PROJECT MANUAL

FOR

WASTEWATER SYSTEM IMPROVEMENTS

FOR THE

VILLAGE OF GROVER HILL, OHIO

WESSLER ENGINEERING, INC.
80 STATE ROAD 103, STE. A
BLUFFTON, OHIO 45817

DECEMBER 2020

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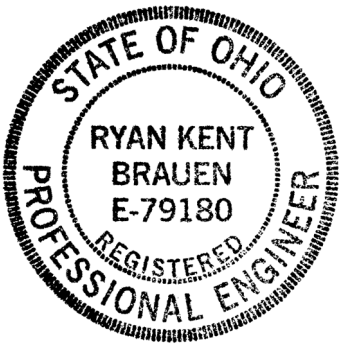

Certified By:

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Jeffrey R. Ballard
Professional Engineer No. PE-80330

DECEMBER 2020

VILLAGE OF GROVER HILL OFFICIALS

ADMINISTRATION

John Moon, Mayor

Susan Moon, Fiscal Officer

Matthew Miller, Village Solicitor

Andrew Leis, ML Tech Services, WWTP Operator

COUNCIL

Jessie Lewis

DeWayne Hinchcliff

Trudy Wilkin

Patrick Comer

Shannon Comer

Tracy Poling

PAULDING COUNTY COMMISSIONERS

Mark Holtsberry

Roy Klopfenstein

Tony Zartman

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Note: Appendix D is not included in printed / electronic version of this Project Manual. You can find a link to the document at https://www.wesslerengineering.com/wp-content/uploads/2020/12/Appendix-D_Septic-Tank-Data-Sheet_Final-Full-Set.pdf

-END-

ADVERTISEMENT FOR BIDDERS

Sealed Bids for Wastewater System Improvements, for the Village of Grover Hill and the Paulding County Commissioners (herein called the "OWNER") will be received by the Owner at the Paulding County Commissioner's Office (115 N. Williams St., #B-1, Paulding, OH 45879) until Wednesday January 27th, 2021 at 10:00 AM (local time). Any Bids received later than the above time will be returned unopened. All Bids will be publicly opened and read aloud at that time.

The Base Bid Unit Price Work includes:

> Complete removal of 23 septic tanks, complete removal and replacement of 188 septic tanks, and the installation of 4 new septic tanks. The rehabilitation of 4 sanitary sewer manholes with new frames and covers. The rehabilitation of 8 sanitary sewer manholes with new benchwalls and channels and composite manhole lining. Installation of 2 new sanitary sewer manholes. Rehabilitation of the Wayne Street lift station and the cleaning and televising of 4, 6, 8, and 10-inch sewer lines. This portion of the work shall be constructed under a Unit Price Contract.

The Add-Alternate Bid No. 1 (WWTP Improvements) Work Includes:

> Cleaning and lining of the septage receiving structure, rehabilitation of the plant drain lift station, cleaning and patching of existing basin liners, modifications of an existing basin to an EQ basin, replacement of failed fine and course bubble diffusers, modifications to the existing flow splitter, removal of the existing sludge dewatering press and other miscellaneous equipment, and the installation of the following: a new Trojan ultraviolet disinfection system, new geotextile dewatering system, new piping and valves, new concrete sidewalk, new generator, new water hydrants, and electrical modifications. This portion of the work shall be constructed under a Lump Sum Contract.

The Owner reserves the right to waive any informalities or minor defects in bids or bidding procedure, or reject any and all bids, or to accept the bid from the lowest most responsible and responsive bidder as exclusively determined by the Owner. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. No Bidder may withdraw a bid within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder determined by the Owner to be the lowest most responsible and responsive.

Submission of a signed Bid by the Bidder constitutes acknowledgment of and acceptance of all the documents and terms and conditions of the Contractual-Legal Requirements and Technical Sections of the specifications in the Project Manual.

The bid security shall be furnished in accordance with Instructions to Bidders.

The Contractor to whom the work is awarded will be required to purchase and maintain insurance coverage as described in the Contract Documents on an "occurrence basis".

All Contractors and Subcontractors involved with the Project will, to the extent practicable, use Ohio products, materials, services, and labor in the implementation of their Project. Additionally,

Contractor compliance with the Equal Employment Opportunity requirements of the Ohio Administrative Code Chapter 123, the Governor's Executive Order of 1972, and Governor's Executive Order 84-9 shall be required.

Domestic Steel Use requirements as specified in Section 153.011 of the Revised Code apply to this Project. Copies of Section 153.011 of the Revised Code can be obtained from any of the offices of the Department of Administrative Services.

Bidder must comply with the Prevailing Wage Rates on Public Improvements in Paulding County and the Village of Grover Hill, Ohio as determined by the Ohio Bureau of Employment Services, Wages, and Hour Division, (614) 644-2239.

Reference drawings used by the Engineer in preparation of the Contract Documents may be examined online at https://www.wesslerengineering.com/planroom.

Copies of the Drawings and Specifications are distributed to Contractors and other interested parties by Wessler Engineering, Inc. (https://www.wesslerengineering.com/planroom) for a non-refundable fee. A complete digital set of bidding documents is available for $150.00. A complete hard copy set of bidding documents can be mailed for $300.00.

Neither the Owner or Engineer will be responsible for full or partial sets of bidding documents, including Addenda if any, obtained from sources other than Engineer.

An up-to-date Plan Holder's List may be viewed at http://wesslerengineering.com/planroom/.

A Pre-Bid Conference will be held at 10:00 AM (local time) on January 12th, 2021 at the Grover Hill Veterans of Foreign Wars (VFW) building in Grover Hill, Ohio (107 S. Main St.). Bidders are encouraged to attend the Pre-Bid Conference.

A copy of this Advertisement for Bidder's will be posted online at the Paulding County Ohio Commissioner's Office website at https://www.pauldingcountyoh.com/.

Village of Grover Hill

John Moon, Mayor

Advertise: December 15, 2020 (West Bend News)

Matthew Miller: Village Solicitor
Susan Moon: Village Fiscal Officer

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINED TERMS

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

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents, in the number and for the nonrefundable fees (if any) stated in the Advertisement for Bidders, may be obtained from www.wesslerengineering.com/planroom/.

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 further demonstrate Bidder’s qualifications to perform the Work, after submitting its Bid and within five days of Owner's request, the apparent successful Bidder and any other Bidder so requested, shall submit written evidence establishing its qualifications such as financial condition, previous experience, present commitments demonstrating the Bidder’s, Subcontractor’s, and Supplier’s qualifications, and the following 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, if applicable;

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

D. The names of proposed Construction Superintendent and Project Manager accompanied by experience statements,

E. Other required information regarding qualifications.

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

1. The Supplementary Conditions identify:
   a. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Bidding Documents.
   b. those drawings of physical conditions relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that the Engineer has used in preparing the Bidding Documents
   c. Reports and plans known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
   d. Technical Data contained in such reports and drawings.
2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous 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.

C. 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. Upon request and when scheduled in advance, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. 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. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates., and 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.

4.04 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. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;

E. 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 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;

F. 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;

G. 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;

H. 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;

I. 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

J. 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 at the time and location stated in the Advertisement for Bidders. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

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.

7.03 If any Addendum is issued within 72 hours prior to the published time for the Bid Opening, excluding Saturdays, Sundays, and legal holidays, the Bid Opening will be extended with no further advertising required. Clarifications that do not change the Specifications for the work may be issued within the 72-hour period without extending the bid opening date and time.

ARTICLE 8 - BID SECURITY (GUARANTY)

8.01 A Bid must be accompanied by Bid security made payable to Owner in the form of a certified check, cashier's check, or an irrevocable letter of credit from a financial institution authorized to transact business in the State of Ohio and acceptable to the Owner in an amount of 10 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates), or by a Bid Guaranty Bond in the amount of 100% of the Bidder's maximum Bid price (as defined above) and issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions. The Bid Guaranty Bond form shall comply with ORC 153.571.

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 seven 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 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 Milestone, 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 Unless identified otherwise in the detailed Specifications, the Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

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.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.

12.03 If requested by Owner, the apparent Successful Bidder, and any other Bidder so requested, shall within the time period stated in the Bid Form, submit to the Owner 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.

12.04 The apparent Successful Bidder, and any other Bidder so requested, shall within the time period stated in the Bid Form, submit to owner the names of their proposed Construction Superintendent and Project Manager accompanied by experience statements with pertinent information regarding similar projects and other evidence of their qualifications.

12.05 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.

ARTICLE 13 - PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents.

13.02 All blanks on the Bid Form shall be completed in ink and signed in ink. Erasures or alterations shall be initialed in ink by the person signing the documents. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

13.03 If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”

13.04 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.

13.05 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 official address of the partnership shall be shown.

13.06 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 official address of the firm shall be shown.

13.07 A Bid by an individual shall show the Bidder’s name and official address.

13.08 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 official address of the joint venture shall be shown.

13.09 All names shall be printed in ink below the signatures.

13.10 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.11 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.12 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; COMPARISON OF BIDS

14.01 Basis of Unit Price Base Bid and Add-Alternate Bid No. 1 (WWTP Improvements)

A. Bidders shall submit a Total Bid on a Unit Price Base Bid and Add-Alternate Bid No. 1 as set forth in the Bid Form.

B. Bids will be compared either on the basis of the Total Unit Price Base Bid OR on the combination with the Add-Alternate Bid No. 1 (sum of Total Unit Price Base Bid and Add-Alternate Bid No. 1), as set forth in the Bid Form.

C. The Owner may elect to accept any combination of the Bid Prices in order for the cost of construction to be sufficiently covered by the Owner's available funds. It is mandatory that Add-Alternate Bid No.1 (WWTP Improvements) be listed in the Bid Form – failure to include Add-Alternate Bid No. 1 (WWTP Improvements) will be considered a non-responsive Bid and will be disqualified. Should only the Unit Price Base Bid be selected by the Owner, no additional compensation will be made to the Contractor for overhead costs.

14.02 Unit Price

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Unit Price Base Bid section of the Bid Form.

B. The "Bid Price" for each Unit Price Base Bid item will be the product of the "Estimated Quantity" for the item and the corresponding "Bid Unit Price" offered by the Bidder. The Total of all Unit Price Base Bid Item Prices 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. Discrepancies between words and figures will be resolved in favor of words.

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 Guaranty Bond. The unbound copy of the Bid Form are to be completed, signed, 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 Bidders 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 Mr. John Moon, Mayor, 301 W. Walnut Grover Hill, OH 45849.

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 for Bidders 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 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.03 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.

19.04 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. Bids will be compared either on the basis of the Total Unit Price Base Bid OR on the combination with Add-Alternate Bid No. 1 (sum of Total Unit Price Base Bid and Add-Alternate Bid No. 1), as set forth in the Bid Form.

a. The “Bid Price” for each Unit Price Base Bid item will be the product of the “Estimated Quantity” for the item and the corresponding “Bid Unit Price” offered by the Bidder. The Total of all Unit Price Base Bid Item Prices 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.

19.05 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 equipment manufacturers/suppliers proposed for those portions of the Work for which the identity of subcontractors and equipment manufacturers/suppliers must be submitted as provided in the Bidding Documents.

19.06 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 either in the General Conditions Paragraph GC-2.02 or the Supplementary Conditions Paragraph SC-2.02.

ARTICLE 22 - SALES AND USE TAXES

22.01 Owner is exempt from state sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. The Owner's General Tax Exemption Certificate Account Number for purchase of materials to be installed as a part of this project will be provided at the Preconstruction Conference. Refer to Paragraph SC-7.09 of the Supplementary Conditions for additional information.

ARTICLE 23 – PREVAILING WAGE RATES

23.01 The Bidder to whom the Contract is awarded will be required to pay, at a minimum, the prevailing wage rate promulgated by the State. Applicable wage rates are included in the Bidding Documents.

Contractor shall provide an “Affidavit of Compliance – Prevailing Wages” upon completion of the project and prior to final payment.

ARTICLE 24 – ENGINEER'S ESTIMATE

24.01 The Engineer's Estimate for the Unit Price Base Bid is $1,737,000 and Add-Alternate Bid No. 1 is $355,000. The total of the Unit Price Base Bid and Add-Alternate Bid No. 1 is $2,092,000.

-END-

BID FORM

Village of Grover Hill, Ohio
Wastewater System Improvements Project

ARTICLE 1 – BID RECIPIENT

1.01 This Bid of _____ (Bidder) is submitted to Village of Grover Hill, Ohio and Paulding County Commissioners (Owner) for construction of **Wastewater System Improvements Project**.

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:

Addendum No.	**Addendum, Date**
_____	_____
_____	_____
_____	_____
_____	_____

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 carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the

Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. 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.

F. 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.

G. 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.

H. 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.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. 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.

ARTICLE 5 - BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

UNIT PRICE BASE BID

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
1	Existing Septic Tank Removal	EA	23	$_____	$_____
2	Septic Tank Removal & Replacement (1,500 gal. HDPE)	EA	157	$_____	$_____
3	Septic Tank Removal & Replacement (2,500 gal. Concrete)	EA	11	$_____	$_____
4	Septic Tank Removal & Replacement (1,500 gal. H-20)	EA	17	$_____	$_____
5	STK-001: New Septic Tank Installation (1,500 gal. HDPE)	LS	1	$_____	$_____
6	STK-061A: New Septic Tank Installation (1,500 gal. H-20)	LS	1	$_____	$_____
7	STK-064: Septic Tank Removal & Replacement (1,500 gal. H-20)	LS	1	$_____	$_____
8	STK-076: New Septic Tank Installation (1,500 gal. HDPE)	LS	1	$_____	$_____
9	STK-111: New Septic Tank Installation (1,500 gal. HDPE)	LS	1	$_____	$_____
10	STK-154: Septic Tank Removal & Replacement (1,500 gal.	LS	1	$_____	$_____

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
	HDPE)				
11	STK-164: Septic Tank Removal & Replacement (2,000 gal. H-20)	LS	1	$_____	$_____
12	Sanitary Lateral 4” SDR-35 PVC	LF	150	$_____	$_____
13	Sanitary Lateral 4” SDR-35 PVC With Full-Depth Granular Backfill	LF	180	$_____	$_____
14	Manhole Rehab: Install Benchwall & Channel	EA	8	$_____	$_____
15	Manhole Rehab: Composite Manhole Lining, Full-Depth	VF	85	$_____	$_____
16	Manhole Rehab: Replace Frame & Cover (Pavement)	EA	4	$_____	$_____
17	New Manhole Installation	EA	2	$_____	$_____
18	Wayne Street Lift Station Rehab	LS	1	$_____	$_____
19	Sanitary Sewer Cleaning & Televising (4-in)	LF	9,655	$_____	$_____
20	Sanitary Sewer Cleaning & Televising (6-in)	LF	2,330	$_____	$_____
21	Sanitary Sewer Cleaning & Televising (8-in)	LF	2,420	$_____	$_____
22	Sanitary Sewer Cleaning & Televising (10-in)	LF	595	$_____	$_____
23	Mobilization, Demobilization, Bonds & Insurance	LS	1	$_____	$_____
24	Temporary Erosion Control	LS	1	$_____	$_____
25	Final Clean-up & Restoration	LS	1	$_____	$_____

TOTAL UNIT PRICE BASE BID

Total of all Unit Price Base Bid Item Prices (in figures) $_____

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.

ADD-ALTERNATE BID NO. 1 (WWTP IMPROVEMENTS) (LUMP SUM)

List Adder for Add-Alternate Bid No. 1 (WWTP Improvements) (in figures) $_____

Add-Alternate Bid No. 1 (WWTP Improvements) shall be mandatory and include all Work shown on Drawing Sheets 3C1 through 5S1 and associated specifications and details provided in the Project Manual and Drawings.

TOTAL BASE BID PLUS ADD-ALTERNATE BID NO. 1

Total of Unit Price Base Bid and Add-Alternate Bid No. 1 (in figures) =

$_____

Total of Unit Price Base Bid and Add-Alternate Bid No. 1 (in words) =

_____

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

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

ARTICLE 7 - ATTACHMENTS TO THIS BID

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

A. Required Bid Security;

B. Affidavit of Bidder Regarding Delinquent Personal Property Taxes;

C. 00240 – OPWC Required Conditions for Bidding;

7.02 After bids have been opened and read aloud, the three (3) lowest bidders shall submit the following to the Engineer within five (5) days:

A. The completed list of subcontractors proposed for completing the portions of the work listed in Article 12 in the Instruction to Bidders accompanied by the experience statements described in the same Article.

B. The completed list of equipment manufacturers/suppliers for the equipment systems listed in Article 12 in the Instructions to Bidders accompanied by the experience statements described in that same Article.

C. The names of the Contractor's proposed Construction Superintendent and Project Manager accompanied by experience statements with pertinent information regarding similar projects and other evidence of their qualifications.

ARTICLE 8 - DEFINED TERMS

8.01 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 9 - 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: _____

Do You Employ Five (5) Or More Employees? Yes____ No_____

BID GUARANTY BOND
(Section 153.571 Ohio Revised Code)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____ _____, as principal (Bidder) and _____as sureties, are hereby held and firmly bound unto the Village of Grover Hill and Paulding County Commissioners as obligee (Owner) in the penal sum of the dollar amount of the bid submitted by the principal to the obligee on the____ day of_____, 20__to undertake the project known as Wastewater System Improvements.

The penal sum referred to herein shall be the dollar amount of the principal's bid to the obligee, incorporating any additive or deductive alternate bids made by the principal on the date referred to above to the obligee, which are accepted by the obligee. In no case shall the penal sum exceed the amount of _____dollars. *(If the foregoing blank is not filled in, the penal sum will be the full amount of the principal* 's *bid, including alternates. Alternatively, if the blank is filled in, the amount stated must not be less than the fall amount of the bid including alternates, in dollars and cents. A percentage is not acceptable.)* For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named principal has submitted a bid for Wastewater System Improvements.

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

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

(continued)

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

SIGNED AND SEALED this_____day of_____, 20_.

BIDDER AS PRINCIPAL

Bidder: _____
(indicate correct name of bidding entity)

By: _____
(Signature)

_____
(Printed Name)

Signature Date: _____

Physical Address for giving notices:

_____

_____

Telephone Number: _____

Fax Number: _____

Email Address: _____

Federal I.D. Number: _____

SURETY

Name: _____

Seal:

Physical Address for giving notices:

_____

_____

SURETY AGENT:

Agency Name: _____

Physical Address for giving notices:

_____

_____

By: _____
Signature (Attach Power of Attorney)

Witness: _____

Name and Title: _____

AFFIDAVIT OF BIDDER REGARDING DELINQUENT PERSONAL PROPERTY TAXES

STATE OF OHIO
COUNTY OF PAULDING

I, _____ am _____
(Name) *(Title)*

of_____
(Bidder)

_____
(Address: Street, City, State, Zip)

Being first duly sworn, deposes and says as follows:
(answering whichever is applicable by placing an "x" before Items 1 or 2)

1. ( ) We are not charged with any delinquent personal property taxes on the general tax list of personal property in Paulding Count, Ohio.

2. ( ) We are charged with delinquent personal property taxes on the general tax list of _____ County, Ohio including unpaid penalties and interest in the amount of $_____.

The Bidder is familiar with the Ohio Revised Code Section 5719.042.

_____
(Signature)

Sworn and subscribed before me this _____ day of _____, 20___.

_____
Notary Public in and for said State

My Commission Expires:_____

The purpose of this affidavit is to comply with the Ohio Revised Code Section 5719.042.

OPWC REQUIRED CONDITIONS FOR BIDDING
(Rev 6/16)

1. STEEL PRODUCTS MADE IN THE UNITED STATES

Domestic steel use requirements as specified in Ohio Revised Code §153.011 apply to this project. Copies of §153.011 can be obtained from any of the offices of the department of administrative services or through http://codes.ohio.gov/orc/153.01_1.

2. PREVAILING WAGES ON STATE PROJECTS WITH NO FEDERAL-AID

(Should this project contain Federal-aid funds then Federal Prevailing Wages must be paid. Contact the appropriate Federal funding agency for language.)

This contract is subject to Ohio Prevailing Wage Laws, Chapter 4115 of the Ohio Revised Code and the Contractor and all subcontractors shall comply with all provisions contained therein or as otherwise provided by this note. The Contractor guarantees that the prevailing wage scale to be paid to all laborers and mechanics employed on this contract shall be in accordance with the schedule of the prevailing hourly wage and fringe benefits as determined by the Ohio Department of Commerce for the county in which the work is being performed. The failure to pay prevailing wages to all laborers and mechanics employed on this project shall be considered a breach of contract. Such a failure may result in the revocation of the contractor's and/or subcontractor's certificate of qualification and debarment. A schedule of the most current prevailing wage rates may be accessed by logging in/registering with the Ohio Department of Commerce, Labor and Worker Safety Division, Wage and Hour Bureau at the following web address:

http://198.234.41.198/w3/webwh.nsf/wrlogin/?openform

The Contractor and all subcontractors shall compensate the employees on this contract at a pay rate not less than the hourly wage and fringe rate listed on the website noted above, for the applicable job classification or as may be modified by the Ohio Department of Commerce, Division of Labor and Worker Safety Wage and Hour Bureau, when new prevailing rates are established.

Overtime shall be paid at one and one-half times the basic hourly rate for any hours worked beyond forty hours during a pay week. The Contractor and all subcontractors shall pay all compensation by company check to the worker and fringe benefit program.

The wage and fringe rates determined for this project or as may be later modified, shall be posted by the Contractor in a prominent and accessible place on the project, field office, or equipment yard where they can be easily read by the workers or otherwise made available to the workers. On the first pay date of contract work the Contractor and all subcontractors shall furnish each employee covered by prevailing wage a completed form

(WHPW-1512) in accordance with section 4115.05 of the Ohio Revised Code, showing the classification, hourly pay rate, and fringes, and identifying the public authority's Prevailing Wage Coordinator, if such employees are not covered by a collective bargaining agreement or understanding between employers and bona fide organizations of labor. These forms shall be signed by the Contractor or subcontractor and the employee and kept in the Contractor's or subcontractor's payroll files.

The Contractor and all subcontractors shall submit to the Prevailing Wage Coordinator, certified payrolls on form WHPW-1512 or equivalent, in accordance with sections 4115.07 and 4115.071 (C) of the Ohio Revised Code, three weeks after the start of work and every subsequent week until the completion of the contract. Additionally, a copy of the "Apprentice Certification" obtained from the Ohio State Apprenticeship Council, must accompany all certified payrolls submitted, for all apprentices working on this project. Upon completion of the contract and before the final payment, the Contractor shall submit to the Prevailing Wage Coordinator a final wage affidavit in accordance with section 4115.07 of the Ohio Revised Code stating that wages have been paid in conformance with the minimum rates set forth in the contract. Please be aware that it is ultimately the responsibility of the Contractor to ensure that all laws relating to prevailing wages in Chapter 4115 of the Ohio Revised Code are strictly adhered to by all subcontractors.

The Contractor and all subcontractors shall make all of its payroll records available for inspection, copying or transcription by any authorized representative of the contracting agency. Additionally, the Contractor and all subcontractors shall permit such representatives to interview any employees during working hours while the employee is on the job.

3. UNRESOLVED FINDING FOR RECOVERY

The Contractor affirmatively represents to the local contracting authority that it is not subject to a finding for recovery under Ohio Revised Code §9.24, or that it has taken the appropriate remedial steps required under §9.24 or otherwise qualifies under that section. The Contractor agrees that if this representation is deemed to be false, the contract shall be void ab initio as between the parties to this contract, and any funds paid by the state hereunder shall be immediately repaid to the local contracting authority, or an action for recovery may be immediately commenced by the local government and/or for recovery of said funds.

4. OHIO WORKERS' COMPENSATION COVERAGE

The Contractor must secure and maintain valid Ohio workers' compensation coverage until the project has been finally accepted by the local contracting authority. A certificate of coverage evidencing valid workers' compensation coverage must be submitted to the local contracting authority before the contract is executed.

The Contractor must immediately notify the local contracting authority, in writing, if it or any subcontractor fails or refuses to renew their workers' compensation coverage. Furthermore, the Contractor must notify the local contracting authority, in writing, if its or any of its subcontractor's workers' compensation policies are canceled, terminated or lapse.

The failure to maintain valid workers' compensation coverage shall be considered a breach of contract which may result in the Contractor or subcontractor being removed from the project, withholding of pay estimates and/or termination of the contract.

5. DRUG-FREE WORKPLACE PROGRAM

In accordance with Ohio Revised Code §153.03 and during the life of this project, the Contractor and all its Subcontractors that provide labor on the Project site must be enrolled in and remain in good standing in the Ohio Bureau of Worker's Compensation ("OBWC") Drug-Free Workplace Program ("DFWP") or a comparable program approved by the OBWC.

6. OHIO PREFERENCE

In accordance with Ohio Revised Code §164.05 (A)(6), to the extent practicable, the Contractor

and subcontractor shall use Ohio products, materials, services and labor in connection with this project.

7. **BID GUARANTY**

In accordance with Ohio Revised Code §153.54, the contractor shall file with the bid a bid guaranty in the form of either: 1) a bond for the full amount of the bid, or 2) a certified check, cashier's check, or letter of credit equal to 10% of the bid.

8. **OHIO ETHICS LAW**

Contractor agrees that it is currently in compliance and will continue to adhere to the requirements of Ohio Ethics law as provided by Section 102.03 and 102.04 of the Ohio Revised Code.

9. **STATE OF OHIO EQUAL EMPLOYMENT OPPORTUNITY REQUIREMENTS NOTICE TO CONTRACTORS:**

The provisions of the Ohio Administrative Code (OAC) 123:2-3-02 through 124:2-9 regarding Equal Employment Opportunity on State Construction Contracts and State- assisted Construction Contracts, and OAC 123:2-3-02 through 123:2-9 regarding Equal Employment Opportunity and Female Utilization Goals are applicable to this project, and each contractor will be required to comply in all aspects of these provisions.

CERTIFICATE OF COMPLIANCE FOR EEO PURPOSES:

All prime contractors must secure a valid Certificate of Compliance from the Department of Administrative Services, Equal Opportunity Division, prior to execution of a construction contract.

See http://www.das.ohio.gov/Divisions/EqualOpportunity/CertificateofCompliance/tabid/129/Default.aspx for instructions for electronic filing.

>>> Does this bidder have a valid Certificate of Compliance?_____Yes_____No

>>> If "No" to the above, will this bidder be able to obtain a valid Certificate of Compliance prior to the execution of a contract?_____Yes_____No

Bidder must provide a "Yes" answer to one or the other of the above questions.

BIDDER'S AFFIRMATIVE ACTION REQUIREMENTS:

Each prime contract bidder must submit an affirmative action program regarding equal employment opportunity to and receive approval from the State Equal Employment Opportunity (EEO) Coordinator prior to the bid opening, **OR** the prime contract bidder must have evidence within its bid adoption of the minority and female utilization work hour utilization goals and the specific affirmative action steps set forth in 123:2-3 through 123:2-9 of the Ohio Administrative Code.

>>> Has the prime contract bidder prepared and submitted an Affirmative Action Program to the State Equal Employment Opportunity Coordinator and that program has been approved by the State Equal Employment Opportunity Coordinator prior to the bid opening ?_____Yes___No

>>>If "no", with this bid response, the prime contract bidder hereby adopts the minority and female work hour utilization goals and the specific affirmative action steps set forth in 123:2-3 through 123:2-9 of the Ohio Administrative Code.

BIDDER'S EEO COVENANTS:
Throughout its performance of any contract awarded to it on this State-assisted project, the prime contract bidder agrees to the following covenants:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry or sex. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, national origin, ancestry or sex. Such action shall include, but is not limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layout or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

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

(3) The contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided by the State Administering Agency advising the said labor union or workers' representatives of the contractor's commitments under this covenant and shall post copies of the notice in conspicuous places available to employees and applicants for employment

(4) The contractor will comply with all provisions of the Ohio Department of Administrative Services, Equal Opportunity Division and with the implementing rules, regulations and applicable orders of the State Equal Employment Opportunity Coordinator.

(5) The contractor agrees to fully cooperate with the State Administering Agency, the State Equal Employment Opportunity Coordinator and with any other official or agency, or the State or Federal government which seeks to eliminate unlawful employment discrimination, and with all other State and Federal efforts to assure equal employment practices under its contract and the contractor shall comply promptly with all requests and directions from the State Administering Agency, the State Equal Employment Opportunity Coordinator and any of the State of Ohio officials and agencies in this regard, both before and during construction.

(6) Full cooperation as expressed in clause (5), above, shall include, but not be limited to, being a witness and permitting employees to be witnesses and complainants in any proceeding involving questions of unlawful employment practices, furnishing all information and monthly utilization work hour reports required by the OAC 123: 2-9-01 and by the rules, regulations and orders of the State Equal Employment Opportunity Coordinator pursuant thereto, and permitting access to its books, records, and accounts by the State Administering Agency and the State Equal

Employment Opportunity Coordinator for purposes of investigation to ascertain compliance with such rules, regulations and orders. Specifically, contractors will submit workforce utilization reports to the State Equal Opportunity Coordinator by the 10th of each month. The monthly reports must be electronically submitted through the following website:
http://das.ohio.gov/EOD/CCInputForm29.htm

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of its contract or with any of the said rules, regulations, or orders, its contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further State Contracts or State-assisted Construction Contracts in accordance with procedures authorized in OAC 123:2-3 through 2-9 and such other sanctions may be instituted and remedies invoked, as provided in OAC 123:2-3 through 2-9 or by regulation, or order of the State Equal Employment Opportunity Coordinator, or as otherwise provided by law.

In the event that its contract is terminated for a material breach of OAC 123:2-3 through 2-9 the contractor shall become liable for any and all damages which shall accrue to the State Administering Agency and Applicant and the State of Ohio as a result of said breach.

(8) The contractor will require the inclusion of language reflecting these same eight covenants within every subcontract or purchase order it executes in the performance of its contract unless exempted by rules, regulations or orders of the State Equal Employment Opportunity Coordinator issued pursuant to O.A.C. 123:2-3-02 so that these provisions will be binding upon each subcontractor or vendor. The contractor will take such actions as the Administering Agency may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided, however, that in any litigation with a subcontractor, vendor or other party as a result of such direction by the State Administering Agency, the contractor may be requested to protect the interests of the State.

>>>The prime contract bidder hereby adopts the foregoing covenants ?_____Yes _____No

BIDDER'S CERTIFICATION:

The undersigned, being a duly authorized officer of the prime contract bidder, does hereby certify to and agree with the foregoing statements and covenants regarding its subscription to the State's Equal Employment Opportunity Requirements for State- assisted Construction Contracts.

_____ _____/_____/_____

Signature of Authorized Officer *Date*

_____

Title

>>> PLEASE NOTE: Only a bidder possessing a valid certificate will be awarded a contract pursuant to Chapter 153 of the Revised Code by an owner referred to in section 153.01 of the Revised Code. Application shall be made at least ten working days prior to the date that the bidder expects to receive the certificate. The bidder's failure to elect one of the two Bidder's Affirmative Action Requirements, adopt the Bidder's EEO Covenants, and complete the foregoing certification may cause the bidder's proposal to be rejected as being non-responsive to the State's Equal Employment Opportunity Requirements and in non-compliance with the State Equal Employment Opportunity Bid Conditions. In addition, the bidder must, prior to the execution of a contract, submit to the local subdivision a valid Certificate of Compliance for Equal Employment Opportunity purposes.

"APPENDIX A" OF THE STATE EEO BID CONDITIONS
MINORITY MANPOWER UTILIZATION GOALS AND TIMETABLES

The following minority goals listed are expressed in terms of percentages of work hours for each trade to be used by the contractor in a designated area. Designated areas are defined as Ohio's Standard Metropolitan Statistical Areas (SMSA). They are: Akron, Cincinnati, Cleveland, Columbus, Dayton, Toledo and Youngstown-Warren. Incases where the project is not located in a designated area, the contractor may adopt minority utilization goals of the near/nearest designated area.

AKRON	
All Trades	10%

COLUMBUS	
All Trades	10%

DAYTON	
All Trades	11%

TOLEDO	
All Trades	9%

YOUNGSTOWN	
All Trades	9%

CINCINNATI	
Trade	
Asbestos Workers	9%
Boilermakers	9%
Carpenters	10%
Elevator Constructors	1%
Floor Layers	10%
Glaziers	10%
Lathers	10%
Marble, Tile, Terrazzo	8%
Millwright	10%
Operating Engineers	11%
Painters	11%
Pipefitters	11%
Plasterers	10%
Plumbers	11%
Sheet Metal Workers	11%
Other Trades	11%

CLEVELAND	
Trade	
Asbestos Workers	17%
Boilermakers	9%
Carpenters	16%
Electricians	20%
Elevator Constructors	20%
Floor Layers	11%
Glaziers	17%
Ironworkers	13%
Operating Engineers	17%
Painters	17%
Pipefitters	17%
Plasterers	20%
Plumbers	17%
Roofers	17%
Other Trades	17%

"APPENDIX B" OF THE STATE EEO BID CONDITIONS

SPECIFIC AFFIRMATIVE ACTION STEPS

The following Affirmative Action steps are directed at increasing minority utilization:

(1) The contractor should maintain a file of the names and addresses of each minority and female referred to it by any individual or organization and what action was taken with respect to each such referred individual, and if the individual was not employed by the contractor, and the reasons therefore. If such individual was sent to the union hiring hall for referral and not referred back by the union or if referred back by the union or if referred, not employed by the contractor, the file should document this and the reason therefore.

To Demonstrate Compliance: Maintain a file of the names, addresses, telephone numbers, and craft of each minority and female applicant showing (a) the date of contact and whether the person was hired; if not, the reason, (b) if the person was sent to a union for referral, and the results (c) follow-up contacts when the contractor was hiring.

(2) The contractor should promptly notify the State Contracting Agency when the Union or Unions with which the contractor has collective bargaining agreements does not refer to the contractor a minority or female worker referred (to the union) by the contractor, or when the contractor has information that the union referral process has impeded efforts to meet its goals.

To Demonstrate Compliance: Have a copy of letters sent, or do not claim the union is impeding the contractors' efforts to comply.

(3) The contractor should disseminate its Equal Employment Opportunity policy within its organization by including it in any company newsletters and annual reports; by advertising at reasonable intervals in union publications; by posting of the policy; by specific review of the policy with minority and female employees; and by conducting staff meetings to explain and discuss the policy.

To Demonstrate Compliance: Have a written EEO policy which includes the name and how to contact the contractor's EEO Officer and (a) include the policy in any company policy manuals, (b) post a copy of the Policy on all company bulletin boards (in the office and on all job sites), (c) records, such as reports or diaries, etc., that each minority and female employee is aware of the Policy and that it has been discussed with them, (d) that the policy has been discussed regularly at staff meetings and (3) copies of newsletters and annual reports which include the Policy.

(4) The contractor should continually monitor all personnel activities to ensure that its EEO policy is being carried out, including the evaluation of minority and female employees for promotional opportunities on a quarterly basis and the encouragement of such employees to seek those opportunities.

To Demonstrate Compliance: Have records that the company EEO Officer reviews all: (a) monthly workforce reports, (b) hiring and terminations, (c) training provided on-the-job, (d) minority and female employees quarterly for promotion and encourages them to prepare for and seek promotion.

The records should be the EEO Officer's job description, reports, memos, personnel files, etc., documenting the activities for possible discriminatory patterns.

(5) The contractor should disseminate its EEO policy externally by informing and discussing it with all recruiting sources; by advertising it in news media, specifically including minority and female news media; and by notifying and discussing it with all subcontractors.

To Demonstrate Compliance: Have copies of (a) letters sent, at least six months or at the start of each new major contract, to all recruiting sources (including labor unions) requiring compliance with the Policy, (b) advertising, which has the EEO "tagline" on the bottom, and (c) purchase order and subcontract agreement forms will include or make reference to the State EEO Covenant, Appendix A or B of the Ohio Administrative Code 123:2-3-02.

(6) The contractor should make specific and reasonably recurrent oral and written recruitment efforts directed at minority and women's organizations, and training organizations with the contractor's recruitment area.

To Demonstrate Compliance: Have a record either in a follow-up file for each organization or on the reverse of the notification letter sent under Item 1, above, of the dates, individuals contacted and the results of the contract from telephone calls or personal meetings with the individuals or groups notified under Item 1.

(7) The contractor, where reasonable, should develop on-the-job training opportunities and participate and assist in all Department of Labor funded and/or approved training programs (including Apprenticeship) Programs relevant to the contractor's employee needs consistent with its obligations in the Bid Conditions.

To Demonstrate Compliance: Have records of contributions in cash, equipment supplied and/or contractor personnel provided as instructors for Bureau of Apprenticeship and Training approved or Department of Labor funded training programs and records of the hiring and training of minorities and females referred to Company by such programs.

(8) The contractor should solicit bids for subcontracts (and joint ventures) from available minority and female subcontractors engaged in the trades covered by the Bid Conditions, including circulation of minority and female contractors associations.

To Demonstrate Compliance: Have copies of letters or other direct solicitation of bids for subcontracts/joint ventures from minority/female contractors with a record of the specific response and any follow-up the contractor has done to obtain a price quotation or to assist a minority/female contractor in preparing or reducing a price quotation; have a list of all minority/female subcontracts awarded or joint ventures participated in with dollar amounts, etc.

EXPLANATION OF AN ACCEPTABLE AFFIRMATIVE ACTION PROGRAM:

An Affirmative Action Program is a set of specific and result-oriented procedures to which a Contractor shall apply every good faith effort. The objective of those procedures and efforts is to assure equal employment opportunity. An acceptable Affirmative Action Program will include an analysis of all trades employed by the Contractor within the last year with an explanation of whether Minorities are currently being under-utilized in any one or more trades. A necessary prerequisite to the development of a satisfactory Affirmative Action Program is the identification and analysis of problem areas inherent in Minority employment and an evaluation of opportunities for utilization of Minority group personnel.

Part I - Basic Contents of an Affirmative Action Program:

1. Development or reaffirmation of the contractor's EEO policy in all personnel actions.
2. Formal internal and external dissemination of contractor's EEO policy.
3. Establishment of responsibilities for implementation of the contractor's affirmative action program.
4. Identification of problem areas (deficiencies) by organizational units and job classification.
5. Establishment of goals and objectives by organizational units and job classification, including timetables for completion.
6. Development and execution of action oriented programs designed to eliminate problems and further designed to attain established goals and objectives.
7. Design and implementation of internal audit and reporting systems to measure effectiveness of the total programs.
8. Compliance of personnel policies and practices with Federal sex discrimination guidelines (41 CFR Part 60-20).
9. Active support of local and national community action programs and community service programs, designed to improve the employment opportunities of minorities.
10. Consideration of ethnic minorities and women not currently in the work force having requisite skills who can be recruited through affirmative action measures.
11. Summary data on applicant flow, hires, terminations and promotions, and training for the last twelve months or the last one hundred applicants, hires, etc., whichever is less.

Part II - Analysis of Individual Trades

1. The minority population of the labor area surrounding (contractor's) projects.
2. The size of the minority unemployment force in the labor area surrounding (the contractor's) projects.
3. The percentage of minority work force as compared with the total work force in the immediate labor area.
4. The general availability of minorities having requisite skills in the immediate labor area.
5. The availability of minorities having requisite skills in the area in which the contractor can reasonably recruit.
6. The availability of promotable minority employees within the contractor's organization.
7. The anticipated expansion, contraction, and turnover of an in the work force.
8. The existence of training institutions capable of training minorities in the requisite skills.
9. The degree of training which the contractor is reasonably able to undertake as a means of making all job classes available to minorities.

Goals, timetables and affirmative action commitments must be designed to correct any identifiable

deficiencies. Where deficiencies exist and where numbers or percentages are relevant in developing corrective action, the contractor shall establish and set forth specific goals and timetables. Such goals and timetables, with supporting data and the analysis thereof shall be a part of the contractor's written affirmative action program. Where the contractor has not established a goal, its written affirmative action program must specifically analyze each of the factors listed above, and must detail its reason for a lack of a goal. The goals and timetables should be attainable in terms of the contractor's analysis of its deficiencies and its entire action. Thus, in establishing its goals and timetables, the contractor should consider the results which could be reasonably expected from its good faith efforts to make its overall affirmative action program work. Ifthe contractor does not meet its goals and timetables, the contractor's good faith efforts shall be judged as to whether the contractor is following its program and attempting to make the program work toward the attainment of its goals.

Support data for the above analysis and program shall be compiled and maintained as part of the contractor's affirmative action program. This data should include applicant flow data and applicant rejection ratios indicating minority status.

Compliance Status: No State Contractor's compliance status shall be judged alone by whether or not he reaches his goals and meets his timetables. Rather each Contractor's compliance posture shall be reviewed and determined by reviewing the contents of his program, the extent of his adherence to his program and his good faith efforts to make his program work toward the realization of the program's goals within the timetables set for completion.

"APPENDIX C" OF THE STATE EEO BID CONDITIONS
FEMALE UTILIZATION GOALS

OAC 123:2-3-05 Required utilization analysis and goals

(A) Each state-involved contractor shall include in his/her affirmative action program the information and analysis required pursuant to part *N* 401-C of appendix A of rule 123:2-1- 01 of the Administrative Code, in addition to female utilization requirements pursuant to the governor's "Executive Order 84-9" and this rule.

(B) As required by the governor's "Executive Order 84-9", the utilization of women shall be, at a minimum, that currently in use by the federal government as of February 15, 1984. This requirement stated at C.F.R. part 60-4 is 6.9 percent utilization of women. This requirement shall remain at 6.9 percent unless further amended by the governor in a subsequent order. This requirement shall be met by a determination of work hours utilized in the same manner as minority utilization hours are calculated.

