or an approved equal.
2. All waterstops shall be Type 6316.
3. Water bars shall be located in all expansive joints in the concrete and in all construction joints in concrete walls.

L. JOINT SEALING COMPOUND

Joint sealing compound shall be a two (2)-part mineral filled epoxy polyurethane, and shall be used for all exposed joints in exterior paving slabs, sidewalk, where concrete slabs abut concrete walls, and in exposed joints in slabs on grade

M. SURFACE COATING

Surface coating for all exposed concrete except where otherwise shown shall be Thoroseal as manufactured by the Standard Dry Wall Co., or an approved equal.

2.02 AIR ENTRAINMENT

- A. Air-entraining admixtures shall be used for all concrete exposed to freezing and thawing or subjected to hydraulic pressure.
- B. A tolerance of up to but not exceeding one inch (1") above the indicated maximum shall be allowed for individual batches on any one (1) day's pour, provided the average of the most recent ten (10) batches within the same pour does not exceed the maximum limits.
- C. No tolerance will be permitted for individual batches when less than ten (10) batches are delivered for one (1) day's pour.

2.03 SLUMPS

- A. All concrete shall be proportioned and produced to have a maximum slump of four inches (4") and a minimum slump of two inches (2").
- B. A tolerance of up to but not exceeding one inch (1") above the indicated maximum shall be allowed for individual batches in any one (1) day's pour, provided the average of the most recent ten (10) batches within the same pour does not exceed the maximum limits.
- C. No tolerance will be permitted for individual batches when less than ten (10) batches are delivered for one (1) day's pour.



2.04 CONCRETE MIXING

- A. Concrete shall be mixed at batch plants or it may be transit mixed as specified herein.
- B. Concrete batch plants must comply with the requirements of ASTM C-94 and ACI-304, with sufficient capacity of producing concrete of the quantity and quality as specified here in. All plant facilities are subject to inspection by the Engineer.
- C. Ready-mix concrete shall comply with requirements of ASTM C-94, and as specified herein, unless otherwise noted.
- D. During hot weather or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C-94 will be required as follows:
 - 1. When air temperatures are between 80° F and 90° F, reduce the mixing and delivery time from one and a half (1-1/2) hours to one (1) hour.
 - 2. When outside air temperatures are above 90° F, reduce the mixing and delivery time from one and a half (1-1/2) hours to forty-five (45) minutes.
- E. Addition of water at the site for concrete mix with insufficient slumps, slumps less than the maximum specified herein, will not be permitted. Concrete delivered to the project with slump less than the minimum or greater than the maximum specified shall be rejected and discarded off site.
- F. Batch tickets for each load of concrete shall be submitted to the Engineer. The following information shall be provided on each batch ticket;
 - 1. Design mix designation;
 - 2. Exact time cement, water, and aggregate were discharged into the mix;
 - 3. Compressive strength of mix; and
 - 4. Amount of water added to the mix.
- G. Maintain equipment in proper operating condition, with drums cleaned before charging of each batch. Schedule delivery of trucks in order to prevent delay of placing after mix.



H. *CONCRETE TYE AND STRENGTHS

Location	Maximum Size Aggregate	*28-Day Compressive Strength
Footings	3/4"	3,000 psi
Liquid Retaining Structures	3/4"	4,500 psi
Slab on grade	3/4"	3,000 psi
Walls	3/4"	4,000 psi
Columns	3/4"	See notes on Plans
Beams, supported slabs, and joists	3/4"	4,000 psi

*Twenty-eight days strength shall be as determined from concrete sampled in accordance with ASTM C-172 and standard 6" X 12" molded cylinders tested in accordance with ASTM C-31 and C-39.

**See notes on plans for required concrete strengths.

PART 3: EXECUTION

3.01 PREPARATION

Before placing concrete, all equipment for mixing and transporting and placing concrete shall be cleaned; all debris and ice shall be removed from spaces to be occupied by the concrete; forms shall be thoroughly cleaned of soil, ice and other coatings that will prevent proper bond; reinforcement shall be securely tied in place; and expansion joint material, anchors, and other embedded items shall be securely positioned. Hardened concrete and foreign materials shall be removed from the conveying equipment.

3.02 CONCRETE PLACEMENT

- A. Place concrete in compliance with the practices and recommendations of ACI 304 or as herein specified.
- B. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practical by methods that will prevent separation or loss of ingredients and in a manner that will ensure that the required quality concrete is obtained.
- C. Conveying equipment shall be of size and design to ensure a continuous flow of concrete at the delivery end.
- D. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited on concrete that has hardened sufficiently to



cause the formation of seams and planes of weakness within the section. If a section cannot be placed continuously, construction joints shall be located at points as provided for in the Drawings or as approved.

- E. Placing shall be carried on at such a rate that the concrete which is being integrated with fresh concrete is still plastic.
- F. Deposit concrete as nearly as possible to its final location to avoid segregation due to rehandling or flowing.
- G. Concrete shall not be allowed to “freefall” a distance greater than three feet (3'-0”). All concrete placed in columns and walls shall be placed through a tremie with the bottom or outlet of the tremie being held at maximum of three feet (3'-0”) above the surface where concrete is being placed.
- H. Screed concrete that is to receive other construction to the proper level to avoid excessive skimming and grouting.
- I. Do not use concrete that has become non-plastic and unworkable or does not meet the required quality control limit, or that has become contaminated by foreign material.
- J. Remove rejected concrete from the project site and dispose of in an acceptable location.
- K. CONSOLIDATION
 - 1. Consolidate concrete placed in forms by mechanical vibrating equipment supplemented by hand-spading, rodding, and tamping.
 - 2. Vibration of forms and reinforcing steel will not be permitted.
 - 3. Insert and withdraw vertically at uniformly spaced locations not further than the visible effectiveness of the vibrator.
 - 4. Do not insert vibrators into lower levels of concrete that have begun to set.
 - 5. At each insertion, limit the duration of vibration to the time necessary to consolidate the concrete and complete embedment of reinforcing and other embedded items without causing segregation of the mix.
- L. Deposit and consolidate concrete in slabs in a continuous operation, within the limits of construction joints until the placing of the entire section is complete.
- M. Bring surface of slabs to the correct elevations with a straight edge and strike off. Use bull floats or darbies to smooth the surface, leaving it free of lumps and hollows.



- N. Do not sprinkle water on the plastic surface. Do not disturb the surface prior to beginning the finish operation.
- O. Concrete placed by pumping shall conform to the recommendations of ACI Publication, Placing Concrete by Pumping Methods.

3.03 CONSTRUCTION JOINTS

- A. Joints not shown on the Drawings shall be made at locations that will least impair the strength of the structure and shall be approved by the Engineer. In general, they shall be located near the middle of the span of members.
- B. Joints in walls and columns shall be located at the underside of floors or slabs, and the tops of foundation walls.
- C. Roughen surfaces of hardened concrete at all vertical construction joints. Clean surface of laitance, coatings, loose particles, and foreign matter to expose aggregate.
- D. Prepare for bonding of fresh concrete that has hardened. At joints between foundation systems and walls, dampen, but do not saturate, the roughened and cleaned surface of set concrete immediately before placing fresh concrete.
- E. In lieu of neat cement grout, bonding grout may be a commercial bonding agent. Apply to cleaned concrete surfaces in accordance with the printed instructions of this bonding material manufacturer.
- F. Provide keyways at least one and a half inches (1-1/2") deep in all construction joints in walls, slabs, and between walls, and foundation systems.
- G. Provide PVC waterstops in all construction joints in concrete walls and in concrete beams and slabs. PVC waterstops shall also be provided between concrete beams and slabs at all expansion joints.

3.04 COLD WEATHER PLACING AND CURING REQUIREMENTS

- A. All concrete placed in temperatures 40°F or below or exposed to temperatures 40°F or below within five (5) days after the concrete is placed, shall conform to the requirements of ACI 306, Recommended Practice for Winter Concreting, unless otherwise specified herein.
- B. The following protection requirements for concrete placed, protected, and cured temperatures 40°F. or less shall be considered the minimum acceptable standard.



1. Slabs, Beams

- a. Enclose the entire perimeter of the floor below with a continuous sheet of reinforced polyethylene or canvas. The enclosure shall be securely fastened to the top of the outside edge of the forms of the area being protected and to the slab or floor level immediately below the concrete being protected.
- b. The top of the concrete surface shall be covered with either insulating blankets designed specifically for this use, or sheets of polystyrene covered with polyethylene.
- c. Sufficient heaters shall be placed in the enclosure below the slabs to maintain the air temperature within all sections of the enclosure between 60°F and 70°F for a minimum period of five (5) days. Salamanders will not be permitted.

2. Columns and Walls

- a. Forms shall remain in place for minimum of five (5) days.
- b. When the outside temperatures falls below 32°F, an insulating blanket shall dropped over and around the perimeter of the column or wall. These blankets shall remain in place for a minimum period of five (5) days.

3. Slabs on Grade

Cover top with insulating blankets. Blankets shall remain in place for a minimum period of five (5) days.

4. Temperature of concrete at placement shall not be less than 55°F.
5. In addition to laboratory-cured test specimens, additional concrete test specimens shall be cured under the same field conditions that the concrete in the field represented by these cylinders is cured and high thermometers shall be placed on the surface of slab to record daily temperatures during curing period.

3.05 HOT WEATHER PLACING

- A. An approved admixture designed to retard the rate of set shall be used for all concrete placed when temperatures exceed 75°F.
- B. Set retarding admixtures shall conform to ASTM C-494, Type D, water reducing and retarding.
- C. Wet forms thoroughly before placing.



- D. Cool reinforcing by wetting sufficiently so that steel temperatures will be nearly equal to the ambient air temperature.
- E. Provide wind breaks around the perimeter of the area where concrete is being placed.
- F. Fresh concrete with temperatures 90°F or above shall be discarded off-site.
- G. The amount of cement used in the job is computed for the temperature indicated on the approved design mix. For higher concrete mix temperature, the weight of the cement shall be increased at the rate of twelve (12) lbs per cubic yard for each 10°F above the concrete mix temperature.

3.06 CURING AND PROTECTION

- A. Protect freshly placed concrete from premature drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete.

B. HORIZONTAL SLAB SURFACES

- 1. Curing for all horizontal slab surfaces, except those to receive a bonded finish material, during periods when the outside air temperature does not exceed 60°F shall be provided by applying a membrane-forming curing compound to concrete surfaces as soon as the final troweling or floating operation has been completed.
- 2. Apply uniformly with a roller brush at a rate not to exceed 200 square feet per gallon.
- 3. Maintain the continuity of the coating and repair damage to the coat during the entire curing period.

C. SURFACES RECEIVING A BONDED FINISH MATERIAL

Curing for surfaces to receive a bonded finish material shall be as noted below.

- 1. Curing for all horizontal surfaces during period when the outside air temperatures will exceed 60°F shall be provided by covering the entire surface with burlap.
- 2. The burlap shall be lapped one-half (1/2) width in order to provide a double thickness of burlap. Immediately following the placement of the burlap, the entire surface shall be maintained continuously wet for a period of seven (7) days.
- 3. Do not permit surfaces to dry at any period during the required curing period.



D. FORMED SURFACES

1. Curing formed surfaces by moist curing with forms in place for the full curing period, or until forms are removed.
 2. If forms are removed before the curing period is complete, apply a membrane-forming curing compound to damp surfaces as soon as the water film has disappeared.
 3. Apply uniformly in continuous operation by roller brushes in accordance with the manufacturer's directions.
- E. Do not use membrane curing compounds on surfaces that are to be covered with a coating material applied directly to the concrete or with any other cover or finish material that shall be bonded to the concrete. These surfaces must be watercured with a full coverage of burlap kept continuously moist for a period of seven (7) days.
- F. During the curing period, protect concrete from damaging mechanical disturbances, including load stresses, shock, excessive vibration, and from change caused by subsequent construction operations.

3.07 SURFACE REPAIRS

- A. Repair and patch defective area immediately after removal of forms as directed by the Engineer.
- B. Cut out honeycombs, rock pockets, voids over one half inch (1/2") in diameter and holes left by tie rods and bolts down to solid concrete, but in no case to a depth of less than one inch (1").
- C. Make edges of cuts perpendicular to the concrete surfaces.
- D. Expose reinforcing steel with at least three quarters inch (3/4") clearance all around.
- E. Dampen all concrete surfaces in contact with patching concrete, and brush with a neat cement grout coating or concrete bonding agent.
- F. Place patching concrete before grout takes its initial set. Mix patching concrete of the same materials to provide concrete of the same type or class as the original adjacent concrete. Place, compact, and finish as required to blend with adjacent finished concrete.
- G. Cure in the same manner as adjacent concrete.



H. FILLING HOLES

1. Fill holes extending through concrete by means of a plunger type gun or other suitable device from the least exposed face to insure complete filing.
2. Remove stains and other discolorations that cannot be removed by cleaning on all exposed surfaces.
3. Repair isolated random cracks and single holes not over one inch (1") in diameter by the dry-pack method.
4. Groove the top of cracks, and cut out holes to sound concrete and clean of dust, dirt, and loose particles.
5. Dampen all cleaned concrete surfaces and brush with a neat cement grout coating.
6. Place dry-pack, consisting of one (1) part Portland cement to two and a half (2-1/2) parts fine aggregate passing a #16 mesh sieve using only enough water as required for handling and placing.
7. Fill in holes and openings left in concrete structures for the passage of work by other trades, unless otherwise shown or directed, after the work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide all other miscellaneous concrete filling shown or required to complete work.

I. UNLEVEL CONCRETE

1. Correct high area in unformed surfaces by grinding, after the concrete has cured at least fourteen (14) days.
2. Correct low areas in unformed surfaces during, or immediately after, completion of surface finishing operations by cutting out the low areas and replacing with fresh concrete.
3. Finish repaired areas to blend into adjacent concrete.
4. Proprietary patching compounds may be used when acceptable to the Engineer.

3.08 SLAB ON GRADE

A. PREPARATION OF SUBGRADE

1. The subgrade shall be well-drained and of adequate and uniform loadbearing nature.



2. The in-place density of the subgrade soils shall be at least the minimum required in the Specifications.
3. The bottom of an undrained granular base course shall not be lower than the adjacent finished grade.
4. The subgrade shall be free of frost before concrete placing begins.
5. If the temperature inside a building where concrete is to be placed is below freezing, it shall be raised and maintained above 50°F long enough to remove all frost from the subgrade.
6. The subgrade shall be moist at the time of concreting. If necessary, it shall be dampened with water in advance of concreting, but there shall be no free water standing on the subgrade nor any muddy or soft spots when the concrete is placed.

B. JOINTS

1. Joints in slabs on grade shall be located as to divide the slab in areas not on excess of eight hundred (800) square feet.
2. The maximum distance between joints in slabs on grade at all points of contact between slabs on grade and vertical surfaces, such as foundation walls and elsewhere as indicated.
3. At exposed joints, recess the Premolded fill on minimum of one half inch (1/2"), and fill the remaining section with a joint seal and as specified herein.
4. All exposed construction joints in the slabs on grade shall have the edges tooled and the crack and groove formed by the edging tool filled with a polyurethane joint sealant.
5. No kold-key or metal form joints will be permitted.

3.09

FINISHES

A. STANDARD ROUGH FORM FINISH

1. Provide a standard rough form finish to all concrete formed surfaces that are to be concealed in the finish work or other construction.

NOTE: Interior faces of walls of water retaining structures are not considered to be concealed.

2. Standard rough form finish shall consist of all defective areas repaired as specified and all holes or voids larger than 3/8" filled with cement grout.



B. STANDARD FINISH FOR EXPOSED SURFACES

1. Provide an applied surface finish of Thoroseal or an approved equal to all exposed interior and exterior concrete finishes, unless otherwise noted.
2. Interior faces of walls of water retaining structures, including areas that are normally submerged are considered to be exposed surfaces and shall receive the specified standard finish for exposed surfaces.
3. The surface finish shall consist of chopping and/or grinding down all high spots, removing grinding of all burrs and/or other projections, filling all voids three-eighths of an inch (3/8") and larger, and cutting out all unsound concrete and patching as specified herein.
4. Before applying the finish, wet and clean the surface of all grease, oils, efflorescence, and other foreign material.
5. Dampen surface immediately prior to application.
6. Apply the finish coat with a tampico fiber brush by laying the finish coat on the wall in a thick coat of a minimum of two (2) lbs per square yard, and brush to a uniform level surface.
7. Do not apply in temperatures 40° F or below, or when temperatures are likely to fall below 40°F within twenty-four (24) hours after application.
8. The finish coat shall be mixed in strict accordance with the manufacturer's written instructions.
9. After the finish coat has cured, apply a finish coat of Quick Seal at a minimum of twelve (12) lbs per square yard. The Thoroseal shall be applied by trained technicians.

C. SMOOTH FORM FINISH

1. Provide a smooth form finish for all exposed interior concrete walls inside building, in pipe gallery areas, or as noted on the Drawings.
2. Standard form finish shall produce a smooth, hard, uniform texture on the concrete.
3. The arrangement of the forms and the number of seams and joints shall be kept to a minimum.
4. Immediately after forms are removed, cut out all unsound concrete and patch as specified herein, and fill all pinholes and other voids larger than one quarter of an inch (1/4") with a cement grout.



5. Compress mortar into voids with a firm rubber trowel or float. After mortar dries, wipe off surface with burlap.

D. SLAB FINISHES

1. Scratched Finish

- a. A scratched finish shall be applied to all surfaces that are to receive a bonded surface finish.
- b. After the concrete has been placed, consolidated, struck off, and leveled to a Class C tolerance, the surface shall be roughened with stiff brushes or rakes before a final set.

2. Floated Finish

- a. A float finish shall be applied to all slab surfaces that are to receive a waterproofing membrane.
- b. After the concrete has been placed, consolidated, struck off, and leveled, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operations.
- c. During or after the first floating, planeness of surface shall be checked with a ten-foot (10'-0") straight edge applied at no fewer than two (2) different angles. All high spots shall be cut down and all low spots filled during this procedure to produce a surface with Class B tolerance throughout.
- d. The slab shall then be floated immediately to a uniform sandy texture.

3. Troweled Finish

- a. A trowel finish shall be applied to all surfaces which are exposed to view or are to receive a floor covering of carpet, vinyl, asbestos, tiles, etc.
- b. The surface shall first be float-finished as specified above.
- c. It shall next be power troweled and finally hand troweled.
- d. The first troweling after power floating shall produce a smooth surface that may still show some trowel marks.
- e. Additional troweling shall be done by hand after the surface has hardened sufficiently.



- f. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface.
- g. The surface shall be thoroughly consolidated by the hand troweling operations.
- h. The finished surface shall be essentially free of trowel marks, uniform in texture, and appearance, and shall be planed to a Class tolerance.
- i. On surface intended to support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by grinding.

4. Broom Finish

- a. Immediately after the concrete has received a float finish as specified above; it shall be given a coarse transverse scored texture by drawing a broom or burlap belt across the surface.
- b. A broom finish shall be applied to all parking surfaces, exterior concrete walks, and concrete paving slabs.

3.10 FINISHING TOLERANCES

- A. Finishes with a Class C tolerance shall be true planes within one quarter inch (1/4") in two feet (2'-0") as determined by a two feet (2'-0") straight edge placed elsewhere on the slab in any directions.
- B. Variation from level for Class A tolerance shall not exceed one quarter inch (1/4") in ten feet (10'-0") or one-half inch (1/2") maximum in any one (1) bay between columns. Variation from level for a Class B and Class C finish shall not exceed one quarter inch (1/4") in ten feet (10'-0") or three quarters of an inch (3/4") in any one (1) bay between columns.

3.11 RELATED UNFORMED SURFACES

As tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to former surfaces, strike off smooth and finish with a texture matching the adjacent formed surfaces. Continue the final surface treatment of formed surfaces uniformly across the adjacent unformed surface, unless otherwise shown.

3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.



- B. Provide machine and equipment bases and foundations, as shown on the Drawings. Set anchor bolts for machines and equipment to template at correct elevations prior to placement of the concrete, complying with certified diagrams or templates of the manufacturer finishing machines and equipment.

3.13 INSPECTION

- A. Before placing concrete, the formwork installation, reinforcing steel, and items to be embedded or cast-in must be complete.
- B. Notify other crafts involved in ample time to permit the installation of their work; cooperate with other trades in setting such work, as required.
- C. Notify Engineer upon completion of installation of all reinforcing and other items in ample time to permit inspection of the work.
- D. Soil bottoms at foundation systems are subject testing laboratory as directed by the Engineer.
- E. Place concrete immediately after approval of foundation excavations.

3.14 TESTING AND QUALITY CONTROL





PART 3: EXECUTION

3.01 FABRICATING AND WELDING TOLERANCE

- A. Bars used for concrete reinforcement shall meet the following requirements for fabrication tolerance.

Sheared Length	+1"
Overall Dimension of Stirrups	+1/2"
All Other Bends	+1"

- B. Bars shall be placed to the following tolerances:

Concrete Cover to Formed Surfaces	+1/4"
Top Bars in Slabs	+1/4"
Top Bars In Beams	+1/2"
Horizontal Tolerance from Vertical Surfaces	+1/4"
Vertical Bars in Columns	+1/4"
Vertical and Horizontal Bars in Walls	+1/2"
Lengthwise in Member	+2"
Wire Fabric	+1/2" from center of slab or location called for on Drawings

- C. Bars may be moved one (1) bar diameter as necessary to avoid interference with other reinforcing steel, conduits, or embedded items. If the bars are moved more than one (1) bar diameter, the resulting arrangement of bars shall be subject to approval.



3.02 WELDING

- A. When required or approved by Engineer, welding of reinforcing steel shall conform to AWS D12.1, Recommended Practice for Welding Reinforcing Steel Metal Inserts, and Connections in Reinforced Concrete Construction.
- B. No welding shall be done at the bend in a bar.
- C. Welding of cross bars (tack welding) shall not be permitted except as authorized or directed by the Engineer.

3.03 PLACING

- A. Minimum concrete protective covering for reinforcement except for extremely corrosive atmosphere or other severe exposures shall be as follows:

Concrete deposited against the ground	3"
Formed surfaces exposed to weather or in contact with the ground	2"
Interior surfaces	1-1/2" for beams and column ties; 3/4" for slabs and walls; Beam and column bars shall be anchored against the ties.

- B. All reinforcement at the time concrete is placed shall be free of mud, oil, or other materials that may adversely affect or reduce the bond. Reinforcement with rust, mill scale, or tooth will be accepted as being satisfactory without cleaning or brushing, provided the dimensions and weights, including heights of deformations, of a cleaned sample shall not be less than required by applicable ASTM Standards. Reinforcing shall be free from scale, loose rust, or coatings that will reduce the bond to the concrete.
- C. All reinforcing bars shall be supported and wired together to prevent displacements by construction loads or the placing of concrete beyond the tolerances as previously set forth.
- D. Over formwork, metal, plastic, or other approved bar chairs and spacers shall be furnished. When the concrete surface will be exposed to weather in the finished structure or where rust would impair architectural finishes, the portions of all accessories in contact with the formwork shall be stainless steel or plastic.



- E. Welded wire fabric shall be lapped at least on-half (1/2) mesh plus end extension of wires but not less than six inches (6"). Wire mesh shall be so placed as to positively secure its position one-third (1/3) of the slab thickness below the top of the slab for slabs on grade.
- F. **SPLICES**
1. Splices and offsets in reinforcements at points of maximum stress shall not be made.
 2. All splices shall be approved by the Engineer and shall provide sufficient lap to transfer the stress between the bars by the required development length of the bars.
 3. The character of design of each splice shall conform to the requirements of ACI 318-77.
 4. All reinforcing steel shall be cut and shop fabricated and delivered according to Section of Delivery, Handling, and Storage above.
- G. The Contractor shall securely maintain the metal reinforcement accurately in place until the concrete is placed. Any and all disturbances of reinforcing from any cause whatsoever shall be fully corrected prior to placing of concrete, and all damaged bar supports and spaces shall be repaired or removed and replaced.

3.04 INSPECTION

The Engineer or his representative shall always be notified of the pouring schedule in advance and in ample time prior to placement of concrete to inspect the reinforcement. Inspection of reinforcement will be made only after each section to be poured is complete.

END OF SECTION



PART 1: GENERAL**1.1 SCOPE OF WORK**

The following specification cover the submittal process, materials, installation, and acceptance of chain link fences and gates. Construction consists of furnishing all labor, equipment, tools, appliances, and materials for a complete fence and gate system.

1.2 REFERENCE DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this section.

1.3 PERFORMANCE REQUIREMENTS

- A. System Description: Unless otherwise indicated on the plans, all fencing will be 6'-0" nominal height, using 2-inch, 9-gauge woven wire mesh fabric with 3 strands of barbed wire hung on angle brackets. The fencing will be supported by posts and a top rail as shown on the drawings. The design and dimension of the fence components shall be as shown on the drawings and as specified herein unless specific design criteria indicated herein require a more robust design.
- B. Delegated Design: Design chain-link fences and gates, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Structural Performance: Chain-link fence and gate framework shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7:
 - 1. Minimum Post Size: Determine according to ASTM F 1043 for framework up to 12 feet high; and post spacing not to exceed 10 feet for Schedule 40 Steel Pipe.
 - 2. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:
 - a. Wind Loads: 90 miles per hour or local codes, whichever is greater.
 - b. Exposure Category: B
 - c. Fence Height: As indicated on Drawings.
 - d. Material Group: IA, ASTM F 1043, Schedule 40 Steel Pipe



1.4 SUBMITTALS

- A. Product Data: For each type of product indicated include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
1. Fence and gate posts, rails, and fittings
 2. Chain-link fabric, reinforcements, and attachments.
 3. Accessories: Barbed wire and angle brackets
 4. Gates and hardware
 5. Gate operators, including operating instructions
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, gate operation, and operational clearances.
- C. Product Certificates: For each type of chain-link fence, and gate, from manufacturer.
- D. Product Test Reports: For framing strength according to ASTM F 1043.
- E. Operation and Maintenance Data: For the Gate Hardware to include in emergency, operation, and maintenance manuals.
- F. Warranty: Sample of warranty

1.5 QUALITY ASSURANCE

The manufacturer shall be reputable and shall be experienced in the manufacture of chain-link fencing.

1.6 PROJECT CONDITIONS

Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.7 DELIVERY, STORAGE AND HANDLING

All materials shall be delivered, stored and handled in strict accordance with the manufacturer's recommendations, and shall be properly protected.

1.8 WARRANTY

All material shall be warranted to be free from defects in workmanship and design for a period of one year from the date of acceptance by the Owner.



PART 2: GENERAL

2.1 CHAIN-LINK FENCE FABRIC

General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:

- A. Fabric Height: As indicated on Drawings.
- B. Steel Wire Fabric: Wire with a diameter of 0.148 inch.
 - 1. Mesh Size 2-inches.
 - 2. Zinc-Coated applied before weaving.
 - 3. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
- C. Selvage: Twisted top and knuckled bottom.

2.2 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:
 - 1. Fence Height: As indicated on Drawings.
 - 2. Heavy Industrial Strength: Material Group IA, round steel pipe, Schedule 40
 - a. Line Post: 2.375 inches diameter.
 - b. End, Corner and Pull Post: 2.875 inches.
 - 3. Horizontal Framework Members: Top rails complying with SATM F 1043. Top rail shall be 1.66 Inches in diameter
 - 4. Metallic Coating for Steel Framing: Type A, consisting of not less than minimum 2.0 oz./sq.ft. zinc coating per ASTM A 653-A 653M

2.3 TENSION WIRE

Metallic-Coated Steel Wire: 0.177-inch diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824, with Type II, zinc coated galvanizing; minimum coating weight which matches chain-link fabric coating weight.

2.4 SWING GATES

- A. General: Comply with ASTM F900 for gate posts and single and/or double swing gate types.
 - 1. Gate Leaf Width: As indicated on drawings.
 - 2. Gate Fabric Height: As indicated on drawings.



B. Pipe and Tubing:

1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framing.

Fence/Gate Width	Posts Diameter	Pounds per linear foot
Up to 6'	3-1/3" x 3-1/2" roll formed section or 2-7/8" OF Pipe	5.14 5.79
Over 6' up to 13'	4" OD Pipe	9.11
Over 13' up to 18'	6-5/8" OD Pipe	18.97
Over 18'	8-5/8" OD Pipe	24.70

C. Gate Frames and Bracing: Gate frame members shall be 1.90" OD round tubular steel and have 3/8" diameter adjustable truss rods. Frame Corner Construction: Welded.

D. Extended Gate Posts and D=Frame Members: Extend gate posts and frame end members above top of chain-link fabric at both ends of gate frame 12 inches to attach barbed wire assemblies.

E. Hardware:

1. Hinges: 360-degree inward and outward swing.
2. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
3. Padlock and Chain: Owner furnished.
4. Drive gates shall have a center plunger rod, catch, and semi-automatic outer catch.

2.5 FITTINGS

A. General: Comply with ASTM F626.

B. Post Caps: Provide for each post.

1. Provide line post caps with loop to receive top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6-inches long.
2. Rail Clamps: Line and corner boulevard clamps for connecting rails in the fence line-to-line posts.



- E. Tension and Brace Bands: Pressed steel
- F. Tension Bars: Steel length not less than 2-inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Truss Rod Assemblies: Steel hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
- H. Barbed Wire Arms: Pressed steel with clips, slots, or other means for attaching strands of barbed wire, and means for attaching to posts; for each post unless otherwise indicated, and as follows:
 - 1. Provide line posts with arms that accommodate top rail or tension wire.
 - 2. Provide corner arms at fence corner posts, unless extended posts are indicated.
 - 3. Type I, single slanted arm.
- I. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
 - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
 - a. Hot-Dip Galvanized Steel: 0.148-inch diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.
- J. Finish:
 - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq.ft. Zinc.

2.6 BARBED WIRE

- A. Steel Barbed Wire: Comply with ASTM A 121, for two-strand barbed wire, 0.099-inch diameter line wire with 0.080-inch diameter, four-point round barbs spaced not more than 5-inches on center
 - 1. Zinc Coating: Type Z, Class 3.



2.7 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound.. Provide formulation that is resistant to erosion from water exposure without needing protection by a dealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

PART 3: EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading is completed unless otherwise permitted by Engineer.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, sprinkler systems, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated. Install fencing on established boundary lines inside property line.

3.4 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in a foundation of 2,500 psi concrete at indicated spacing into firm, undisturbed soil. Concrete foundation shall have a minimum diameter 9-inches or three times the diameter of the post and shall be at least 36-inches deep.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete.



2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Exposed Concrete: Extend 2-inches above grade; shape and smooth to shed water.
 - b. Concealed Concrete: Leave the top of the concrete foundation 2-inches below grade to allow covering with surface material.
 - c. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and comply with anchoring material manufacturer's written instruction, and finished sloped to drain water away from post.
 - d. Posts Set into Voids in Concrete: Form or core drill holes not less than 5-inches deep and $\frac{3}{4}$ -inches larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
- C. Terminal Posts: Locate terminal end, corner, and grate post per ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts evenly at 10 feet or less apart true to line.
- E. Tension Wire: Install according to ASTM F567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24-inches on center. Install tension wire in locations, indicated before stretching fabric. Provide horizontal tension wire at the following locations:
 1. Extended along bottom of fence fabric. Install bottom tension wire within 6-inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.



- F. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- G. Chain-Link fabric: Apply fabric to outside of enclosing framework. Leave 1-inch between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- H. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15-inches on center.
- I. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12-inches on center and to braces at 24-inches on center.
- J. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
- K. Barbed Wire: Install barbed wire uniformly spaced, angled toward security side of fence. Pull wire taut, install securely to extension arms, and secure to end posts or terminal arms.
- L. Barbed Tape: Comply with ASTM F1911. Install barbed tape uniformly in configuration indicated and fasten securely to prevent movement or displacement.

3.5 GATE INSTALLATION

Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.



3.6 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp excessive deflection, distortion, nonalignment, misplacement, disruption, locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

3.7 DEMONSTRATION

Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION