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

NOTICE OF AWARD

Date of Issuance:

Owner: Owner's Contract No.:

Engineer: Engineer's Project No.:

Project: Contract Name:

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 receipt 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.

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: Engineer

"SAMPLE FORM"

AGREEMENT

THIS CONTRACT is dated this _____ day of _____, 20___, by and between the Village of Grover Hill, Ohio and Paulding County Ohio Commissioners (collectively, "Owner") and _____ _____("Contractor").

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Wastewater System Improvements

ARTICLE 2 – ENGINEER

2.01 The Project has been designed by Wessler Engineering, Inc. (Engineer), which is 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 3 – CONTRACT TIMES

3.01 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.

3.02 The Work will be substantially completed within 330 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 360 days after the date when the Contract Times commence to run.

3.03 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial and other losses if the Work is not completed within the times specified in Paragraph 3.02 above, plus any extensions thereof allowed in accordance with the Contract Documents. 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), the Owner, in the form of a Change Order, shall deduct from the monies due the Contractor $1,000.00 for each calendar day that expires after the time specified in Paragraph 3.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, the Owner, in the form of a Change Order, shall deduct from the monies due the Contractor $1,000.00 for each day that expires after the time specified in Paragraph 3.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 4 – CONTRACT PRICE

4.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds as follows:

_____	($_____)
(words)	(figure)

For all Work, at the prices stated in Contractor's Bid.

The Bid prices for Unit Price Base Bid Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 10.06 of the General Conditions.

ARTICLE 5 – PAYMENT PROCEDURES

5.01 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.

5.02 Progress Payments; Retainage

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment as recommended by Engineer on a monthly basis during performance of the Work as provided in Paragraph 5.02.A.1 below. 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 Documents.

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 Documents.

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

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.

5.03 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.

ARTICLE 6 – INTEREST

6.01 All amounts not paid when due as provided in Article 15 of the General Conditions shall bear interest at the rate allowed by law at the place of the Project.

ARTICLE 7 – CONTRACTOR'S REPRESENTATIONS

7.01 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 carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. 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.

F. 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.

G. 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.

H. 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.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. 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 8 – ACCOUNTING RECORDS

8.01 Contractor shall keep such full and detailed accounts of materials incorporated and labor and equipment utilized for the Work consistent with the requirements of Paragraph 13.01.E of the General Conditions and as may be necessary for proper financial management under this Agreement. Subject to prior written notice, owner shall be afforded reasonable access during normal business hours to all Contractor's records, books, correspondence, instructions, plans, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

A. The Contract Documents consist of the following:

1. This Agreement

2. Bid Guaranty Bond

3. Performance Bond

4. General Conditions

5. Supplementary Conditions

6. Wage Determination and Payroll Submittal

7. Specifications as listed in the Table of Contents.

8. Addenda (Numbers ___ to ___, inclusive)

9. Exhibits to this Agreement (enumerated as follows):

    a. Contractor's Bid (Bid Form)

10. The following which may be delivered or issued on or after the Effective Date of the Contract:

    a. Notice to Proceed

    b. Notice of Commencement

    c. Certificate of Owner's Attorney

    d. Certificate of Owner's Financial Officer

11. The following which must be completed before payment is issued:

    a. Application for Payment

    b. Change Orders

    c. Partial Release of Liens and Claims

12. The following which must be completed before final payment is issued:

    a. Application for Payment

    b. Change Orders

    c. Certificate of Substantial Completion

    d. Maintenance Bond

    e. Final Release of Liens and Claims

    f. Affidavit – Municipal Income Tax

    g. Affidavit of Compliance, Prevailing Wage

B. The documents listed in paragraph 9.01A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed in this Article 9.

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. 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 Campaign Contributions

A. Contractor hereby certifies that all applicable parties listed in Division (I) of O.R.C. Section 3517.13 are in full compliance with Divisions (I) and (J) or O.R.C. Section 3517.13.

10.06 Contractor's Certifications

A. Contractor certifies that is has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.05:

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 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.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in triplicate (3 copies).

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

OWNER:	CONTRACTOR:
_____	_____
By: _____	By: _____
Title: _____	Title: _____
[CORPORATE SEAL]	[CORPORATE SEAL]
Attest: _____	Attest: _____
Title: _____	Title: _____
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
	License No.: _____ (Where applicable)
	(If Contractor is a corporation or a partnership or a joint venture, attach evidence of authority to sign.)

MAINTENANCE BOND
VILLAGE OF GROVER HILL, OHIO

Instructions:

Successful Bidder must use this form or other form containing the same material conditions and provisions as approved in advance by Engineer.

Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute bond.

Surety company executing this bond shall appear on the most current list of "Surety Companies Acceptable on Federal Bonds," as specified in the U.S. Treasury Department Circular 570, as amended, and be authorized to transact business in the State of Ohio.

KNOW ALL MEN BY THESE PRESENTS: that

"Contractor"_____

and

"Surety": [name] _____
[address] _____
_____
a corporation chartered and existing under the laws of the State of _____, and authorized to do business in the State of Ohio,

are held and firmly bound unto the Village of Grover Hill, Ohio and Paulding County Ohio Commissioners hereinafter called OWNER, in the penal sum of _____ _____Dollars, ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, together with interest at the maximum legal rate from date of demand and any attorney fees and court costs incurred by Obligee to enforce this instrument, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Contractor has entered into a certain Agreement with the OWNER, dated as of the _____ day of _____, 20___, by which Contractor has agreed to perform and furnish certain work for or in furtherance of construction of public improvements described generally as _____, which Agreement, and the "Contract Documents" as referred to therein, are hereby incorporated herein by reference;

WHEREAS, the Contractor has installed and completed and met all improvements, installations and requirements applicable to the above described work, but said improvements and installations have not yet been accepted for public maintenance; and

WHEREAS, the Owner requires a guarantee from the Contractor against defective materials and workmanship in connection with such maintenances.

NOW, THEREFORE, Contractor warrants the workmanship and all materials used in the construction, installation and completion of said Work, to be of good quality and completed in a workmanlike manner in accordance with the Agreement and Contract Documents and all laws, ordinances, rules, standards and regulations applicable to said Work;

FURTHERMORE, the conditions of the Surety's obligation hereunder are such that if Contractor at his own expense, for a period of three years after said Work, improvements and installations are accepted for public maintenance by the Owner, shall make all repairs or replacements thereto which may become necessary by reason of improper or defective workmanship or materials, or any failure thereof to conform to the provisions of the Agreement or Contract Documents, then Surety's obligation is to be null and void; otherwise such obligation shall remain in full force and effect. Any repairs or replacements made under this Bond shall in like manner be subject to the terms and conditions hereof.

Contractor and Surety covenant that all action required by law to be taken by them to authorize the execution and delivery of this bond have been previously been taken, that the officers whose signatures appear below have been fully empowered to execute and deliver this instrument and that once executed and delivered, it shall represent the lawful and binding obligation of the parties.

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

CONTRACTOR:_____

By:_____ _____
[signature] [printed name]

ATTEST:

_____, Secretary
[signature]

SURETY:_____

By:_____, Attorney-in-Fact
[signature]

_____ _____
[printed name] [address]

_____

AFFIDAVIT OF COMPLIANCE
WITH OHIO REVISED CODE SECTION 3517.13

STATE OF OHIO)
)
COUNTY OF _____)

_____being duly sworn deposes and states as follows:

1. I am duly authorized to make the statements contained herein on behalf of _____ ("the Contracting Party").

2. The Contracting Party is a/an (select one):

_____Individual, partnership, or other unincorporated business association (including without limitation, a professional association organized under Ohio Revised Code Chapter 1787), estate, or trust

_____Corporation organized and existing under the laws of the State of _____.

_____Labor organization

3. I hereby affirm that the Contracting Party and each of the individuals specified in R.C. 3517.13(1) (with respect to non-corporate entities and labor organizations) or R.C. 3517.13(J) (with respect to corporations) are in full compliance with the political contribution limitations set forth in R.C. 3517.13(1) and (J), as applicable.

4. I understand that a false representation on this certification will incur penalties pursuant to 3517.992(R)(3).

Affiant further sayeth naught.

By:_____

Title:_____

SWORN TO BEFORE ME and subscribed in my presence this _____ day of _____

_____, 20_____.

_____
Notary Public

My commission expires:_____

ESCROW AGREEMENT FOR CONTRACTOR'S RETAINAGE

In accordance with a certain Contract between the Village of Grover Hill, Ohio, and Paulding County Ohio Commissioners (hereinafter referred to as "the Owner") and _____, (hereinafter referred to as "the Contractor"), an Escrow Agent is hereby appointed to hold funds arising out of the Owner's agreement to pay retainage into an escrow fund, said Agent to be:

_____

_____

_____

All retained funds will be placed with the above Escrow Agent from the date your Contract is certified as being 50% complete pursuant to Sections 153.13, and 153.14 and 153.63 Ohio Revised Code.

During the time the aforementioned retained funds are in the custody of the Escrow Agent, the Escrow Agent has authority to invest the escrow funds in the classes of securities listed below which, in the judgment of the Escrow Agent, allow for the least risk to capital preservation and provide for a reasonable income. The income from investment of the escrowed funds shall be accumulated in the escrow account.

(a) Obligation issued or guaranteed as to interest and principal by the government of the United States, or obligations of the State of Ohio or any political subdivision thereof;

(b) Obligations including certificates of deposit of any national bank located in this State and/or any bank as defined by Section 1101.01, O.R.C.;

(c) Repurchase agreements fully secured by obligations of any kind specified in clauses (a) and (b) above; or

(d) Interest in any money market fund or trust, the investments of which are generally restricted to obligations of any of the kind specified in clauses (a) through (c) above.

The Escrow Agent shall hold the escrowed principal and interest until receipt of notice from the Owner, or until receipt of an Arbitration Order or an Order of the Court of Claims, or other appropriate courts, specifying the amount of the escrowed principal to be released and the person to whom it is to be released. Upon receipt of such a request or order, the Escrow Agent shall, within 30 days, pay such amount of principal and interest earned on the retainage to the Contractor less the Escrow Agent's fee.

It is understood that the Escrow Agent shall have no duties, obligations, or liabilities hereunder other than to hold and invest said funds and to deliver them in accordance with the provisions hereof.

CONTRACTOR:

_____
(Name and Title of Person Signing)

OWNER: VILLAGE OF GROVER HILL, OHIO

_____
(Name and Title of Person Signing)

OWNER: PAULDING COUNTY COMMISSIONERS, OHIO

_____
(Name and Title of Person Signing)

ESCROW WAIVER

In accordance with a certain Contract between the Village of Grover Hill, Ohio, and Paulding County Ohio Commissioners (hereinafter referred to as "the Owner") and _____, (hereinafter referred to as "the Contractor") it is mutually agreed by and between the parties hereto that because of the short-term duration of the within contract, no escrow account will be established pursuant to Sections 153.13, 153.14 and 153.63 of the Ohio Revised Code nor shall any interest be paid on any retainage.

CONTRACTOR:

_____
(Name and Title of Person Signing)

OWNER: VILLAGE OF GROVER HILL, OHIO

_____
(Name and Title of Person Signing)

OWNER: PAULDING COUNTY OHIO COMMISSIONERS, OHIO

_____
(Name and Title of Person Signing)

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

NOTICE TO PROCEED

Owner:	Village of Grover Hill, Ohio Paulding County Commissioners, Ohio	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Wessler Engineering	Engineer's Project No.:	701218.04.001
Project:	Wastewater System Improvements	Contract Name:	Wastewater System Improvements
		Effective Date of Contract:	

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [_____, 20__]. *[see Paragraph 4.01 of the General Conditions]*

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, [the date of Substantial Completion is _____, and the date of readiness for final payment is_____] ***or*** [the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

Before starting any Work at the Site, Contractor must comply with the following:
[Note any access limitations, security procedures, or other restrictions]

Owner**:**

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

PERFORMANCE BOND
(Section 153.57 Ohio Revised Code)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____ as principal (Contractor), and _____ as sureties, are hereby held and firmly bound unto the Village of Grover Hill and Paulding County Ohio Commissioners as obligee (Owner) in the penal sum of _____ dollars ($_____), for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named principal did on the ____ day of _____20___, enter into a certain Contract with the Owner, which said contract is made a part of this bond the same as though set forth herein;

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

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

CONTRACTOR AS PRINCIPAL

Contractor: _____
(indicate correct name of bidding entity)

By: _____
(Signature)

_____
(Printed Name)

Signature Date: _____

Physical Address for giving notices:

_____

_____

Telephone Number: _____

Fax Number: _____

Email Address: _____

Federal I.D. Number: _____

SURETY

Name: _____

Seal:

Physical Address for giving notices:

_____

_____

SURETY AGENT:

Agency Name: _____

Physical Address for giving notices:

_____

_____

By: _____
Signature (Attach Power of Attorney)

Witness: _____
Name and Title: _____

NOTICE OF COMMENCEMENT OF PUBLIC IMPROVEMENT
SECTION 1311.252 OHIO REVISED CODE

State of Ohio, County of _____, ss:

Notice is hereby given by the undersigned public authority ("Public Authority") of the commencement of a public improvement ("Project") as follows:

1. The Project is identified as:

   Project Name: _____

   Location: _____

2. The Public Authority responsible for the Project is:

   Public Authority: _____

   Address: _____

3. All principal contractors on the Project, the trade and Surety of each are as follows:

   Principal Contractors Name _____

   Address: _____

   Trade: _____

   Surety Name and Address: _____

4. The Public Authority first executed a contract with a principal contractor for the Project on:

   Date: _____

5. The name and address of the representative of the Public Authority upon whom services may be made for the purposes of serving an affidavit pursuant to Section 1311.26 of the Ohio Revised Code is:

   Name: _____

   Address: _____

Public Authority: _____

Signature: _____

Title: _____

The signator of this Notice of Commencement of Public Improvement ("Notice") personally appeared before me on behalf of the Public Authority, a notary public in and for said county, and swore that all the information in the Notice is true as he/she verily believes and further that he/she is fully authorized by the Pubic Authority to give said notice.

Sworn to before me and subscribed in my presence this _____ day of _____, 20___.

_____
Notary Public

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly authorized and acting legal representative of _____ do hereby certify as follows:

I have examined the attached contract(s), surety bonds, insurance, and the manner of execution thereof, and I am of the opinion that each of the aforesaid documents meets the requirements set forth within and have been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Signature: _____

Date: _____

CERTIFIATE OF OWNER'S FINANCIAL OFFICER

WITNESS:

I, _____, Fiscal Officer, hereby certify that the money to meet this contract has been lawfully appropriated for the purpose of the contract and is in the treasury of _____, Ohio, or is in the process of collection to the credit of the appropriate fund free from prior encumbrance.

_____ _____

Fiscal Officer *Date*

SEAL:

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

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Issued and Published Jointly by

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

National Society of Professional Engineers®

Endorsed by

CSI NUCA
REPRESENTING UTILITY & EXCAVATION CONTRACTORS

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.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

National Society of Professional Engineers

1420 King Street, Alexandria, VA 22314-2794

(703) 684-2882

www.nspe.org

American Council of Engineering Companies

1015 15th Street N.W., Washington, DC 20005

(202) 347-7474

www.acec.org

American Society of Civil Engineers

1801 Alexander Bell Drive, Reston, VA 20191-4400

(800) 548-2723

www.asce.org

NOTE: EJCDC publications may be purchased at www.ejcdc.org, or from any of the sponsoring organizations above.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, 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, expediters, 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.

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2013 Edition). All provisions which 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.

The terms "field order and work directive change" listed throughout these Supplementary Conditions are to be replaced by "field transmittal memo".

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Defined Terms

ADD the following term and definition to Paragraph 1.01.A:

49. Field Transmittal Memorandum (FTM) – A written communication issued by the Engineer during the Construction period.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.02 Copies of Documents

AMEND the first sentence of Paragraph 2.02.A. to read as follows:

A. Owner shall furnish to Contractor one (1) printed copies of the Drawings and Project Manual (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.

SC-2.03 Before Starting Construction

ADD the following new subparagraph after 2.03 A.3.

4. A minimum list of items to be included in the Schedule of Values for the Lump Sum WWTP work is provided in Section 01990 – Schedule of Values. In the event the Schedule of Values appears to be front-loaded or unbalanced, in the opinion of the Owner or the Engineer, Contractor shall provide detailed documentation to support the values in question, or revise the Schedule of Values to address Owner and Engineer's concerns.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01 Commencement of Contract Times; Notice to Proceed

DELETE Paragraph GC-4.01 in its entirety and INSERT the following:

The Contract Times will commence on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 60 days after the Effective Date of the Agreement.

SC-4.05 Delays in the Contractor's Progress

REPLACE Section 4.05.C.2 in its entirety with the following:

2. abnormal weather conditions: abnormal weather conditions shall be defined as inclement weather which prevents Contractor from making progress on the critical path Work for more days each month than listed in the table below. It is the Contractor's responsibility to document the weather conditions from an approved weather service and to document the impacts to the critical path. If the number of days in which inclement weather delays Contractor's critical path progress exceeds the days in table 4.05.C.2. in any given month, then Contractor shall be given a no cost time extension to the contract duration equal to the number of documented inclement weather days that exceed the amount in table 4.05.C.2.

Table 4.05.C.2	
Contractor shall plan for the following number of inclement weather days:	
January	8
February	8
March	7
April	6
May	5
June	5
July	4
August	4
September	5
October	6
November	6
December	6

Source: ODOT, Construction and Material Specifications, Table 108.06-1

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

SC-5.02 Use of Site and Other Areas

ADD the following paragraphs immediately following Paragraph 5.02.D:

E. *Operations Within Right-of-Way*: In public thoroughfares, all operations of the Contractor, including those of a temporary nature, must be confined within the applicable right-of-way limits. The Contractor shall be solely responsible for any encroachment on private property beyond the right-of-way limits.

F. *Operations Within Private Easement*: On private property in a private easement, all operations of the Contractor, including those of a temporary nature, must be confined within the applicable easement limits. The Contractor shall be solely responsible for any encroachment on private property beyond the easement limits. Contractor shall notify the property owner(s) at least two (2) working days prior to the start of construction on any portion of work on private property.

SC-5.03 Subsurface and Physical Conditions

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, reports and plans relating to hazardous environmental conditions, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

B. Not Used

SC-5.06 Hazardous Environmental Conditions

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.

B. Not Used.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.02 Insurance—General Provisions

ADD the following Paragraph 6.02.K.:

K. The Contractor's Certificate of Insurance shall name the Owner and the Engineer as additionally insured. The Certificate of Insurance shall clearly state the insurance coverage required is in effect and has not been decreased by claims, if any, paid by the Insurance Company. The Contractor's insurance shall not be canceled or expire without the written consent of the Owner.

SC-6.03 Contractor's Liability Insurance

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	$ 1,000,000.00
Bodily injury by disease, each employee	$ 1,000,000.00
Bodily injury/disease aggregate	$ 1,000,000.00

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

General Aggregate	$ 1,000,000.00
Products - Completed Operations Aggregate	$ 1,000,000.00
Each Occurrence (Bodily Injury and Property Damage)	$ 1,000,000.00

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

Bodily Injury:	
Each person	$ 1,000,000.00
Each accident	$ 1,000,000.00
Property Damage:	
Each accident	$ 1,000,000.00
[or]	
Combined Single Limit of	$ 1,000,000.00

4. Excess or Umbrella Liability:

Each Occurrence	$ 1,000,000.00
General Aggregate	$ 1,000,000.00

SC-6.05 Property Insurance

DELETE Section GC-6.05 in its entirety and REPLACE with the following:

Property Insurance in the form of a Builder's Risk policy is not required.

SC-6.08 Maintenance Bond

A. Contractor shall, as a condition to Owner's obligation to make final payment, supply a three (3) year Maintenance Bond executed by a surety meeting the qualifications set for in Article 6 - General Conditions and in such form as prescribed by the Contract Documents, which bond shall secure the obligations contained in the Maintenance Bond, beginning on the date of Final Acceptance in an amount equal to ten percent (10%) of the contract amount as adjusted for Change Orders or such different percentages as may be specified by other Contract Documents.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.01 Concerning Supervision and Superintendence

ADD the following to Paragraph 7.01.B:

The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

SC-7.02. Labor; Working Hours

ADD the following to Paragraph 7.02.A:

Owner and Engineer reserve the right to require the Contractor to remove from the Project labor personnel (including subcontractors) who the Owner or Engineer determine to not be competent, suitably qualified, or reasonably disciplined in the performance of the Work.

ADD the following new subparagraphs immediately after Paragraph 7.02.B:

1. Regular working hours will be 7:30 am to 4:30 pm Monday through Friday
2. Owner's legal holidays are:

New Year's Day	January 1
Martin Luther King, Jr. Day	Third Monday in January
George Washington's Birthday	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veterans Day	November 11
Thanksgiving Day	Fourth Thursday in November
Christmas Day	December 25

SC-7.08 Permits

AMEND the first sentence of Paragraph 7.08.A to read as follows:

Contractor shall obtain and pay for all construction permits and licenses except those listed in Section 01010 – Summary of Work.

SC-7.09 Taxes

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 Ohio 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.

SC-7.16 Shop Drawings, Samples, and Other Submittals

DELETE Paragraphs 7.16.E.2 and 7.16.E.3 and REPLACE them with the following:

E.2. Contractor will furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than two submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples, or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time.

E.3. In the event Contractor request a change of a previously approved item, Contractor shall reimburse Owner for Engineer's charges for review of the item unless the need for such change is beyond the control of the Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

ADD a new paragraph immediately following Paragraph 10.03.A:

B. The duties, responsibilities and limitations of the authority of the Resident Project Representative shall be as shown on the attached Exhibit "A".

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

SC-11.01 Amending and Supplementing Contract Documents

DELETE Paragraph 11.01.A in its entirety and insert the following in its place:

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, a Field Order, or a Field Transmittal Memo.

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

SC-15.01 Progress Payments

Replace Paragraph 15.01.A in its entirety and INSERT the following:

A. Basis for Progress Payments

1. 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. The Contractor shall, within 10 days of receipt of Notice to Proceed, submit a complete and detailed Schedule of Values. A minimum list of items to be included in the Schedule of Values is provided in Section 01990. The Schedule of Values shall be approved by the Owner and Engineer. In the event the Schedule of Values appears to be front-loaded or unbalanced, in the opinion of the Owner or the Engineer, Contractor shall provide detailed documentation to support the values in question, or revise the Schedule of Values to address Owner and Engineer's concerns.
2. The value assigned to each item of the Work in the Schedule of Values may be considered in evaluating additions and deletions in the Scope of Work.
3. 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.
4. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

SC-15.01.B Application for Payments

Replace the first sentence of Paragraph 15.01.B with the following:

At the date established 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.

SC 15.01.D Payment Becomes Due

Delete Paragraph 15.01.

Delete Paragraph 15.01.D in its entirety and INSERT the following:

1. Thirty (30) days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 15.01.E) become due, and when due will be paid by Owner to Contractor, unless payment is provided through a governmental funding agency. The time limit for payment from a funding agency to become due shall be in accordance with the respective funding agency's timeline for approval and disbursement of funds. If payment from the funding agency is disbursed through the Owner, payment to the Contractor shall become due ten (10) days after Owner's receipt of funds from the funding agency.

SC-15.03 Substantial Completion

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.

Insert Paragraph 15.03.C.1 as follows:

1. 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 as Engineer shall determine in accordance with Paragraph 15.01.C.6 of the General Conditions, less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion, and less any applicable liquidated damages.

ARTICLE 18 – MISCELLANEOUS

SC-18.09 ***Occupational Safety and Health Act of 1970***

A. These construction documents and the joint and several phases of construction hereby contemplated are to be governed, at all times, by applicable provisions of the federal laws, including but not limited to, the latest amendments of the following:

Williams - Steiger Occupational Safety and Health Act of 1980, Public Law 91-596.

Part 1910 - Occupational Safety and Health Standards, Chapter XVII of Title 29, code of Federal Regulations.

SC-18.10 ***Liquidated Damages***

In the event the Contractor fails to complete satisfactorily the entire work contemplated and provided for under this contract on or before the dates of completion determined as

described elsewhere herein, the Owner shall, in the form of a Change Order, deduct from the monies due the Contractor the sums as outlined in Article 3 of the “Sample Form” of the Agreement. If the monies due the Contractor are less than the amount of such liquidated damages, then the Contractor or his surety shall pay the balance to the Owner.

-END-

EXHIBIT "A"

DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF RESIDENT PROJECT REPRESENTATIVE

Prepared by

ENGINEERS' JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
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and by

AMERICAN SOCIETY OF CIVIL ENGINEERS

A LISTING OF THE DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF THE RESIDENT PROJECT REPRESENTATIVE**

**unless otherwise noted

ENGINEER shall furnish a Resident Project Representative (RPR), assistants and other field staff to assist ENGINEER in observing performance of the Work of the CONTRACTOR.

Through more extensive on-site observations of the Work in progress and field checks of materials and equipment by the RPR and assistants, ENGINEER shall endeavor to provide further protection for OWNER against defects and deficiencies in the Work; but, the furnishing of such services will not make ENGINEER responsible for or give ENGINEER control over construction means, methods, techniques, sequences or procedures or for safety precautions or programs, or responsibility for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

The duties and responsibilities of the RPR are limited to those of ENGINEER in ENGINEER's agreement with the OWNER and in the construction Contract Documents, and are further limited and described as follows:

A. General

RPR will be ENGINEER's employee or agent at the Site, will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with ENGINEER and CONTRACTOR. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of CONTRACTOR.

B. Duties and Responsibilities of RPR

1. *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.

2. *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.

3. *Liaison* –
   a. Serve as ENGINEER's liaison with CONTRACTOR; working principally through CONTRACTOR's authorized representative and assist in providing information regarding the 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.

4. *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.

5. *Shop Drawings and Samples* –
   a. Record date of receipt of Samples and approved Shop Drawings.
   b. Receive samples, which are furnished at the Site by CONTRACTOR, and notify ENGINEER of availability of Samples for examination.

6. *Modifications* –
   Consider and evaluate CONTRACTOR'S suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to ENGINEER. Transmit to CONTRACTOR in writing decisions as issued by ENGINEER.

7. *Review of Work, 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 CONRACTOR's work in progress 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.

8. *Inspections, Tests, and System Startups*-
   a. Verify that tests, equipment and systems startups 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 startups.

9. *Records* –
   a. 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.
   b. Maintain records for use in preparing Project documentation.

10. *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 Drawings 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, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.

11. *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.

12. *Certificates, Maintenance and Operation Manuals* –
    During the course of the Work, verify that certificates, maintenance and operation manuals and other data required by the Specifications to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with Contract Documents, and have these documents delivered to ENGINEER for review and forwarding to OWNER prior to payment for that part of the Work.

13. *Completion* –
    a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.
    b. Participate in a final inspection in the company of ENGINEER, OWNER, and CONTRACTOR and prepare a final list of items to be completed and deficiencies to be remedied.

c. Observe whether all items on 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. Limitations of Authority

Resident Project Representative 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, Suppliers, or CONTRACTOR's superintendent.
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 unless such advice or directions are specifically required by the Contract Documents.
5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activites 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.

"General Decision Number: OH20200001 11/06/2020

Superseded General Decision Number: OH20190001

State: Ohio

Construction Types: Heavy and Highway

Counties: Ohio Statewide.

Heavy and Highway Construction Projects

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate,if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2020
1	01/24/2020
2	02/07/2020
3	03/13/2020
4	03/20/2020
5	04/10/2020
6	05/01/2020
7	06/12/2020
8	06/19/2020
9	07/10/2020
10	07/17/2020
11	07/31/2020
12	09/25/2020
13	11/06/2020

BROH0001-001 06/01/2019

DEFIANCE, FULTON (Excluding Fulton, Amboy & Swan Creek

Townships), HENRY (Excluding Monroe, Bartlow, Liberty, Washington, Richfield, Marion, Damascus & Townships & that part of Harrison Township outside corporate limits of city of Napoleon), PAULDING, PUTNAM and WILLIAMS COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0001-004 06/01/2019

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 29.34	16.11

BROH0003-002 06/01/2019

FULTON (Townships of Amboy, Swan Creek & Fulton), HENRY (Townships of Washington, Damascus, Richfield, Bartlow, Liberty, Harrison, Monroe, & Marion), LUCAS and WOOD (Townships of Perrysburg, Ross, Lake, Troy, Freedom, Montgomery, Webster, Center, Portage, Middleton, Plain, Liberty, Henry, Washington, Weston, Milton, Jackson & Grand Rapids) COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0005-003 05/01/2019

CUYAHOGA, LORAIN & MEDINA (Hinckley, Granger, Brunswick, Liverpool, Montville, York, Homer, Harrisville, Chatham, Litchfield & Spencer Townships and the city of Medina)

	Rates	Fringes
BRICKLAYER		
BRICKLAYERS; CAULKERS; CLEANERS; POINTERS; & STONEMASONS	$ 34.85	16.94
SANDBLASTERS	$ 35.10	16.94
SEWER BRICKLAYERS & STACK BUILDERS	$ 35.35	16.94
SWING SCAFFOLDS	$ 35.35	16.94

BROH0006-005 06/01/2019

CARROLL, COLUMBIANA (Knox, Butler, West & Hanover Townships), STARK & TUSCARAWAS

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0007-002 06/01/2019

LAWRENCE

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0007-005 06/01/2019

PORTAGE & SUMMIT

	Rates	Fringes
BRICKLAYER	$ 29.34	16.11

BROH0007-010 06/01/2019

PORTAGE & SUMMIT

	Rates	Fringes
MASON - STONE	$ 29.34	16.11

BROH0008-001 06/01/2019

COLUMBIANA (Salem, Perry, Fairfield, Center, Elk Run, Middleton, & Unity Townships and the city of New Waterford), MAHONING & TRUMBULL

	Rates	Fringes
BRICKLAYER	$ 29.34	16.11

BROH0009-002 06/01/2019

BELMONT & MONROE COUNTIES and the Townships of Warren & Mt. Pleasant and the Village of Dillonvale in JEFFERSON COUNTY

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11
Refractory	$ 31.45	19.01

BROH0010-002 06/01/2019

COLUMBIANA (St. Clair, Madison, Wayne, Franklin, Washington, Yellow Creek & Liverpool Townships) & JEFFERSON (Brush Creek & Saline Townships)

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0014-002 06/01/2019

HARRISON & JEFFERSON (Except Mt. Pleasant, Warren, Brush Creek, Saline & Salineville Townships & the Village of Dillonvale)

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0016-002 06/01/2019

ASHTABULA, GEAUGA, and LAKE COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0018-002 06/01/2019

BROWN, BUTLER, CLERMONT, HAMILTON, PREBLE (Gasper, Dixon, Israel, Lanier, Somers & Gratis Townships) & WARREN COUNTIES:

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0022-004 06/01/2019

CHAMPAIGN, CLARK, CLINTON, DARKE, GREENE, HIGHLAND, LOGAN, MIAMI, MONTGOMERY, PREBLE (Jackson, Monroe, Harrison, Twin, Jefferson & Washington Townships) and SHELBY COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0032-001 06/01/2019

GALLIA & MEIGS

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0035-002 06/01/2019

ALLEN, AUGLAIZE, MERCER and VAN WERT COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0039-002 06/01/2019

ADAMS & SCIOTO

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0040-003 06/01/2019

ASHLAND, CRAWFORD, HARDIN, HOLMES, MARION, MORROW, RICHLAND, WAYNE and WYANDOT (Except Crawford, Ridge, Richland & Tymochtee Townships) COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

FOOTNOTE: Layout Man and Sawman rate: $1.00 per hour above journeyman rate.
Free standing stack work ground level to top of stack; Sandblasting and laying of carbon masonry material in swing stage and/or scaffold; Ramming and spading of plastics and gunniting: $1.50 per hour above journeyman rate.
""Hot"" work: $2.50 above journeyman rate.

BROH0044-002 06/01/2019

	Rates	Fringes
Bricklayer, Stonemason COSHOCTON, FAIRFIELD, GUERNSEY, HOCKING, KNOX, KICKING, MORGAN, MUSKINGUM, NOBLE (Beaver, Buffalo, Seneca & Wayne Townships) & PERRY COUNTIES:	$ 29.34	16.11

BROH0045-002 06/01/2017

FAYETTE, JACKSON, PIKE, ROSS and VINTON COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 28.65	14.55

BROH0046-002 06/01/2019

ERIE, HANCOCK, HURON, OTTAWA, SANDUSKY, SENECA, WOOD (Perry & Bloom Townships) and WYANDOT (Tymochtee, Crawford, Ridge & Richland Townships) COUNTIES & the Islands of Lake Erie north of Sandusky

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

FOOTNOTE: Layout Man and Sawman rate: $1.00 per hour above

journeyman rate.
Free standing stack work ground level to top of stack;
Sandblasting and laying of carbon masonry material in swing
stage and/or scaffold; Ramming and spading of plastics and
gunniting: $1.50 per hour above journeyman rate.
""Hot"" work: $2.50 above journeyman rate.

BROH0052-001 06/01/2019

ATHENS COUNTY

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0052-003 06/01/2019

NOBLE (Brookfield, Noble, Center, Sharon, Olive, Enoch, Stock, Jackson, Jefferson & Elk Townships) and WASHINGTON COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 29.34	16.11

BROH0055-003 06/01/2017

DELAWARE, FRANKLIN, MADISON, PICKAWAY and UNION COUNTIES

	Rates	Fringes
Bricklayer, Stonemason	$ 28.65	14.55

CARP0003-004 05/01/2017

MAHONING & TRUMBULL

	Rates	Fringes
CARPENTER	$ 26.20	17.42

CARP0069-003 05/01/2017

CARROLL, STARK, TUSCARAWAS & WAYNE

	Rates	Fringes
CARPENTER	$ 25.98	15.98

CARP0069-006 05/01/2017

COSHOCTON, HOLMES, KNOX & MORROW

	Rates	Fringes
CARPENTER	$ 24.04	15.29

CARP0171-002 05/01/2019

BELMONT, COLUMBIANA, HARRISON, JEFFERSON & MONROE

	Rates	Fringes
CARPENTER	$ 27.37	20.02

CARP0200-002 05/01/2017

ADAMS, ATHENS, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GALLIA, GUERNSEY, HIGHLAND, HOCKING, JACKSON, LAWRENCE, LICKING, MADISON, MARION, MEIGS, MORGAN, MUSKINGUM, NOBLE, PERRY, PICKAWAY, PIKE, ROSS, SCIOTO, UNION, VINTON and WASHINGTON COUNTIES

	Rates	Fringes
CARPENTER	$ 29.07	16.22
Diver	$ 39.41	10.40
PILEDRIVERMAN	$ 29.07	16.22

CARP0248-005 07/01/2008

LUCAS & WOOD

	Rates	Fringes
CARPENTER	$ 27.27	14.58

CARP0248-008 07/01/2008

	Rates	Fringes
CARPENTER DEFIANCE, FULTON, HANCOCK, HENRY, PAULDING & WILLIAMS COUNTIES	$ 23.71	13.28

CARP0254-002 05/01/2017

ASHTABULA, CUYAHOGA, GEAUGA & LAKE

	Rates	Fringes
CARPENTER	$ 32.40	16.97

CARP0372-002 05/01/2016

ALLEN, AUGLAIZE, HARDIN, MERCER, PUTNAM & VAN WERT

	Rates	Fringes
CARPENTER	$ 24.54	18.21

CARP0639-003 05/01/2017

MEDINA, PORTAGE & SUMMIT

	Rates	Fringes
CARPENTER	$ 30.42	16.99

CARP0735-002 05/01/2019

ASHLAND, ERIE, HURON, LORAIN & RICHLAND

	Rates	Fringes
CARPENTER	$ 26.30	17.91

CARP1311-001 05/01/2017

BROWN, BUTLER, CHAMPAIGN, CLARK, CLERMONT, CLINTON, DARKE, GREENE, HAMILTON, LOGAN, MIAMI, MONTGOMERY, PREBLE, SHELBY & WARREN

	Rates	Fringes
Carpenter & Piledrivermen	$ 29.34	15.95
Diver	$ 40.58	9.69

CARP1393-002 07/01/2008

CRAWFORD, DEFIANCE, FULTON, HANCOCK, HENRY, LUCAS, OTTAWA, PAULDING, SANDUSKY, SENECA, WILLIAMS & WOOD

	Rates	Fringes
Piledrivermen & Diver's Tender	$ 27.30	16.05

DIVERS - $250.00 per day

CARP1393-003 07/01/2008

ALLEN, AUGLAIZE, HARDIN, MERCER, PUTNAM, VAN WERT & WYANDOT

	Rates	Fringes
Piledrivermen & Diver's Tender	$ 25.15	15.92

DIVERS - $250.00 per day

CARP1871-006 05/01/2017

BELMONT, HARRISON, & MONROE

	Rates	Fringes
Diver, Wet	$ 48.11	17.33
Piledrivermen; Diver, Dry	$ 32.07	17.33

CARP1871-008 05/01/2017

ASHLAND, ASHTABULA, CUYAHOGA, ERIE, GEAUGA, HURON, LAKE,
LORAIN, MEDINA, PORTAGE, RICHLAND & SUMMIT

	Rates	Fringes
Diver, Wet	$ 45.80	18.84
Piledrivermen; Diver, Dry	$ 30.53	18.84

CARP1871-014 05/01/2017

CARROLL, STARK, TUSCARAWAS & WAYNE

	Rates	Fringes
Diver, Wet	$ 38.34	16.95
Piledrivermen; Diver, Dry	$ 25.56	16.95

CARP1871-015 05/01/2017

COSHOCTON, HOLMES, KNOX & MORROW

	Rates	Fringes
Diver, Wet	$ 37.34	16.07
Piledrivermen; Diver, Dry	$ 24.89	16.07

CARP1871-017 05/01/2017

MAHONING & TRUMBULL

	Rates	Fringes
Diver, Wet	$ 40.65	17.62
Piledrivermen; Diver, Dry	$ 27.10	17.62

CARP2235-012 01/01/2014

COLUMBIANA & JEFFERSON

	Rates	Fringes
PILEDRIVERMAN	$ 31.74	16.41

CARP2239-001 07/01/2008

CRAWFORD, OTTAWA, SANDUSKY, SENECA & WYANDOT

	Rates	Fringes
CARPENTER	$ 23.71	13.28

ELEC0008-002 05/25/2020

DEFIANCE, FULTON, HANCOCK, HENRY, LUCAS, OTTAWA, PAULDING,
PUTNAM, SANDUSKY, SENECA, WILLIAMS & WOOD

	Rates	Fringes
CABLE SPLICER	$ 38.98	18.96
ELECTRICIAN	$ 41.81	4.5%+20.73

ELEC0032-003 12/02/2019

ALLEN, AUGLAIZE, HARDIN, LOGAN, MERCER, SHELBY, VAN WERT & WYANDOT (Crawford, Jackson, Marseilles, Mifflin, Ridgeland, Ridge & Salem Townships)

	Rates	Fringes
ELECTRICIAN	$ 31.37	19.24

ELEC0038-002 04/27/2020

CUYAHOGA, GEAUGA (Bainbridge, Chester & Russell Townships) & LORAIN (Columbia Township)

	Rates	Fringes
ELECTRICIAN		
Excluding Sound & Communications Work	$ 39.88	21.22

FOOTNOTES;
- a. 6 Paid Holidays: New Year's Day; Memorial Day; July 4th; Labor Day; Thanksgiving Day; & Christmas Day
- b. 1 week's paid vacation for 1 year's service; 2 weeks' paid vacation for 2 or more years' service

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ELEC0038-008 04/29/2019

CUYAHOGA, GEAUGA (Bainbridge, Chester & Russell Townships) & LORAIN (Columbia Township)

	Rates	Fringes
Sound & Communication Technician		
Communications Technician	$ 27.55	11.98
Installer Technician	$ 26.30	11.94

FOOTNOTES;
- a. 6 Paid Holidays: New Year's Day; Memorial Day; July 4th; Labor Day; Thanksgiving Day; & Christmas Day
- b. 1 week's paid vacation for 1 year's service; 2 weeks' paid vacation for 2 or more years' service

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ELEC0064-003 11/25/2019

COLUMBIANA (Butler, Fairfield, Perry, Salem & Unity Townships) MAHONING (Austintown, Beaver, Berlin, Boardman, Canfield, Ellsworth, Coitsville, Goshen, Green, Jackson, Poland, Springfield & Youngstown Townships), & TRUMBULL (Hubbard & Liberty Townships)

	Rates	Fringes
ELECTRICIAN	$ 34.67	15.83

ELEC0071-001 01/01/2019

ASHLAND, CHAMPAIGN, CLARK, COSHOCTON, CRAWFORD, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GUERNSEY, HIGHLAND, HOCKING, JACKSON (Coal, Jackson, Liberty, Milton, Washington & Wellston Townships), KNOX, LICKING, MADISON, MARION, MONROE, MORGAN, MORROW, MUSKINGUM, NOBLE, PERRY, PICKAWAY, PIKE (Beaver, Benton, Jackson, Mifflin, Pebble, Peepee, Perry & Seal Townships), RICHLAND, ROSS, TUSCARAWAS (Auburn, Bucks, Clay, Jefferson, Oxford, Perry, Salem, Rush, Washington & York Townships), UNION, VINTON (Clinton, Eagle, Elk, Harrison, Jackson, Richland & Swan Townships), and WASHINGTON COUNTIES

	Rates	Fringes
Line Construction		
Equipment Operators	$ 33.62	13.40
Groundmen	$ 24.17	11.32
Linemen & Cable Splicers	$ 38.27	14.42

ELEC0071-004 01/01/2019

AUGLAIZE, CLINTON, DARKE, GREENE, LOGAN, MERCER, MIAMI, MONTGOMERY, PREBLE, and SHELBY COUNTIES

	Rates	Fringes
Line Construction		
Equipment Operator	$ 33.62	13.40
Groundman	$ 24.17	11.32
Lineman & Cable Splicers	$ 38.27	14.42

ELEC0071-005 12/31/2018

ASHTABULA, CUYAHOGA, GEAUGA, LAKE & LORAIN

	Rates	Fringes
LINE CONSTRUCTION: Equipment Operator		
DOT/Traffic Signal & Highway Lighting Projects	$ 32.44	14.10
Municipal Power/Transit Projects	$ 40.10	16.42
LINE CONSTRUCTION: Groundman		

DOT/Traffic Signal & Highway Lighting Projects	$ 25.06	12.26
Municipal Power/Transit Projects	$ 31.19	14.11
LINE CONSTRUCTION:		
Linemen/Cable Splicer		
DOT/Traffic Signal & Highway Lighting Projects	$ 36.13	15.03
Municipal Power/Transit Projects	$ 44.56	17.58

ELEC0071-008 01/01/2019

COLUMBIANA, MAHONING, and TRUMBULL COUNTIES

	Rates	Fringes
Line Construction		
Equipment Operator	$ 33.62	13.40
Groundman	$ 24.17	11.32
Lineman & Cable Splicers	$ 38.27	14.42

ELEC0071-010 01/01/2019

BELMONT, CARROLL, HARRISON, HOLMES, JEFFERSON, MEDINA, PORTAGE, STARK, SUMMIT, and WAYNE COUNTIES

	Rates	Fringes
Line Construction		
Equipment Operator	$ 33.62	13.40
Groundman	$ 24.17	11.32
Lineman & Cable Splicers	$ 38.27	14.42

ELEC0071-013 01/01/2019

BROWN, BUTLER, CLERMONT, HAMILTON, and WARREN COUNTIES

	Rates	Fringes
Line Construction		
Equipment Operator	$ 33.62	13.40
Groundman	$ 24.17	11.32
Lineman & Cable Splicers	$ 38.27	14.42

ELEC0071-014 01/01/2019

ADAMS, ATHENS, GALLIA, JACKSON (Bloomfield, Franklin, Hamilton, Lick, Jefferson, Scioto & Madison Townships), LAWRENCE, MEIGS, PIKE (Camp Creek, Marion, Newton, Scioto, Sunfish & Union Townships), SCIOTO & VINTON (Brown, Knox, Madison, Vinton & Wilkesville Townships)

	Rates	Fringes
Line Construction		

Equipment Operator	$ 33.62	13.40
Groundman	$ 24.17	11.32
Lineman & Cable Splicers	$ 38.27	14.42

ELEC0082-002 12/02/2019

CLINTON, DARKE, GREENE, MIAMI, MONTGOMERY, PREBLE & WARREN
(Wayne, Clear Creek & Franklin Townships)

	Rates	Fringes
ELECTRICIAN	$ 31.15	19.96

ELEC0082-006 11/26/2018

CLINTON, DARKE, GREENE, MIAMI, MONTGOMERY, PREBLE & WARREN
(Wayne, Clear Creek & Franklin Townships)

	Rates	Fringes
Sound & Communication Technician		
Cable Puller	$ 12.18	3.85
Installer/Technician	$ 24.35	11.29

ELEC0129-003 02/24/2020

LORAIN (Except Columbia Township) & MEDINA (Litchfield &
Liverpool Townships)

	Rates	Fringes
ELECTRICIAN	$ 35.35	17.68

ELEC0129-004 02/24/2020

ERIE & HURON (Lyme, Ridgefield, Norwalk, Townsend, Wakeman,
Sherman, Peru, Bronson, Hartland, Clarksfield, Norwich,
Greenfield, Fairfield, Fitchville & New London Townships)

	Rates	Fringes
ELECTRICIAN	$ 35.35	17.68

ELEC0141-003 09/01/2019

BELMONT COUNTY

	Rates	Fringes
CABLE SPLICER	$ 30.63	25.87
ELECTRICIAN	$ 30.38	25.87

ELEC0212-003 11/26/2018

BROWN, CLERMONT & HAMILTON

	Rates	Fringes
Sound & Communication Technician	$ 24.35	10.99

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* ELEC0212-005 06/03/2020

BROWN, CLERMONT, and HAMILTON COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 31.30	19.07

ELEC0245-001 01/01/2020

ALLEN, HARDIN, VAN WERT & WYANDOT (Crawford, Jackson, Marseilles, Mifflin, Richland, Ridge & Salem Townships)

	Rates	Fringes
Line Construction		
Equipment Operator	$ 32.37	25.9%+6.75
Groundman Truck Driver	$ 17.70	25.9%+6.75
Lineman	$ 40.46	25.9%+6.75

FOOTNOTE: a. Half day's Paid Holiday: The last 4 hours of the workday prior to Christmas or New Year's Day

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ELEC0245-003 01/01/2020

DEFIANCE, FULTON, HANCOCK, HENRY, HURON, LUCAS, OTTAWA, PAULDING, PUTNAM, SANDUSKY, SENECA, WILLIAMS, and WOOD COUNTIES

	Rates	Fringes
Line Construction		
Cable Splicer	$ 46.53	25.9%+6.75
Groundman/Truck Driver	$ 17.70	25.9%+6.75
Heli-arc Welding	$ 40.76	25.9%+6.75
Lineman	$ 40.46	25.9%+6.75
Operator - Class 1	$ 32.37	25.9%+6.75
Operator - Class 2	$ 28.32	25.9%+6.75
Traffic Signal & Lighting Technician	$ 36.41	25.9%+6.75

FOOTNOTE: a. 6 Observed Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; & Christmas Day. Employees who work on a holiday shall be paid at a rate of double their applicable classified straight-time rates for the work performed on such holiday.

ELEC0245-004 01/01/2020

ERIE COUNTY

	Rates	Fringes
Line Construction		
Cable Splicer	$ 46.53	25.9%+6.75
Groundman/Truck Driver	$ 17.70	25.9%+6.75
Lineman	$ 40.46	25.9%+6.75
Operator - Class 1	$ 32.37	25.9%+6.75
Operator - Class 2	$ 28.32	25.9%+6.75

FOOTNOTE: a. 6 Observed Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; & Christmas Day. Employees who work on a holiday shall be paid at a rate of double their applicable classified straight-time rates for the work performed on such holiday.

ELEC0246-001 10/29/2018

	Rates	Fringes
ELECTRICIAN	$ 38.00	84%+a

FOOTNOTE: a. 1 1/2 Paid Holidays: The last scheduled workday prior to Christmas & 4 hours on Good Friday.

ELEC0306-005 05/28/2018

MEDINA (Brunswick, Chatham, Granger, Guilford, Harrisville, Hinckley, Homer, Lafayette, Medina, Montville, Sharon, Spencer, Wadsworth, Westfield & York Townships), PORTAGE (Atwater, Aurora, Brimfield, Deerfield, Franklin, Mantua, Randolph, Ravenna, Rootstown, Shalersville, Streetsboro & Suffield Townships), SUMMIT & WAYNE (Baughman, Canaan, Chester, Chippewa, Congress, Green, Milton, & Wayne Townships)

	Rates	Fringes
CABLE SPLICER	$ 36.87	16.56
ELECTRICIAN	$ 34.54	5%+18.06

ELEC0317-002 06/01/2020

GALLIA & LAWRENCE

	Rates	Fringes
CABLE SPLICER	$ 32.68	18.13
ELECTRICIAN	$ 35.10	26.22

ELEC0540-005 01/01/2020

CARROLL (Northern half, including Fox, Harrison, Rose &

Washington Townhships), COLUMBIANA (Knox Township), HOLMES, MAHONING (Smith Township), STARK, TUSCARAWAS (North of Auburn, Clay, Rush & York Townships), and WAYNE (South of Baughman, Chester, Green & Wayne Townships) COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 33.71	24.22

ELEC0573-003 06/01/2020

ASHTABULA (Colebrook, Wayne, Williamsfield, Orwell & Windsor Townships), GEAUGA (Auburn, Middlefield, Parkman & Troy Townships), MAHONING (Milton Township), PORTAGE (Charlestown, Edinburg, Freedom, Hiram, Nelson, Palmyra, Paris & Windham Townships), and TRUMBULL (Except Liberty & Hubbard Townships)

	Rates	Fringes
ELECTRICIAN	$ 34.11	19.46

ELEC0575-001 06/01/2020

ADAMS, FAYETTE, HIGHLAND, HOCKING, JACKSON (Bloomfield, Franklin, Hamilton, Jefferson, Lick, Madison, Scioto, Coal, Jackson, Liberty, Milton & Washington Townships), PICKAWAY (Deer Creek, Perry, Pickaway, Salt Creek & Wayne Townships), PIKE (Beaver, Benton, Jackson, Mifflin, Pebble, PeePee, Perry, Seal, Camp Creek, Newton, Scioto, Sunfish, Union & Marion Townships), ROSS, SCIOTO & VINTON (Clinton, Eagle, Elk, Harrison, Jackson, Richland & Swan Townships)

	Rates	Fringes
ELECTRICIAN	$ 33.75	18.47

ELEC0648-001 09/02/2019

BUTLER and WARREN COUNTIES (Deerfield, Hamilton, Harlan, Massie, Salem, Turtle Creek, Union & Washington Townships)

	Rates	Fringes
CABLE SPLICER	$ 30.50	18.23
ELECTRICIAN	$ 30.00	19.85

ELEC0673-004 02/01/2020

ASHTABULA (Excluding Orwell, Colebrook, Williamsfield, Wayne & Windsor Townships), GEAUGA (Burton, Chardon, Claridon, Hambden, Huntsburg, Montville, Munson, Newbury & Thompson Townships) and LAKE COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 33.81	21.47
ELECTRICIAN	$ 33.56	21.47

ELEC0683-002 06/01/2020

CHAMPAIGN, CLARK, DELAWARE, FAIRFIELD, FRANKLIN, MADISON, PICKAWAY (Circleville, Darby, Harrison, Jackson, Madison, Monroe, Muhlenberg, Scioto, Walnut & Washington Townships), and UNION COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 35.50	21.06
ELECTRICIAN	$ 34.50	21.06

ELEC0688-003 06/01/2020

ASHLAND, CRAWFORD, HURON (Richmond, New Haven, Ripley & Greenwich Townships), KNOX (Liberty, Clinton, Union, Howard, Monroe, Middleberry, Morris, Wayne, Berlin, Pike, Brown & Jefferson Townships), MARION, MORROW, RICHLAND and WYANDOT (Sycamore, Crane, Eden, Pitt, Antrim & Tymochtee Townships) COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 30.00	19.66

* ELEC0972-002 06/01/2020

ATHENS, MEIGS, MONROE, MORGAN, NOBLE, VINTON (Brown, Knox, Madison, Vinton & Wilkesville Townships), and WASHINGTON COUNITES

	Rates	Fringes
CABLE SPLICER	$ 37.35	27.81
ELECTRICIAN	$ 33.95	27.71

ELEC1105-001 05/28/2018

COSHOCTON, GUERNSEY, KNOX (Jackson, Clay, Morgan, Miller, Milford, Hilliar, Butler, Harrison, Pleasant & College Townships), LICKING, MUSKINGUM, PERRY, and TUSCARAWAS (Auburn, York, Clay, Jefferson, Rush, Oxford, Washington, Salem, Perry & Bucks Townships) COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 30.95	17.96

ENGI0018-003 05/01/2019

ASHTABULA, CUYAHOGA, ERIE, GEAUGA, LAKE, LORAIN, MEDINA, PORTAGE, and SUMMIT COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 38.63	15.20
GROUP 2	$ 38.53	15.20
GROUP 3	$ 37.49	15.20
GROUP 4	$ 36.27	15.20
GROUP 5	$ 30.98	15.20
GROUP 6	$ 38.88	15.20
GROUP 7	$ 39.13	15.20

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Air Compressor on Steel Erection; Barrier Moving Machine; Boiler Operator on Compressor or Generator when mounted on a Rig; Cableway; Combination Concrete Mixer & Tower; Concrete Plant (over 4 yd. Capacity); Concrete Pump; Crane (All Types, Including Boom Truck, Cherry Picker); Crane-Compact, Track or Rubber over 4,000 lbs. capacity; Cranes-Self Erecting, Stationary, Track or Truck (All Configurations); Derrick; Dragline; Dredge (Dipper, Clam or Suction); Elevating Grader or Euclid Loader; Floating Equipment (All Types); Gradall; Helicopter Crew (Operator-Hoist or Winch); Hoe (all types); Hoisting Engine on Shaft or Tunnel Work; Hydraulic Gantry (Lifting System); Industrial-Type Tractor; Jet Engine Dryer (D8 or D9) Diesel Tractor; Locomotive (Standard Gauge); Maintenance Operator Class A; Mixer, Paving (Single or Double Drum); Mucking Machine; Multiple Scraper; Piledriving Machine (All Types); Power Shovel; Prentice Loader; Quad 9 (Double Pusher); Rail Tamper (with auto lifting & aligning device); Refrigerating Machine (Freezer Operation); Rotary Drill, on Caisson work; Rough Terrain Fork Lift with Winch/Hoist; Side-Boom; Slip-Form Paver; Tower Derrick; Tree Shredder; Trench Machine (Over 24"" wide); Truck Mounted Concrete Pump; Tug Boat; Tunnel Machine and/or Mining Machine; Wheel Excavator; and Asphalt Plant Engineer (Cleveland District Only).

GROUP 2 - Asphalt Paver; Automatic Subgrader Machine, Self-Propelled (CMI Type); Bobcat Type and/or Skid Steer Loader with Hoe Attachment Greater than 7,000 lbs.; Boring Machine More than 48""; Bulldozer; Endloader; Horizontal Directional Drill (Over 50,000 ft lbs thrust); Hydro Milling Machine; Kolman-type Loader (production type-Dirt); Lead Greaseman; Lighting & Traffic Signal Installation Equipment (includes all groups or classifications); Material Transfer Equipment (Shuttle Buggy) Asphalt; Pettibone-Rail Equipment; Power Grader; Power Scraper; Push Cat; Rotomill (all), Grinders & Planers of All types; Trench Machine (24"" wide & under); Vermeer type Concrete Saw; and Maintenance Operators (Portage and Summit Counties Only).

GROUP 3 - A-Frame; Air Compressor on Tunnel Work (low pressure); Asphalt Plant Engineer (Portage and Summit Counties Only); Bobcat-type and/or Skid Steer Loader with or without Attachments; Highway Drills (all types); Locomotive (narrow gauge); Material Hoist/Elevator; Mixer, Concrete (more than one bag capacity); Mixer, one bag capacity (Side Loader); Power Boiler (Over 15 lbs. Pressure) Pump Operator installing & operating Well Points; Pump (4"" & over discharge); Roller, Asphalt; Rotovator (lime soil stabilizer); Switch & Tie Tampers (without lifting & aligning device); Utility Operator (Small equipment); Welding Machines; and Railroad Tie Inserter/Remover; Articulating/straight bed end dumps if assigned (minus $4.00 per hour.

GROUP 4 - Backfiller; Ballast Re-locator; Bars, Joint & Mesh Installing Machine; Batch Plant; Boring Machine Operator (48"" or less); Bull Floats; Burlap & Curing Machine; Concrete Plant (capacity 4 yd. & under); Concrete Saw (Multiple); Conveyor (Highway); Crusher; Deckhand; Farm-type Tractor with attachments (highway); Finishing Machine; Fireperson, Floating Equipment (all types); Forklift; Form Trencher; Hydro Hammer expect masonary; Hydro Seeder; Pavement Breaker; Plant Mixer; Post Driver; Post Hole Digger (Power Auger); Power Brush Burner; Power Form Handling Equipment; Road Widening Trencher; Roller (Brick, Grade & Macadam); Self-Propelled Power Spreader; Self-Propelled Power Subgrader; Steam Fireperson; Tractor (Pulling Sheepfoot, Roller or Grader); and Vibratory Compactor with Integral Power.

GROUP 5 - Compressor (Portable, Sewer, Heavy & Highway); Drum Fireperson (Asphalt Plant); Generator; Masonry Fork Lift; Inboard-Outboard Motor Boat Launch; Oil Heater (asphalt plant); Oiler/Helper; Power Driven Heater; Power Sweeper & Scrubber; Pump (under 4"" discharge); Signalperson; Tire Repairperson; VAC/ALLS; Cranes - Compact, track or rubber under 4,000 pound capacity; fueling and greasing; and Chainmen.

GROUP 6 - Master Mechanic & Boom from 150 to 180.

GROUP 7 - Boom from 180 and over.

ENGI0018-004 05/01/2019

ADAMS, ALLEN, ASHLAND, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, HURON, JACKSON, JEFFERSON, KNOX, LAWRENCE, LICKING, LOGAN, LUCAS, MADISON, MARION, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PREBLE, PUTNAM, RICHLAND, ROSS, SANDUSKY, SCIOTO, SENECA, SHELBY, STARK, TUSCARAWAS, UNION, VAN

WERT, VINTON, WARREN, WASHINGTON, WAYNE, WILLIAMS, WOOD, and YANDOT COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 37.14	15.20
GROUP 2	$ 37.02	15.20
GROUP 3	$ 35.98	15.20
GROUP 4	$ 34.80	15.20
GROUP 5	$ 29.34	15.20
GROUP 6	$ 37.39	15.20
GROUP 7	$ 37.64	15.20

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Air Compressor on Steel Erection; Barrier Moving Machine; Boiler Operator on Compressor or Generator when mounted on a Rig; Cableway; Combination Concrete Mixer & Tower; Concrete Plant (over 4 yd. Capacity); Concrete Pump; Crane (All Types, Including Boom Truck, Cherry Picker); Crane-Compact, Track or Rubber over 4,000 lbs. capacity; Cranes-Self Erecting, Stationary, Track or Truck (All Configurations); Derrick; Dragline; Dredge (Dipper, Clam or Suction); Elevating Grader or Euclid Loader; Floating Equipment (All Types); Gradall; Helicopter Crew (Operator-Hoist or Winch); Hoe (all types); Hoisting Engine on Shaft or Tunnel Work; Hydraulic Gantry (Lifting System); Industrial-Type Tractor; Jet Engine Dryer (D8 or D9) Diesel Tractor; Locomotive (Standard Gauge); Maintenance Operator Class A; Mixer, Paving (Single or Double Drum); Mucking Machine; Multiple Scraper; Piledriving Machine (All Types); Power Shovel; Prentice Loader; Quad 9 (Double Pusher); Rail Tamper (with auto lifting & aligning device); Refrigerating Machine (Freezer Operation); Rotary Drill, on Caisson work; Rough Terrain Fork Lift with Winch/Hoist; Side-Boom; Slip-Form Paver; Tower Derrick; Tree Shredder; Trench Machine (Over 24"" wide); Truck Mounted Concrete Pump; Tug Boat; Tunnel Machine and/or Mining Machine; and Wheel Excavator.

GROUP 2 - Asphalt Paver; Automatic Subgrader Machine, Self-Propelled (CMI Type); Bobcat Type and/or Skid Steer Loader with Hoe Attachment Greater than 7,000 lbs.; Boring Machine More than 48""; Bulldozer; Endloader; Hydro Milling Machine; Horizontal Directional Drill (over 50,000 ft. lbs. thrust);Kolman-type Loader (production type-Dirt); Lead Greaseman; Lighting & Traffic Signal Installation Equipment (includes all groups or classifications); Material Transfer Equipment (Shuttle Buggy) Asphalt; Pettibone-Rail Equipment; Power Grader; Power Scraper; Push Cat; Rotomill (all), Grinders & Planers of All types; Trench Machine (24"" wide & under); and Vermeer type Concrete Saw.

GROUP 3 - A-Frame; Air Compressor on Tunnel Work (low pressure); Asphalt Plant Engineer; Bobcat-type and/or Skid Steer Loader with or without Attachments; Highway Drills

(all types); Locomotive (narrow gauge); Material Hoist/Elevator; Mixer, Concrete (more than one bag capacity); Mixer, one bag capacity (Side Loader); Power Boiler (Over 15 lbs. Pressure) Pump Operator installing & operating Well Points; Pump (4"" & over discharge); Railroad Tie Inserter/Remover; Roller, Asphalt; Rotovator (lime soil stabilizer); Switch & Tie Tampers (without lifting & aligning device); Utility Operator (Small equipment); and Welding Machines; Artiaculating/straight bed end dumps if assigned (minus $4.00 per hour.

GROUP 4 - Backfiller; Ballast Re-locator; Bars, Joint & Mesh Installing Machine; Batch Plant; Boring Machine Operator (48"" or less); Bull Floats; Burlap & Curing Machine; Concrete Plant (capacity 4 yd. & under); Concrete Saw (Multiple); Conveyor (Highway); Crusher; Deckhand; Farm-type Tractor with attachments (highway); Finishing Machine; Fireperson, Floating Equipment (all types); Fork Lift; Form Trencher; Hydro Hammer expect masonary; Hydro Seeder; Pavement Breaker; Plant Mixer; Post Driver; Post Hole Digger (Power Auger); Power Brush Burner; Power Form Handling Equipment; Road Widening Trencher; Roller (Brick, Grade & Macadam); Self-Propelled Power Spreader; Self-Propelled Power Subgrader; Steam Fireperson; Tractor (Pulling Sheepfoot, Roller or Grader); and Vibratory Compactor with Integral Power.

GROUP 5 - Compressor (Portable, Sewer, Heavy & Highway); Drum Fireperson (Asphalt Plant); Generator; Masonary Forklift; Inboard-Outboard Motor Boat Launch; Oil Heater (asphalt plant); Oiler/Helper; Power Driven Heater; Power Sweeper & Scrubber; Pump (under 4"" discharge); Signalperson; Tire Repairperson; VAC/ALLS; Cranes - Compact, track or rubber under 4,000 pound capacity; fueling and greasing; and Chainmen.

GROUP 6 - Master Mechanic & Boom from 150 to 180.

GROUP 7 - Boom from 180 and over.

ENGI0066-023 06/01/2017

COLUMBIANA, MAHONING & TRUMBULL COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR ASBESTOS; HAZARDOUS/TOXIC WASTE PROJECTS		
GROUP 1 - A & B	$ 39.23	19.66
ASBESTOS; HAZARDOUS/TOXIC WASTE PROJECTS		
GROUP 2 - A & B	$ 38.90	19.66
ASBESTOS; HAZARDOUS/TOXIC WASTE PROJECTS		

GROUP 3 - A & B.....$ 34.64 ASBESTOS; HAZARDOUS/TOXIC WASTE PROJECTS		19.66
GROUP 4 - A & B.....$ 30.70 ASBESTOS; HAZARDOUS/TOXIC WASTE PROJECTS		19.66
GROUP 5 - A & B.....$ 27.30 HAZARDOUS/TOXIC WASTE PROJECTS		19.66
GROUP 1 - C & D.....$ 35.96 HAZARDOUS/TOXIC WASTE PROJECTS		19.66
GROUP 2 - C & D.....$ 35.66 HAZARDOUS/TOXIC WASTE PROJECTS		19.66
GROUP 3 - C & D.....$ 31.76 HAZARDOUS/TOXIC WASTE PROJECTS		19.66
GROUP 4 - C & D.....$ 28.14 HAZARDOUS/TOXIC WASTE PROJECTS		19.66
GROUP 5 - C & D.....$ 25.03 ALL OTHER WORK		19.66
GROUP 1.....$ 32.69 ALL OTHER WORK		19.66
GROUP 2.....$ 32.42 ALL OTHER WORK		19.66
GROUP 3.....$ 28.87 ALL OTHER WORK		19.66
GROUP 4.....$ 25.58 ALL OTHER WORK		19.66
GROUP 5.....$ 22.75		19.66

GROUP 1 - Rig, Pile Driver or Caisson Type; & Rig, Pile Hydraulic Unit Attached

GROUP 2 - Asphalt Heater Planer; Backfiller with Drag Attachment; Backhoe; Backhoe with Shear attached; Backhoe-Rear Pivotal Swing; Batch Plant-Central Mix Concrete; Batch Plant, Portable concrete; Berm Builder-Automatic; Boat Derrick; Boat-Tug; Boring Machine Attached to Tractor; Bullclam; Bulldozer; C.M.I. Road Builder & Similar Type; Cable Placer & Layer; Carrier-Straddle; Carryall-Scraper or Scoop; Chicago Boom; Compactor with Blade Attached; Concrete Saw (Vermeer or

similar type); Concrete Spreader Finisher; Combination, Bidwell Machine; Crane; Crane-Electric Overhead; Crane-Rough Terrain; Crane-Side Boom; Crane-Truck; Crane-Tower; Derrick-Boom; Derrick-Car; Digger-Wheel (Not trencher or road widener); Double Nine; Drag Line; Dredge; Drill-Kenny or Similar Type; Easy Pour Median Barrier Machine (or similar type); Electromatic; Frankie Pile; Gradall; Grader; Gurry; Self-Propelled; Heavy Equipment Robotics Operator/Mechanic; Hoist-Monorail; Hoist-Stationary & Mobile Tractor; Hoist, 2 or 3 drum; Horizontal Directional Drill Operator; Jackall; Jumbo Machine; Kocal & Kuhlman; Land-Seagoing Vehicle; Loader, Elevating; Loader, Front End; Loader, Skid Steer; Locomotive; Mechanic/Welder; Metro Chip Harvester with Boom; Mucking Machine; Paver-Asphalt Finishing Machine; Paver-Road Concrete; Paver-Slip Form (C.M.I. or similar); Place Crete Machine with Boom; Post Driver (Carrier mounted); Power Driven Hydraulic Pump & Jack (When used in Slip Form or Lift Slab Construction); Pump Crete Machine; Regulator-Ballast; Hydraulic Power Unit not attached to Rig for Pile Drillings; Rigs-Drilling; Roto Mill or similar Full Lane (8' Wide & Over); Roto Mill or similar type (Under 8'); Shovel; Slip Form Curb Machine; Speedwing; Spikemaster; Stonecrusher; Tie Puller & Loader; Tie Tamper; Tractor-Double Boom; Tractor with Attachments; Truck-Boom; Truck-Tire; Trench Machine; Tunnel Machine (Mark 21 Java or similar); & Whirley (or similar type)

GROUP 3 - Asphalt Plant; Bending Machine (Pipeline or similar type); Boring machine, Motor Driven; Chip Harvester without Boom; Cleaning Machine, Pipeline Type; Coating Machine, Pipeline Type; Compactor; Concrete Belt Placer; Concrete Finisher; Concrete Planer or Asphalt; Concrete Spreader; Elevator; Fork Lift (Home building only); Fork lift & Lulls; Fork Lift Walk Behind (Hoisting over 1 buck high); Form Line Machine; Grease Truck operator; Grout Pump; Gunnite Machine; Horizontal Directional Drill Locator; Single Drum Hoist with or without Tower; Huck Bolting Machine; Hydraulic Scaffold (Hoisting building materials); Paving Breaker (Self-propelled or Ridden); Pipe Dream; Pot Fireperson (Power Agitated); Refrigeration Plant; Road Widener; Roller; Sasgen Derrick; Seeding Machine; Soil Stabilizer (Pump type); Spray Cure Machine, Self-Propelled; Straw Blower Machine; Sub-Grader; Tube Finisher or Broom C.M.I. or similar type; & Tugger Hoist

GROUP 4 - Air Curtain Destructor & Similar Type; Batch Plant-Job Related; Boiler Operator; Compressor; Conveyor; Curb Builder, self-propelled; Drill Wagon; Generator Set; Generator-Steam; Heater-Portable Power; Hydraulic Manipulator Crane; Jack-Hydraulic Power driven; Jack-Hydraulic (Railroad); Ladavator; Minor Machine Operator; Mixer-Concrete; Mulching Machine; Pin Puller; Power Broom; Pulverizer; Pump; Road Finishing Machine (Pull Type); Saw-Concrete-Self-Propelled (Highway Work); Signal Person; Spray Cure Machine-Motor Powered; Stump Cutter; Tractor; Trencher Form; Water Blaster; Steam Jenny; Syphon; Vibrator-Gasoline; & Welding Machine

GROUP 5 - Brakeperson; Fireperson; & Oiler

IRON0017-002 05/01/2020

ASHTABULA (North of Route 6, starting at the Geauga County Line, proceeding east to State Route 45), CUYAHOGA, ERIE (Eastern 2/3), GEAUGA, HURON (East of a line drawn from the north border through Monroeville & Willard), LAKE, LORAIN, MEDINA (North of Old Rte. #224), PORTAGE (West of a line from Middlefield to Shalersville to Deerfield), and SUMMIT (North of Old Rte. #224, including city limits of Barberton) COUNTIES

	Rates	Fringes
IRONWORKER		
Ornamental, Reinforcing, & Structural	$ 35.93	23.11

IRON0017-010 05/01/2020

ASHTABULA (Eastern part from Lake Erie on the north to route #322 on the south to include Conneaut, Kingsville, Sheffield, Denmark, Dorset, Cherry Valley, Wayne, Monroe, Pierpont, Richmond, Andover & Williamsfield Townships)

	Rates	Fringes
IRONWORKER		
Structural, including metal building erection & Reinforcing	$ 35.93	23.11

IRON0044-001 06/01/2018

ADAMS (Western Part), BROWN, BUTLER (Southern Part), CLERMONT, CLINTON (South of a line drawn from Blanchester to Lynchburg), HAMILTON, HIGHLAND (Excluding eastern one-fifth & portion of county inside lines drawn from Marshall to Lynchburg from the northern county line through E. Monroe to Marshall) and WARREN (South of a line drawn from Blanchester through Morrow to the west county line) COUNTIES

	Rates	Fringes
IRONWORKER, REINFORCING		
Beyond 30-mile radius of Hamilton County Courthouse	$ 28.67	21.20
Up to & including 30-mile radius of Hamilton County Courthouse	$ 27.60	20.70

IRON0044-002 06/01/2020

CLINTON (South of a line drawn from Blanchester to Lynchburg), HAMILTON, HIGHLAND (Excluding eastern one-fifth & portion of county inside lines drawn from Marshall to Lynchburg from the northern county line through E. Monroe to Marshall) & WARREN (South of a line drawn from Blanchester through Morrow to the west county line)

	Rates	Fringes
IRONWORKER		
Fence Erector	$ 28.76	21.40
Ornamental; Structural	$ 30.27	21.40

IRON0055-003 07/01/2019

CRAWFORD (Area Between lines drawn from where Hwy #598 & #30 meet through N. Liberty to the northern border & from said Hwy junction point due west to the border), DEFIANCE (S. of a line drawn from where Rte. #66 meets the northern line through Independence to the eastern county border), ERIE (Western 1/3), FULTON, HANCOCK, HARDIN (North of a line drawn from Maysville to a point 4 miles south of the northern line on the eastern line), HENRY, HURON (West of a line drawn from the northern border through Monroeville & Willard), LUCAS, OTTAWA, PUTNAM (East of a line drawn from the northern border down through Miller City to where #696 meets the southern border), SANDUSKY, SENECA, WILLIAMS (East of a line drawn from Pioneer through Stryker to the southern border), WOOD & WYANDOT (North of Rte. #30)

	Rates	Fringes
IRONWORKER		
Fence Erector	$ 21.30	20.92
Flat Road Mesh	$ 29.77	21.30
Tunnels & Caissons Under Pressure	$ 29.77	21.30
All Other Work	$ 30.38	24.40

IRON0147-002 06/01/2015

ALLEN (Northern half), DEFIANCE (Northern part, excluding south of a line drawn from where Rte. #66 meets the northern line through Independence to the eastern county border), MERCER (Northern half), PAULDING, PUTNAM (Western part, excluding east of a line drawn from the northern border down through Miller City to where #696 meets the southern border), VAN WERT, and WILLIAMS (Western part, excluding east of a line drawn from Pioneer through Stryker to the southern border) COUNTIES

	Rates	Fringes
IRONWORKER	$ 25.39	20.64

IRON0172-002 06/01/2020

CHAMPAIGN (Eastern one-third), CLARK (Eastern one-fourth), COSHOCTON (West of a line beginning at the northwestern county line going through Walhonding & Tunnel Hill to the southern county line), CRAWFORD (South of Rte. #30), DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, HARDIN (Excluding a line drawn from Roundhead to Maysville), HIGHLAND (Eastern one-fifth), HOCKING, JACKSON (Northern half), KNOX, LICKING, LOGAN (Eastern one-third), MADISON, MARION, MORROW, MUSKINGUM (West of a line starting at Adams Mill going to Adamsville & going from Adamsville through Blue Rock to the southern border), PERRY, PICKAWAY, PIKE (Northern half), ROSS, UNION, VINTON and WYANDOT (South of Rte. #30) COUNTIES

	Rates	Fringes
IRONWORKER	$ 30.75	20.80

IRON0207-004 06/01/2020

ASHTABULA (Southern part starting at the Geauga County line), COLUMBIANA (E. of a line from Damascus to Highlandtown), MAHONING (N. of Old Route #224), PORTAGE (E. of a line from Middlefield to Shalersville to Deerfield) & TRUMBULL

	Rates	Fringes
IRONWORKER		
Layout; Sheeter	$ 31.25	25.75
Ornamental; Reinforcing; Structural	$ 28.06	24.70
Ornamental; Reinforcing	$ 30.25	25.75

IRON0290-002 06/01/2020

ALLEN (Southern half), AUGLAIZE, BUTLER (North of a line drawn from east to the west county line going through Oxford, Darrtown & Woodsdale), CHAMPAIGN (Excluding east of a line drawn from Catawla to the point where #68 intersects the northern county line), CLARK (Western two-thirds), CLINTON (Excluding south of a line drawn from Blanchester to Lynchburg), DARKE, GREENE, HIGHLAND (Inside lines drawn from Marshall to Lynchburg & from the northern county line through East Monroe to Marshall), LOGAN (West of a line drawn from West Liberty to where the northern county line meets the western county line of Hardin), MERCER (Southern half), MIAMI, MONTGOMERY, PREBLE, SHELBY & WARREN (Excluding south of a line drawn from Blanchester through Morrow to the western county line) COUNTIES

	Rates	Fringes
IRONWORKER	$ 29.68	22.90

IRON0549-003 12/01/2018

BELMONT, GUERNSEY, HARRISON, JEFFERSON, MONROE & MUSKINGUM
(Excluding portion west of a line starting at Adams Mill going to Adamsville and going from Adamsville through Blue Rock to the south border)

	Rates	Fringes
IRONWORKER	$ 33.34	20.81

IRON0550-004 05/01/2019

ASHLAND, CARROLL, COLUMBIANA (W. of a line from Damascus to Highlandtown), COSHOCTON (E. of a line beginning at NW Co. line going through Walhonding & Tunnel Hill to the South Co. line), HOLMES, HURON (S. of Old Rte. #224), MAHONING (S. of Old Rte. #224), MEDINA (S. of Old Rte. #224), PORTAGE (S. of Old Rte. #224), RICHLAND, STARK, SUMMIT (S. of Old Rte. #224, Excluding city limits of Barberton), TUSCARAWAS, & WAYNE

	Rates	Fringes
Ironworkers:Structural, Ornamental and Reinforcing	$ 28.90	19.87

IRON0769-004 06/01/2020

ADAMS (Eastern Half), GALLIA, JACKSON (Southern Half), LAWRENCE & SCIOTO

	Rates	Fringes
IRONWORKER	$ 32.75	26.34

IRON0787-003 12/01/2019

ATHENS, MEIGS, MORGAN, NOBLE, and WASHINGTON COUNTIES

	Rates	Fringes
IRONWORKER	$ 30.18	22.75

LABO0265-008 05/01/2018

	Rates	Fringes
LABORER		
ASHTABULA, ERIE, HURON, LORAIN, LUCAS, MAHONING, MEDINA, OTTAWA, PORTAGE, SANDUSKY, STARK, SUMMIT, TRUMBULL & WOOD COUNTIES		
GROUP 1	$ 31.05	10.95
GROUP 2	$ 31.22	10.95
GROUP 3	$ 31.55	10.95

GROUP 4	$ 32.00	10.95
CUYAHOGA AND GEAUGA COUNTIES ONLY: SEWAGE PLANTS, WASTE PLANTS, WATER TREATMENT FACILITIES, PUMPING STATIONS, & ETHANOL PLANTS CONSTRUCTION	$ 33.66	10.95
CUYAHOGA, GEAUGA & LAKE COUNTIES		
GROUP 1	$ 32.28	10.95
GROUP 2	$ 32.45	10.95
GROUP 3	$ 32.78	10.95
GROUP 4	$ 33.23	10.95
REMAINING COUNTIES OF OHIO		
GROUP 1	$ 30.62	10.95
GROUP 2	$ 30.79	10.95
GROUP 3	$ 31.12	10.95
GROUP 4	$ 31.57	10.95

LABORER CLASSIFICATIONS

GROUP 1 - Asphalt Laborer; Carpenter Tender; Concrete Curing Applicator; Dump Man (Batch Truck); Guardrail and Fence Installer; Joint Setter; Laborer (Construction); Landscape Laborer; Mesh Handlers & Placer; Right-of-way Laborer; Riprap Laborer & Grouter; Scaffold Erector; Seal Coating; Surface Treatment or Road Mix Laborer; Sign Installer; Slurry Seal; Utility Man; Bridge Man; Handyman; Waterproofing Laborer; Flagperson; Hazardous Waste (level D); Diver Tender; Zone Person & Traffic Control

GROUP 2 - Asphalt Raker; Concrete Puddler; Kettle Man Pipeline); Machine Driven Tools (Gas, Electric, Air); Mason Tender; Brick Paver; Mortar Mixer; Power Buggy or Power Wheelbarrow; Paint Striper; Sheeting & Shoring Man; Surface Grinder Man; Plastic Fusing Machine Operator; Pug Mill Operator; & Vacuum Devices (wet or dry); Rodding Machine Operator; Diver; Screwman or Paver; Screed Person; Water Blast, Hand Held Wand; Pumps 4"" & Under (Gas, Air or Electric) & Hazardous Waste (level C); Air Track and Wagon Drill; Bottom Person; Cofferdam (below 25 ft. deep); Concrete Saw Person; Cutting with Burning Torch; Form Setter; Hand Spiker (Railroad); Pipelayer; Tunnel Laborer (without air) & Caisson; Underground Person (working in Sewer and Waterline, Cleaning, Repairing & Reconditioning); Sandblaster Nozzle Person; & Hazardous Waste (level B)

GROUP 3 - Blaster; Mucker; Powder Person; Top Lander; Wrencher (Mechanical Joints & Utility Pipeline); Yarner; Hazardous Waste (level A); Concrete Specialist; Concrete Crew in Tunnels (With Air-pressurized - $1.00 premium); Curb Setter & Cutter; Grade Checker; Utility Pipeline Tapper; Waterline; and Caulker

GROUP 4 - Miner (With Air-pressurized - $1.00 premium); & Gunite Nozzle Person

TUNNEL LABORER WITH AIR-PRESSURIZED ADD $1.00 TO BASE RATE

SIGNAL PERSON WILL RECEIVE THE RATE EQUAL TO THE RATE PAID THE LABORER CLASSIFICATION FOR WHICH HE OR SHE IS SIGNALING.

PAIN0006-002 05/01/2018

ASHTABULA, CUYAHOGA, GEAUGA, LAKE, LORAIN, PORTAGE (N. of the East-West Turnpike) & SUMMIT (N. of the East-West Turnpike)

	Rates	Fringes
PAINTER		
COMMERCIAL NEW WORK; REMODELING; & RENOVATIONS		
GROUP 1	$ 27.90	16.16
GROUP 2	$ 28.30	16.16
GROUP 3	$ 28.60	16.16
GROUP 4	$ 34.16	16.16
COMMERCIAL REPAINT		
GROUP 1	$ 26.40	16.16
GROUP 2	$ 26.80	16.16
GROUP 3	$ 27.10	16.16

PAINTER CLASSIFICATIONS - COMMERCIAL NEW WORK; REMODELING; & RENOVATIONS

GROUP 1 - Brush; & Roller

GROUP 2 - Sandblasting & Buffing

GROUP 3 - Spray Painting; Closed Steel Above 55 feet; Bridges & Open Structural Steel; Tanks - Water Towers; Bridge Painters; Bridge Riggers; Containment Builders

GROUP 4 - Bridge Blaster

PAINTER CLASSIFICATIONS - COMMERCIAL REPAINT

GROUP 1 - Brush; & Roller

GROUP 2 - Sandblasting & Buffing

GROUP 3 - Spray Painting

PAIN0007-002 07/01/2019

FULTON, HENRY, LUCAS, OTTAWA (Excluding Allen, Bay, Bono, Catawba Island, Clay Center, Curtice, Danbury, Eagle Beach, Elliston, Elmore, Erie, Fishback, Gem Beach & Genova) & WOOD

	Rates	Fringes
PAINTER		

NEW COMMERCIAL WORK

GROUP 1	$ 27.64	17.79
GROUP 2	$ 27.39	17.79
GROUP 3	$ 27.39	17.79
GROUP 4	$ 27.39	17.79
GROUP 5	$ 27.39	17.79
GROUP 6	$ 27.39	17.79
GROUP 7	$ 27.39	17.79
GROUP 8	$ 27.39	17.79
GROUP 9	$ 27.39	17.79

REPAINT IS 90% OF JR

PAINTER CLASSIFICATIONS

GROUP 1 - Brush; Spray & Sandblasting Pot Tender

GROUP 2 - Refineries & Refinery Tanks; Surfaces 30 ft. or over where material is applied to or labor performed on above ground level (exterior), floor level (interior)

GROUP 3 - Swing Stage & Chair

GROUP 4 - Lead Abatement

GROUP 5 - All Methods of Spray

GROUP 6 - Solvent-Based Catalized Epoxy Materials of 2 or More Component Materials, to include Solvent-Based Conversion Varnish (excluding water based)

GROUP 7 - Spray Solvent Based Material; Sand & Abrasive Blasting

GROUP 8 - Towers; Tanks; Bridges; Stacks Over 30 Feet

GROUP 9 - Epoxy Spray (excluding water based)

PAIN0012-008 05/01/2019

BUTLER COUNTY

	Rates	Fringes
PAINTER		
GROUP 1	$ 21.95	10.20
GROUP 2	$ 25.30	10.20
GROUP 3	$ 25.80	10.20
GROUP 4	$ 26.05	10.20
GROUP 5	$ 26.30	10.20

PAINTER CLASSIFICATIONS

GROUP 1: Bridge Equipment Tender; Bridge/Containment Builder

GROUP 2: Brush & Roller

GROUP 3: Spray

GROUP 4: Sandblasting; & Waterblasting

  GROUP 5: Elevated Tanks; Steeplejack Work; Bridge; & Lead
  Abatement

PAIN0012-010 05/01/2019

BROWN, CLERMONT, CLINTON, HAMILTON & WARREN

	Rates	Fringes
PAINTER		
HEAVY & HIGHWAY BRIDGES-		
GUARDRAILS-LIGHTPOLES-		
STRIPING		
Bridge Equipment Tender and Containment Builder	$ 21.95	10.20
Bridges when highest point of clearance is 60 feet or more; & Lead Abatement Projects	$ 26.30	10.20
Brush & Roller	$ 25.30	10.20
Sandblasting & Hopper Tender; Water Blasting	$ 26.05	10.20
Spray	$ 25.80	10.20

PAIN0093-001 12/01/2018

ATHENS, GUERNSEY, HOCKING, MONROE, MORGAN, NOBLE and
WASHINGTON COUNTIES

	Rates	Fringes
PAINTER		
Bridges; Locks; Dams; Tension Towers; & Energized Substations	$ 34.04	18.50
Power Generating Facilities	$ 30.89	18.50

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* PAIN0249-002 06/01/2020

CLARK, DARKE, GREENE, MIAMI, MONTGOMERY & PREBLE

	Rates	Fringes
PAINTER		
GROUP 1 - Brush & Roller	$ 24.17	11.22
GROUP 2 - Swing, Scaffold Bridges; Structural Steel; Open Acid Tank; High Tension Electrical		

Equipment; & Hot Pipes	$ 24.17	11.22
GROUP 3 - Spray; Sandblast; Steamclean; Lead Abatement	$ 24.92	11.22
GROUP 4 - Steeplejack Work	$ 25.12	11.22
GROUP 5 - Coal Tar	$ 25.67	11.22
GROUP 6 - Bridge Equipment Tender & or Containment Builder	$ 32.88	11.22
GROUP 7 - Tanks, Stacks & Towers	$ 27.81	11.22
GROUP 8 - Bridge Blaster, Rigger	$ 35.88	11.22

PAIN0356-002 09/01/2009

KNOX, LICKING, MUSKINGUM, and PERRY

	Rates	Fringes
PAINTER		
Bridge Equipment Tenders and Containment Builders	$ 27.93	7.25
Bridges; Blasters; andRiggers	$ 34.60	7.25
Brush and Roller	$ 20.93	7.25
Sandblasting; Steam Cleaning; Waterblasting; and Hazardous Work	$ 25.82	7.25
Spray	$ 21.40	7.25
Structural Steel and Swing Stage	$ 25.42	7.25
Tanks; Stacks; and Towers	$ 28.63	7.25

PAIN0438-002 12/01/2018

BELMONT, HARRISON and JEFFERSON COUNTIES

	Rates	Fringes
PAINTER		
Bridges, Locks, Dams, Tension Towers & Energized Substations	$ 32.80	17.68
Power Generating Facilities	$ 29.65	17.68

PAIN0476-001 06/01/2019

COLUMBIANA, MAHONING, and TRUMBULL COUNITES

	Rates	Fringes
PAINTER		
GROUP 1	$ 25.82	16.58
GROUP 2	$ 32.45	16.58
GROUP 3	$ 26.03	16.58
GROUP 4	$ 26.47	16.58
GROUP 5	$ 26.47	16.58

GROUP 6.....$ 26.72 16.58
GROUP 7.....$ 27.82 16.58

PAINTER CLASSIFICATIONS:

GROUP 1: Painters, Brush & Roller

GROUP 2: Bridges

GROUP 3: Structural Steel

GROUP 4: Spray, Except Bar Joist/Deck

GROUP 5: Epoxy/Mastic; Spray- Bar Joist/Deck; Working Above 50 Feet; and Swingstages

GROUP 6: Tanks; Sandblasting

GROUP 7: Towers; Stacks

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* PAIN0555-002 09/01/2020

ADAMS, HIGHLAND, JACKSON, PIKE & SCIOTO

	Rates	Fringes
PAINTER		
GROUP 1	$ 31.48	16.46
GROUP 2	$ 32.97	16.46
GROUP 3	$ 34.46	16.46
GROUP 4	$ 37.38	16.46

PAINTER CLASSIFICATIONS

GROUP 1 - Containment Builder

GROUP 2 - Brush; Roller; Power Tools, Under 40 feet

GROUP 3 - Sand Blasting; Spray; Steam Cleaning; Pressure Washing; Epoxy & Two Component Materials; Lead Abatement; Hazardous Waste; Toxic Materials; Bulk & Storage Tanks of 25,000 Gallon Capacity or More; Elevated Tanks

GROUP 4 - Stacks; Bridges

PAIN0639-001 05/01/2011

	Rates	Fringes
Sign Painter & Erector	$ 20.61	3.50+a+b+c

FOOTNOTES: a. 7 Paid Holidays: New Year's Day; Memorial Day; July 4th; Labor Day; Thanksgiving Day; Christmas Day & 1 Floating Day
b. Vacation Pay: After 1 year's service - 5 days' paid vacation; After 2, but less than 10 years' service - 10

days' paid vacation; After 10, but less than 20 years' service - 15 days' paid vacation; After 20 years' service - 20 days' paid vacation
c. Funeral leave up to 3 days maximum paid leave for death of mother, father, brother, sister, spouse, child, mother-in-law, father-in-law, grandparent and inlaw provided employee attends funeral

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PAIN0788-002 06/01/2019

ASHLAND, CRAWFORD, ERIE, HANCOCK, HURON, MARION, MORROW, OTTAWA (Allen, Bay, Bono, Catawba Island, Clay Center, Curtice, Danbury, Eagle Beach, Elliston, Elmore, Erie, Fishback, Gem Beach & Genoa), RICHLAND, SANDUSKY, SENECA & WYANDOT

	Rates	Fringes
PAINTER		
Brush & Roller	$ 24.66	14.05
Structural Steel	$ 26.26	14.05

WINTER REPAINT: Between December 1 to March 31 - 90%JR

$.50 PER HOUR SHALL BE ADDED TO THE RATE OF PAY FOR THE CLASSIFICATION OF WORK:

While working swingstage, boatswain chair, needle beam and horizontal cable. While operating sprayguns, sandblasting, cobblasting and high pressure waterblasting (4000psi).

$1.00 PER HOUR SHALL BE ADDED TO THE RATE OF PAY FOR THE CLASSIFICATION OF WORK:

For the application of catalized epoxy, including latex epoxy that is deemed hazardous, lead abatement, or for work or material where special precautions beyond normal work duties must be taken. For working on stacks, tanks, and towers over 40 feet in height.

PAIN0813-005 12/01/2008

GALLIA, LAWRENCE, MEIGS & VINTON

	Rates	Fringes
PAINTER		
Base Rate	$ 24.83	10.00
Bridges, Locks, Dams & Tension Towers	$ 27.83	10.00

PAIN0841-001 06/01/2018

MEDINA, PORTAGE (South of and including Ohio Turnpike), and SUMMIT (South of and including Ohio Turnpike) COUNTIES

	Rates	Fringes
Painters:		
GROUP 1	$ 25.75	14.35
GROUP 2	$ 26.40	14.35
GROUP 3	$ 26.50	14.35
GROUP 4	$ 26.60	14.35
GROUP 5	$ 27.00	14.35
GROUP 6	$ 39.20	11.75
GROUP 7	$ 27.00	14.35

PAINTER CLASSIFICATIONS:

GROUP 1 - Brush, Roller & Paperhanger

GROUP 2 - Epoxy Application

GROUP 3 - Swing Scaffold, Bosum Chair, & Window Jack

GROUP 4 - Spray Gun Operator of Any & All Coatings

GROUP 5 - Sandblast, Painting of Standpipes, etc. from Scaffolds, Bridge Work and/or Open Structural Steel, Standpipes and/or Water Towers

GROUP 6 - Public & Commerce Transportation, Steel or Galvanized, Bridges, Tunnels & Related Support Items (concrete)

GROUP 7 - Synthetic Exterior, Drywall Finisher and/or Taper, Drywall Finisher and Follow-up Man Using Automatic Tools

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PAIN0841-002 06/01/2018

CARROLL, COSHOCTON, HOLMES, STARK, TUSCARAWAS & WAYNE

	Rates	Fringes
PAINTER		
Bridges; Towers, Poles & Stacks; Sandblasting Steel; Structural Steel & Metalizing	$ 22.78	13.63
Brush & Roller	$ 21.77	13.63
Spray; Tank Interior & Exterior	$ 22.60	13.63

PAIN1020-002 04/01/2019

ALLEN, AUGLAIZE, CHAMPAIGN, DEFIANCE, HARDIN, LOGAN, MERCER, PAULDING, PUTNAM, SHELBY, VAN WERT, and WILLIAMS COUNTIES

	Rates	Fringes
PAINTER		

Brush & Roller	$ 24.57	15.03
Drywall Finishing & Taping	$ 23.27	15.03
Lead Abatement	$ 26.32	15.03
Spray, Sandblasting Pressure Cleaning, & Refinery	$ 25.32	15.03
Swing Stage, Chair, Spiders, & Cherry Pickers	$ 24.82	15.03
Wallcoverings	$ 22.17	15.03

All surfaces 40 ft. or over where material is applied to or labor performed on, above ground level (exterior), floor level (interior) - $.50 premium

Applying Coal Tar Products - $1.00 premium

PAIN1275-002 05/01/2019

DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, MADISON, PICKAWAY, ROSS & UNION

	Rates	Fringes
PAINTER		
Bridges	$ 34.24	14.20
Brush; Roller	$ 24.76	14.20
Sandblasting; Steamcleaning; Waterblasting (3500 PSI or Over)& Hazardous Work	$ 25.46	14.20
Spray	$ 25.26	14.20
Stacks; Tanks; & Towers	$ 28.27	14.20
Structural Steel & Swing Stage	$ 25.06	14.20

PLAS0109-001 05/01/2018

MEDINA, PORTAGE, STARK, and SUMMIT COUNTIES

	Rates	Fringes
PLASTERER	$ 28.86	17.11

PLAS0109-003 05/01/2018

CARROLL, HOLMES, TUSCARAWAS, and WAYNE COUNTIES

	Rates	Fringes
PLASTERER	$ 28.21	17.11

PLAS0132-002 05/01/2018

BROWN, BUTLER, CLERMONT, HAMILTON, HIGHLAND, WARREN COUNTIES

	Rates	Fringes

PLASTERER.....$ 28.86 17.11

PLAS0404-002 05/01/2018

ASHTABULA, CUYAHOGA, GEAUGA, AND LAKE COUNTIES

	Rates	Fringes
PLASTERER	$ 29.63	17.11

PLAS0404-003 05/01/2018

LORAIN COUNTY

	Rates	Fringes
PLASTERER	$ 28.86	17.11

PLAS0526-022 05/01/2018

COLUMBIANA, MAHONING, and TRUMBULL COUNTIES

	Rates	Fringes
PLASTERER	$ 28.86	17.11

PLAS0526-023 05/01/2018

BELMONT, HARRISON, and JEFFERSON COUNTIES

	Rates	Fringes
PLASTERER	$ 28.21	17.11

PLAS0886-001 05/01/2018

FULTON, HANCOCK, HENRY, LUCAS, PUTNAM, and WOOD COUNTIES

	Rates	Fringes
PLASTERER	$ 29.63	17.11

PLAS0886-003 05/01/2018

DEFIANCE, ERIE, HURON, OTTAWA, PAULDING, SANDUSKY, and SENECA COUNTIES

	Rates	Fringes
PLASTERER	$ 28.86	17.11

PLAS0886-004 05/01/2018

ALLEN, AUGLAIZE, HARDIN, LOGAN, MERCER, and VAN WERT COUNTIES

	Rates	Fringes

PLASTERER.....$ 28.21 17.11

PLUM0042-002 07/01/2018

ASHLAND, CRAWFORD, ERIE, HURON, KNOX, LORAIN, MORROW, RICHLAND & WYANDOT

	Rates	Fringes
Plumber, Pipefitter, Steamfitter	$ 34.20	22.07

PLUM0050-002 07/06/2020

DEFIANCE, FULTON, HANCOCK, HENRY, LUCAS, OTTAWA, PAULDING, PUTNAM, SANDUSKY, SENECA, WILLIAMS & WOOD

	Rates	Fringes
Plumber, Pipefitter, Steamfitter	$ 43.60	26.73

PLUM0055-003 05/04/2020

ASHTABULA, CUYAHOGA, GEAUGA, LAKE, MEDINA (N. of Rte. #18 & Smith Road) & SUMMIT (N. of Rte. #303, including the corporate limits of the city of Hudson)

	Rates	Fringes
PLUMBER	$ 37.07	27.71

PLUM0083-001 07/01/2017

BELMONT & MONROE (North of Rte. #78)

	Rates	Fringes
Plumber and Steamfitter	$ 32.16	31.51

PLUM0094-002 05/01/2020

CARROLL (Northen Half), STARK, and WAYNE COUNTIES

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 35.78	21.44

PLUM0120-002 05/04/2020

ASHTABULA, CUYAHOGA, GEAUGA, LAKE, LORAIN (the C.E.I. Power House in Avon Lake), MEDINA (N. of Rte. #18) & SUMMIT (N. of #303)

	Rates	Fringes
PIPEFITTER	$ 40.22	25.48

PLUM0162-002 06/01/2020

CHAMPAIGN, CLARK, CLINTON, DARKE, FAYETTE, GREENE, MIAMI, MONTGOMERY & PREBLE

	Rates	Fringes
Plumber, Pipefitter, Steamfitter	$ 32.25	26.47

PLUM0168-002 06/01/2019

MEIGS, MONROE (South of Rte. #78), MORGAN (South of Rte. #78) & WASHINGTON

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 35.32	31.63

PLUM0189-002 06/01/2019

DELAWARE, FAIRFIELD, FRANKLIN, HOCKING, LICKING, MADISON, MARION, PERRY, PICKAWAY, ROSS & UNION

	Rates	Fringes
Plumber, Pipefitter, Steamfitter	$ 38.45	16.98

PLUM0219-002 05/31/2018

MEDINA (Rte. #18 from eastern edge of Medina Co., west to eastern corporate limits of the city of Medina, & on the county road from the west corporate limits of Medina running due west to and through community of Risley to the western edge of Medina County - All territory south of this line), PORTAGE, and SUMMIT (S. of Rte. #303) COUNTIES

	Rates	Fringes
Plumber and Steamfitter	$ 37.02	23.79

PLUM0392-002 06/01/2020

BROWN, BUTLER, CLERMONT, HAMILTON & WARREN

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 33.91	22.29

PLUM0396-001 08/01/2020

COLUMBIANA (Excluding Washington & Yellow Creek Townships & Liverpool Twp. - Secs. 35 & 36 - West of County Road #427), MAHONING and TRUMBULL COUNTIES

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 34.30	26.56

PLUM0495-002 06/01/2018

CARROLL (Rose, Monroe, Union, Lee, Orange, Perry & Loudon Townships), COLUMBIANA (Washington & Yellow Creek Townships & Liverpool Township, Secs. 35 & 36, West of County Rd. #427), COSHOCTON, GUERNSEY, HARRISON, HOLMES, JEFFERSON, MORGAN (South to State Rte. #78 & from McConnelsville west on State Rte. #37 to the Perry County line), MUSKINGUM, NOBLE, and TUSCARAWAS COUNTIES

	Rates	Fringes
Plumber, Pipefitter, Steamfitter	$ 38.24	23.09

PLUM0577-002 06/01/2019

ADAMS, ATHENS, GALLIA, HIGHLAND, JACKSON, LAWRENCE, PIKE, SCIOTO & VINTON

	Rates	Fringes
Plumber, Pipefitter, Steamfitter	$ 34.90	24.11

PLUM0776-002 08/01/2019

ALLEN, AUGLAIZE, HARDIN, LOGAN, MERCER, SHELBY and VAN WERT COUNTIES

	Rates	Fringes
Plumber, Pipefitter, Steamfitter	$ 36.64	24.73

TEAM0377-003 05/01/2020

STATEWIDE, EXCEPT CUYAHOGA, GEAUGA & LAKE

	Rates	Fringes
TRUCK DRIVER		
GROUP 1	$ 28.89	15.40

GROUP 2.....$ 29.31 15.40

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - Asphalt Distributor; Batch; 4- Wheel Service; 4-Wheel Dump; Oil Distributor & Tandem

GROUP 2 - Tractor-Trailer Combination: Fuel; Pole Trailer; Ready Mix; Semi-Tractor; & Asphalt Oil Spraybar Man When Operated From Cab; 5 Axles & Over; Belly Dump; End Dump; Articulated Dump; Heavy Duty Equipment; Low Boy; & Truck Mechanic

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TEAM0436-002 05/01/2019

CUYAHOGA, GEAUGA & LAKE

	Rates	Fringes
TRUCK DRIVER		
GROUP 1	$ 28.40	16.95
GROUP 2	$ 28.90	16.95

GROUP 1: Straight & Dump, Straight Fuel

GROUP 2: Semi Fuel, Semi Tractor, Euclids, Darts, Tank, Asphalt Spreaders, Low Boys, Carry-All, Tourna-Rockers, Hi-Lifts, Extra Long Trailers, Semi-Pole Trailers, Double Hook-Up Tractor Trailers including Team Track & Railroad Siding, Semi-Tractor & Tri-Axle Trailer, Tandem Tractor & Tandem Trailer, Tag Along Trailer, Expandable Trailer or Towing Requiring Road Permits, Ready-Mix (Agitator or Non-Agitator), Bulk Concrete Driver, Dry Batch Truck, Articulated End Dump

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

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information

on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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

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

Union Rate Identifiers

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

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

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

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

Union Average Rate Identifiers

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

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

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION"

NON-DISCRIMINATION AFFIDAVIT

STATE OF _____ ss _____

COUNTY OF _____

_____ being first duly sworn, deposes and says that he/she is
Name

_____ of _____ the party
Title Company

that made the foregoing proposal or bid; that such party does not and shall not discriminate against any employee or applicant for employment because of race, creed, sex, disability or military status as defined in section 4112.01 of the Ohio Revised Code, or color as is described and prohibited by Section 153.59 and/or 125.111 of the Ohio Revised Code. Furthermore, if awarded the contract under this proposal or bid, said party shall indemnify and hold harmless the Fulton County Board of Commissioners for any violations of Section 153.59 or 125.111 of the Ohio Revised Code made by any contractor, subcontractor or any person who works on behalf of the party relating to the ensuing contract.

_____
Signature

_____
Affiant

_____
Company

_____
Address

_____
City/State/Zip Code

Sworn to and subscribed before me this _____ day of _____ , 20___. (Seal)

My Commission Expires:

_____
Date

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____

Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here | **Signature of U.S. person ▶** | **Date ▶**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

INDEPENDENT CONTRACTOR/WORKER ACKNOWLEDGMENT

OPERS

Ohio Public Employees Retirement System
277 East Town Street, Columbus, Ohio 43215-4642

Employer Outreach: 1-888-400-0965
www.opers.org

This form is to be completed if you are an individual who begins providing personal services to a public employer on or after Jan. 7, 2013 but are not considered by the public employer to be a public employee and will not have contributions made to OPERS. This form must be completed not later than 30 days after you begin providing personal services to the public employer.

STEP 1: Personal Information

Social Security Number

___ — ___ — ____

First Name | MI | Last Name

Name of Current Employer

STEP 2: Public Employer Information

Name of Public Employer for Which You Are Providing Personal Services

Employer Contact

First Name | MI | Last Name

Employer Code

Employer Contact Phone Number

___ — ___ — ____

Service Provided to Public Employer

Start Date of Service

Month / Day / Year

End Date of Service

Month / Day / Year

STEP 3: Acknowledgment

The public employer identified in Step 2 has identified you as an independent contractor or another classification other than a public employee. Ohio law requires that you acknowledge in writing that you have been informed that the public employer identified in Step 2 has classified you as an independent contractor or another classification other than a public employee for the services described in Step 2 and that you have been advised that contributions to OPERS will not be made on your behalf for these services.

If you disagree with the public employer's classification, you may contact OPERS to request a determination as to whether you are a public employee eligible for OPERS contributions for these services. Ohio law provides that a request for a determination must be made within five years after you begin providing personal services to the public employer, unless you are able to demonstrate through medical records to the Board's satisfaction that at the time the five-year period ended, you were physically or mentally incapacitated and unable to request a determination.

By signing this form, you are acknowledging that the public employer for whom you are providing personal services has informed you that you have been classified as an independent contractor or another classification other than a public employee and that no contributions will be remitted to OPERS for the personal services you provide to the public employer. If entering into a contract to provide services as an independent contractor to the same employer from which you retired, or to any employer if less than two months after the retirement allowance commences, the pension portion of your benefit will be forfeited during the period of the contract. The annuity portion of your benefit will be suspended and will be paid in a lump sum upon termination of the contract.

This acknowledgement will remain valid as long as you continue to provide the same services to the same employer with no break in service regardless of whether the initial contract period is extended by any additional agreement of the parties. You also acknowledge that you understand you have the right to request a determination of your eligibility for OPERS membership if you disagree with the public employer's classification.

This form must be retained by the public employer and a copy sent to OPERS. The public employer's failure to retain this acknowledgment may extend your right to request a determination beyond the five years referenced above.

Not Applicable

Contractor EIN#_____

Signature_____ Today's Date____/____/____

Do not print or type name

AFFIDAVIT OF COMPLIANCE
Prevailing Wages

I, _____,
(Name and title of person signing affidavit)

do hereby certify that the wages paid to all employees of _____
(Company Name)

for all hours worked on the _____
(Project name and location)

project, during the period from _____to_____ are in
(Project Dates)

compliance with prevailing wage requirement of Chapter 4115 of the Ohio Revised Code.

I further certify that no rebates or deductions have been or will be made, directly or indirectly, from any wages paid in connection with this project, other than those provided by law.

_____
Signature of Officer or Agent

Sworn to and subscribed in my presence this _____ day of _____, _____.

_____
Notary Public

CONTRACTOR'S AFFIDAVIT OF WAIVER OF LIENS

State of Ohio
County of _____

TO WHOM IT MAY CONCERN:

The undersigned, on behalf of _____, the Contractor, having a contract dated _____ with the _____ to perform and/or furnish labor, materials, appliances, tools, utilities, fuel or equipment as set forth in said contract, for the installation or construction of _____ located at _____

hereby makes oath and says that all bills for labor, materials, fuel, or anything or purpose for which a lien or liens may or can be filed under the laws of the place in which this building or project is constructed, arising out of or in connection with the aforementioned trace, have been paid, that there are no claims of subcontractors, laborers or materialmen for which a lien or claims can be filed or claims made against the Owner.

_____
Contractor Name

_____
By

_____
Title

Sworn to before me and subscribed in my presence at _____
This _____ day of _____, 20___ .

_____
Notary Public

Seal

_____
My Commission Expires

Record of Employee Interview

U.S. Department of Housing and Urban Development
Office of Labor Relations

OMB Approval No. 2501-0009
(exp. 10/31/2010)

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. This agency may not collect this information, and you are not required to complete this form, unless it displays a currently valid OMB control number. The information is collected to ensure compliance with the Federal labor standards by recording interviews with construction workers. The information collected will assist HUD in the conduct of compliance monitoring; the information will be used to test the veracity of certified payroll reports submitted by the employer. **Sensitive Information.** The information collected on this form is considered sensitive and is protected by the Privacy Act. The Privacy Act requires that these records be maintained with appropriate administrative, technical, and physical safeguards to ensure their security and confidentiality. In addition, these records should be protected against any anticipated threats or hazards to their security or integrity that could result in substantial harm, embarrassment, inconvenience, or unfairness to any individual on whom the information is maintained. **The information collected herein is voluntary, and any information provided shall be kept confidential.**

1a. Project Name	2a. Employee Name
1b. Project Number	2b. Employee Phone Number (including area code)
1c. Contractor or Subcontractor (Employer)	2c. Employee Home Address & Zip Code
	2d. Verification of identification? Yes ☐ No ☐

3a. How long on this job?	3b. Last date on this job before today?	3c. No. of hours last day on this job?	4a. Hourly rate of pay?	4b. Fringe Benefits?	4c. Pay stub?
				Vacation Yes ☐ No ☐ Medical Yes ☐ No ☐ Pension Yes ☐ No ☐	Yes ☐ No ☐

5. Your job classification(s) (list all) --- continue on a separate sheet if necessary

6. Your duties

7. Tools or equipment used

	Y	N		Y	N
8. Are you an apprentice or trainee?	☐	☐	10. Are you paid at least time and ½ for all hours worked in excess of 40 in a week?	☐	☐
9. Are you paid for all hours worked?	☐	☐	11. Have you ever been threatened or coerced into giving up any part of your pay?	☐	☐

12a. Employee Signature	12b. Date

13. Duties observed by the Interviewer (Please be specific.)

14. Remarks

15a. Interviewer name (please print)	15b. Signature of Interviewer	15c. Date of interview

Payroll Examination

16. Remarks

17a. Signature of Payroll Examiner	17b. Date

Previous editions are obsolete

Form HUD-11 (08/2004)

U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

U.S. Wage and Hour Division
Rev. Dec. 2008

OMB No.: 1215-0149
Expires: 12/31/2011

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐ | ADDRESS

PAYROLL NO. | FOR WEEK ENDING | PROJECT AND LOCATION | PROJECT OR CONTRACT NO.

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT. OR ST.	(4) DAY AND DATE HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS FICA	WITH-HOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
			O											
			S											
			O											
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that is will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Start. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

Federal Labor Standards Provisions

CONFLICT OF INTEREST

Interest of Local Public Officials

No member of the governing body of the locality and no other officer, employee, agent or public official of such locality, who exercises any functions or responsibilities in connection with the planning and carrying out of the program, shall have any personal financial interest, direct or indirect, in this contract; and the Contractor shall take appropriate steps to assure compliance.

Interest of Contractor & Employees

The Contractor covenants that he presently has no interest and shall not acquire interest, direct or indirect, in the study area or any parcels therein or any other interest which would conflict in any manner or degree with the performance of his services hereunder. The Contractor further covenants that in the performance of this Contract, no person having any such interest shall be employed.

Records & Audits

The Contractor shall maintain accounts and records, including personnel, property and financial records, adequate to identify and account for all costs pertaining to the Contract and such other records as may be deemed necessary by the City/County to assure proper accounting for all project funds. These records will be made available for audit purposes to the City/County or any authorized representative, and will be retained for three years after the expiration of this Contract unless permission to destroy them is granted by the City/County.

Federal or State Officials Not to Benefit

No members of or delegate to the Congress of the United States of America, and no resident U.S. Commissioner, nor any officer or employee of the State of Ohio subject to Ohio Ethics Law (ORC. Sec. 102.03 (A)) will be admitted to any share or part hereof or to any benefit to arise here from.

SPECIAL CONDITIONS PERTAINING TO HAZARDS SAFETY STANDARDS & ACCIDENT PREVENTION

A. Lead-Based Paint Hazards
(*Applicable to contracts for construction or rehabilitation of residential structures.)*

The construction or rehabilitation of residential structures is subject to the HUD Lead-Based Paint Regulations, 24 CFR Part 35. The Contractor and Subcontractors shall comply with the provisions for the elimination of lead-base paint hazards under sub-part B of said regulations and certifications required under Section 35.14 (f) thereof.

B. Use of Explosives
When the use of explosives is necessary for the prosecution of the work, the Contractor shall observe all local, state and federal laws in purchasing and handling explosives. The Contractor shall take all necessary precaution to protect completed work, neighboring property, water lines, or other underground structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the material shall be covered with suitable timber, steel or rope mats.

The Contractor shall notify all owners of public utility property of intention to use explosives at least eight (8) hours before blasting is done, close to such property. Any supervision or direction of use of explosives by the Engineer does not in any way reduce the responsibility of the Contractor or his Surety for damages that may be caused by such use.

C. Danger Signals & Safety Devices
The Contractor shall make all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night, suitable barricades and other devices necessary to protect the public. In case the Contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of the work to the Contractor. Such action by the Owner does not relieve the Contractor of any liability incurred under these specifications or contract.

SPECIAL EQUAL OPPORTUNITY PROVISIONS

A. Activities and Contracts Not Subject to Executive Order 11246, as Amended
(Applicable to Federally assisted construction contracts and related subcontracts $10,000 and under)

During the performance of this Contract, the Contractor agrees as follows:

1. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor shall take affirmative action to ensure that the applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

2. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Owner setting forth the provisions of this non-discrimination clause.

3. Contractors shall incorporate foregoing requirements in all subcontracts.

B. Executive Order 11246 (Contracts/ Subcontracts above $10,000)

1. *Section 202 Equal Opportunity Clause*

During the performance of this Contract, the Contractor agrees as follows:

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

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

(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other Contractor or understanding, a notice to be provided by the Owner advising the said labor union or workers' representatives of the contractor's commitment under this section, and shall post copies of the notice in conspicuous places made available to the employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Ohio Department of Development's Office of Housing and Community compliance with such rules, regulations and others.

(6) In the event of the Contractor's non-compliance with the non-discrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, or by rules, regulations or orders of the Secretary of Labor, or as otherwise provided by the law.

(7) The Contractor will include the provisions of the sentence immediately to Section 204 of Executive Order 11246 of September 24, 1965, so that enforcing such provisions, including sanctions for non-compliance. Provided, however, that in the event a contractor becomes involved in, or as is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Department, the Contractor may request the

2. *Notice of Requirement for Affirmative Action to Ensure Equal Opportunity (Executive Order 11246).*

(Applicable to contracts/subcontracts exceeding $10,000)

(1) The Offerer's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

(2) The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trace on all construction work in the covered area, are as follows:

Goals for Minority Participation	Goals for Female Participation
4.4%	**6.9%**

These goals are applicable to all the Contractor's construction work (whether or not it is federal or federally assisted) performed in the covered areas. The Contractor's compliance with the Executive Order

and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3 (a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be in violation of the Contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

(3) *The Contractor shall provide written notification to the manager of the Office of Housing and Community Partnerships, Ohio Department of Development, P.O. Box 1001, Columbus, OH 43216-1001 within ten (10) working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the Contract resulting from this solicitation.* The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

(4) As used in this Notice, and in the Contract resulting from this solicitation, the "covered area" is (Insert description of the geographical areas where the Contract is to be performed giving the state, county, and city, if any):

3. *Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)*

(1) As used in these specifications:

a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
c. "Employer Identification Number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
d. "Minority" includes:
   (i) Black: all persons having origins in any of the Black African racial groups not of Hispanic origin;
   (ii) Hispanic: all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race;
   (iii) Asian and Pacific Islander: all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands; and

(iv) American Indian or Alaskan Native: all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.

(2) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

(3) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through as association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

(4) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

(5) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collaborative bargaining agreement, to refer either minorities or woman shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

(6) In order for nonworking training hours of apprentices and trainees to be training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(7) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or it unions have employment opportunities available, and maintain a record of organizations' responses.

c. Maintain a current file of the name, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations: by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female

employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specification with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including in any advertising in the news media, specifically including minority and the female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on site and in other areas of the Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc. such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being

carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

q. Covered construction contractors performing contracts in geographical areas where they do not have a federal or federally assisted construction contract shall apply at the minority and female goals established for the geographical area where the contract is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting offices.

(8) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through 7q). The efforts of a contractor association, join contractor union, contractor community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through 7q of these Specifications provided that the actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation hall not be in defense for the Contractor's non-compliance.

(9) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

(10) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex or national origin.

(11) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

(12) The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

(13) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity . If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

(14) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by OHCP and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

(15) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

C. Certification of Nonsegregated Facilities (Over $10,000)

By the submission of this bid, the bidder, offerer, applicant or subcontractor certifies that he does not maintain or provide for his employees any segregated facility at any of his establishments, and that he does not permit employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for employees any segregated facilities at any of his establishments, and he will not permit employees to perform their services at any location under his control where segregated facilities are maintained. The bidder, offerer, applicant or subcontractor agrees that breach of this certification is a violation of the Equal Opportunity Clause of this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms, time clocks, locker rooms, and other storage and dressing areas, parking lots, drinking fountains, recreation or entertainment areas provided for the employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certification from propose subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that he will retain such certifications in his files; and that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where proposed subcontractors have submitted identical certifications for specific time periods.)

D. Civil Rights Act of 1964

Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal finance assistance.

E. Section 109 of the Housing and Community Development Act of 1974

a. No person in the Unites States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the direct benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

F. "Section 3" Compliance in the Provision of Training, Employment and Business Opportunities

a. The work to be performed under this contract is on a project assisted under a program providing direct federal financial assistance from the Department of Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u. [Section 3 requires that to the greatest extent feasible opportunities for training and employment be given lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the area of the project.]

b. The parties to this contract will comply with the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary of Housing and Urban Development set forth in 24 CFR 135, and all applicable rules and orders of the Department issued thereunder prior to the execution of this contract. The parties to this contract certify and agree that they are under no contractual or other disability which would prevent them from complying with these requirements.

c. The Contractor will send to each labor organization or representative of workers with which he has a collective bargaining agreement or other contract or understanding, if any, a notice advising the said labor organization or workers' representative of his commitments under this Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment or training.

d. The Contractor will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for recipient of federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations issued by the Secretary of Housing and Urban Development, 24 CFR Part 135. The Contractor will not subcontract with any subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under CFR Part 135 and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.

e. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR Part 135, and all the applicable rules and orders of Department issued hereunder prior to the execution of the contract, shall be a condition of the federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors, and assigns to those sanctions specified by the grant or loan agreement or contract through which federal assistance is provided, and to such sanctions as are specified by 24 CFR Part 135.

CONTRACTOR

Section 3 Plan Format

_____ agrees to implement the following specific affirmative action steps directed at increasing the utilization of lower income residents and businesses within **Paulding** County.

A. To ascertain from the locality's CDBG program official the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plan.

B. To attempt to recruit from within the county the necessary number of lower income residents through: local advertising, media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U.S. Employment Service.

C. To maintain a list of all lower income area residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if vacancy exists.

*D. To insert this Section 3 Plan in all bid documents, and to require all bidders on subcontracts to submit a Section 3 Affirmative Action Plan including utilization goals and the specific steps planned to accomplish these goals.

*E. To insure that subcontracts which are typically let on a negotiated rather than a bid basis in areas other than Section 3 covered project areas, are also let on a negotiated basis, whenever feasible, when let in Section 3 covered project area.

*F. To formally contact unions, subcontractors and trade associations to secure their cooperation for this program.

G. To insure that all appropriate project area business concerns are notified of pending subcontractual opportunities.

H. To maintain records, including copies of correspondence, memoranda, etc., which document that all of the above affirmative action steps have been taken.

I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of this Section 3 Plan.

J. To list on Table A, information related to proposed subcontracts.

K. To list on Table B, all projected workforce needs for all phases of this project by occupation, trade, skill level and number of positions.

As officers and representatives of _____

We the undersigned have read and fully agree to this Affirmative Action Plan, and become party to the full implementation of this program.

_____ _____

Signature Date

_____

Printed Name and Title

* Loans, grants, contracts and subsidies for less than $10,000 will be exempt.

TABLE A
PROPOSED SUBCONTRACTS BREAKDOWN

For the period covering the duration of the CDBG Assisted Project.

Type of Contract (Business of Profession)	Total Number of Contracts	Total Approximate Dollar Amount	Estimated Number Contracts to Project Area Businesses*	Estimated Dollar Amount to Project Area Businesses*

*The Project Area is coextensive with the **Paulding County** boundaries.

_____
Company

_____

_____
EEO Officer (Signature)

TABLE B
ESTIMATED PROJECT WORKFORCE BREAKDOWN

Type of Contract (Business of Profession)	Total Number of Contracts	Total Approximate Dollar Amount	Estimated Number Contracts to Project Area Businesses*	Estimated Dollar Amount to Project Area Businesses*
Officers/Supervisors				
Professionals				
Technicians				
Housing Sales/Rental Mgmt.				
Office Clerical				
Service Workers				
Others				

Trade

Journeymen				
Helpers				
Apprentices				
Maximum Number of Trainees				
Others				

*Lower income project area residents (L.I.P.A.R.) Are individuals residing within Paulding County of whose family income does not exceed 51% of the median income of the SMSA.

_____

Contractor

OHIO DEPARTMENT OF DEVELOPMENT
OFFICE OF HOUSING AND COMMUNITY PARTNERSHIPS
CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY

NAME OF PRIME CONTRACTOR _____

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless the report is submitted

CONTRACTOR'S CERTIFICATION

NAME OF BIDDER _____

ADDRESS OF BIDDER _____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.

☐ YES ☐ NO

2. Compliance reports were required to be filed in connection with such contract or subcontract.

☐ YES ☐ NO

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.

☐ YES ☐ NO

4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?

☐ YES ☐ NO

SIGNATURE_____DATE_____

TYPED NAME AND TITLE_____

Modeled after form HUD-12

OHIO DEPARTMENT OF DEVELOPMENT
OFFICE OF HOUSING AND COMMUNITY PARTNERSHIPS
CERTIFICATION OF PROPOSED SUBCONTRACTOR REGARDING
EQUAL EMPLOYMENT OPPORTUNITY

NAME OF SUBCONTRACTOR _____

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless the report is submitted

SUBCONTRACTOR'S CERTIFICATION

NAME OF BIDDER _____

ADDRESS OF BIDDER _____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.

   ☐ YES ☐ NO

2. Compliance reports were required to be filed in connection with such contract or subcontract.

   ☐ YES ☐ NO

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.

   ☐ YES ☐ NO

4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?

   ☐ YES ☐ NO

SIGNATURE _____ DATE _____

TYPED NAME AND TITLE _____

Modeled after form HUD-12

CERTIFICATION OF BIDDER REGARDING SECTION 3 AND SEGREGATED FACILITIES

_____

Name of Prime Contractor

_____

Project Name

The undersigned hereby certifies that:

(a) Action 3 provisions are included in the Contract;

(b) A written Section 3 Plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds $10,000);

(c) No segregated facilities will be maintained.

_____

Signature

_____

Printed Name and Title

_____

Date

CERTIFICATION OF PROPOSED SUBCONTRACTOR REGARDING SECTION 3 AND SEGREGATED FACILITIES

_____

Name of Subcontractor

_____

Project Name

The undersigned hereby certifies that:

(a) Action 3 provisions are included in the Contract;

(b) A written Section 3 Plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds $10,000);

(c) No segregated facilities will be maintained.

_____

Signature

_____

Printed Name and Title

_____

Date

CERTIFICATION OF COMPLIANCE WITH AIR & WATER ACTS

(Applicable to federally assisted construction contracts and related subcontracts exceeding $100,000)

Compliance with Air & Water Acts

During the performance of this contract, the contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended.

In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall furnish to the Owner the following:

(1) A stipulation by the Contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.

(2) Agreement by the Contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USC 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.

(3) A stipulation that as a condition for the award of the contract, prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the contract, is under consideration to be listed on the EPA List of Violating Facilities.

(4) Agreement by the Contractor that he will include, or cause to be included, the criteria and requirements in paragraph (1) through (4) of this section in every nonexempt subcontract and requiring that the Contractor will take such action as the government may direct as a means of enforcing such provisions.

ENGINEER'S CERTIFICATION
COMPLIANCE WITH MINIMUM STANDARDS FOR
ACCESSIBILITY BY THE PHYSICALLY HANDICAPPED

Grantee Number: _____

Project Name: _____

Pursuant to the requirements of the Architectural Barriers Act of 1968, 42 USC 4151, and the regulations issued subsequent thereto, the undersigned certifies that the design on the above mentioned project is in conformance with the minimum standards contained in the American Standard Specifications for Making Buildings and Facilities Accessible to and usable by, the Physically Handicapped, Number A-117.1R-1971 (as modified by 41 CFR 101-10.603).

Designer for the Project: _____
(Name and Address)

_____

_____

_____

Signature: _____

Printed Name: _____
Date: _____

Name of Chief Executive
Officer/Official: _____

Signature: _____
Date: _____

Federal and State Requirements

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT'S FEDERAL LABOR STANDARDS PROVISIONS, HUD-4010 DATED 2/84 (REVISED)

Applicability

The Project or program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions applicable to such Federal assistance.

1. (i) Minimum Wages.

All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act 29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv): also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the Employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates confirmed under 29 CFR Part 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representative, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(b) or (c) of this paragraph shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of labors or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the ages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or problem, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding

HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics,

including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and Basic Records

Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or cost anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification or trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(I). This information may be submitted in ant form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington D.C. 20402. The prime contractor is responsible for the submission of copies of payroll by all subcontractor. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each Payroll submitted shall be accompanied by a "Statement of Compliance", signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under 29 CFR Part 5.5(a)(3)(I) and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deduction as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

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

(d) The falsification of any of the above certification may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor of subcontractor shall make the record required under paragraph A.3.(I) of this section available for inspection, copying, or transcription by authorized representative of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for disbarment action pursuant to 29 CFR Part 5.12.

4. (i) Apprentices and Trainees

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable

ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. in addition, any apprentice performing work n the job site in excess of thereto permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. if the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approval.

(ii) Trainees

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

program is approved.

(iii) Equal Employment Opportunity

The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act Requirements

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

6. Subcontracts

The contractor or subcontractor will insert in any subcontracts the clauses contained in 29 CFR 5.5(A)(1) through (10) and such other clauses as HUD or its designee may by appropriate instruction require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

7. Contractor Termination; Debarment

A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements

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

9. Disputes Concerning Labor Standards

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5,6 and 7. Disputes within the meaning of this clause includes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility

By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29

CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal

Housing Administration transactions", provides in part "Whoever, for the purpose of... influencing in any way the action of such Administration... makes, utter or publishes any statement, knowing the same to be false... shall be fined not more than $5,000 or imprisonment not more than two years, or both".

11. Complaints, Proceedings, or Testimony by Employees

No laborer or mechanic to whom the wages, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this contract to his employer.

B. Contract Work Hours and Safety Standards Act

As used in this paragraph, terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime Requirements

No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; Liability for Unpaid Wages; Liquidated Damages

In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without

payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for Unpaid Wages and Liquidated Damages

HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or clause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts

The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulation issued by the Secretary of Labor pursuant to Title Part 1926 (formerly part 1518) and failure top comply may result in imposition of sanction pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat 96).

(3) The Contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The Contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

CONTRACTOR
CERTIFICATE OF COMPLIANCE WITH FEDERAL
LABOR STANDARDS PROVISIONS

I, the undersigned _____, the duly authorized representative of _____ hereinafter referred to as the contractor, do hereby certify that I have examined the Federal Labor Standards Provisions (HUD-4010) with related certificates and documents, and all of the conditions surrounding these provisions including, but not limited to the following:

1. The contractor is responsible for employing only eligible subcontractors who have certified eligibility in written contracts containing Federal Labor Standards Provisions.

2. The contractor is responsible for the payment of federal prevailing wage rates by its subcontractors while performing work under this contract. If the subcontractor fails to pay the prevailing wages as specified in this contract, the prime contractor may be required to make appropriate restitution to the underpaid workers.

3. The contractor is responsible for collecting weekly certified payrolls from its subcontractor, reviewing said payrolls for compliance with the federal wage rates, and forward same to the local government contract authority.

4. The contractor also understands that only those classifications listed in the original bid documents are applicable to this job, and no special classifications may be incorporated after contract award.

The Prime Contractor hereby agrees to perform all of its responsibilities in conformance with the Federal Labor Standards Provisions both diligently and affectively.

_____
Signature

_____
Date

COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM
CONTRACTOR'S CERTIFICATION
CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

1. The undersigned, having executed a contract with **Paulding** County for the construction of the above-identified project acknowledges that:

   (a) The Labor Standards provisions are included in the aforesaid contract:

   (b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, in his responsibility;

2. He certifies that:

   (a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6 (b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR Part 5) or pursuant to Section 3 (a) of the Davis-Bacon Act, as amended [40 U.S.C. 275a-2(a)].

   (b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.

4. He certifies that:

   (a) The legal name and the business address of the undersigned is:

   (b) The undersigned is:

   _____ (1) A Single Proprietorship
   _____ (2) A corporation organized in the State of
   _____ (3) A Partnership
   _____ (4) Other Organization (Describe):

(c) The name, title and address of the owner, partners or officers of the undersigned are:

NAME	TITLE	ADDRESS

(d) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are: (If none, so state):

NAME	ADDRESS	NATURE OF INTEREST

(e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are: (If none, so state):

NAME	ADDRESS	TRADE CLASSIFICATION

Date: _____

Contractor Signature: _____

Printed Name: _____

WARNING

U.S. CRIMINAL CODE, Section 1010, Title 18, U.S.C., provides in part: "Whoever...makes, passes, utters or publishes any statement, knowing the same to be false...shall be fined not more than $5,000 or imprisoned not more than two years, or both."

COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM
SUBCONTRACTOR'S CERTIFICATION
CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

1. The undersigned, having executed a contract with **Paulding** County for the construction of the above-identified project acknowledges that:

   (a) The Labor Standards provisions are included in the aforesaid contract:

   (b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, in his responsibility;

2. He certifies that:

   (a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6 (b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR Part 5) or pursuant to Section 3 (a) of the Davis-Bacon Act, as amended [40 U.S.C. 275a-2(a)].

   (b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.

4. He certifies that:

   (a) The legal name and the business address of the undersigned is:

   (b) The undersigned is:

   _____ (1) A Single Proprietorship
   _____ (2) A corporation organized in the State of
   _____ (3) A Partnership
   _____ (4) Other Organization (Describe):

(c) The name, title and address of the owner, partners or officers of the undersigned are:

NAME	TITLE	ADDRESS

(d) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are: (If none, so state):

NAME	ADDRESS	NATURE OF INTEREST

(e) The names, addresses and trade classifications of all other building construction contractors in which the undersigned has a substantial interest are: (If none, so state):

NAME	ADDRESS	TRADE CLASSIFICATION

Date: _____

Subcontractor Signature: _____

Printed Name: _____

WARNING

U.S. CRIMINAL CODE, Section 1010, Title 18, U.S.C., provides in part: "Whoever...makes, passes, utters or publishes any statement, knowing the same to be false...shall be fined not more than $5,000 or imprisoned not more than two years, or both."

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 Summary

A. Unit Price Work Includes:

1. Complete removal of 23 septic tanks, complete removal and replacement of 188 septic tanks, and the installation of 4 new septic tanks. The rehabilitation of 4 sanitary sewer manholes with new frames and covers. The rehabilitation of 8 sanitary manholes with new benchwalls and channels and composite manhole lining. Installation of 2 new sanitary sewer manholes. Rehabilitation of the Wayne Street lift station and the cleaning and televising of 4, 6, 8, and 10-inch sewer lines.

B. The Add-Alternate Bid No. 1 (WWTP Improvements) Work Includes:

1. Cleaning and lining of the septage receiving structure, rehabilitation of the plant drain lift station, cleaning and patching of existing basin liners, modifications of an existing basin to an EQ basin, replacement of all fine and coarse bubble diffusers, modifications to the existing flow splitter, removal of the existing sludge dewatering press and other miscellaneous equipment, and the installation of the following: a new Trojan ultraviolet disinfection system, new geotextile dewatering system, new piping and valves, new concrete sidewalk, new generator, new water hydrants, and electrical modifications.

1.02 Contract

A. Work shall be constructed under a Unit Price Contract.

B. The Contractor shall not be allowed extra compensation by reason of any matter or thing concerning which the Contractor might have fully informed himself prior to the bidding. No verbal agreement, understandings or conversations with an agent or employee of the Owner and/or Engineer either before or after the execution of this Contract, shall affect or modify the terms of obligations herein contained.

1.03 Completion

A. Commence Work required by the Contract Documents within 10 days after the date of the Notice to Proceed, and fully complete the Work within the Contract Times stated in the Bid Form and Agreement unless the Contract Times are extended otherwise by the Contract Documents.

B. The Project will not be ready for substantial completion review until test and performance evaluations are completed, all work is complete and ready for service and occupancy, proper paint and stains are dry, windows are clean, interior of all

rooms requiring work have been broom cleaned and mopped and the site is clear of construction rubbish and debris.

1.04 Work by Others

A. The Owner reserves the right to let other Contracts in connection with other portions of the project.

1.05 Items to be Provided by Owner

A. Those items shown on the Drawings and/or specified herein.

1.06 Coordination

A. Select order of work and establish schedule or working hours for construction, subject to approval of Owner and Engineer which will assure orderly and expeditious progress of work.

B. Maintain existing service affected by Contractors' operations under the contract. Schedule construction to minimize interruptions to existing services, and inconveniences to others.

1.07 Rights of Access

A. The Contractor agrees that representatives of the Engineer, Owner and regulatory agencies will have access to the work wherever it is in preparation or progress and that the Contractor will provide facilities for such access and inspection.

1.08 Safety and Health Regulations for Construction

A. Obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926, otherwise known as "Safety and Health Regulations for Construction and CFR Part 1910.46 Permit Required for Confined Space" are the sole responsibility of the Contractor. Provide the Owner and Engineer the name of the Contractor's Safety Officer, plus the on-site Safety Representative, if other than the Superintendent, as indicated under Article 6.21 of the General Conditions of the Construction Contract.

1.09 Discovery of Hazardous Material

A. If, during the course of this work, the existence of hazardous material, including asbestos containing material, is observed in the work area, immediately notify the Owner (and Engineer) in writing. Do not perform any work pertinent to the hazardous material prior to receipt of special instructions from the Owner (and Engineer).

1.10 Easements

A. The Owner has obtained right-of-way easements for the work, including the septic tank removals and replacements (see Septic Tank Schedule) over and through certain private lands for construction. The width or limits of such easements will be defined by the Owner before the Work begins. If the methods of construction

employed by the Contractor require the use of land beyond the limits obtained by the Owner, make agreements with the property owners affected for the use of such additional land. Such additional agreements will not include any liability for the Owner or Engineer and shall have no direct effect on the completion of the project, project cost, or the time of completion.

B. In all such right-of-way easements, carefully remove the property owner's fences, shrubs, trees, or other obstacles to the construction procedure; coordinate with the property owner and Engineer a minimum of 48 hours prior to removal. Dispose of materials and debris at a location secured by the Contractor and in accordance with all applicable laws. Restore all fencing to existing conditions, trees and shrubs shall not be replaced within easement limits. Place backfill to the grade of the existing ground level or as otherwise shown on the Drawings.

C. Include the cost of all restoration of property in the Contractor's bid. No additional payment will be allowed for restoration work.

1.11 Operations Within Right-of-Way

A. If the methods of the construction employed are such as to require the use of land beyond the public right-of-way limits, make arrangements with the property owners affected for the use of such additional land. Such additional agreements will not include any liability for the Owner or Engineer and shall have no direct effect on the completion of the project, project cost, or the time of completion.

1.12 Permits

A. The Owner has obtained permits which are related to the design and construction of the completed facilities. Permits obtained by the Owner include, but are not limited to, permits from the following:

1. OEPA National Pollutant Discharge Elimination System (NPDES) - Construction Site Stormwater General Permit (Permit No. 2GC05947*AG) under OHC000005 I
2. ODOT ROW Permit (Permit No. U30082020)
3. OEPA Division of Surface Water Permit-to-Install (PTI) (Permit No. 1351799)

B. Obtain permits related to construction activities as specified in the General Conditions.

1. All necessary permits or licenses from the city, state or county in connection with construction procedures will be obtained by the Contractor. The construction shall be performed in full accordance with any and all requirements of the State of Ohio as well as county and local requirements.
2. Obtain copies of the design permits listed under 1.12 from the Owner and abide by all terms and conditions of the permits.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

-END-

SECTION 01050 - CONSTRUCTION ENGINEERING

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Providing all equipment, personnel and materials necessary for performing Construction Engineering, including layout and verification of existing conditions and infrastructure, to complete the Work as described in these Specifications.

1.02 Project/Site Conditions

A. Field Measurements

1. Make all measurements and check all dimensions and elevations necessary for the proper construction of the Work called for by the Drawings and Specifications.
2. Make all necessary measurements to prevent misfitting in said Work, and be responsible for the accuracy of the layout, staking and construction of the Work.

PART 2 - MATERIALS

Not Used.

PART 3 - EXECUTION

3.01 Examination

A. Verification of Conditions

1. Check and verify elevations and locations of existing infrastructure and conditions shown on the Drawings, or otherwise present at the site, that may affect the Work. Allow adequate time for modifications to be made to the Work to account for conditions which may differ from those shown on the Drawings.
2. Verify conditions and accessible existing infrastructure prior to the preparation of shop drawings associated with, or that may be impacted by, existing conditions and infrastructure.
3. Obtain and verify elevations of inaccessible infrastructure immediately after exposure by excavation.
4. No additional compensation will be made to the Contractor for failure to obtain this information in a timely manner which would have permitted modifications to the Work that would have avoided additional work, delays, and cost.

3.02 Preparation

A. Perform all necessary Construction Engineering, including layout and staking, to ensure that the work conforms to the lines, grades, and elevations shown on the Drawings or otherwise specified or required.

1. Establish all necessary lines, points, and corners with references for recovery of said items during construction.
2. Conduct a level circuit to establish additional benchmarks for use during construction.
3. Set stakes for structures.
4. Set any other reference points as required for control lines and grades.

B. When staking utilities, perform the necessary checking to establish location and grade to best fit the conditions.

-END-

SECTION 01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.01 Summary

A. Section Includes

1. General reference standards, rules and regulations that govern construction work, alterations, repairs, mechanical installations and appliances connected therewith
2. Abbreviations used in these Specifications

1.02 Quality Assurance

A. Regulatory Requirements: Work shall comply with the following:

1. Occupational Safety and Health Act
2. State Building rules and regulations of the Ohio Department of Commerce Division of Industrial Compliance and Division of State Fire Marshal
3. Ohio Department of Natural Resources
4. Ohio Environmental Protection Agency
5. Army Corps of Engineers
6. National Electric Code
7. National Electric Safety Code
8. Uniform Building Code
9. Life Safety Code
10. Utility regulations
11. Local ordinances, state, and federal rules and regulations pertaining to the Work

B. Such rules, regulations and ordinances are to be considered part of these Specifications.

C. Fees for licenses shall be paid by the Contractor.

1.03 Reference Abbreviations

A. Reference to a technical society, trade association or standards setting organization may be made in the Specifications by abbreviations in accordance with the following list:

AABC	Associated Air Balance Council
AAR	Association of American Railroads
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
ADC	Air Diffusion Council
AFBMA	Anti-Friction Bearing Manufacturers Association

A-E	Architect/Engineer
AGA	American Gas Association
AHAM	Association of Home Appliance Manufacturers
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
APA	The Engineered Wood Association
ARI	American Refrigeration Institute
ASCE	American Society of Civil Engineers
ASLA	American Society of Landscape Architects
ASME	American Society of Mechanical Engineers
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association
CABO	Council of American Building Officials
CAGI	Compressed Air and Gas Institute
CISPI	Cast Iron Soil Pipe Institute
CTI	Cooling Tower Institute
DHI	Door and Hardware Institute
DOH	Department of Health
DOT	Department of Transportation
FS	Federal Specifications
FHWA	Federal Highway Administration, Department of Transportation
FM	Associated Factory Mutual Laboratories
GANA	Glass Association of North America
HPVA	Hardwood Plywood and Veneer Association
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IFI	Industrial Fasteners Institute
IGCC	Insulating Glass Certification Council
IPCEA	Insulated Power Cable Engineers Association
MIL	Military Specifications
MSS	Manufacturer’s Standardization Society
NAAMM	National Association of Architectural Metal Manufacturers
NACM	National Association of Chain Manufacturers
NAIMA	North American Insulation Manufacturers Association
NAVFAC	U.S. Naval Facilities Engineering Command
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association

NIST	National Institute of Standards and Technology
NSF	National Sanitation Foundation
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
OPC	Ohio Plumbing Code
OSHA	Occupational Safety and Health Administration
PCI	Precast Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
PFI	Pipe Fabricators Institute
SAE	Society of Automotive Engineers
SPECS	Specifications
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPI	Society of the Plastics Industry
SSPC	The Society for Protective Coatings
STI	Steel Tank Institute
TCNA	Tile Council of North America
UL	Underwriter's Laboratories, Inc.
USBR	US Bureau of Reclamation
WWPA	Western Wood Products Association

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

-END-

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.01 Preconstruction Conference

A. A Preconstruction Conference will be scheduled within 14 days after delivery of the executed Agreement by Owner to Contractor, but before starting the Work, at the site or other location designated by the Owner. The Engineer will make arrangements for the meeting and notify participants in advance of the meeting date and location. Required attendees include the Engineer, Contractor, subcontractors, and the Owner or his representative. Significant proceedings of this meeting will be recorded by the Engineer and copies distributed to the participants.

B. At the meeting, submit a preliminary Construction Progress Schedule, Schedule of Submittals (including name, type and specification section), Schedule of Values (per Section 01990) and a list of subcontractors and suppliers if a list was not previously submitted with the Contractor’s bid, or if subcontractors and suppliers have changed.

1.02 Monthly Progress Meetings

A. A monthly Progress Meeting will be conducted on a specific day of every month at the job site. A supervisory representative, able to make management decisions, from the Contractor shall attend the meeting. The date, time and location of said meeting will be determined at the Preconstruction Conference.

B. Present a written status report, neatly prepared, at each meeting. The status report shall include at least the following information: Construction progress, update of schedule, delays, changes, status of RFIs, RFPs, problems, differing conditions, anticipated payment requests, personnel changes, and regulatory compliance updates. The status report shall cover all subcontractors.

C. Require the attendance of subcontractors' supervisory personnel, as necessary, to assist in the presentation of the status report.

D. Five copies of the status report shall be prepared for distribution to the Owner's and Engineer's representatives.

E. If the Contractor fails to have a supervisory representative attend the Progress Meeting or if the Contractor fails to distribute a written status report as specified in paragraph B above, the Owner may withhold approval of a Partial Payment Application until such time as the Progress Meeting can be rescheduled at the convenience of the Owner and the Engineer.

F. Significant proceedings of this meeting will be recorded by the Engineer and copies distributed to the participants.

1.03 Special Meetings

A. Special Meetings may be called by the Engineer or Contractor as progress of the work dictates.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

-END-

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Administrative and procedural requirements for submittals and construction documentation, including construction schedules, shop drawings, product data, requests for information, field transmittal memos, samples, tests, O&M manuals and pay applications. Provide content, number of copies and other information as specified for all submittals.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 Construction Schedules

A. Submit Progress Schedules (Bar Charts or CPM/PERT Charts) at the monthly Progress Meetings during the contract period.

1. Provide complete sequence of construction by activity showing dates for beginning and completion of each element of construction.
2. Identify work in separate phases, or other logically grouped activity.
3. Identify first work day of each week on a horizontal time scale. Sheet size shall be 24” x 36” maximum and 8 ½” x 11” minimum, but of sufficient size to allow space for updating.

B. Engineer will review Progress Schedules for conformance to the contract completion dates. If required, resubmit within 7 days after return of reviewed copy addressing Engineer’s review comments.

C. Show all changes occurring since previous submission of updated schedule. Indicate progress of each activity and show completion dates. Include major changes in scope, activities modified since previous updating, revised projections due to changes and other identifiable changes.

D. If the Progress Schedule reflects completion date(s) different than the Contract Times, the Contract Times are not thereby voided, nullified, or affected. The Contract Times govern. Where the Progress Schedule reflects completion date(s) that are earlier than the Contract Times, the Engineer may accept such Progress Schedule with the Contractor to specifically understand that no Change Request of Claim for additional Contract Time or Contract Price shall be brought against the Owner resulting from the Contractor’s failure to complete the work by the earlier date(s) indicated on the accepted Progress Schedule.

E. Distribute copies of monthly progress schedule to Engineer, Owner's Representative(s), the job site file, subcontractors, and other concerned parties.

F. Instruct recipients to report any inability to comply, and provide detailed explanation, with suggested remedies.

3.02 Products and Materials Approvals

A. The Contractor shall submit to the Engineer shop drawings and complete catalog data for every manufactured item of equipment and all components to be used in the work in accordance with the General Conditions. Shop Drawings and manufactured equipment submittals for approval shall comply with Specification Section 01300, Part 3.03.

B. Products and materials shall be submitted and processed electronically to the Engineer. The Engineer reserves the right to request up to six (6) hard copies of all submittals. Full-size drawings may be requested by the Engineer for review.

C. A Specification followed by one or more manufacturers and "or approved equal" is open to equal products or materials as determined to be "equal" solely by the Engineer. The Engineer's decision shall be final in this regard.

D. Where specific manufacturers and/or model numbers for materials or equipment are listed in the detailed Specifications, these items have served as the basis for the design of the new facilities and/or improvements in this project. Materials and equipment submitted as an alternate or "or equal" item must be certified by the Contractor as:

1. Meeting or exceeding the requirements of the detailed Specifications,
2. Being of equal or better quality, and
3. Being of equal function to the specific manufacturer and/or model listed.

E. If the submitted alternate or "or equal" item requires any modification or deviation from the Drawings, prepare and submit detailed drawings to the Engineer showing all modifications in structures, piping, electrical, mechanical, or other work required to adapt the work to the submitted alternate or "or equal" item. The Engineer will review the submitted detailed drawings of the modifications and indicate whether changes are necessary to comply with the project requirements. Detailed drawings which do not comply with the project requirements shall be revised and resubmitted.

F. The Contractor's listed "add" or "deduct" associated with alternate equipment items shall be based upon an "installed price" and shall take into consideration and include any cost of the design or construction changes that may be required as a result of an alternate or "or equal" material or equipment.

G. Voluntary alternate and/or "or equal" equipment that is installed by Contractor but fails to meet the specified requirements as determined by the Engineer shall be replaced with the specified item at the Contractor's expense.

3.03 Shop Drawings

A. Submit Shop Drawings to the Engineer within 30 days after Notice-to-Proceed in accordance with the following requirements.

1. Submit Shop Drawings and complete catalog data to the Engineer for every item and all components to be used in the work in accordance with the General Conditions. The Shop Drawings shall be of sufficient detail to assure that the item complies with the Specifications and shall provide the necessary data for installation, operation, and maintenance.
2. Completion of the project within the contracted time is critical, and Shop Drawing and catalog data quality can affect the construction time. Shop Drawings shall be legible. Faxed copies of the Shop Drawings are unacceptable and will be returned without review.
3. Submit drawings to the Engineer for review before equipment is fabricated or sent to the project. Also, submit wiring diagrams pertinent to equipment. Submittals shall be applicable to this project and not a "cover-all" type drawings.
4. "Typical" drawings or general catalog cut-sheets are not acceptable unless they meet the specified product without modification. Manufacturer's standard drawings and cut-sheets may be submitted provided they are made to indicate the items or equipment being provided specifically for this project by the following methods:
   a. Project name, item or equipment name, and other item or equipment identifiers and descriptions are included on the drawings and cut sheets.
   b. All sizes, special features, options, modifications, etc., that are provided specific to this project are noted in some fashion.
   c. All options or features not provided specific to this project are deleted, crossed out, or otherwise removed from consideration.
5. Information to be included in submittals:
   a. Manufacturer's model number or catalog number, size and performance curves and data. Indicate operating point on curves and tabular data, for each piece of equipment that curves or data represent.
   b. Indication of all performance data, construction materials, finishes and modifications to manufacturer's standard design called for in the Specifications
   c. Location of connections for all piping required.
   d. Rough-in foundation and support point dimensions.
   e. Wiring diagrams or connection diagrams pertaining to this project only.
   f. Data shall be coordinated and included in single submittal.
   g. For submissions such as catalogs, delete or strike out information not pertinent to work so that there is no confusion.
   h. Submittals not conforming to the above will be returned without review.
6. Engineer cannot review incomplete Shop Drawings and will not accept responsibility for any delays caused by incomplete Shop Drawing submittals. Complete submittals must include a response to each requirement listed in the Specifications. Include all significant data on Shop Drawing submittals shown in Specifications. Submittals which do not comply with these requirements will be returned as an incomplete submittal.

7. Submit Shop Drawings in brochure form and include all related items in one brochure.
8. Contractor agrees that Shop Drawing submittals processed by the Engineer are not Change Orders; that the purpose of Shop Drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and materials he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.
9. Contractor further agrees that if deviations, discrepancies or conflicts between Shop Drawings and Specifications are discovered either prior to or after Shop Drawing submittals are processed by the Engineer, the design Drawings and Specifications shall control and shall be followed.
10. If any part of a Shop Drawing lists data or information which is in conflict or differs from the Specification or Drawings, clearly indicate the difference or conflict on the submittal and include in a cover letter a description of the differences listed under "Exceptions to the Specifications and/or Drawings". Submittals which contain differences or discrepancies which are not noted may be rejected.
11. Contractor shall not markup shop drawings in red ink. Engineer will make all his review comments in red ink.
12. If the first Shop Drawing submittal is rejected by the Engineer, and the second Shop Drawing submittal for the same item is also rejected by the Engineer, then the review fees and expenses that the Engineer incurs in conjunction with the review of the third and subsequent Shop Drawing submittals shall be charged to the Contractor by the Owner, and the Contractor shall reimburse the Owner. Engineer's review fees and expenses shall be based upon the current "Hourly Rate and Reimbursable Expense Schedule" of the Engineer and this compensation shall be paid to the Owner within 30 days of being invoiced. As an option, Owner may withhold Engineer’s review fees and expenses from payment to Contractor.
13. Review of Shop Drawings does not relieve Contractor of responsibility for correct ordering of material and equipment. Contractor review should ensure that equipment will fit in available space.
14. Affix Contractor’s company name and date in form of a stamp, to all Shop Drawings submittals before submitting. The signature of Contractor's Representative is required.
15. Contractor's Certification: Material data and Shop Drawings shall be submitted by the Contractor with a cover letter, or the Contractor's stamp of approval, indicating that he has reviewed, checked, and approved the data submitted; that they are in compliance with the requirements of the project and with the provisions of the Contract Documents; that any exceptions to the Specifications or Drawings are specifically noted or pointed out as such; and that he has verified all field measurements and construction criteria, materials, catalog numbers, and similar data.

B. The Engineer shall have 21 calendar days from the date of submittal to review and return submittals. The Contractor shall not be allowed any claims for shop drawing review that is completed within the 21-day review period. The Engineer may agree to expedite his shop drawing review on an item by item basis, but it is imperative

that all shop drawing submittals be complete and properly marked as indicated in this Section.

C. Procedure for seeking Engineer's review of the Shop Drawings

1. Submit complete sets of Shop Drawings and other descriptive data together with a letter of transmittal to the Engineer for review. The letter of transmittal shall contain the name of the project, workmanship and materials section number, the name of the Contractor, the list of drawings submitted including numbers and titles, requests for any approval of departures from the contract requirements, and any other pertinent information as required for the items being submitted.
2. Engineer's review comments shall have the following meaning:
   a. If a drawing or descriptive data is stamped "No Exceptions Taken" or "Make Corrections Noted", then no further submittals by the Contractor will be required and a letter of transmittal will be returned to the Contractor.
   b. If a drawing or descriptive data is stamped "Make Corrections Noted", make the corrections indicated and proceed as noted.
   c. If a drawing or descriptive data is stamped "Rejected-Resubmit" or "Revise and Resubmit", the Contractor will receive marked copies with a letter of transmittal noting the Engineer's review comments. Make the necessary corrections and resubmit the documents, as required. The letter transmitting corrected documents shall indicate that the documents comprise a re-submittal.
3. If any corrections, other than those noted by the Engineer, are made on a Shop Drawing prior to re-submittal, such changes should be pointed out by the Contractor upon re-submittal.
4. Revise and resubmit the Shop Drawings as required, until the submittal is marked "No Exceptions Taken" or "Make Corrections Noted".
5. Failure to provide required information and certification with or on the submittals shall be cause for the return of Shop Drawings or equipment data without review or other action.

3.04 Equipment Manuals

A. Submit Manufacturer Operation and Maintenance (O&M) Manuals to the Engineer for review a minimum of 60 days prior to system start up for each respective system or equipment. System or equipment start up and substantial completion may be delayed at the discretion of the Engineer if O&M Manuals are not received by the Engineer in the time frame specified herein.

B. The status of the Operation and Maintenance (O&M) Manual must be marked as NO EXCEPTIONS TAKEN or MAKE CORRECTIONS NOTED by Engineer before equipment can be placed into service for operation by the Owner.

C. Furnish two (2) printed sets and one (1) electronic copy in searchable, bookmarked PDF (Adobe or other) format of the equipment manufacturer's O&M materials and manuals to the Engineer. The electronic PDF shall use OCR (Optical Character Recognition) for alphanumeric recognition of all printed characters.

D. All O&M Manuals submitted shall be specific for the items and models furnished under this contract and reflect as-approved and as-installed information. Standard manuals from equipment suppliers which reflect all sizes and options of equipment available from the supplier shall be clearly marked to indicate the applicable sizes and options specific to this project. All non-applicable information shall be marked as such by crossing out. Indicate actual model numbers and equipment options. Manuals not marked as indicated above will be returned to the Contractor without review.

E. Manual Organization

1. Organize O&M Manuals into suitable sets of manageable size.
2. Bind data into individual binders for each manual, properly identified on front and spine. For large manuals, provide an index sheet and thumb tabs for separate information categories.
3. Provide heavy-duty, three-ring, vinyl-covered binders, 1/2 to 3 inches thick as required to contain information, sized for 8½" x 11" or 11" x 17" paper with inside pockets or pocket folders for folded sheets.
4. Operation and Maintenance Data shall be arranged in a Technical Manual in the following format:
    a. Category 1 - Equipment Summary:
        1) Summary: A summary table shall indicate the equipment name, equipment number, and process area in which the equipment is installed.
    b. Category 2 - Operational Procedures:
        1) Procedures: Manufacturer-recommended procedures on the following shall be included in Category 2:
            a) Installation
            b) Adjustment
            c) Startup
            d) Location of controls, special tools, equipment required, or related instrumentation as needed for operation
            e) Operation procedures
            f) Waste disposal
            g) Load changes
            h) Calibration
            i) Shutdown
            j) Troubleshooting
            k) Disassembly
            l) Reassembly
            m) Realignment
            n) Clearances and tolerances
            o) Testing to determine performance efficiency
            p) Tabulation of proper settings for all pressure relief valves, low- and high-pressure switches, and other protection devices
            q) List of all electrical relay settings including alarm and contact settings
    c. Category 3 - Preventive Maintenance Procedures:
        1) Procedures: Preventive maintenance procedures shall include all manufacturer-recommended procedures to be performed on a periodic

basis, both by removing and replacing the equipment or component, and by leaving the equipment in place. This includes but is not limited to:

a) A written explanation with illustrations as required for each preventive maintenance task, including finishes.
b) Recommended intervals for execution of preventive maintenance tasks.
c) Lubrication and other consumables charts.
d) Table of alternative lubricants.
e) Troubleshooting instructions to aid in the diagnosis of common equipment problems.
f) List of required maintenance tools and equipment. Contractor shall provide all maintenance tools and equipment specified by the manufacturer as necessary for the proper operation, calibration and maintenance of the item provided.

2) Schedules: Recommended frequency of preventive maintenance procedures shall be included. Lubrication schedules, including lubricant SAE grade, type, and temperature ranges, shall be covered.
3) Interaction: Descriptions of any interactions while operating major subsystems or components.

d. Category 4 - Parts List:
   1) Parts List: A complete parts list shall be furnished, including a generic description and manufacturer's identification number for each part. Addresses and telephone numbers of the nearest supplier and parts warehouse shall be included.
   2) Drawings: Cross-sectional or exploded view drawings shall accompany the parts list.
e. Category 5 - Wiring Diagrams:
   1) Diagrams: Part 5 shall include complete internal and connection wiring diagrams for electrical equipment items.
f. Category 6 - Shop Drawings:
   1) Drawings: This part shall include approved shop or fabrication drawings, complete with dimensions.
g. Category 7 - Safety:
   1) Procedures: This part describes the safety precautions to be taken when operating and maintaining the equipment or working near it.
h. Category 8 - Documentation:
   1) All equipment warranties, affidavits, and certifications required by the Technical Specifications shall be placed in this part.

5. The Technical Manual shall be subdivided first by specification section number; second, by equipment item; and last, by category.

F. Information to be Included

1. Include in each O&M Manual information specified in individual Specification Sections and the following:
   a. Project title, equipment manufacturer, local equipment supplier, subcontractor, and prime contractor, including contact information (address, phone number, and e-mail) for each.

b. Term, name, or identifier used in the Contract Documents for the item listed.
c. Detailed description of the item.
d. Full nameplate information for each item provided including serial numbers, model number, horsepower, voltage, etc.
e. Owner's assigned equipment or valve number.
f. Copy of manufacturer warranties specific to this project.
g. Copies of factory tests or certified tests and reports, if required by the Specification Section or by referenced standards.
h. Equipment installation instructions.
i. Troubleshooting guide and emergency instructions.
j. Recommended maintenance materials, instructions, and procedures, including schedules, drawings, and diagrams.
k. Precautions against improper maintenance and exposure.
l. Inspection and system test procedures.
m. Complete, detailed written operating instructions for each product or piece of equipment including but not limited to:
    1) operating characteristics;
    2) limiting conditions;
    3) operating instructions for start-up, normal, and emergency conditions;
    4) regulation and control; and
    5) shutdown.
n. Complete, detailed written preventive maintenance instructions as defined in this Section.
o. A manufacturer's recommended spare parts lists including a listing of those spare parts and/or consumables which are to be provided for each equipment item and local sources of supply for parts as applicable.
p. A written explanation of all safety considerations relating to operation or maintenance procedures.
q. Complete parts lists showing parts, catalog numbers and generic description, along with assembly drawing, exploded view or sectional drawing with all parts identified. Parts listing shall include part name and original equipment manufacturer's parts numbers.
r. Copy of all approved shop drawings and copy of warranty bond and service contract as applicable.
s. Copies of revised Shop Drawings and Product Data showing as-installed information, including:
    1) Detailed drawings and descriptions of equipment showing all dimensions, elevations, parts, constructed details, materials of construction, performance data, descriptive literature, weights, and other physical characteristics, including performance curves, motor starting and full-load amps, motor horsepower, and motor data.
    2) Project name, equipment name, tag numbers, location, and/or other identifying description included on the drawings and cut sheets.
    3) All sizes, special features, options, modifications, etc., that are provided specific to this project.
    4) All options or features not provided specific to this project are deleted, crossed out, or otherwise removed.

t. Electrical & Controls Information:
   1) Detailed drawings and descriptions of electrical and controls equipment, including main and auxiliary control panels, showing all dimensions, parts, constructed details, and materials of construction.
   2) Complete electrical system drawings and description including, but not limited to, the following:
      a) Complete system interconnection diagrams between power supply, control panels, drive motors, secondary drive motors, and all ancillary equipment connected to control system, including terminal number connection points.
      b) Control panel overall dimensions and layout of external and internal mounted components.
      c) Complete electrical schematics with power wiring and control wiring in accordance with current standards. Schematics shall include all component ratings.
   3) Complete motor rating including all nameplate data, guaranteed minimum rated efficiency, and speed torque curves
   4) Description of control system in written form including functions monitored, controlled, and alarmed. Include sequence of operation and interface requirements.

G. Each prime contractor is responsible for O&M manuals for its own Work. Where a manual includes information on installations by more than one contract, the Contractor who is the principal source of information, as designated by the Engineer, is responsible to receive information from other contractors, coordinate and collate information for a unified manual, and provide binders and submittal as specified.

3.05 Partial Payment Claims

A. These claims are described in the General Conditions. Four (4) sets of these fully executed claims shall be submitted to the Engineer monthly as determined at the Preconstruction Conference.

B. Submit to the Engineer one copy of all purchase orders, invoices and delivery tickets for materials claimed as stored materials, or for pay items based on a unit of weight or volume of material installed, on partial payment claims. Prices must be shown on the invoices or delivery tickets if the Contractor is claiming reimbursement for materials stored onsite, in the possession of the Owner. Amounts claimed for stored materials cannot exceed the amounts indicated in the invoice for the applicable items. Amounts claimed for a stored material shall not exceed the value of that work item listed on the approved Schedule of Values.

-END-

SECTION 01400 – QUALITY ASSURANCE AND QUALITY CONTROL

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Documents requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Documents requirements.
3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.02 Definitions

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratories shall mean the same as testing agency.

1.03 Delegated Design

A. Where professional design services or certifications by a design professional are specifically required of the Contractor by the Contract Documents, provide these services and certifications in compliance with specific performance and design criteria indicated. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

B. Submit a statement, signed and sealed by the responsible design professional, for each product or system specifically assigned to Contractor to be designed or certified by a design professional, indicating the products or systems are in

compliance with performance and design criteria indicated. Include list of codes, loads, and other design factors used in performing these services.

1.04 Tests and Inspections

A. All materials and each part or detail of the work shall be subject to inspection by the Owner and Engineer at all times. The Owner and Engineer shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

B. Shop inspections may be required including observations of the preparation, manufacture and coating of materials and products at the plant.

C. The inspection of the work shall not relieve the Contractor of any obligation to fulfill his contract as prescribed. Defective work shall be made good and unsuitable materials shall be rejected, not withstanding that such defective work and materials have been previously overlooked and accepted on estimates for payments.

D. All work shall be tested to the satisfaction of the Owner and Engineer before acceptance. The cost of all tests is to be borne by the Contractor.

E. Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents within 30 days of Notice to Proceed. Include the following information in the schedule:

1. Specification Section number and title
2. Description of test and inspection
3. Identification of applicable standards
4. Identification of test and inspection methods
5. Number of tests and inspections required
6. Time schedule or time span for tests and inspections
7. Entity responsible for performing tests and inspections
8. Requirements for obtaining samples
9. Unique characteristics of each quality-control service

F. Distribute schedule to Owner, Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

G. Prepare and submit certified written reports that include the following:

1. Date of issue
2. Project title and number
3. Name, address, and telephone number of testing agency
4. Dates and locations of samples and tests or inspections
5. Names of individuals making tests and inspections
6. Chain of Custody Record (where applicable)
7. Description of the Work and test and inspection method
8. Identification of product and Specification Section
9. Complete test or inspection data

10. Test and inspection results and an interpretation of test results
11. Ambient conditions at time of sample taking and testing and inspection
12. Comments or professional opinion on whether tested or inspected Work complies with the Contract Documents requirements
13. Name and signature of laboratory inspector
14. Recommendations on retesting and reinspection

1.05 Submittals

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article, submit data to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.06 Quality Assurance

A. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

C. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspection indicated, and that specializes in types of tests and inspections to be performed.

1.07 Quality Control

A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
2. Do not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

C. Retesting/Reinspection: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspection, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspection equipment at Project site.

F. Schedule time for tests, inspections, obtaining samples, and similar activities. Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 Repair and Protection

A. On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

-END-

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Providing and coordinating temporary facilities, utilities and controls.

B. Related Sections

1. Section 01010 – Summary of Work
2. Section 01090 – Reference Standards

1.02 References

A. Ohio Manual on Uniform Traffic Control Devices (OMUTCD), latest editions

1.03 Submittals

A. Quality Assurance/Control Submittals

1. Before beginning work adjacent to any street, provide the Engineer with a proposed signing schedule, which shall include location, size and messages at all signs to be used.

1.04 Quality Assurance

A. Regulatory Requirements

1. Obtain permits as specified in Section 01010.
2. Comply with the latest applicable Federal, State, and local codes, including but not limited to, the agencies and codes specified in Section 01090.
3. Maintain lights and barricades on all obstructions and hazards during contract period in conformance with federal, state and local laws and codes.

PART 2 - PRODUCTS

2.01 Temporary Facilities, Utilities and Services

A. Sanitary Facilities

1. Provide sanitary facilities for use of all construction personnel including personnel of other contractors for the duration of the project as follows:
   a. Chemical units complete with weather-tight enclosure adequately ventilated and equipped with latching door.
   b. Maintain chemical units weekly or at lesser periods if determined necessary. Chemical units shall be in accordance with the rules and regulations of the locality of the project (State, county or city).

c. Furnish toilet paper and hand sanitizer for the chemical units and replenish supply as needed.

B. Water and Electric Service

1. Install and maintain all extensions from the service sources to work areas as required providing adequate water supply and electric power for all aspects of the work and in accordance with all relevant codes and regulations.

C. Heat and Ventilation

1. Provide heat and ventilation as required to maintain specified conditions for construction operations, to provide for a safe working environment in accordance with health regulations, and to protect materials and finishes from damage due to temperature or humidity. Follow requirements set forth elsewhere in these Specifications.
2. Whenever fixtures, water services or items subject to damage from cold have been installed, maintain the temperature above 50 degrees Fahrenheit.
3. Prior to operation of permanent facilities for temporary purposes, verify that installation is approved for operation, and that filters are in place. Provide and pay for operation, maintenance, and utilities and fully service all equipment, including cleaning filters, until the time the Work is turned over to the Owner.
4. Provide ventilation of enclosed areas to cure materials, to disperse humidity, and to prevent accumulations of dust, fumes, vapors, or gases.
5. No open fires will be permitted.

D. Trash Containers

1. Provide a trash container for the disposal of packaging materials, pieces of broken pipe, rubbish, trash and all other debris. Empty trash containers weekly or as container is filled.

E. Fire Extinguishers

1. Provide multipurpose dry chemical fire extinguishers as required. Mount units in protective red enclosures plainly marked and readily accessible.

F. Bulletin Board

1. Provide a bulletin board or display area to post required notices in an appropriate weather-protected manner.

G. Construction Signs and Equipment

1. Provide and erect construction signs, lights, channelizing devices, and other traffic control equipment in accordance with the OMUTCD.

PART 3 - EXECUTION

3.01 Installation

A. Locate temporary facilities herein specified, and facilities required by the Contractor and his Subcontractors for storage or other purposes in the performance of their contracts, to avoid interference with work. Relocate as required and/or directed by Owner and Engineer.

B. Construct temporary structures on stable foundation with code approved service connections.

C. Install temporary electrical service and distribution overhead. Do not run branch circuits on floor.

3.02 Protection

A. Piping Rough-ins: Keep foreign materials out of piping by capping or other protection. Trades responsible for stoppage will be charged for cleaning.

B. Safety: Maintain signs, lights, and barricades on all obstructions and hazards during construction period in conformance with local, state, and federal laws and codes.

3.03 Access Roads and Parking Areas

A. Provide and maintain vehicular access to the site and within the site for use by persons and equipment involved in the construction of the project. Maintain access roads and driveways with sufficient compacted aggregate to provide a suitable support for vehicular traffic and anticipated loads.

B. Provide and maintain temporary parking facilities for use by construction personnel, the Owner, and the Engineer. Maintain parking facilities free of construction materials, mud, snow, ice and debris.

C. Restore areas to original or to specified conditions shown on the Drawings at completion of the work.

3.04 Maintenance of Traffic

A. General

1. Comply with the requirements of the State, City or County Highway and Street Departments for all traffic maintenance.
2. Maintain all construction signs, lights, channelizing devices, and other traffic control equipment in proper working order.
3. During construction, maintain and protect the pedestrian and vehicular traffic at all times on all streets involved and provide access to all residential and commercial establishments adjacent to the construction area.

B. Notification Requirements

1. Before closing any thoroughfare, notify and, if necessary, obtain a permit or permits from the duly constituted public authority having jurisdiction (state, county, or city).
2. Notify the Owner and Engineer of intended road or drive closures 72 hours in advance of the proposed closing. Place all proper detour signs and barricades prior to the actual street closing.
3. Notify each resident or property owner of work which will impact access to his property a minimum of 2 business days in advance of restricting access to the property.

C. Lane/Road Restriction Requirements

1. Do not unduly or unnecessarily restrict or impede normal traffic through the streets of the community. Keep the traveled way of all streets, roads, and alleys clear and unobstructed. Do not use streets, roads, or alleys for the storage of construction materials, equipment supplies, or excavated earth, except when and where necessary.
2. Adjacent street segments shall not be closed at the same time to reduce delays for emergency responders. For this requirement, an "adjacent street segment" shall include the next block of the same street in either direction, the same block of a parallel street in either direction, and the nearest blocks of perpendicular (connecting) streets in all directions.
3. Daily lane closures on the public streets may be permitted. Lane closures are only permissible between 7:00 am and 5:00 pm, weekdays. Unless otherwise provided, maintain at least one 12-foot wide lane of traffic at all streets and service drives during construction of the project. Provide flagmen or temporary signals where required to maintain flow of traffic. During non-construction hours, open all lanes for public use.
4. The Contractor may limit or prohibit public parking within the limits of the project.
5. If required by duly constituted public authority, construct bridges or other temporary crossing structures over trenches at no additional cost to Owner. Such structures shall be of adequate strength and proper construction and shall be maintained in such manner as not to constitute an undue traffic hazard.

D. Access to Private Property

1. Private driveways shall not be closed, except when and where necessary, and then only upon advance notice to the Engineer and for the shortest practicable period of time, consistent with efficient and expeditious construction. When a residential driveway is closed due to construction activity, designate safe parking areas and provide access to adjacent properties. The Contractor shall be liable for any damage to persons or property resulting from his work.
2. Maintain a clean pedestrian access to all establishments within the project limits during construction by use of temporary bridging or other means.

E. Walks and Passageways

1. Make provisions at cross streets for the free passage of vehicles and foot passengers, either by bridging or otherwise.
2. Do not unnecessarily obstruct the sidewalks, gutters, or streets, or prevent in any manner the flow of water in streets. Use all proper and necessary means to permit the free passage of surface water along the gutters.
3. Immediately remove and dispose of excavated materials and offensive matter to avoid inconveniencing the public and adjacent tenants. Erect suitable barriers to prevent such inconveniences and to prevent injury to trees, sidewalks, fences, and adjacent properties.
4. At any time during construction, when there is not a curb adjacent to the roadway, place barricades as shown on the Drawings or as directed by the Owner. Protect any gaps adjacent to an open sidewalk with orange snow fencing.

F. Pavement Restoration

1. Streets in which excavation has occurred shall be temporarily restored to receive traffic as soon as possible. Permission to close additional streets shall be denied the Contractor if, in the opinion of the Owner or Engineer, the restoration on streets where excavation has occurred has not progressed satisfactorily.
2. Maintain the road surfaces during the construction, take precautions to prevent unnecessary damage to partially completed surfaces, and repair any portions which do become damaged. Bear all costs involved in such maintenance, precautions, and repairs, including the cost of all necessary materials.

3.05 Barricades, Warning Lights and Arrow Boards

A. Provide, erect and maintain all necessary barricades, suitable and sufficient danger signals and signs. Take all necessary precautions for the protection and safety of the public, workmen, structures and equipment. Roads closed to traffic shall be protected by effective barricades. Obstructions shall be illuminated during hours of darkness.

B. Erect warning signs in advance of any location on the project where operations may interfere with the use of the road by traffic and at all intermediate points where the new work crosses or coincides with an existing road.

C. Place sufficient warning lights and arrow boards on or near the work and keep them illuminated during periods of construction and reduced visibility (from twilight in the evening until sunrise). The Contractor is responsible for all damages that any party or the Owner may sustain in consequences of neglecting the necessary precautions in prosecuting this work.

3.06 Removal and Clean-Up

A. Remove all temporary facilities, utilities, services and materials upon completion of construction. Remove debris and clean area. Repair all damage and restore area to finish condition.

-END-

SECTION 01550 – OPERATIONS DURING CONSTRUCTION

PART 1 - GENERAL

1.01 Summary

A. Section Includes:

1. Furnishing and installing temporary facilities and services, scheduling and sequencing of construction, and utilizing construction procedures necessary to maintain wastewater treatment and pumping operations during construction.
2. Requirements for developing a plan for construction activities, scheduling, and sequencing construction to maintain wastewater treatment and pumping operations during construction.
3. Specific requirements which may influence the Contractor's Bid Price and scheduling are included in this Section. However, specific procedures are not limited to the ones included in this Section, and additional and more detailed procedures may be required during construction. If requested by the Engineer, provide a written plan describing how these requirements will be met. Include all costs in Bid Price for meeting the requirements described in this Section.

B. Related Sections

1. Section 02050 – Demolition

1.02 System Description

A. The Owner owns and operates a wastewater collection and treatment system that currently consists of individual septic tanks Owned by the Village at each parcel. The septic tank discharge is collected via a small diameter gravity sewer system which all flows to the Wayne Street Lift Station where system flows are pumped directly to the aeration basin at the WWTP. The WWTP is an extended aeration treatment process consisting of a lined earthen aeration basin and sludge holding basin. Clarification is provided by a pair of pre-cast rectangular secondary clarifiers and disinfection is achieved using tablet chlorination and de-chlorination. Return and waste sludge flows are conveyed via an airlift pump in each clarifier. Solids are removed via liquid hauling.

1.03 Submittals

A. Provide a written plan detailing how the requirements for maintaining treatment, electrical, and other utility operations will be met. Indicate sequencing and scope of each item of work, including requirements for the removal of existing equipment or items from service and the duration of the removal from service. Include dates for the beginning and commencement of each task.

B. The Engineer will review the plan only for compliance with the intent of maintaining operation of the water facilities during construction.

C. Make revisions to the written plan submitted based on the Engineer's review and incorporate those revisions into the Project.

1.04 Maintaining Operations

A. It is essential that treatment in the existing wastewater treatment/pumping facilities is not interrupted during construction or diminished in quality/quantity by construction procedures or methods.

B. Accomplish connections to the existing piping, installation of valves and tees in the existing piping, modifications to existing tanks, and installation or removal of any treatment unit with minimal interruption of flow through these facilities.

C. Include in Bid Price and bear all expenses required to maintain wastewater treatment or pumping operations during construction of new facilities, including temporary pumping and piping, temporary electrical service, and other operations and services.

D. Should temporary facilities be required, have on site, or at immediate accessibility, back-up facilities in the event of failure of the primary temporary units.

E. Procedures as set forth herein are included as a guide only and do not relieve the Contractor from any costs to provide and maintain any or all temporary facilities and equipment that may be required to maintain full plant/pumping operation during the construction period. The Contractor may use procedures other than those set forth herein with prior approval of the Engineer. The approval of the Engineer shall be only for compliance with the intent of maintaining full operation of the treatment/pumping facilities.

1.05 Construction Schedule

A. Notify the Owner and Engineer one week in advance of any interruptions or access to existing treatment/pumping facilities. Such interruptions shall be strictly coordinated with the Plant Superintendent.

1.06 Plant Operations and Maintenance

A. Existing facilities: Existing facilities which are required to be in service during their modification will be operated by the Owner.

B. Temporary facilities: Furnish and install temporary facilities and equipment, such as pumps, piping, flumes, valves, gates, etc. required to maintain full wastewater treatment and pumping operations in the existing facilities.

1. Operate temporary facilities and equipment 24 hours a day if needed to maintain the treatment process.
2. Coordinate, and provide instructions for, the operation of temporary facilities in writing to the Engineer.
3. Provide, and pay energy costs for, temporary utilities.

C. New Facilities: Operate and maintain new facilities prior to completion of construction whether utilized or not in the treatment/pumping process.

1. New facilities/equipment required to be in service before acceptance by the Owner will be operated by and maintained by the Contractor.

D. Operation of new or modified facilities/equipment by the Owner before tested and accepted does not imply acceptance of these facilities/the equipment by the Owner.

E. New or modified facilities and equipment which have been completed, tested, and accepted by the Owner per Specification Section 01650, Article 1.05 will be operated and maintained by the Owner.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 General Procedures

A. Schedule and coordinate the Work so that:

1. Minimal interruptions are made to facility operations,
2. The number of process shut downs are minimized, and
3. Portions of the facility which are shut down or taken out of service are minimized.

B. As a general rule, a shutdown for a specific process will be provided only once, and the Contractor is responsible for completing all work necessary for that item during that time and within the time frame specified.

C. Prior to the start of modifications to any existing facility, assemble labor, materials, and equipment required to complete the modifications without interruption and/or inordinate delays.

D. Coordinate Work for connections of new piping to existing piping or new pipe to existing structures so that all new piping necessary is installed up to the connection point and connections can be made with minimal process interruption.

E. Coordinate discharge from dewatering of existing tanks with the Engineer and Plant Certified Operator. The Owner is responsible for draining existing tanks and structures to the extent possible using existing equipment unless specifically stated otherwise. The Contractor is responsible for cleaning and removing remaining residuals and debris from the drained tanks to the extent needed to perform the Work.

F. Complete modification to one existing facility, or connection to one existing pipeline, before starting another modification or connection to existing facilities. Avoid modification and connections to more than one of the existing facilities simultaneously, unless approved by the Engineer.

G. Where bypass pumping is required, the Contractor is responsible for determining pumping requirements. Provide bypass pumps sized to pump the peak flow for which a bypassed process or portion of the plant is designed. If requested by the Engineer or Owner, provide back-up equipment on site in case the primary equipment should fail.

3.02 Timing

A. Coordinate construction which requires any portion of the treatment/pumping facilities to be taken out of service with the Engineer. Be prepared to undertake these procedures at times of low flow, if necessary.

3.03 Specific Procedures

A. Improvements to the Existing Polishing Basin (EQ Basin) shall be fully complete prior to draining and cleaning the Existing Aeration Basin and replacing all Aeration Basin diffusers.

B. The Aeration Basin may be taken offline, one-time, for a maximum of 72 hours, during dry-weather conditions, for the purposes of cleaning the Existing Aeration Basin and replacing all diffusers. While the Aeration Basin is offline, raw sewage from the Wayne Street Lift Station may be pumped to the improved Polishing Basin (EQ Basin) for temporary treatment. Ensure that a minimum of 1-ft. of freeboard is maintained in the EQ Basin while the Aeration Basin is offline, and if necessary, transfer the contents of the EQ Basin to the Aerobic Digester for additional storage. At no point shall raw sewage exceed the capacity of the existing basins.

C. The Contractor is responsible for bypass pumping at the Wayne Street Lift Station while out of service. Annual average daily flow is 57,500 gpd, maximum daily flow 246,000 gpd. Contractor is responsible for conveying all flows while completing the work specified and indicated on the Drawings.

D. The power may be shutdown at the WWTP for a maximum of 12-hours for the purposes of installing the new 200A service rated disconnect and manual transfer switch. Notify Engineer and Owner in writing a minimum of 1-week in advance of completing this transfer.

E. The complete Sludge Dewatering System, including sludge feed pump, polymer feed system, related piping, dewatering slab and dumpster, and related startup/training shall be completed a minimum of 1-month prior to cleaning of the Aerobic Digester and replacement of all diffusers within the Aerobic Digester. This will allow the Owner to drain and dewater the accumulated solids within the Aerobic Digester using the Sludge Dewatering System. This work shall also be complete prior to the cleaning and diffuser replacements in the Aeration Basin.

F. The existing disinfection system cannot be taken out of service until the new disinfection system is ready for permanent service (pertains only during disinfection season April 1 – October 31).

G. Collection system sewer cleaning and televising shall not be completed until all septic tanks have been replaced/installed, the Wayne Street Lift Station improvements have been completed, and the Aerobic Digester and Solids Handling System improvements are complete.

H. A summary of tasks dependent on other work, as identified in sections A – G, above, is as follows:

1. WWTP - Aeration Basin: EQ basin modifications shall be completed prior to taking the basin offline for cleaning and diffuser replacement.
2. WWTP - Aerobic Digester: Sludge dewatering system shall be online prior to taking the aerobic digester offline for cleaning and diffuser replacement.
3. WWTP - Electrical Disconnect: EQ basin modifications shall be complete prior to the installation of the new 200A manual disconnect.
4. WWTP - UV Disinfection: Contractor shall maintain effluent disinfection during construction, unless UV work is performed outside of the Village's disinfection period (April 1 – October 31).
5. Collection System - Sewer Cleaning and Televising: Work shall be completed following installation of all new septic tanks, and completion of the Wayne Lift Station improvements, Aerobic Digester improvements, and Sludge Dewatering System improvements.

3.04 Site Access

A. The project site is fenced and gated. Coordinate access to the site, including access to gated drives and locked facilities, with the Owner.

B. Schedule the construction of the new drives and demolition of existing drives and/or construct temporary drives as necessary to provide uninterrupted access to existing facilities.

C. Provide access at all times when the Contractor is not working on the site.

D. Interruptions to access when the Contractor is working on the site shall only occur when connections between new or temporary drives and existing drives are being constructed or removed. Coordinate this Work with the Engineer and Owner.

E. Sufficiently stabilize and maintain temporary drives to permit passage of fully loaded semi-trailer trucks without assistance from other vehicles or construction equipment.

-END-

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 Delivery, Storage and Handling

A. The delivery, receipt, storage and handling of all fixtures, equipment, materials, components and appurtenances (collectively “products”) shall be the responsibility of the Contractor.

B. Load and unload all products by lifting with hoists and skidding to avoid shock or damage. Under no circumstances shall products be dropped.

C. Do not skid or roll products on or against other products. Use padded slings, hooks, pipe tongs, etc, to handle all products in a manner to prevent damage.

D. Pack, transport and store all equipment components and motors in protective enclosures such that they are not subjected to forces or elements that may result in damage. Promptly remove damaged products from the job site and replace with undamaged products.

E. Do not stack equipment components or motors. Adequately support equipment during transport and storage to prevent undue stress.

F. Obtain storage space for all products used on this project. The Owner will not receive, store or house products being delivered to the site for Contractor or his Subcontractor.

G. Store products to prevent dirt and debris from entering and accumulating. Protect products from heat, cold, sunlight, contamination and other adverse conditions.

H. Deliver, store, protect, and handle products in accordance with the manufacturer’s instructions. Products not properly stored or protected may be subject to rejection as determined by the Engineer.

1.02 Local Labor and Materials

A. Whenever possible, the Contractor, his subcontractors, material men, or others who employ labor, shall employ labor locally.

B. Purchase materials such as sand, cement, gravel, pipe, steel, and lumber from local dealers when such local dealers' prices meet competition’s and where such materials meet the Specifications.

1.03 Domestic Product Requirements

A. All steel and foundry products provided for public works projects, including ferrous and non-ferrous metals, piping, fittings, and piping-related products, shall be manufactured in the United States as specified in Section 153.011 of the Ohio Revised Code.

1.04 Unavailability of Materials and Equipment

A. Bids must be based on use of the products specified, subject to the provisions of any addenda issued. If the Contractor is unable to furnish or use any of the products specified because of any order by a governmental agency limiting the manufacture or use, or because of the lack of availability in the market for such products, the Contractor shall offer substitutes suitable for the purpose, considering the factors of quality, serviceability, appearance, and maintenance. No substitute shall be used until it has been approved by the Engineer.

B. No consideration will be given to the use of substitutes on account of market conditions unless the Contractor demonstrates that, for the item in question, he placed his order and submitted shop drawings without delay, that he has shown due diligence in attempting to locate the item as specified, and that the unavailability is due to market conditions in general throughout the particular industry.

C. If substitutes are used in the work, the compensation to be paid to the Contractor shall be subject to review and adjustment. The basis upon which the amount of price and adjustments will be founded shall be the cost of the appropriate items at the time the bids were opened.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

-END-

SECTION 01650 – STARTING OF SYSTEMS

PART 1 - GENERAL

1.01 Summary

A. Section Includes:

1. Starting of equipment and systems
2. Demonstration, training and instructions
3. Acceptance of Equipment

1.02 Submittals

A. Submit O&M Manuals to the Engineer for review prior to system start up for each respective system or piece of equipment in accordance with Section 01300.

B. Provide an abstract or outline of the start-up, testing and training procedures to the Engineer at least five (5) days prior to the scheduled start-up.

C. Following start-up, a typed, bound Start-Up Certification Report covering the manufacturer's representative's findings shall be submitted to the Engineer for review and approval. The report shall certify that the equipment is properly installed and functioning for the purpose intended. The report shall include the following:

1. Type of inspections performed;
2. A description of the start-up procedures taken;
3. Detailed description of any deficiencies observed along with the corrective measures taken;
4. The results of all field tests, including necessary graphs, charts, tables, etc., specified in the detailed Specification or required by the referenced standards.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 Examination

A. Verification of Conditions

1. Verify that each piece of equipment for system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
2. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

3. Verify that wiring and support components for equipment are complete and tested.

3.02 Preparation

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Engineer seven days prior to start-up of each item. Coordinate system or equipment start-up with Plant Superintendent and Engineer.

3.03 Field Quality Control

A. Manufacturers Field Service

1. Execute start-up under supervision of applicable manufacturer's representative and Contractor's personnel and in accordance with manufacturer's instructions. When indicated in individual Specification sections, require manufacturer to provide an authorized representative to be present at the site.
2. Manufacturer's services shall be furnished at the Contractor's expense.
3. The services provided shall be by a qualified representative for the specified period of time and for the specified number of trips. A working day is defined as a normal 8-hour working day on the job and does not include travel time.
4. Manufacturer's services shall include:
   a. Inspect the complete installation of the equipment.
   b. Place the equipment in operation and make any necessary adjustments.
   c. Perform tests specified in the detailed Specification and as recommended by the equipment manufacturer.
   d. Instruct Owner's personnel in the proper operation and maintenance of the equipment (training) as described in Article 3.04.
5. The purpose of these services is to demonstrate to the Owner and Engineer's complete satisfaction that the equipment has been properly installed and will satisfactorily perform the functions for which it is intended.

B. If equipment or systems are not completed for proper start-up and training procedures, the representative shall schedule another visit at no additional cost to the Owner. The Contractor shall bear all expenses associated with the start-up, testing and training procedures, and required reporting, including labor, transportation, lodging and material costs.

3.04 Demonstration, Training and Instructions

A. Training will not be permitted without prior start-up and operation of the equipment. Training shall be performed separate and distinct from start-up and testing tasks. Manufacturer's O&M Manuals and materials shall be incorporated in the training procedures, with emphasis on items or materials of greatest importance.

B. Demonstrate project equipment and instruct in a classroom environment located at the plant site. Instruction shall be by a manufacturer's representative who is knowledgeable about the equipment and its application to the project.

C. Utilize O&M Manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate start-up, operation, control, adjustments, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time at equipment location.

E. Prepare and insert additional data in O&M Manuals when need for additional data becomes apparent during instruction.

F. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

G. Provide demonstration such that the Owner may video the training if so desired.

3.05 Acceptance of Equipment

A. Acceptance of equipment shall be defined as that point in time when the following requirements have been fulfilled and the equipment is placed in operation:

1. All required submittals and documentation have been submitted, and are acceptable to the Engineer.
2. All start-up and training procedures have been satisfactorily performed and the Start-Up Certification Report has been submitted, and is acceptable, to the Engineer.
3. All equipment O&M Manuals and materials have been submitted, and are acceptable to the Engineer.
4. All spare parts have been provided to the Owner.

B. The date of formal acceptance by the Owner for a particular item of equipment, or Date of Acceptance, shall be the date of Substantial Completion as described in the General Conditions, unless specifically approved otherwise by the Engineer.

C. Equipment which is absolutely necessary to be placed into operation prior to Substantial Completion may be accepted by the Owner as described in the General Conditions, provided that all the above requirements have been met. Once the Start-Up Certification Report has been submitted and is acceptable to the Engineer, an Acceptance Agreement for Partial Work Completed may be issued, which indicates the Date of Acceptance. The Contractor shall maintain ownership and have total responsibility for the equipment until the Date of Acceptance Agreement for Partial Work Completed is agreed to by all parties. The Owner shall provide regular operation and maintenance of the equipment after acceptance. Only equipment which must be placed into operation prior to Substantial Completion in order to maintain adequate treatment through the facility will be considered for acceptance prior to Substantial Completion, as determined by the Engineer.

D. The manufacturer's and Contractor's warranty for each item of equipment shall not begin until the equipment is placed into permanent operation, as determined by the Date of Acceptance established for each piece of equipment.

-END-

SECTION 01710 - CLEANING

PART 1 - GENERAL

1.01 Summary

A. Section Includes

1. Intermediate Cleaning During Construction
2. Final Cleaning
3. Final Inspection

1.02 Quality Assurance

A. Requirements of Regulatory Agencies

1. Maintain project in accordance with Occupational Safety and Health Act of 1970 as amended, in terms of cleanup.

1.03 Project/Site Conditions

A. Environmental Requirements

1. Conduct cleaning and disposal operations in accordance with local ordinances, state and federal regulations and anti-pollution laws.
2. Do not burn or bury rubbish and waste materials on project site. Do not dispose of volatile wastes; such as, mineral spirits, oil or paint thinner in storm or sanitary drains.

PART 2 - PRODUCTS

2.01 Cleaning Materials

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 General

A. All cleaning shall be the responsibility of the Contractor unless specifically noted otherwise. If rubbish and debris are not removed from the work areas as specified, or cleaning of the buildings, structures and site are not completed as specified, the Owner reserves the right to have the cleaning done at the expense of the Contractor.

B. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly painted surfaces.

C. Provide on-site containers for collection of waste materials, debris and rubbish.

3.02 Intermediate Cleaning During Construction

A. Execute cleaning to ensure that all structures and buildings, grounds, roadways and property are maintained free from accumulations of waste materials, debris and rubbish caused by construction activities. Remove all surplus materials from the job site on a daily basis.

B. Prior to placing and other equipment and work areas into service, perform intermediate cleaning as follows:

1. Remove and dispose of all temporary structures and debris, including dirt, sand, gravel, rubbish, and waste material from the tanks, filters, and work areas.
2. Thoroughly clean, sweep, and wash down all tanks, filters, and work areas.
3. Thoroughly clean, and when so directed, disinfect all materials and equipment being modified, rehabilitated, and or replaced.
4. Direct all Subcontractors to similarly clean all tanks, filters, and areas in which they have worked, and to thoroughly clean all materials and equipment provided under their contracts.

3.03 Final Cleaning

A. General: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's cleaning instructions.

B. At the completion of work and immediately prior to final inspection, clean the entire Project as follows:

1. Clean the project site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of waste materials, debris, rubbish and foreign substances.
2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
3. Remove tools, construction equipment, machinery, and surplus material from the site.
4. Thoroughly clean, sweep, wash, and polish all work and equipment under the Contract, including finishes.
5. Remove all dirt, sand, gravel, and other material.
6. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish.
7. Remove labels that are not permanent labels.

8. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.
9. Remove snow and ice from access to all buildings and structures, new or existing, affected by the work.
10. Replace air-handling filters, new and existing, if units were operated during construction.
11. Clean new and existing ducts, blowers, and coils, if air-handling units were operated without filters during construction.
12. Vacuum clean all interior spaces, including inside cabinets.
13. Clean transparent materials, including mirrors and glass in doors and windows.
14. Clean interior of all panels, cabinets, pull boxes, and other equipment enclosures.
15. Wash and wipe clean all lighting fixtures, lamps, and other electrical equipment which may have become soiled during construction.
16. Perform touch-up painting.

C. Leave the structures and site in a complete and finished condition to the satisfaction of the Engineer and Owner.

D. At completion of work, remove tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy or operation as applicable.

3.04 Final Inspection

A. In preparation for substantial completion or occupancy, conduct inspection of sight-exposed interior and exterior finished surfaces, and of concealed spaces.

B. After cleaning is complete the final inspection may be scheduled. The inspection will be done with the Owner and Engineer.

-END-

SECTION 01720 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Administrative and procedural requirements for Project Record Documents.

B. Project Record Documents required include the following as applicable:

1. Marked-up copies of Contract Drawings
2. Marked-up copies of Shop Drawings
3. Newly prepared drawings
4. Marked-up copies of Addenda, and Change Orders
5. Marked-up Product Data submittals
6. Field Orders
7. Record Samples
8. Field records for variable and concealed conditions
9. Record information on Work that is recorded only schematically
10. Field Test Reports
11. Equipment Test Reports

C. Related Sections

1. Section 01300 – Submittals

1.02 Maintenance of Documents and Samples

A. File Drawings in accordance with Project Filing Format of Uniform Construction Index. Make documents and samples available at all times for the Engineer's inspections.

B. Store record documents and samples apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition.

1.03 Submittals

A. Record Drawings

1. For substantial completion to be established, deliver one (1) set of "Contractor's Record Drawings" to Engineer. The Engineer will review the Record Drawings prior to acceptance.
2. Contractor may complete Record Drawings in electronic format using Owner-approved CAD-based software.
3. Organize into sets and bind and label sets for the Owner's continued use.
4. If the Engineer determines the Record Drawings are not in conformance with the specifications, the Engineer will return the Record Drawings to the Contractor. Revise the Record Drawings and resubmit to the Engineer prior to

final completion. The Engineer will review the revised Record Drawings for conformance to specifications. If the revised Record Drawings are not in conformance with the specifications the Engineer or a third party as determined by the Owner will then perform all necessary field survey and measurements, field excavations and locations, engineering calculations, and drafting to complete the Record Drawings in conformance with the specifications.

5. The Contractor shall be responsible for payment to the Owner for work to make the corrections and revisions to the incomplete Record Drawings submitted by the Contractor.
6. The Engineer will not recommend Final Completion until Record Drawings are submitted and approved.

B. Markup Procedures

1. During construction, maintain one (1) set of Contract Drawings and Shop Drawings for Project Record Document purposes. Label each drawing "Contractor's Record Drawing" in 2-inch high printed letters. Keep Record Drawings current. Do not permanently conceal any work until required information has been recorded.
   a. Legibly and accurately mark these Drawings in an understandable drawing technique to show the actual installations where the installation varies from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Items required to be marked include as applicable, but are not limited to, the following:
      1) Dimensional changes to the Drawings
      2) Revisions to details shown on the Drawings
      3) Depths of foundations below the first floor
      4) Locations and depths of underground utilities
         a) All valves (gate, plug, air release, combination sewage, etc.) shall be located and referenced to three (3) permanent surface improvements.
         b) All fittings (tees, wyes, bends, crosses, plugs, caps, etc.) shall be located and referenced to three (3) permanent surface improvements.
         c) All force mains shall be located and referenced to the centerline of the road or street at 500 foot minimum intervals.
         d) All structures (manholes, septic tanks, vaults, etc.) shall be located and referenced to three (3) permanent surface improvements.
         e) All sewer laterals shall be located and referenced to the downstream manhole (stationing in feet) and depth of lateral at property line.
      5) Revisions to routing of piping and conduits
      6) Revisions to electrical circuitry
      7) Actual equipment locations
      8) Duct size and routing
      9) Locations of concealed internal utilities
      10) Changes made by Change Order or Field Transmittal Memo
      11) Changes made following the Engineer's written orders

12) Details not on original Contract Drawings

c. Mark record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
d. Mark record sets with red erasable colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
e. Mark important additional information that was either shown schematically or omitted from original Drawings.
f. Note Field Transmittal Memo numbers, alternate numbers, Change Order numbers, and similar identification.

2. Responsibility for Markup: Contractor shall be solely responsible for the measurement and recording of the Record Drawings. The presence of the Engineer or Owner shall not relieve the Contractor in any way of his/her obligation in this regard.
   a. The individual or entity who obtained record data, whether the installer, subcontractor or similar entity, should provide their Record Drawings to the Contractor. The Contractor shall be responsible for collecting and recording subcontractor's and other's information on the Record Drawings.

C. Record Product Data

1. During the construction period, maintain one (1) copy of each Product Data submittal for Project Record Document purposes.
   a. Mark Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Product Data submitted. Include significant changes in the product delivered to the site and changes in manufacturer's instructions and recommendations for installation.
   b. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   c. Note related Change Orders and markup of Record Drawings, where applicable.
   d. Upon completion of markup, submit a complete set of Product Data to the Engineer for the Owner's records.
   e. Where Record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.
   f. Each subcontractor is responsible for marking up and submitting record Product Data for its own Work. Contractor is responsible for collecting and submitting Record Product Data.

D. Record Sample Submittal

1. Immediately prior to date of Substantial Completion meet with the Engineer and the Owner's personnel at the site to determine which of the samples maintained during the construction period shall be transmitted to the Owner for record purposes. Comply with the Engineer's instructions for packaging, identification marking, and delivery to the Owner's sample storage space.

2. Dispose of other samples in a manner specified for disposing of surplus and waste materials.

E. Miscellaneous Records

1. Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities and equipment.
2. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Engineer for the Owner's records.
3. Miscellaneous records include, but are not limited to, the following categories as applicable:
   a. Field records on excavations and foundations
   b. Field records on underground construction and similar work
   c. Survey showing locations and elevations of underground lines
   d. Invert elevations of drainage piping
   e. Surveys establishing building lines and levels
   f. Authorized measurements utilizing unit prices or allowances
   g. Records of landscaping and plant treatments
   h. Ambient and substrate condition tests
   i. Certification received in lieu of labels on bulk products
   j. Batch mixing and bulk delivery records
   k. Testing and qualification of tradesmen
   l. Documented qualification of installation firms
   m. Load and performance testing
   n. Inspections and certifications by governing authorities
   o. Leakage and water-penetration tests
   p. Fire-resistance and flame-spread test results
   q. Equipment Manuals
   r. Final inspection and correction procedures

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 Recording

A. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project.

B. The Documents shall be available for review by the Engineer and Owner at all times. Have Documents readily available for review at the monthly progress meetings. Partial pay claims may be withheld if record documents are not kept updated in a satisfactory manner.

-END-

SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 Summary

A. Section Includes

1. Procedural requirements for cutting and patching as applicable to mechanical, structural, electrical and related installations.

B. Related Sections:

1. Section 02050 – Demolition

1.02 Definitions

A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.03 Submittals

A. Submit a plan describing cutting and patching procedures at least 10 days before cutting and patching will be performed. Include the following information:

1. Describe cutting and patching extent; show how the work will be performed.
2. Describe changes to existing structural elements and operating components as well as changes in building's appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform the work.
4. Indicate the dates cutting and patching will be performed.
5. List utilities that will be disturbed, affected, relocated or temporarily out of service. Indicate how long service will be disrupted.
6. Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Obtain approval of cutting and patching plan from Engineer before commencing cutting and patching work. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.04 Quality Assurance

A. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

C. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.

1. Primary operational systems and equipment
2. Air or smoke barriers
3. Fire-protection systems
4. Control systems
5. Communication systems
6. Conveying systems
7. Electrical wiring systems
8. Operating systems of special construction in Division 13 Sections
9. Piping systems
10. Ventilation systems

D. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.

1. Water, moisture, or vapor barriers
2. Membranes and flashings
3. Exterior curtain-wall construction
4. Equipment supports
5. Piping, ductwork, vessels, and equipment
6. Noise- and vibration-control elements and systems

E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.01 Materials

A. Use materials identical to existing materials unless otherwise specified or approved. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

B. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

PART 3 - EXECUTION

3.01 Examination

A. Verification of Conditions

1. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers before beginning work.
3. Plan the work to avoid interference of use of adjoining areas or interruption of free passage to adjoining areas.

3.02 Preparation

A. Protection

1. Protect existing construction prior to and during cutting and patching to prevent damage.
2. Provide temporary support of work to be cut.
3. Correct any unsafe or unsatisfactory conditions prior to proceeding with installation.
4. Provide protection from adverse weather conditions for portions of project that might be exposed during cutting and patching operations.

B. Provisions for Existing Services

1. Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize or avoid interruption of services to occupied areas.

3.03 Installation

A. Cutting: Interface with Existing Construction

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original or specified condition.
2. Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original installer; comply with original installer's written recommendations.
3. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
4. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

5. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
6. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
7. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

B. Proceed with patching after construction operations requiring cutting are complete.

C. Patching

1. Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
2. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
3. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
4. Floors and Walls: Where walls or partitions that are removed extend from one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
5. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
6. Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
7. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.
8. For watertight structures, patch and seal leaks using approved, compatible materials per the manufacturer’s recommendations.

-END-

SECTION 01990 - PAY ITEMS

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Measurement and payment for all Unit Price Base Bid Items and Add-Alternate Bid No. 1 (WWTP Improvements).

1.02 Add-Alternate Bid No. 1 (WWTP Improvements)

A. Submit a Schedule of Values for the various items of work to be completed on the project for the Add-Alternate Bid No. 1 (WWTP Improvements) for review by the Engineer. The Schedule shall include prices which when added together equal the Contract Price for the Add-Alternate Bid No. 1 (WWTP Improvements) Work. The Schedule will be used in processing Monthly Partial Pay Claims. The following is a minimum list of items to be included in the Schedule.

B. Septage Receiving Station and Plant Drain Lift Station

1. Cleaning
2. Coatings

C. Equalization Basin

1. Demolition
2. Piping
3. Basin Cleaning
4. Liner Repairs
5. Package Diffused Aeration Equipment
6. Electrical

D. Aeration and Sludge Basins

1. Aeration Basin Cleaning
2. Aeration Basin Diffuser Replacements
3. Aeration Basin Liner Repairs
4. Sludge Basin Cleaning
5. Sludge Basin Diffuser Replacements
6. Sludge Basin Liner Repairs

E. Flow Splitter

1. Flow Splitter Modifications
2. Clarifier Isolation Valves

F. Disinfection

1. Demolition of Existing Chlorination Structure
2. New Ultraviolet Disinfection System

3. Piping and Valves
4. Electrical

G. Sludge Dewatering System

1. Existing Belt Press and Conveyor Removal
2. Concrete Removal
3. Sludge Dewatering Pump
4. Polymer Feed System
5. Piping and Valves
6. Concrete Dewatering Pad and Piping
7. Dumpster
8. Coatings
9. Electrical

H. Administration Building

1. Laboratory Centrifuge
2. Dissolved Oxygen Meter
3. Colorimeter
4. Electrical
5. Emergency Generator

I. Miscellaneous

1. Yard Hydrants
2. Final Grade and Seed
3. Sidewalk

1.03 Unit Prices

A. Measurement and Payment

1. Payments will be made to the Contractor for the actual quantities of work performed or materials furnished in accordance with the Drawings and Specifications. The scheduled quantities of work to be done and materials to be furnished may each be increased or decreased without in any way invalidating the unit price bid. The unit price bid shall not change.
2. Make all measurements and check all dimensions necessary for the proper construction of the work called for by the Drawings and Specifications. During the prosecution of the work, make all necessary measurements to prevent misfitting in said work and record such accurate measurements to the construction on a set of construction drawings to be submitted to the Engineer.
3. The method of measuring the work for payment under the various pay items shall be as indicated in Pay Items below. In any event, the unit price stated in the Contract to be paid for the respective item shall include, and be payment in full for, the installation complete in all details and ready for use and operation as shown on the Drawings and as specified.
4. Payment will be made under each item only for such work that is not specifically included under other items.

1.04 Final Measurements

A. The Contractor shall make all measurements and check all dimensions necessary for the proper construction of the work called for by the Drawings and Specifications; and, during the prosecution of the work, he shall make all necessary measurements to prevent misfitting in said work and shall record such accurate measurements to the construction on a set of construction drawings to be submitted to the Engineer.

B. The method of measuring the work for payment under the various items shall be as indicated below. In any event, the unit or lump sum price for the respective items shall include the installation complete in all details and ready for use.

1.05 Pay Items

The unit prices stated in the Contract (unit price base bid) to be paid for the respective items shall be payment in full for the completion of all work specified and described to be included in the respective items, complete and ready for use and operation, including construction engineering and testing, as shown on the Drawings and as specified. Payment will be made under each item only for such work as is not specifically included under other items.

The unit prices shall include the following incidental as applicable: the furnishing of all labor, material, and equipment necessary to complete the work, including construction engineering; sheeting; excavation; clearing and grubbing including tree removal; dewatering; bypass pumping; pipe bedding, haunching, initial backfill, granular backfill (where required), and backfilling; compaction; pipe laying; jointing; fittings; removing and disposing of excess material; supporting and protecting utility poles and lines; safety; core drilling and connecting piping to structures, grouting and sealing pipe penetrations; connecting to or removing existing structures or pipes; cleaning and testing; sawcutting; formwork, installing slabs, walls, tops, castings, and channels, finishing, tooling, jointing, curing, slump and compression tests; cleaning and surface preparation; repair and/or replacement of existing storm sewers or drainage structures, curb and gutters, sidewalk, field tile, water service lines affected by the Work; repair of other miscellaneous items damaged or affected by the Work; maintenance of traffic/traffic control; initial clean-up and restoration; and other miscellaneous or incidental work necessary to complete the Work as specified and as indicated on the Drawings.

Item (1) Existing Septic Tank Removal (EACH)

Contractor shall receive payment for Existing Septic Tank Removal on a unit price per each existing septic tank removed in accordance with the price contained in the Bid Form. The price for Existing Septic Tank Removal shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, capping of existing laterals, backfill, compacted excavated material, and all incidental work required for a complete removal and disposal of the existing septic tank and backfill as specified and shown on the Drawings.

Item (2) Septic Tank Removal & Replacement (1,500 gal. HDPE) (EACH)

Contractor shall receive payment for Septic Tank Removal & Replacement (1,500 gal. HDPE) on a unit price per each existing septic tank removed and replaced in accordance with the price contained in the Bid Form. The price for Septic Tank Removal & Replacement (1,500 gal. HDPE) shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, installation of new 1,500 gal. HDPE septic tank, sewer disconnect, reconnection to existing laterals, backfill, compacted excavated material, and all incidental work required for a complete removal and disposal of the existing septic tank and installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (3) Septic Tank Removal & Replacement (2,500 gal. Concrete) (EACH)

Contractor shall receive payment for Septic Tank Removal & Replacement (2,500 gal. Concrete) on a unit price per each existing septic tank removed and replaced in accordance with the price contained in the Bid Form. The price for Septic Tank Removal & Replacement (2,500 gal. Concrete) shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, installation of new precast 2,500 gal. concrete septic tank, sewer disconnect, reconnection to existing laterals, backfill, compacted excavated material, and all incidental work required for a complete removal and disposal of the existing septic tank and installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (4) Septic Tank Removal & Replacement (1,500 gal. H-20) (EACH)

Contractor shall receive payment for Septic Tank Removal & Replacement (1,500 gal. H-20) on a unit price per each existing septic tank removed and replaced in accordance with the price contained in the Bid Form. The price for Septic Tank Removal & Replacement (1,500 gal. H-20) shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, installation of new H-20 rated 1,500 gal. precast concrete septic tank, sewer disconnect, reconnection to existing laterals, backfill, compacted excavated material, and all incidental work required for a complete removal and disposal of the existing septic tank and installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (5) STK-001: New Septic Tank Installation (1,500 gal. HDPE) (LUMP SUM)

Contractor shall receive payment for STK-001: New Septic Tank Installation (1,500 gal. HDPE) on a lump sum basis per the proper installation of septic tank STK-001 in accordance with the price contained in the Bid Form. The price for STK-001: New Septic Tank Installation (1,500 gal. HDPE) shall include the permanent plugging of the existing sewer lateral to the river, installation of a new HDPE septic tank at location identified by property Owner/Engineer, new 4-in. service lateral (5 ft.), sewer disconnect, new 4-in. discharge piping from the septic tank to the existing sanitary sewer main (5 ft.), connection to the existing sanitary sewer main, pavement restoration, backfill, compacted excavated material, and all incidental work required for a complete installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (6) STK-061A: New Septic Tank Installation (1,500 gal. H-20) (LUMP SUM)

Contractor shall receive payment for STK-061A: New Septic Tank Installation (1,500 gal. H-20) on a lump sum basis per the proper installation of septic tank STK-061A in accordance with the price contained in the Bid Form. The price for STK-061A: New Septic Tank Installation (1,500 gal. H-20) shall include the installation of a new H-20 septic tank at location identified by property Owner/Engineer, new 4-in. service lateral (5 ft.), sewer disconnect, new 4-in. discharge piping from the septic tank to the existing sanitary sewer main (5 ft.), connection to the existing sanitary sewer main, backfill, compacted excavated material, and all incidental work required for a complete installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (7) STK-064: Septic Tank Removal & Replacement (1,500 gal. H-20) (LUMP SUM)

Contractor shall receive payment for STK-064: Septic Tank Removal & Replacement (1,500 gal. H-20) on a lump sum basis per the proper installation of septic tank STK-064 in accordance with the price contained in the Bid Form. The price for STK-064: Septic Tank Removal & Replacement (1,500 gal. H-20) shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, installation of a new H-20 septic tank, new 4-in. service lateral (5 ft.), sewer disconnect, new 4-in. discharge piping from the septic tank to the existing sanitary sewer main (5 ft.), connection to the existing sanitary sewer main, backfill, compacted excavated material, and all incidental work required for a complete installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (8) STK-076: New Septic Tank Installation (1,500 gal. HDPE) (LUMP SUM)

Contractor shall receive payment for STK-076: New Septic Tank Installation (1,500 gal. HDPE) on a lump sum basis per the proper installation of septic tank STK-076 in accordance with the price contained in the Bid Form. The price for STK-076: New Septic Tank Installation (1,500 gal. HDPE) shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, installation of a new HDPE septic tank at location identified by property Owner/Engineer, new 4-in. service lateral (5 ft.), sewer disconnect, new 4-in. discharge piping from the septic tank to the existing sanitary sewer main (5 ft.), connection to the existing sanitary sewer main, pavement restoration, backfill, compacted excavated material, and all incidental work required for a complete installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (9) STK-111: New Septic Tank Installation (1,500 gal. HDPE) (LUMP SUM)

Contractor shall receive payment for STK-111: New Septic Tank Installation (1,500 gal. HDPE) on a lump sum basis per the proper installation of septic tank STK-111 in accordance with the price contained in the Bid Form. The price for STK-111: New Septic Tank Installation (1,500 gal. HDPE) shall include the installation of a new HDPE septic tank at location identified by property Owner/Engineer, new 4-in. service lateral (5 ft.), sewer disconnect, new 4-in. discharge piping from the septic tank to the existing sanitary sewer main (5 ft.), connection to the existing sanitary sewer main, pavement restoration, backfill, compacted excavated material, and all incidental work required for a complete installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (10) STK-154: Septic Tank Removal & Replacement (1,500 gal. HDPE) (LUMP SUM)

Contractor shall receive payment for STK-154: Septic Tank Removal & Replacement (1,500 gal. HDPE) on a lump sum basis per the proper removal and replacement of septic tank STK-154 in accordance with the price contained in the Bid Form. The price for STK-154: Septic Tank Removal & Replacement (1,500 gal. HDPE) shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, installation of new HDPE septic tank at location identified by property Owner, new 4-in. service lateral (5 ft.), sewer disconnect, new 4-in. discharge piping from the septic tank to the existing sanitary sewer main (5 ft.), backfill, compacted excavated material, and all incidental work required for a complete removal and disposal of the existing septic tank and installation of the new septic tank and backfill as specified and shown on the Drawings. Property Owner shall be responsible for disassembly and re-assembly of existing deck.

Item (11) STK-164: Septic Tank Removal & Replacement (2,000 gal. H-20) (LUMP SUM)

Contractor shall receive payment for STK-164: Septic Tank Removal & Replacement (2,000 gal. H-20) on a lump sum basis per the proper removal and replacement of septic tank STK-164 in accordance with the price contained in the Bid Form. The price for STK-164: Septic Tank Removal & Replacement (2,000 gal. H-20) shall include the pumping and proper disposal of septage waste, complete removal of existing septic tank, installation of new H-20 septic tank, reconnection to existing laterals, sewer disconnect, backfill, compacted excavated material, and all incidental work required for a complete removal and disposal of the existing septic tank and installation of the new septic tank and backfill as specified and shown on the Drawings.

Item (12) Sanitary Lateral 4” SDR-35 PVC (LF)

Contractor shall receive payment for Sanitary Lateral 4” SDR-35 PVC on a unit price per linear foot installed in accordance with the price contained in the Bid Form. The price for Sanitary Lateral 4” SDR-35 PVC shall include installation for new 4-in. service lateral outside of the 5 ft. required to be replaced on the inlet and outlet sides of tanks, backfill, compacted excavated material, and all incidental work required for complete installation and reconnection to existing or non-existing laterals or sewer main as specified and shown on the Drawings.

Item (13) Sanitary Lateral 4” SDR-35 PVC With Full-Depth Granular Backfill (LF)

Contractor shall receive payment for Sanitary Lateral 4” SDR-35 PVC With Full-Depth Granular Backfill on a unit price per linear foot installed in accordance with the price contained in the Bid Form. The price for Sanitary Lateral 4” SDR-35 PVC With Full-Depth Granular Backfill shall include installation for new 4-in. service lateral outside of the 5 ft. required to be replaced on the inlet and outlet sides of tanks, full-depth granular backfill, compacted excavated material, and all incidental work required for complete installation and reconnection to existing or non-existing laterals or sewer main as specified and shown on the Drawings.

Item (14) Manhole Rehab: Install Benchwall & Channel (EACH)

Contractor shall receive payment for Manhole Rehab: Install Benchwall & Channel on a unit price per benchwall installed in accordance with the price contained in the Bid Form. The price for Manhole Rehab: Install Benchwall & Channel shall include bypass pumping, cleaning, filling of voids, disposal, and all incidental work required for a complete installation as specified and as shown on the Drawings.

Item (15) Manhole Rehab: Composite Manhole Lining, Full-Depth (VF)

Contractor shall receive payment for structure rehabilitation via composite manhole lining on a unit price per vertical foot basis (as measured from the lowest invert elevation of the manhole effluent line to the bottom of the casting to the nearest one tenth (0.1) foot) in accordance with the unit prices contained in the Bid Form. The price for Manhole Rehab: Composite Manhole Lining, Full-Depth shall include, cleaning/pressure-washing, debris removal, application of lining materials, patching, filling of voids, step removal, and all incidental work required for a complete installation as specified and as shown on the Drawings.

Item (16) Manhole Rehab: Replace Frame & Cover (Pavement) (EACH)

Contractor shall receive payment for Manhole Rehab: Replace Frame & Cover (Pavement) on a unit price per each manhole frame and cover replaced in accordance with the price contained in the Bid Form. The price for Manhole Rehab: Replace Frame & Cover (Pavement) shall include complete removal of existing chimney section(s), installation of new chimney section(s), pavement replacement, and all incidental work required for a complete removal and disposal of the existing frame and cover and installation of a new frame and cover as specified and as shown on the Drawings.

The old frame and cover shall be first offered to the Owner. If unwanted, the Contractor shall retain the frame and cover for his/her use or dispose of the items properly.

Item (17) New Manhole Installation (EACH)

Contractor shall receive payment for New Manhole Installation on a unit price per each manhole installed in accordance with the price contained in the Bid Form. The price for New Manhole Installation shall include complete installation of manhole and frame and cover, composite manhole lining (full depth), pavement repair (per ODOT standards), and all incidental work required for a complete installation of a manhole as specified and as shown on the Drawings.

Item (18) Wayne Street Lift Station Rehab (LUMP SUM)

Contractor shall receive payment for Wayne Street Lift Station Rehab on a lump sum basis in accordance with the price contained in the Bid Form. The price for Wayne Street Lift Station Rehab shall include the cleaning and composite lining of the wet well, demolition of the existing valve vault, installation of the new valve vault structure, new piping, coatings, reconnection to the existing force main, electrical, telemetry, bypass pumping, and all incidental work required for a complete rehabilitation of the Wayne Street Lift Station as specified and as shown on the Drawings.

Items (19-22) Sanitary Sewer Cleaning & Televising (4, 6, 8, 10-in) (LF)

Contractor shall receive payment for Sanitary Sewer Cleaning & Televising (4, 6, 8, 10-in) per lineal feet per pipe size in accordance with the price contained in the Bid Form. Lineal feet shall be measured along the centerline of the sewer from the center of manhole or cleanout casting of an upstream structure to the center of manhole or cleanout casting of a downstream structure. If any obstruction in the sewer segment prohibits the cleaning and passage of the television camera, and a reverse set up is not manageable due to a buried manhole, cleanout, or other accessibility issue, then the Contractor shall be paid based upon length cleaned and televised. Water for cleaning and debris disposal shall be the responsibility of the Contractor.

Item (23) Mobilization, Demobilization, Bonds, & Insurance (LUMP SUM)

The Bidder shall include an amount not to exceed 5% of the Total Bid Price for mobilization, bonds, and insurance as listed on the Bid Form. The costs associated with mobilization, demobilization, Payment and Performance Bonds, Maintenance Bonds, and insurance, as specified in the contract specifications, are included in this item. Not more than 60% of this bid item will be paid for mobilization. The remaining 40% will be paid after all equipment and materials have been demobilized.

Item (24) Temporary Erosion Control (LUMP SUM)

Contractor shall receive payment for Temporary Erosion Control on a lump sum basis in accordance with the price contained in the Bid Form. The price for Temporary Erosion Control shall include all work required for preparation of the areas to receive the erosion control including grading, silt fences, straw bales, inlet protection, and removal of all undesired debris such as construction materials, rocks, silt, etc..., and all incidental work required for installation and on-going maintenance of the erosion control measures, as required until seeding or paving has been established.

Item (25) Final Clean-up & Restoration (LUMP SUM)

The Bidder shall receive payment for Final Clean-up & Restoration on a lump sum basis in accordance with the price contained in the Bid Form. The removal of excess material and debris, final topsoil and grading, seeding, mulching, aggregate/pavement (match existing), and all incidental work necessary to complete the project shall be included in this item. Payment will be made at such time as the site restoration and clean-up are complete in the opinion of the Engineer.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

-END-

DIVISION 2 – SITE WORK

SECTION 02050 – DEMOLITION

PART 1 - GENERAL

1.01 Summary

A. Section Includes: All work necessary for the removal and disposal of buildings, structures, foundations, storage tanks, septic tanks, piping, fittings, equipment, sidewalks, curbs, roadways, power and lighting poles, signs, and landscaping, or any part thereof including wood, masonry, steel, concrete, asphalt, mechanical and electrical equipment and materials, and other equipment and materials shown or specified to be removed.

B. Related Sections

1. Section 01500 – Construction Facilities and Temporary Controls
2. Section 01550 – Plant Operations During Construction
3. Section 01731 – Cutting and Patching
4. Section 02101 – Stormwater Pollution Prevention and Erosion Control

1.02 Submittals

A. Provide all submittals, including the following, as specified in Section 01300.

1. Site Inspection: Visit the site and inspect all existing structures, the nature and condition of the items to be removed and site conditions and constraints before submitting the bid.
2. Observe and record any defects which may exist in buildings and structures adjacent to but not directly affected by the demolition work. Provide the Owner with a copy of this inspection record and obtain Engineer's approval prior to commencing the demolition.

1.03 Quality Assurance

A. Accomplish all demolition work so there is no injury to any persons and no damage to adjacent structures or property. All demolition methods shall be in full compliance with municipal, county, state and federal ordinances and laws. Contractor is solely responsible for complying with the requirements of the Occupational Safety and Health Administration (OSHA).

B. Comply with the Federal EPA and OSHA regulations pertaining to the handling and disposal of lead-containing materials as well as municipal, county, state and federal ordinances regarding the disposal of rubble, scrap metal, hazardous material and refuse.

C. Examine drawings of the existing structures and equipment identified in the Supplementary Conditions, Paragraph SC-4.02, if any, during the development of

the demolition procedures. Develop and submit demolition procedures to the Engineer prior to the start of demolition. The procedures shall provide for safe conduct of the work, protection of property to remain undisturbed, and coordination of other work in progress. Include a detailed description of the methods and equipment to be used for each operation and sequence of operations.

D. Limits: Exercise care to assure that masonry and concrete are broken and removed in reasonably small masses. Where only parts of a structure are to be removed, cut the masonry or concrete along limiting lines with a suitable saw so that damage to the remaining structure is held to a minimum.

1.04 Warranty

A. Refill and restore to the finish grade settlement greater than 2 inches in the backfill which takes place within the warranty period at no additional cost to the Owner. Restore the surface area where settlement has occurred, including, but not limited to topsoil, seeding, fertilizing, and erosion control measures.

PART 2 - PRODUCTS

2.01 Materials

A. Temporary Materials

1. Erect temporary fencing, barricades, and other items in accordance with the requirements in Section 01500.

B. Repair and Replacement Materials

1. Use materials in the repair or replacement of existing work identical or equal to the materials used in existing work when new.

PART 3 - EXECUTION

3.01 Examination

A. The Contractor is solely responsible for verifying the dimensions, materials, weight, connections, construction method, surrounding conditions and any other relevant items necessary for the work prior to bidding.

3.02 Preparation

A. Protection

1. Access: Provide safe access to and egress from all working areas at all times during the demolition. Provide adequate protection of those access and egress areas from falling materials.

2. General Safety: Provide warning signs, protective barriers, and warning lights adjacent to the work as needed to protect construction personnel and the general public. Maintain these items during the demolition period.
3. Existing Services: Do not begin the demolition work until all mechanical and electrical services affected by the work have been properly disconnected. Reroute or reconnect interconnecting piping and electrical services that are to remain in service either permanently or temporarily in a manner that will not interfere with the operation of the remaining facilities.
4. Hazards: Perform testing and air purging where the presence of hazardous chemicals, gases, flammable materials or other dangerous substances are apparent or suspected, and eliminate the hazard before demolition is started.
5. Provide adequate scaffolding, shoring, bracing, railings, toe boards and protective coverings during demolition to protect personnel and equipment against injury or damage.
6. Cover floor openings not used for material drops with material substantial enough to support loads placed on them. Properly secure the covers to prevent accidental movement.
7. Provide adequate lighting at all times during demolition.
8. Close off areas below demolition work while the demolition work is being performed.
9. Carefully protect all mechanical and electrical equipment from the deposit and accumulation of dust and debris.

3.03 Application

A. General

1. Plant Operation: Plan, sequence and perform the demolition work without restricting the operation of the plant. Coordinate with the Engineer and Owner prior to beginning the demolition work.
2. The use of explosives will not be permitted.
3. Disconnect utilities at points indicated on the Drawings or as specified. Where such disconnection will interrupt the utility services to an area not included in the contract, make arrangements for such interruption with the Engineer at least 72 hours in advance of the interruption.
4. Control the amount of dust resulting from demolition to prevent the spread of dust to occupied portions of buildings and to avoid creation of nuisance in the surrounding area. Do not use water when it will result in, or create, hazardous or objectionable conditions such as ice, flooding, and pollution.
5. Repair existing buildings, roads, structures, parking areas, etc. damaged during demolition.
6. If during the course of the work, the existence of asbestos is observed in the work area, promptly notify the Owner in writing. Do not perform any work pertinent to the asbestos material prior to receipt of special instructions from the Owner. Should any special measures for asbestos removal be required, the cost thereof shall be handled by an appropriate Change Order or a separate contract or subcontract by the Owner.

B. Septic Tank Removal

1. Coordinate all existing tank removals with Engineer and property owner; no tank shall be removed without seven (7) days advance written notice to the property owner.
2. Pump and properly dispose of septic waste in accordance with State and local requirements (disposal of septic waste at the Village of Grover Hill WWTP will not be authorized).
3. Excavate existing tank and confirm tank size, outlet piping, and inlet piping.
4. Completely remove 5 feet of outlet and inlet piping and temporarily plug piping.
5. Completely remove existing septic tank and properly dispose of tank and debris in accordance with State and local requirements.
6. Complete all septic tank demolition and removals to the satisfaction of the Engineer.

C. Equipment Removal

1. Coordinate all equipment removal work with Owner's Representative to assure a minimum of interruptions with ongoing operations.
2. Complete all removals and demolition to the satisfaction of the Owner and the Engineer.
3. Remove equipment concrete bases.
4. Remove control panels, ductwork and miscellaneous appurtenances to the source.

D. Piping and Utilities Removal

1. Completely remove exposed piping, conduit, wiring, supports, hangars, etc. greater than one inch in diameter to the source in structures and buildings which are to be demolished. Piping, wiring, conduit, etc. are not shown on the Drawings.
2. Underground piping, conduit and wiring which are to be abandoned and do not interfere with site restoration may be left in place, unless otherwise shown on the Drawings. Plug and seal cut ends of underground piping to be abandoned. Do not leave abandoned branches of piping and wiring “live”. Isolate abandoned branches by closing branch valve at main or by disconnecting branch at main. Plug, cap, and seal active branch at isolating valve or point of disconnection.
3. Remove hydrants completely.
4. Close valves and abandoned in place. Remove valve boxes completely.

E. Structures and Buildings Removal

1. Remove all parts of existing structures and buildings unless otherwise noted.
2. Remove walls to not less than two (2) feet below finish grade unless the Drawings indicate otherwise. Break up slabs in basements, vaults, and tanks which are to be demolished and filled with concrete debris and sand. Break up and displace slabs in a manner which permits the proper flow of groundwater.

3. Completely remove concrete bases for tanks, poles, towers, and similar structures if the bases are less than one (1) cubic yard in volume or less than three (3) feet below finish grade. Remove other concrete bases to not less than two (2) feet below finish grade unless the Drawings indicate otherwise.

F. Openings

1. Plug all openings in walls, floors, and ceilings resulting from the removal of existing equipment, piping, and conduit using pipe plugs, blind flanges, caps, or expansive grout.
2. Plug openings in a manner that will result in a structurally suitable seal and a neat and presentable appearance.
3. Patch all openings in block, brick, stone, or metal walls, roofs, or other material resulting from demolition with the same material.
4. Patch openings left in roofs watertight with similar roofing materials.

G. Exposed Bolts and Hardware

1. Cut off bolts and hardware left exposed after demolition of piping or equipment flush to the wall, ceiling, or floor and coat. Patch all voids remaining with grout.

H. Coating

1. Where equipment and miscellaneous items are removed from areas which are coated: If an area is left uncoated due to the removal or demolition of an item, coat that area to match existing coatings as close as possible.

I. Concrete Removal

1. Remove concrete to the next adjacent joint whenever possible.
2. When removing concrete adjacent to existing concrete, saw cut concrete to be removed to a straight line.
3. When removing concrete adjacent to buildings, do not damage the building. Repair any damage incurred to the building with no additional compensation. It is the Contractor's responsibility to determine the best way to remove concrete at buildings. If the existing sidewalk is an integral part of the building, save the pavement as close to the building as possible, at the direction of the Engineer.
4. Where concrete sidewalk is removed over existing basement vaults, do not damage the structural components of the vault.

J. Pavement, Sidewalks, Curbs, and Gutters

1. Completely remove pavement, sidewalks, curbs and gutters as shown on the Drawings.
2. Saw cut pavement, sidewalks, curbs and gutters to assure breaks in pavement, sidewalks, curbs, and gutters not removed are along straight lines. The faces of the remaining pavement, sidewalk, curb, and gutter faces shall be approximately vertical.

K. Inlets & Manholes

1. Where inlets and manholes are removed, backfill the void with granular backfill in accordance with Section 02220. Set aside inlet castings and grates which are not broken for pick up by the Owner. If the Owner does not claim the inlet castings and grates they become the property of the Contractor. Immediately remove them from the site.

L. Backfilling

1. Backfill excavations, trenches, holes and pits resulting from demolition as specified in Section 02200.
2. Break all block, brick or concrete debris resulting from demolition into two (2) foot square manageable pieces and use as fill material in the underground tanks or building basement. Mix the debris with granular sand as it is poured into the demolished structures to form a fill free of voids. Compact the fill by hand tamping or approved mechanical tamping device per Section 02200.

M. Grading and Seeding

1. Rough grade and finish grade the site to the grades shown on the Drawings and as specified in Section 02200.
2. Seed and mulch the site as indicated on the Drawings and as specified in Section 02101.

N. Owner's Property

1. Remove equipment, piping, and materials designated to remain property of the Owner in a manner to preserve the existing conditions of such items. Damage caused by the Contractor in removing and transporting such items shall be repaired at the Contractor's expense. Such damage shall include, but not be limited to, bending, warping, burning, impacting, and any damage caused from dropping, wetting, or otherwise mishandling.
2. The items listed in the Demolition Sheet below are to remain the property of the Owner. Remove all items listed and stockpile at a storage location designated by the Owner.
3. All items not selected by the Owner become the property of the Contractor unless indicated otherwise on the Drawings.

3.04 Cleaning

A. Remove all debris and rubbish from the structures and work areas during demolition and do not allow debris and rubbish to accumulate in piles or on the site. Remove debris and rubbish from the site every 48 hours or less.

B. Dispose of material in accordance with all local, state and federal rules, regulations and ordinances. Obtain any permits necessary to dispose of materials.

C. Remove all temporary facilities, equipment and materials resulting from the demolition. Clean up the job site following demolition.

DEMOLITION SHEET

	ITEM	LOCATION
1.	Fiberglass Weir	EQ Basin
2.	Sludge Dewatering Press	Solids Handling Building
3.	Sludge Conveyor	Solids Handling Building

-END-

SECTION 02101 - STORM WATER POLLUTION PREVENTION AND EROSION CONTROL

PART 1 - GENERAL

1.01 Summary

A. Section Includes

1. All temporary and permanent control measures as shown on the Drawings or as ordered by the Owner during the life of the contract to control water pollution, soil erosion, and siltation through the use of berms, dams, dikes, sediment traps, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.
2. Temporary erosion control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

B. Related Sections

1. Section 02102 - Material Handling and Spill Prevention Plan
2. Section 02110 - Site Clearing
3. Section 02200 - Earthwork

1.02 Quality Assurance

A. Regulatory Requirements

1. Provide grass seed containers bearing a seed label tag in accordance with the requirements of the Ohio Agricultural Seed Law.
2. Provide fertilizer conforming to federal and state regulations and to the standards of the Association of Official Agricultural Chemists.
3. Comply with all federal, state and local erosion control and pollution prevention laws

B. Authority of Owner: The Owner has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations, and to direct the Contractor to provide immediate permanent or temporary control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds and areas of water impoundment.

1.03 Delivery, Storage and Handling

A. Deliver grass seed in new and unopened containers or bags.

PART 2 - PRODUCTS

2.01 Materials

A. General: Provide materials in accordance with the requirements specified herein.

B. Temporary Grass Seed

1. Quick-growing species such as ryegrass, Italian ryegrass, or cereal grasses suitable to the area
2. Use grass species that will not compete with the grasses sown later for permanent cover
3. Application: apply temporary seeding to all disturbed areas to be left idle for 15 days or more during the growing season, unless other erosion control measures are indicated on the Drawings.

C. Permanent Grass Seed

1. Type, mixture, and quantity to meet the application rate, as shown on the Drawings
2. Contains no more than 5 percent inert matter
3. Contains no objectionable weeds

D. Sod

1. Free of weeds
2. Use within 1 week of its cutting - do not allow to dry out
3. Strongly rooted sod, a minimum of 2 years old
4. Capable of growth upon planting

E. Mulch

1. Hay, straw, fiber mats, netting, bark or wood fiber
2. Straw mulch shall consist of threshed straw of cereal grain such as oats, wheat, barley, rye, and rice.
3. Free of objectionable weeds, seeds, or other material that may be detrimental to the planting being established.
4. Application: Apply mulch to all areas that have been seeded and to disturbed areas to be left idle for 15 days or more outside of the growing season unless other measures are indicated on the Drawings.
5. Application rates:
   a. Straw/hay mulch: 92 pounds per 1,000 square feet (2 ton/acre)
   b. Wood fiber mulch: 46 pounds per 1,000 square feet (1 ton/acre)
   c. Wood chips: 230 pounds per 1,000 square feet (5 ton/acre)

F. Fertilizer

1. Contains the minimum percentage of available nutrients (Nitrogen, Phosphorus, and Potash) based on soil content, seed mix and local conditions.
2. If local conditions do not indicate otherwise and soil testing is not required, provide 12-12-12 analysis fertilizer.
3. Application rate: as specified by the supplier

G. Topsoil

1. Provide topsoil meeting the requirements specified in Section 02200.

H. Erosion Control Blanket: Provide North American Green SC150, or approved equal.

I. Fiber Filtration Tubes

1. Natural or man-made fiber filter media encased within cylindrical tubes composed of a photodegradable mesh.
2. Performance: slowing and filtering of suspended particles in storm water runoff. The tubes shall allow water to flow freely while providing filtration of suspended particles.

J. Geotextile Fabric for Use Under Riprap, Crushed Stone or Aggregate

1. Provide non-woven needle punched or heat bonded geotextile fabric consisting of strong, rot resistant, chemically stable long-chain synthetic polymer materials which are dimensionally stable relative to each other. The geotextile plastic yarn or fibers shall consist of at least 85 percent by weight of polyolefins, polyesters, or polyamides and resist deterioration from ultraviolet and heat exposure.
2. Provide geotextile meeting or exceeding ODOT requirements or as follows:

TEST	METHOD	REQUIREMENTS
Grab Strength	ASTM D4632	80 lb (355.8 N)
Seam Strength	ASTM D4632	70 lb (311.4 N)
Puncture Strength	ASTM D6241	25 lb (111.2 N)
Trapezoid Tear	ASTM D4533	25 lb (111.2 N)
Apparent Opening Size	ASTM D4751	Sieve No. 50 max.
Permeability	ASTM D4491	0.1 mm/sec
Ultraviolet Degradation	ASTM D4355	70% strength retained

K. Straw Bale Filters: Use materials specified on the Drawings

L. Silt Fence: Use materials specified on the Drawings

M. Temporary Slope Drains: Use materials specified on the Drawings

N. Temporary Sediment Trap: Use materials specified on the Drawings

O. Other: All other materials shall meet commercial grade standards and be approved by the Owner before being incorporated into the project.

PART 3 - EXECUTION

3.01 Preparation

A. Do not start work until the erosion and sediment control schedules and methods of operations for the applicable construction activities have been accepted by the Owner.

B. Coordinate temporary erosion and sediment control measures contained herein with the permanent erosion control measures and soil stabilization methods as specified as part of this contract to assure economical, effective, and continuous erosion and sediment control throughout the construction and warranty period.

3.02 Protection

A. Establish vegetation in accordance with the Seasonal Soil Protection Chart on the Drawings.

B. Temporarily or permanently stabilize unvegetated areas that are scheduled or likely to be left inactive for 15 days or more with measures appropriate for the season in order to minimize erosion potential.

C. For construction projects on agricultural land, final stabilization is accomplished by returning land to its preconstruction use.

D. Do not discharge pollutants such as sediments, fuels, lubricants, bitumen, raw sewage, or wash water from concrete mixing operations (concrete washout), water from trench or pit dewatering, and other harmful materials into or near storm water conveyances, wetlands, rivers, streams, and impoundments or into natural or manmade channels leading thereto.

E. Do not apply pesticides when working in or adjacent to a floodway, river, stream, ditch, or other storm water conveyance.

F. Properly dispose of all waste materials.

3.03 Installation - General

A. Incorporate all permanent erosion control features into the project at the earliest practical time. Except where future construction operations will damage slopes, perform the permanent seeding, mulching and other slope protection work in stages as soon as substantial areas of exposed slopes can be made available.

B. Use temporary erosion and pollution control measures to correct conditions that develop during construction, that are needed prior to installation of permanent control features, or that are needed temporarily to control erosion that develops during normal construction practices.

C. Schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately thereafter if the

project conditions permit; otherwise, install temporary erosion control measures between successive construction stages.

D. Limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with progress in completing the finish grading, seeding, mulching and other such permanent control measures in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, install temporary erosion control measures.

E. In the event temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or as ordered by the Owner, perform such work at Contractor's expense.

F. Maintain all erosion and sediment control practices during the construction period.

3.04 Installation - Erosion and Sediment Control Measures

A. Temporary Construction Entrance

1. Install a temporary construction entrance as specified in the Drawings.
2. Construct temporary construction entrances where needed and in location shown on the Drawings to prevent tracking of soil or mud onto publicly or privately owned paved surfaces.
3. Place temporary construction entrances at locations where construction vehicles will repeatedly access a disturbed or unpaved area from a paved roadway.
4. Not all locations of construction entrances may be shown on the Drawings. The contractor is responsible for locating and placing construction entrances to prevent tracking and to avoid disturbance to existing waterways.
5. Should tracking of soil occur, clear accumulated sediment from public and private driveways on a daily basis at a minimum and more frequently as sediment is tracked onto roadways.
6. Redistribute or properly dispose of collected sediments in a manner that is in accordance with all applicable statutes and regulations.
7. Do not rinse tracked material with water unless water is collected and disposed of properly.

B. Silt Fence

1. Install silt fence as shown on the Drawings to provide sediment control at the top of slopes, at the down-gradient project limits, as periodic filter breaks on down slopes, at project limits and other locations indicated.
2. Provide additional silt fence where the extents of land disturbance extend beyond the lengths of silt fence shown on the Drawings.
3. Install silt fence across a utility route in accordance with the following:
   a. At locations where the utility route runs uphill or downhill, install silt fence perpendicular to the direction of runoff and parallel to contour lines.
   b. Install a silt fence segment at every 5 feet in elevation change along the utility route. Less frequent intervals will be allowed if the Contractor can demonstrate erosion can be prevented and disturbed soil can be stabilized by other erosion control means such as mulching.

c. Turn the ends of each silt fence segment in the uphill direction to collect sediment.
d. Install silt fence segments from edge of land disturbance to edge of land disturbance.

4. Install silt fence along the length of the utility route in accordance with the following:
   a. At locations where the utility route runs along the slope, install silt fence at the edge of the land disturbance on the downhill side of the utility route.
   b. Silt fence installed along the utility route shall be continuous until the land disturbance termination point or the direction of the slope begins to be uphill or downhill with the utility route.
   c. Turn the ends of each silt fence segment in the uphill direction to collect sediment.

C. Fiber Filtration Tubes

1. Install in accordance with manufacturer's instructions.
2. Use fiber filtration tubes for the slowing and filtering of storm water
3. Use the appropriate tube size for the slope and the distance between tubes as specified by the manufacturer
4. The tubes shall allow water to flow freely and provide filtration of suspended particles.

D. Straw Bale Filters:

1. Install according to the Drawings
2. Use straw bale filters for the slowing and filtering of storm water before it enters storm water conveyances such as driveway culverts or other inlet structures that drain small drainage areas.
3. Do not use across a stream, ditch, channel, swale or where concentrated flows will occur.
4. Trench straw bales into the ground so that runoff filters through the straw bale and not around or under the straw bale.

E. Dust Control

1. Use water to dampen surfaces to minimize dust and prevent wind erosion.
2. Do not rinse surfaces with water unless water is collected and disposed of properly.
3. Implement dust control methods on a routine basis where conditions warrant.
4. Provide water and dust suppression when requested by the Engineer or Owner.

F. Pumping Bags

1. Install pumping bags according to the Drawings.
2. Provide pumping bags to filter sediment from dewatering operations.
3. Properly dispose of used pumping bags.
4. Appropriately size the bags for the amount of flow.
5. Use pumping bags on an erosion resistant surface.
6. Do not discharge sediment-laden water from dewatering operations into or near storm water conveyances, wetlands, rivers, streams, and impoundments or into

natural or manmade channels leading thereto. Refer also to Section 02102 for the disposal of sediment-laden water.

G. Outlet Protection:

1. Construct outlet protection to prevent erosion, provide energy dissipation and retain sediment in areas of concentrated flow where storm water conveyances outfall.
2. Place at pipe and channel outfalls and in locations as specified in the Drawings

H. Inlet Protection

1. Install inlet protection at all storm water inlets within the construction area, or in areas that receive runoff from disturbed areas, to prevent sediments, construction debris, and other potential storm water pollutants from entering storm sewer inlets and catch basins.
2. For inlets within a road or driving lane, equip the inlet protection practice with an overflow or bypass so ponding water does not cause unsafe driving conditions.
3. Remove accumulated sediment and debris collected by inlet protection practices and dispose of properly after every rain event.
4. When cleaning or removing inlet protection, do not place sediment and debris in a ditch, stream, wetland, waterway or storm water conveyance.

I. Riprap Check Dam: Install riprap check dams as illustrated on the Drawings or as needed to reduce erosion potential and capture potential pollutants in drainage channels or areas of concentrated flow.

J. Concrete Washout Area: Refer to Section 02102 for Concrete Washout requirements.

K. Temporary Slope Drains: When necessary, route runoff away from steep slopes through the use of a temporary slope drain. Install in accordance with the Drawings.

L. Temporary Sediment Trap: Construct a temporary sediment trap as shown on the Drawings to retain sediment in a pooling area. Construct the temporary sediment trap of an embankment or excavated area and provide a stone outlet structure.

M. Grass

1. Restore all non-paved surfaces that were disturbed during construction with permanent seeding or sod unless shown otherwise on the Drawings.
2. Prior to seeding disturbed areas must be graded and receive a minimum of 6 inches of topsoil. Use excavated material which meets the specified requirements for topsoil, or if the quantity of suitable topsoil is not sufficient, use topsoil obtained from another source.
3. Scarify the planting area to a minimum depth of 6 inches. Mix soil amendments such as fertilizer and lime if required, in the top 2 to 4 inches of topsoil with a disk or rake operated across the slope.
4. Apply seed uniformly with a drill or cultipacker seeder, or by broadcasting. Cover seed with topsoil a minimum of 1/2 inch. Cover newly seeded areas with anchored mulch or erosion control blanket.

5. Keep seeded and fertilized areas adequately watered to a minimum of 1 inch depth per week until germination of all seed is completed and uniform grass cover is accomplished.
6. Immediately prior to installing sod, water the planting area with a fine spray to a minimum penetration of 1 inch.
7. Do not place frozen sod, and do not place sod on frozen or dry soil. Do not place sod when the air temperature is less than 32 degrees Fahrenheit.
8. Lay sod with closely fitted abutting joints without stretching and overlapping, and stagger the ends of the strips. Trim and fit sod into irregular areas to eliminate gaps.
9. On slope areas, lay sod starting from the bottom of the slope and lay sod horizontal to the contour. Where slopes are greater than a horizontal to vertical ratio of 3 to 1, staple or stake each sod strip at the corners and in the middle.
10. After initial watering, tamp or roll sod with a roller to eliminate irregularities. Repeat watering at regular intervals to keep sod moist until it is rooted and to maintain growth until final acceptance.

N. Mulch: Anchor mulch unless held in place by a tackifier or netting.

O. Erosion Control Blanket

1. Where construction disturbs slopes equal or steeper than 3 to 1 or within drainage channels, protect bare slopes with an erosion control blanket as shown on the Drawings.
2. When vegetation is to be established, place erosion control blanket over the seed and anchor according to manufacturer's instructions to prevent the seed from washing away.
3. Place erosion control blankets on seedbeds free of sticks, rocks and other objects larger than 1 inch.

3.05 Soil Stockpiles

A. Manage soil stockpiles for wind erosion, storm water erosion and sediment control.

B. Temporarily or permanently stabilize stockpiled soil that is scheduled or likely to be left inactive for 15 days or more with measures appropriate for the season in order to minimize erosion potential.

C. Position stockpiles away from any ditch, stream, wetland, or storm water conveyance.

D. Properly dispose of soil that will not be used for the project.

3.06 Trench Excavation

A. Pile material from trench excavations in an area away from any ditch, stream, wetland or storm water conveyance and install silt fence around the material for sediment control.

B. Install inlet protection within the project area when excavated material is placed on a paved surface.

C. Following pipe installation, backfill trenches and temporarily or permanently stabilized all bare areas to prevent soil erosion.

3.07 Directional Drilling or Horizontal Boring Erosion and Sediment Control

A. Install erosion and sediment control measures in accordance with the Drawings.

B. Install silt fence around all work areas at bore and receiving pits to control sediments.

C. Pile materials from ditch excavation away from ditches, streams, wetlands or storm water conveyances.

D. Properly dispose of material that is not used to back fill pits.

E. Filter pit dewatering discharge in accordance with 02102 for the Disposal of Sediment-Laden Water.

F. Seed and mulch disturbed soil surfaces.

3.08 Working Near Karst Features or Water Wells

Karst features are underground geological formations that range from sinkholes, vertical shafts and springs, to complex underground drainage systems and caves. Underground karst features and water well aquifers are to be protected from construction activities and potential pollution sources.

A. Identify water wells and known karst features on the Drawings.

B. Implement erosion and sediment control practices to reduce sedimentation introduction into karst features and groundwater.

C. Position construction materials and equipment so that the area slopes away from karst features and wells.

D. Provide secondary containment for all chemicals, fuels or other liquids to capture spills or leaks.

E. Clean up spills with absorbents or dry methods. Do not allow spills to soak into the ground and do not wash off with water or detergents.

F. Properly dispose of waste materials.

3.09 Field Quality Control

A. Inspections

1. Inspect all erosion and sediment control measures at least once every 7 days.
2. Inspect all erosion control measures the next business day after any storm event with greater than 0.5 inches of rain per 24 hours has occurred. The frequency may be reduced to monthly if the site if temporarily stabilized or runoff is unlikely due to weather conditions (frozen soil).

3. Conduct a weekly inspection of the construction site to identify areas contributing to storm water discharges associated with construction activity.
4. Inspect on a regular basis disturbed areas, material storage areas and equipment storage areas that are exposed to precipitation for evidence of, or the potential for, pollutants leaving the project site or entering a storm drainage conveyance.
5. Inspect storm water discharge locations to determine if control measures are effective in preventing adverse impacts to receiving waters.
6. Observe erosion and sediment control devices to ensure that they are operating properly.
7. Inspect haul routes and construction entrance(s) daily for evidence of off-site vehicle tracking of sediments.
8. Inspect staging area to ensure that solid and liquid wastes are being properly disposed of and are not allowed to be discharged into storm water runoff.

3.10 Maintenance

A. Maintain all erosion and sediment control measures and perform the following maintenance procedures throughout the project and until such time as the disturbed area has been completely stabilized or other provisions have altered the need for these measures.

1. Implement maintenance practices as specified in the Drawings.
2. Replace mulch materials to their original level when the level has been substantially reduced due to decomposition of the organic mulches and displacement or disappearance of both the organic and inorganic mulches.
3. Remove rubbish and channel obstructions from bare and vegetated channels within the project limits. Repair damage from scour or bank failure, rodent holes, and breaching of diversion structures. Remove deposits of sediment.
4. Immediately repair excessive wear, movement or failure of erosion control blankets.
5. Repair any damage to silt fence barriers immediately and monitor barriers daily during prolonged rainfall.
6. Repair or replace any filter fabric which has decomposed or become ineffective prior to its expected usable life.
7. Remove sediment deposits after each storm event. Remove sediment when deposits reach approximately half the height of a silt fence barrier.
8. Till and smooth to conform to the existing grade and reseed any sediment deposits remaining in place after erosion and sediment control measures are no longer required and have been removed.
9. Maintain construction entrances in a condition to prevent tracking or flowing of sediment onto roads. This could require periodic top dressing of the construction entrance with additional surface materials as conditions demand. Repair and clean out any features used to trap sediment and remove all sediment spilled, dropped, washed, or tracked onto road surfaces and dispose of properly.
10. Remove accumulated sediments and debris from inlet protection devices after each storm event.
11. Periodically remove concrete and residual liquid from the concrete washout area, as needed to maintain available space for the future washout and rainwater. Dispose of in accordance with Section 02102.
12. Repair any and all rills that may appear. Re-grade to eliminate rill and stabilize ground by seeding or other methods as approved by Owner.

13. Remove and dispose of all temporary erosion and sediment control practices within 30 days after site stabilization is achieved or after the temporary practices are no longer needed, as determined by the Owner.
14. Stabilize the site and reapply seed and mulch to achieve 70 percent density of cover on vegetated areas.

3.11 Schedules

A. Coordinate erosion and sediment control measures with construction activities so controls are in place before construction begins.

1. Install the temporary construction entrance and sediment traps or filters before clearing and grading begins.
2. Install temporary perimeter controls (e.g. silt fences and inlet protection) before clearing and grading begins.
3. Do not clear, grub or grade until it is necessary for construction to proceed. Maintain natural vegetation and vegetated buffers when practical to reduce the need for control devices. Maintain all controls as described throughout the construction project and until upstream drainage areas are stabilized.
4. Permanently stabilize bare soils once construction activities cease in an area.

3.12 Payment: Storm Water Pollution Prevention and Erosion Control work will not be measured and paid for directly but be considered as a subsidiary obligation of the Contractor with costs included in the contract prices bid for the items to which they apply unless otherwise shown in the Bid Form.

-END-

SECTION 02102 – MATERIAL HANDLING AND SPILL PREVENTION PLAN

PART 1 - GENERAL

1.01 Summary

A. Section includes a plan outlining procedures to:

1. Help protect the health and safety of those working at the project site as well as the environment
2. Prevent the contamination of storm water runoff by onsite pollutants
3. Help prevent fuel and chemical spills
4. Provide a response procedure should a spill occur

B. Related Sections

1. Section 02101 – Storm Water Pollution Prevention and Erosion Control
2. Section 02110 - Site Clearing

1.02 References

A. Ohio Revised Code 3750 – Emergency Planning

B. Ohio Administrative Code 3745-56 – Above Ground Storage Tanks and Hazardous Materials

C. AWWA C651 – Disinfecting Water Mains

1.03 Definitions

A. Minor Spill: Approximately 10 gallons or less of pollutant with no contamination of ground or surface waters. Minor spills can generally be controlled by the first responder with help from other site personnel.

B. Major or Hazardous Spill: More than 10 gallons with the potential for death, injury, or illness to humans or animals or has the potential for surface or groundwater pollution.

C. Pollutants generated onsite may include gasoline, diesel fuel, oils, grease, paints, pesticides, nutrients, concrete washout, soil, solvents, paper, plastic, Styrofoam, metals, glass, and other forms of liquid or solid wastes.

1.04 Quality Assurance

A. Regulatory Requirements

1. Ensure material handling and storage associated with construction activity complies with the spill prevention and spill response requirements in Ohio Revised Code 3750 Emergency Planning

2. Ensure aboveground storage tanks containing hazardous materials are stored appropriately according to the requirements in Ohio Administrative Code Chapter 3745-56.
3. Dispose of contaminated soils, absorbents and spill cleanup materials in accordance with all Federal, State, and local regulations.
4. Do not use water to flush spilled material unless authorized by a Federal, State, or local agency.
5. Additional regulation or requirements may be required. Consult a spill response professional to ensure all appropriate and required steps have been taken.
6. Do not remove contaminated material from the site until approval is given by Emergency Response (when emergency response is required).

PART 2 - PRODUCTS

2.01 Not Used.

PART 3 - EXECUTION

3.01 Preparedness

A. Prepare a contact list of First Responders and the chain of command in the event of a spill on the site. Include names, contact numbers and information on circumstances requiring the initiation of the contact list and chain of command.

B. Maintain a list of qualified contractors, vacuum trucks, tank pumpers, and other equipment and businesses qualified to perform cleanup operations.

C. Provide a list and quantity of absorbent materials and supplies the Contractor will make available onsite in sufficient quantities to address minor spills.

D. Train construction personnel, equipment operators, subcontractors and other employees on proper fueling procedures, prevention of spills, spill response procedures, and communication procedures.

3.02 Spill Response

A. Minor Spills

1. Contain the spill to prevent material from entering the waterways and the storm or groundwater systems. Immediately clean up the spill with absorbent materials.
2. Do not flush with water, bury or allow soaking in to the ground.
3. Tarps can be used to cover spilled material during rain events on land.
4. Use absorbent material to cleanup spills on land.
   a. Contain spills on impervious surfaces with a dry absorbent.
   b. Contain spills on clayey soils by constructing an earthen dike and dispose of as soon as possible to prevent migration deeper into the soil and groundwater. Remove contaminated soils.

5. Use containment booms to prevent the migration of spills on water.
    a. Contain spills on water with a containment boom and absorb with an oil-only boom, mechanical skimmer or other similar device.
    b. Outside agencies will determine additional cleanup measures.
    c. Report oil spills that cause a sheen upon the waters.
6. Place contaminated absorbents and soils into a container for later disposal. Ensure the lid is closed and mark or label the container for identification purposes.
7. Contact 911 if the spill could be a safety issue.
8. Contact supervisors and designated inspectors immediately.
9. Dispose of waste appropriately.

B. Major or Hazardous Spills

1. Control or contain the spill without risking bodily harm.
2. Temporarily plug or cover storm drains if possible to prevent migration of the spill into the storm water system.
3. Use containment booms to prevent the migration of spills on water.
    a. Contain spills on water with a containment boom and absorb with an oil-only boom, mechanical skimmer or other similar device.
    b. Outside agencies will determine additional cleanup measures.
    c. Report oil spills that cause a sheen upon the waters.
4. Immediately contact the local Fire Department at 911 to report any hazardous material spill.
5. Contact supervisors and designated inspectors immediately. Contact county or municipal officials responsible for storm water facilities. The Contractor is responsible for having these contact numbers available at the job site. Submit a written report to the Owner as soon as possible.
6. Contact the Ohio Environmental Protection Agency (OEPA), Office of Emergency Response as soon as possible, but within 2 hours of discovery at 1-800-282-9378. Note the following information for future reports to the OEPA or the National Response Center (1-800-424-8802):
    a. Name, address and phone number of person making the spill report
    b. The location of the spill
    c. The date and time of the spill
    d. Identification of the spilled substance
    e. Cause of the spill
    f. Approximate quantity of the substance that has been spilled or may be further spilled and the amount recovered
    g. The duration and source of the spill
    h. Name and location of the damaged waters
    i. Name of spill response organization
    j. Measures taken in the spill response
    k. Other pertinent information

3.03 Spill Prevention and Material Handling Practices

A. Vehicle and Equipment Fueling

1. Purpose: To prevent fuel spills and leaks and to reduce or eliminate contamination of storm water and waterways.
2. Implementation
   a. Use offsite commercial fueling stations when possible. Use onsite vehicle and equipment fueling only where it is impractical to send vehicles and equipment offsite to a commercial fueling station.
   b. When performing fueling onsite provide a designated fueling area.
   c. Do not “top-off” fuel tanks.
   d. Keep available absorbent spill cleanup materials and spill kits in fueling areas and on fueling trucks.
   e. Use drip pans or absorbent pads during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
   f. Inspect vehicles and equipment daily for leaks. Repair leaks immediately or remove them from the project site.
   g. Protect dedicated fueling areas from storm water run-on and runoff, and locate them at least 50 feet away from the downstream drainage facilities, storm water conveyances or waterways.
   h. Perform fueling on level-grade areas.
   i. Protect fueling areas with berms and dikes to contain spills.
   j. Equip nozzles used in vehicle and equipment fueling with an automatic shut off.
   k. Do not leave fueling operations unattended.
   l. Avoid mobile refueling of construction equipment; rather transport the equipment to the designated fueling area.
   m. Store all petroleum products in tightly sealed containers which are clearly labeled.
   n. Observe Federal, State, and local regulations for any stationary above ground storage tanks.

B. Vehicle Maintenance Areas

1. Purpose: To prevent spills during the normal maintenance of construction machinery.
2. Implementation:
   a. As feasible, perform maintenance offsite in a covered facility with an impervious floor.
   b. Use a dedicated site for machinery maintenance.
   c. Locate maintenance areas at least 50 feet from storm water inlets or water bodies.
   d. Maintain spill kits and absorbent materials in close proximity to maintenance areas. Utilize drip pans and absorbent pads to prevent oils or other maintenance fluids from reaching the soil surfaces.
   e. Inspect equipment daily for leaks or worn hoses. Repair or replace as needed to prevent onsite spills.
   f. Properly dispose of all spilled fluids and fluids removed from machinery.

C. Solid Waste Management

1. Purpose: To prevent or reduce the discharge of pollutants to waterways or storm water from construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.
2. Suitable Applications: Suitable for construction sites where the following wastes are generated or stored:
   a. Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
   b. Packaging materials including wood, paper and plastic
   c. Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
   d. Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
   e. Construction waste including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, Styrofoam, plastic and other packaging for construction materials
   f. Sediments and other materials collected in erosion and sediment control measures (silt fence, inlet protection, catch basin sumps, etc.)
   g. Natural debris such as excess soil, stone, sand, leaves, branches, brush or wood
3. Implementation:
   a. Develop a plan for proper waste disposal including the disposal of excess soil and excavated material. If a commercial disposal facility will not be utilized for soil disposal, then develop a Storm Water Pollution Prevention Plan for the selected disposal area.
   b. Select designated waste collection areas onsite.
   c. Inform trash-hauling contractors that only watertight dumpsters are acceptable for onsite use.
   d. Inspect dumpsters for leaks, and repair dumpsters that are not watertight.
   e. Provide an adequate number of containers with lids or covers to prevent loss of wastes from wind and to prevent the collection of rainwater.
   f. Collect site trash daily or more frequent if needed during demolition work. Do not allow containers to overflow. Clean up immediately if a container spills, leaks or overflows.
   g. Remove solid waste promptly from erosion and sediment control devices.
   h. Ensure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acid, pesticides, additives, curing compounds) are not disposed of in dumpsters designed for construction debris.
   i. Do not hose out dumpsters on the construction site. Ensure that dumpster cleaning is conducted by the trash hauling contractor off site.
   j. Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas. Do not locate solid waste storage areas in areas prone to flooding or ponding.
   k. Locate solid waste dumpsters a minimum of 50 feet away from waterways, storm water inlets or other drainage facilities.
   l. Minimize the potential for spills or leaks to drain immediately into a waterway or drainage facility.
   m. Do not bury construction waste onsite.

n. Cover construction material hauled from the site in dump trucks with a tarpaulin.
o. Inspect construction waste areas regularly.

D. Fluids, Paints, Solvents and Other Chemicals Storage and Use

1. Purpose: To prevent spills during the use and storage of the materials.
2. Implementation
   a. Store materials in manufacturer's containers.
   b. Maintain Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS) on all products.
   c. Store materials in a weather proof/vandal resistant locker or building.
   d. Keep materials away from flammable sources.
   e. Follow manufacturer's instructions for the proper use and storage of all materials.
   f. Do not perform washout of solvent from paint supplies near or into a waterway or storm water inlet. Wash water is to be disposed of as wastewater.
   g. Tightly seal and store paint containers and curing compounds when not required for use.
   h. Do not discharge excess paint to a waterway or storm system. Properly dispose of excess paint according to the manufacturer's instructions and in accordance with all Federal, State, and local regulations.

E. Secondary Containment

1. Provide secondary containment for aboveground storage tanks or storage areas containing hazardous materials that are located outside.
2. Provide secondary containment consistent with good engineering standards.
3. Provide secondary containment that is compatible with the hazardous materials being stored.
4. Provide secondary containment that will prevent a release from entering waters for a 72 hour period.
5. Secondary containment must meet one of the following:
   a. Double-walled tank,
   b. Dikes, berms, retaining walls, trenches, or
   c. Diversionary system
6. Provide secondary containment with a capacity to contain at least 110% of the volume of the largest aboveground tank or the volume of the largest aboveground tank plus enough freeboard to contain precipitation generated by a 25 year/24 hour rain event.
7. Provide secondary containment with a minimum 120 gallon capacity for storage area holding only drums.
8. Maintain the secondary containment to protect the integrity and capacity of the area.
9. Remove collected liquid in the secondary containment area within 72 hours of its discovery to maintain the capacity. Remove ice as soon as weather permits. Liquid that collects within the secondary containment area must meet all applicable requirements of the Water Quality Standards if discharged to waters of the state.

F. Disposal of Sediment-Laden Water

1. Purpose: To prevent the purposeful discharge of sediment-laden water from the project site.
2. Implementation:
   a. Do not discharge sediment-laden water from pumping operations into or near storm water conveyances, wetlands, rivers, streams, waterways and impoundments or into natural or manmade channels leading thereto.
   b. Discharge sediment-laden water from dewatering of trenches, or other excavations by means of a pump or similar means into a manufactured pumping bag for filtering in accordance with the manufacturer's recommendations unless the pumped water is routed through another erosion control measure such as a sediment trap or outlets onto a well-established vegetated area without eroding.
   c. Pumping operations moving clean water through a site are not required to have a pumping bag or similar device at the outlet.
   d. Protect the point of discharge to prevent soil erosion.

G. Concrete Washout Area

1. Provide a designated concrete washout area for use of washing out concrete trucks in order to contain potential storm water pollutants. Use one of the following methods:
   a. Construct a minimum 10-foot by 10-foot by 3-foot deep area (or larger as required to contain liquid and solid waste from concrete washout operations) with a polyethylene lining. Construct and prepare the base of the system so that it is free of rocks and other debris that may cause tears or punctures in the polyethylene lining.
   b. Install and maintain a pre-fabricated containment system in accordance with the manufacturer's instructions.
   c. Use a polyethylene-lined roll-off dumpster when other methods are not practicable.
   d. Subcontract with a concrete supplier that collects all washout water and pumps it back into the mixer drum for proper disposal off-site. In this instance, a concrete washout area would not be required.
2. Install orange safety fencing around concrete washout area perimeter. Post signage directing contractors and suppliers to the designated concrete washout location.
3. Locate washout areas at least 50 feet from storm drains, open ditches, or water bodies.
4. Inspect system daily and after each storm event. Inspect the integrity of the overall structure including, where applicable, the containment system. Inspect the system for leaks, spills, and tracking of soil by equipment. Inspect the polyethylene liner for failure. The liner may need to be replaced after every cleaning if removal of material has damaged the liner. Repair the concrete washout structure, as needed, or construct a new system.
5. Allow concrete wastes to set. Break up and properly dispose of hardened wastes. Liquid that collects in the washout area could be high in alkalinity and could contain pollutants. Liquid must be disposed of as wastewater. Upon removal of waste, inspect the structure.

6. Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile or dispose of in the trash.
7. Discuss the concrete management techniques (such as handling of concrete waste and washout) with the ready-mix concrete supplier before any deliveries are made.
8. Incorporate requirements for concrete waste management into material supplier and subcontractors' agreements. Inspect construction activities on a regular basis to ensure suppliers, contractors, and others are utilizing designated washout areas. If concrete waste is being disposed of improperly, identify the violators and take appropriate action.
9. Perform washout of concrete trucks offsite or in designated areas only. Never dispose of washout from concrete trucks in a ditch, stream, wetland, waterway, or storm water conveyance.
10. Do not dump excess concrete onsite, except in designated areas.
11. When concrete washout systems are no longer required, close the concrete washout systems. Dispose of all hardened concrete and other materials used to construct the system. Backfill, grade, and stabilize any holes, depressions, and other land disturbances associated with the system.

H. Fertilizers

1. Apply fertilizers only in the minimum amounts recommended by the manufacturer.
2. Work fertilizers into the soil to limit exposure to storm water.
3. Store fertilizers in a covered area and transfer partially used bags to a sealable container to avoid spills.

I. Chlorinated Water

1. Neutralize and dispose of heavily chlorinated water following completion of the disinfection and testing of water lines in accordance with AWWA C651, Appendix C.

-END-

SECTION 02110 - SITE CLEARING

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Furnishing all labor, tools, equipment, and materials necessary to complete all clearing and grubbing, removal of trees, stumps, and fences as applicable, and disposal of removed items and debris as described herein.

B. Related Sections

1. Section 02101 - Storm Water Pollution Prevention and Erosion Control
2. Section 02220 - Trenching, Backfilling and Compaction for Utilities

PART 2 - PRODUCTS

2.01 Topsoil

A. Topsoil shall be reasonably free from subsoil, debris, and stones larger than 1 inch in diameter.

B. Refer to (Section 02101) for additional topsoil requirements.

PART 3 - EXECUTION

3.01 Clearing

A. Carefully remove the property owner's fences, shrubs, trees, or other obstacles to the construction procedure; coordinate with the property owner and Engineer a minimum of 48 hours prior to removal. Dispose of materials and debris at a location secured by the Contractor and in accordance with all applicable laws. Restore all fencing to existing conditions, trees and shrubs shall not be replaced within easement limits. Place backfill to the grade of the existing ground level or as otherwise shown on the Drawings.

3.02 Grubbing

A. Remove any stumps, roots larger than 1-1/2 inches in diameter, vegetation, boulders, and other objectionable material within the limits of the construction area.

B. Remove tree stumps and roots to the following depth:

1. Within paved area: 24 inches below subgrade
2. Within building and structure areas: 36 inches below subgrade
3. Within lawn areas: 24 inches below subgrade
4. Within the septic tank excavation limits (length, width, and depth)

C. Scrape clean all areas to be stripped of topsoil. Remove all brush, weeds, grass, roots and other materials that will interfere with lawn maintenance.

D. Strip the construction area of all topsoil to its entire depth. Do not use topsoil for subgrade fill. Stockpile topsoil for use in finish grading operations in approved areas, and protect from erosion.

E. Dispose of all rubbish and debris resulting from clearing and grubbing operations off the property and in accordance with all applicable laws. Do not burn any rubbish and debris onsite.

3.03 Trimming

A. Remove interfering branches without injury to tree trunks. Do not paint or cover wounds to the tree or pruned branches.

3.04 Protection

A. Protect existing trees and shrubbery in the construction area that are to remain. Remove and replace in kind all trees and shrubbery in the construction area that are to remain but that are damaged or killed during construction.

B. Tree Protection During Excavation - Adhere to the following procedure when installing underground electric, water, sewer lines and structures near trees.

1. When possible, avoid trenching inside the dripline of a tree.
2. Cut roots cleanly. Do not paint cut roots.
3. Backfill the trench as soon as possible. Do not leave the roots exposed to air.
4. Clean up around trees immediately after construction.

C. Protect existing utilities that are to remain.

3.05 Tree Protection for Indiana Bat Habitat

A. In order to avoid impacts to *Myotis Sodalis* (the Indiana Bat), removal of trees larger than 3 inches at breast height (54 inches above the ground surface) is not allowed from **April 1st through September 30th.**

B. Contact the Ohio Department of Natural Resources if Indiana Bats are encountered.

3.06 Management of Trees for the Emerald Ash Borer

A. Emerald Ash Borer (EAB), *Agrilus planipennis Fairmaire*, is an exotic beetle that damages all species of ash trees (genus *Fraxinus*) and other hardwood trees. In accordance with federal regulations (7 CFR 301.53-1 through 301.53-9), all trees potentially containing EAB are not to be moved out of the federally quarantined area. Coniferous trees (such as pine, spruce or fir) are not regulated by 7 CFR

301.53-1 through 301.53-9. The EAB quarantine restricts movement of the following:

1. Cut firewood of any kind, expect pine. Firewood may move between federally quarantined states in the quarantined area if this is allowed by each state. It is best to verify with each destination state Department of Agriculture for their rules or contact ODNR Division of Forestry for assistance and the latest information on quarantine status.
2. Living EAB insects of any life stage from immature to adult.
3. Any whole ash trees, including nursery trees.
4. Limbs, stumps, branches, or debris from ash trees with a diameter of 1 inch or more.
5. Ash logs, slabs, or untreated ash lumber with the bark attached.
6. Ash chips and ash bark chips (both composted and non-composted) that are 1 inch or more in diameter.
7. Any product made from ash wood that was recently alive and growing that might move any life stage of the beetle.

For additional guidance regarding the proper disposal of tree material that could potentially be infested with EAB, contact the Ohio Department of Natural Resources Division of Forestry at 1-877-247-8733 or The Ohio State Department of Plant Pathology at 614-292-1375.

-END-

SECTION 02111 –RECORDING OF CONSTRUCTION AREAS

PART 1 - GENERAL

1.01 Scope

A. Prior to construction, Contractor shall walk each work site with a member of the Owner's staff (and Engineer) to record existing site conditions. Contractor shall furnish and provide one copy of audio-visual DVD recordings of all site conditions located within the construction area as shown on the Drawings and as specified herein.

B. Before Contractor begins construction activities, Contractor shall provide all labor, materials, equipment, services and perform all operations necessary to furnish the Owner and Engineer a complete color DVD recording of the surface features and conditions within the proposed construction zone of influence.

C. The audio-visual DVD recording shall include all DVD’s, DVD storage cases, DVD index labels and run sheet logs. The purpose of this coverage shall be to accurately document the pre-construction conditions of the surface features.

PART 2 - PRODUCTS

2.01 Equipment

A. Recordings shall be still frame capable, color, DVD format videodiscs. The recorded videodiscs shall be compatible for playback with any Standard DVD player or on personal computer. The discs shall be new.

B. The camcorder used for the recordings shall be high quality color camcorder with ¼", 1/3", or ½" charged coupled device-imaging system. Camera must have optical stabilization; electronic stabilization is not acceptable. Camera must be capable of 20x minimum optical magnification. Camera must be capable of producing NTSC 525 lines resolution/60 fields/30 frames per second. Minimum illumination capabilities of at least 3-lux.

PART 3 - EXECUTION

3.01 Information to be Included

A. The zone of influence shall be defined as an area located within the permanent and temporary construction easement, an area 30 feet beyond either side of the centerline of the construction area, the road Right-of-Way, and shall also include those areas adjacent to these areas which may be affected by routine construction operations or as requested by the Owner and/or the Engineer.

B. The surface features within the construction zone of influence shall include, but not be limited to, all visible roadways, pavements, curbs, driveways, sidewalks,

culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery and fences.

C. A runsheet log must be provided that accurately catalogs the contents of each videodisc. Information in the runsheet must include:

1. Street name, easement, or address.
2. Drawing sheet number or numbers relative to the line entry of a particular area of coverage.
3. Roll numbers.
4. Real time code indexing for each segment of the project. Real time code indexing will indicate hours, minutes, and seconds to cross reference with playback equipment to locate specific points of interest on the project.
5. Direction of travel for each specific segment.
6. Viewing side for each specific segment.
7. Starting point for each specific segment.
8. Ending point for each specific segment.
9. Project information, i.e., project title, owner, date.

D. All DVD's must be labeled with appropriate project information and be able to be cross-referenced with runsheets. Information on videodisc labels shall include:

1. Roll number.
2. Project Title.
3. Location of project.
4. Month and year of coverage.
5. As multiple copies of each videodisc will be made available, DVD's must be marked as sets, i.e.: Engineer's set, Owner's set, Contractor's set.
6. Quick reference list of contents of a particular videodisc.

3.02 Miscellaneous Details

A. The recording of the project shall take place prior to the placement of equipment and materials on the jobsite. All videodiscs shall be logged and presented to the Engineer and Owner before the actual construction is started for their review. Particular and detailed attention shall be given to any defects noted, such as cracks, disturbed areas, damaged items, or as may be required by Owner and Engineer. It is the intent of this coverage to accurately and clearly document pre-existing conditions and especially any items that may result in construction claims.

B. To preclude the possibility of tampering or editing in any manner, all recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recordings, as well as the corresponding engineering stationing numbers. The date information will contain the month, day and year.

C. Accompanying the recording shall be a corresponding and simultaneously recorded audio track containing the commentary of the camera operator. Each disc shall begin with the current date, project name, municipality, and the general location, i.e., name of street, viewing side, and direction of progress. The

commentary shall assist in the maintenance of viewer orientation, identification of surface features, and objective description of the points of interest being shown on the video portion of the recording.

3.03 Recording

A. All recording shall be done during times of good visibility. No recording shall be done during periods of visible precipitation, or when more than 10 percent of the ground area is covered with snow, unless authorized by the Owner.

B. Houses and buildings shall be identified visually by house number, when visible, in such a manner that structures of the proposed system, i.e., manholes on a sewer system, gate valves and hydrants on a water system can be located by reference. In all instances, locations shall be identified by audio or visual means at intervals not to exceed 100 linear feet.

C. To produce the proper detail and perspective, adequate lighting will be required to fill in the shadow area caused by trees, utility poles, road signs, and other such objects in residential areas or as directed by the Engineer.

D. The rate of speed in the general direction of travel of the conveyance used during taping shall be directly proportional to the number, size, and value of the surface features within that construction area's zone of influence. The rate of speed shall not exceed 48 feet per minute in residential areas, or 100 feet per minute in non-residential areas. The rate of travel for Haul Routes, Rainfall Studies, and Road Surface View shall be approximately five (5) miles per hour. Panning rates and zoom-in, zoom-out rates shall be electronically or manually controlled sufficiently such that during playback will produce clarity of the object viewed. The playback picture shall be in focus and be of extreme clarity at all times.

E. Where conventional wheeled vehicles are used, camera is to be mounted securely to produce steady viewing. Camera lens is to be a minimum of eight (8) feet from ground of viewing area, or at a level to facilitate best perspective and line of sight. Vehicles used while performing documentation must be plainly marked with Company name and phone number. Caution signs, flags, and strobes may be utilized on vehicle as necessary.

F. Contractor shall be able to televise and tape areas with paved roads, along co-owned easements through parks, lawns, and open fields. If recording on private property, Contractor shall give the Owner sufficient prior notice of such entry so that property owners may be advised of and their permission obtained for the work. If permission is denied, runsheet log will be duly noted.

G. The Owner and/or Engineer shall have the authority to designate what area may be omitted or added for recording.

H. The Owner and/or Engineer shall have the authority to reject all or any portion of the recording not conforming to Specifications.

-END-

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.01 Summary

A. Section includes:

1. Stripping, storage and redistribution of topsoil, cut and fill operations, and rough and finish grading.
2. Excavation, backfilling, compaction, hauling, and disposal of materials
3. Dewatering operations

B. Related Sections

1. Section 02101 – Stormwater Pollution Prevention and Erosion Control
2. Section 02110 – Site Clearing
3. Section 02220 - Trenching Backfilling & Compaction
4. Section 03300 – Cast-in-Place Concrete

1.02 References

A. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

B. Ohio Department of Transportation (ODOT) Standard Specifications, latest edition

C. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.03 Definitions

A. Pavement/Structure Loading Zone: The area within 5 feet of any edge of pavement, curb, gutter, sidewalk, building, structure, vault, tank, pad or other load bearing feature.

B. Structural Pad: The area within an imaginary line that extends downward from the outside edge of a footing, foundation, mat or other load-bearing feature at a 1H:2V slope.

C. Structural Fill: Material placed beneath foundations and structures and used to fill an excavation around the vertical sides of structures, directly over structures, and where described in the Specifications and indicated on the Drawings.

D. Plastic Clay: Soil type CH with a Liquid Limit above 50.

E. Common Excavation: All excavation not classified as rock excavation or excavation that is otherwise classified.

F. Rock Excavation

1. Igneous, metamorphic, and sedimentary rock which cannot be excavated without blasting or the use of a modern power shovel of no less than one cubic yard capacity, properly used, having adequate power and in good running condition, or the use of other equivalent power equipment.
2. Boulders or detached stones each having a volume of one half (1/2) cubic yard or more.

G. Unclassified Excavation: Excavation of all materials of whatever character encountered in the work.

H. Borrow: Approved material required for the construction of embankments or other portions of the work, and obtained from offsite.

I. Unsuitable Material: Include frozen soil, relatively soft material, relatively wet material, deleterious material, plastic clays, or soils that exhibit a high organic content.

1.04 Submittals

A. Test Results

1. Structural fill material testing and classification results, including: material source, natural and optimum moisture content, sieve analysis, maximum dry density, classification.
2. Field compaction test results
3. Subgrade evaluations

1.05 Quality Assurance

A. Qualifications

1. Provide the services of a qualified testing laboratory to perform all laboratory tests and evaluations.
2. Provide the services of a qualified testing agency experienced in geotechnical engineering and field determinations of soil suitability for the evaluation of foundations, pavements, and structures subgrade soils and conditions.

1.06 Job Conditions

A. Maintain benchmarks, monuments, and other reference points, and replace any that are disturbed or destroyed.

1.07 Warranty

A. Refill and restore to the original grade settlement in the backfill which takes place within the warranty period at no additional cost to the Owner. Restore the surface area where settlement has occurred, including, but not limited to seeding; fertilizing; erosion control; and restoration of streets, drives, yards, and sidewalks.

B. Guarantee survival of all disturbed and replaced trees and shrubs during the warranty period.

PART 2 - PRODUCTS

2.01 Materials

A. Regular Backfill

1. Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487-06, or a combination of these groups; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

B. Structural Fill

1. Clean, well-graded, coarse-grained granular material free of organic material, debris, deleterious materials, or frozen soils.
   a. Coarse-Grained Granular Material
      1) Less than 5%, by weight, passing a No. 200 sieve.
      2) 100% passing a 1" sieve.
      3) Coarse sands and gravel-sand mixtures, including variously graded sands and gravels. Soil types GW, GP, SW and SP are included in this class.
2. Low Strength Mortar
   a. Seven-Day Compressive Strength: 700 psi min
   b. Material meeting Section 03300.

C. Topsoil

1. Natural, fertile, agricultural soil, capable of sustaining vigorous plant and lawn growth.
2. Uniform composition throughout, without admixture of subsoil.
3. Free of stones, lumps, clods, and sticks larger than 1-inch; live plants and their roots, sticks, and other extraneous matter.

PART 3 - EXECUTION

3.01 Preparation

A. Clear areas as specified in Section 02110.

B. Remove all topsoil at construction areas. Stockpile topsoil for use in finish grading operation. Do not use topsoil for fill.

C. Do not place fill materials until the subgrade and construction have been inspected by the Engineer.

D. Before borrow or disposal operations begin, provide the Engineer plans for the control of water including measures to keep sediment from entering streams.

3.02 Excavation

A. Keep open excavations free of water and manage groundwater so as to not impact the work.

1. Prior to beginning excavations, provide dewatering equipment suitable for the groundwater conditions encountered.
2. Use diversion ditches, dikes, or other suitable means to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.
3. Provide and maintain adequate pumping and other dewatering equipment to remove and dispose of surface and ground water entering excavations.
4. Filter the water from dewatering operations to remove sediment before discharge.

B. Protect open excavations by roping areas off, or with barricades or railings, to prevent injury to personnel. Comply with all applicable Occupational Safety and Health Administration (OSHA) regulations.

C. Excavate true to line and grade, and elevation at bottom of the excavation. Excavate to undisturbed structurally stable subsoil. Notify Engineer where excavation, in order to reach such subsoil, must continue deeper than required by the elevations indicated on the Drawings. No additional payments will be made for unauthorized excess excavation.

D. Excavate to the dimensions indicated for new construction plus sufficient space as applicable to permit erection of forms, shoring, masonry, foundations, structure installations, and excavation inspections.

E. Excavate below structures, slabs and pavement to permit placement of subbase material.

F. Provide shoring or piling as required to protect excavation bank.

G. Boulders, if encountered, must be disposed of outside of the construction area.

3.03 Contaminated Soils and Groundwater

A. If suspected contaminated soils or groundwater are discovered during excavation, inform the Engineer immediately and cease excavation.

B. Contact the corresponding regulatory agency based on the excavation location.

1. If the excavation is within the ODOT right-of way, contact ODOT Office of Environmental Services (614-466-7100) and report the suspected contamination to the OEPA Spill Hotline (800-282-9378). Follow ODOT Site Assessment Guidelines for proper investigation and handling of the suspected contaminated soils or groundwater.

2. If the excavation is outside of the ODOT right-of-way, the Owner will report the suspected contamination to OEPA Spill Hotline. OEPA may direct the Owner to additional regulatory agencies depending on the nature of the suspected contamination.

C. Keep suspected contaminated soils separate from soils that appear to be “clean” or uncontaminated.

1. DO NOT place suspected contaminated soils, in environmentally sensitive areas such as waterways, floodways, wetlands, karst features, or stormwater conveyances.
2. Place suspected contaminated soil on a plastic tarp and cover with an additional plastic tarp or place in containers (e.g. drums) with a lid.
3. Place a berm around the covered stockpile to ensure that soils are not blown by wind or carried by stormwater.
4. Follow the direction of the regulatory agency in handling, storage, characterization, and disposal of contaminated soils.

D. Leave suspected contaminated groundwater in the excavated area.

1. If the suspected contaminated groundwater must be removed from the excavated area, pump to covered containers (e.g. drums or totes) for proper disposal.
2. Follow all federal, state and local disposal requirements for suspected contaminated groundwater.
   a. Discharging contaminated groundwater to a waterway or stormwater conveyance requires an emergency NPDES permit from OEPA’s Division of Surface Water.
   b. Discharging contaminated groundwater to the sanitary sewer requires local approval and analytical tests per the local sewer use ordinance or wastewater discharge requirements.

E. Any increase or decrease of cost resulting from encountering contaminated soils or groundwater will be adjusted in the manner provided in the General Conditions.

3.04 Subgrade Evaluation

A. Prepare all areas that will support foundations, floors, pavements, or newly placed structural fill prior to subgrade evaluation. Remove all loose surficial soil, topsoil, and other unsuitable materials at least 5 feet beyond the limits of the proposed pavement and structures when feasible.

B. Once excavations have reached the required elevations and dimensions, notify the Engineer and Contractor’s testing agency so the subgrade can be evaluated. Do not place fill material until the subgrade and construction has been inspected and approved by the Engineer and Contractor’s testing agency.

C. Foundation subgrade evaluation

1. The Contractor's testing agency will test the exposed subgrade to confirm that a bearing surface of adequate strength has been reached.
2. Further excavate localized soft soil zones encountered at the bearing elevation until adequate support soils are encountered, or the minimum undercut depths are achieved, whichever is greater.
3. Replace the undercuts with compacted structural fill.
4. For each type of soil on which footings will be placed, conduct at least one bearing test for every 500 square feet of structure foundation, but in no case less than three tests, to verify required design bearing capacities.

D. Paved and slab area subgrade evaluation

1. Under observation of the Engineer and Contractor's testing agency, proof-roll the subgrade in the location of the new pavement and structures shown on the Drawings.
2. Proof rolling shall consist of repeated passes of a loaded pneumatic-tired vehicle such as a tandem-axle dump truck or scraper.
3. Any areas found to rut, pump, or deflect excessively must be compacted in place or undercut and replaced with compacted structural fill, as directed by the Engineer.

E. Minimum undercut depths to be provided if unsuitable soils, plastic clays, or other unsuitable subgrade conditions are encountered shall be as follows:

1. Subgrade under foundation: minimum 24" undercut
2. Subgrade under slabs: minimum 18" undercut
3. Subgrade under paved areas: minimum 12" undercut

3.05 Filling and Backfilling

A. General

1. Once the subgrade has been approved by the Contractor's testing agency and the Engineer, fill and/or backfill the excavations to the required grades as shown on the Drawings.
2. Suspend earthwork operations when satisfactory results cannot be obtained because of rain, freezing weather, or other unsatisfactory conditions in the field.
3. Material shall be of the proper moisture content before compaction. Do not perform filling or backfill if the material is too wet to permit proper compaction.
4. Place layers in the deepest portion of the fill first. As placement progresses, construct layers approximately parallel to the finished grade line.
5. Place layers in successive horizontal layers for the full width of the section and at the loose lift thickness specified.

B. The Contractor is responsible for the stability of the fill above the top of footings. Do not backfill until walls are braced or shored and the Engineer has approved the

backfilling operation. If fill is to be provided on both sides of walls, fill on both sides at same time.

C. Install vapor barrier on drainage fill prior to installing slab-on-grade floor slabs. Place drainage fill under floor slabs, slabs on grade, walks, and paving to indicated depths but not less than four (4) inches in depth.

3.06 Compaction

A. General

1. Compact fill using equipment capable of compacting each lift its full depth. Maintain moisture at optimum content during compaction operations.
2. Provide compacting equipment of the design, weight, and quantity to obtain the required soil compaction. Under no circumstances will a bulldozer or similar tracked vehicle be used as compacting equipment.
3. Use water distribution equipment with suitable sprinkling devices to add moisture to the soil, if required.
4. Compact areas inaccessible to a roller by mechanical tampers. Operate the equipment in such a manner that hardpan, cemented gravel, clay, or other chunky soil material are broken up into small particles and become incorporated with the material in the layer.
5. Compaction by flooding is not acceptable.
6. If a fill area excavation extends beyond the limits of that fill area definition, continue with the same fill material and compaction across the entire excavation unless approved by Engineer.

B. Degree of Compaction

1. Compact to the limits specified below and in accordance with ASTM D1557.
2. Fill areas beneath footings, foundations, and mats (within the Structural Pad):
   a. From bottom of fill to within 12" of top of fill: Place Structural Fill in 8" maximum loose lifts and compact each layer to 100% of maximum dry density (ASTM D1557).
   b. Final 12" of fill: Place Structural Fill in 6” maximum loose lifts and compact each lift to 100% of maximum dry density (ASTM D1557).
3. Fill areas beneath floor slabs, adjacent to and within 5' of foundations, and over foundation (outside the Structural Pad but within the Structure Loading Zone):
   a. From bottom of fill to within 12" of top of fill: Place Structural Fill in 8" maximum loose lifts and compact to not less than 95% of maximum dry density (ASTM D1557).
   b. Final 12" of fill: Place Structural Fill in 6" maximum loose lifts and compact each lift to 100% of maximum dry density (ASTM D1557).
4. Fill areas adjacent to walls:
   a. Place Structural Fill in 8" maximum loose lifts and compact to 90% of maximum dry density (ASTM D1557) for fills not required to support structural loads above and compact to 95% maximum dry density (ASTM D1557) for fills required to support structural loads above.

5. Fill areas within the Pavement Loading Zone:
   a. From bottom of fill to within 12” of top of fill: Place structural fill in 8” maximum loose lifts and compact each layer to 95% of maximum dry density (ASTM D1557).
   b. Final 12” of fill: Place structural fill in 6” maximum loose lifts and compact each lift to 100% of maximum dry density (ASTM D1557).
6. For all other fill areas: Place regular backfill in 8" maximum loose lifts and compact each layer to 90% of maximum dry density (ASTM D1557).

C. Field Density Testing

1. Perform one field density test for every 500 square feet of fill on each lift, but in no case less than three tests, to ensure that adequate compaction is being achieved.

3.07 Proof Rolling of Fills

A. Perform proof rolling operations using a pneumatic tire roller conforming to the requirements of ODOT Specification 204.

3.08 Grading

A. Furnish, operate, and maintain equipment necessary to control uniform layers, section, and smoothness of grade for maximum compaction and drainage.

B. Rough Grading

1. Evenly grade to an elevation 6 inches below the finish grade elevations indicated.
2. Protect all constructed items during grading operations, and repair if damaged.
3. All areas in the project, including excavated and filled sections and adjacent transition areas, shall be reasonably smooth, compacted, and free from irregular surface changes.
4. Provide a finish grade ordinarily obtainable from either blade-grader or scraper operations, unless otherwise specified.
5. The finished subgrade surface generally shall be not more than 0.3 feet above or below the established grade or approved cross-section, with due allowance for topsoil and seeding or sod as applicable.
6. The tolerance for areas within 10 feet of buildings shall not exceed 0.15 feet above or below the established sub-grade.
7. All ditches, swales and gutters as applicable shall be finished to drain readily.
8. Evenly slope the subgrade to provide drainage away from the building walls in all directions at a grade not less than ½-inch per foot.
9. Provide grade rounding at top and bottom of banks and at other breaks in grade.

C. Protection

1. Protect newly graded areas from the action of the elements.

2. Repair settlement or washing that occurs prior to acceptance of the work, and reestablish grades to the required elevations and slopes.
3. Fill to required subgrade levels any areas where settlement occurs.

D. Finish Grading

1. Proceed to finish elevations shown on Drawings with a tolerance of plus or minus .04 ft. (1/2 inch).
2. Rake subsoil clean of stones and debris. Scarify to a depth of 3 inches.
3. Spread stockpiled topsoil over prepared subgrade to a minimum depth of six (6) inches, and roll until suitable for seeding or placement of sod as applicable.
4. Maintain surfaces and replace additional topsoil necessary to repair erosion.

E. Complete final restoration operations including grading, seeding, and/or other necessary treatments to blend the area into the surrounding landscape as shown on the Drawings. Assure restored areas within 150 feet of the nearest right-of-way line are well drained.

F. No additional payments will be made for restoration of borrow areas. Drainage, location, or use of the pit, shall comply with existing laws, regulations, and ordinances. Under no conditions shall borrow sites detract from the appearance of the natural topographical features or increase any potential hazard.

-END-

SECTION 02220 - TRENCHING, BACKFILLING AND COMPACTION

PART 1 - GENERAL

1.01 Scope

A. Perform all excavation work as required for the installation of process piping, gravity lines, water mains, valves, hydrants, electrical ductbanks, and appurtenances including necessary clearing, grubbing, excavation, trenching, filling, backfilling, restoration of drives, sidewalks, yards and other related work.

B. Existing Underground Facilities and their connections have been shown on the Drawings according to the best available information. Determination of the exact location and the protection of these Facilities, their support and maintenance in operation during construction, is the responsibility of the Contractor in the performance of the Work.

C. Proceed with caution in the excavation and preparation of trenches so that the exact location of Underground Facilities, both known and unknown, may be determined. The Contractor shall be responsible for the repair of existing Underground Facilities when broken or damaged. Unforeseen conflicts with existing Underground Facilities encountered during excavation and preparation of trenches shall immediately be brought to the attention of the Engineer. If it is determined that the new piping cannot be installed at locations shown on the Drawings, adjustments in alignment of the piping may be made as favorably reviewed by the Engineer.

D. The Contractor shall be accountable and responsible for all sheeting and bracing used, and for damages to persons or property resulting from the improper quality, strength, placing, maintenance and removal of the sheeting and bracing, including damage to trees, shrubs, walkways and other property. All sheeting and bracing shall be capable of sustaining the lateral forces of the trench banks and be in compliance with applicable Occupational Safety and Health Act (OSHA) regulations.

E. Include in the Bid the cost to locate, relocate, support, protect, maintain, replace and reinstall existing Underground Facilities on the Site that interfere or conflict with the Work. The Contractor shall bear any and all costs to locate, relocate, support, protect, maintain, replace and install said existing Facilities. The cost to locate, relocate, support, protect, maintain, replace and reinstall existing Underground Facilities shall not be considered as an additional payment item.

1.02 Guarantee

A. Refill and restore to the original grade any settlement in the backfill which takes place within the one-year warranty period, at no additional cost to the Owner. Restore the surface area where settlement has occurred, including, but not limited to seeding, fertilizing, erosion control and restoration of paved drives, yard areas, and sidewalks.

PART 2 - PRODUCTS

2.01 Bedding and Backfill Material Classes

Bedding and backfill material classes referenced within this section shall be defined as follows and in accordance with Ohio Department of Transportation (ODOT), Construction and Materials Specifications, most current version:

A. Structural Backfill - Type 1: Aggregate gradations meeting Items 304, 411, or 617 except 0 to 20 percent may pass the No. 200 sieve, as listed in ODOT Section 703.11.A.

B. Structural Backfill – Type 2: Aggregate gradations meeting Items 703.05.A, 703.02.A, or the gradations listed in ODOT Section 703.11.B.

C. Structural Backfill - Type 3: Aggregate gradations meeting Size No. 57 or 67 from Table 703.01-1, as listed in ODOT Section 703.11.A.

D. Excavated Material (Natural Soils): As listed in ODOT Section 703.16.A. Excavated material suitable for use as trench backfill as specified must be clean and free of trash, construction debris, rocks larger than six inches, frozen soil lumps, wood, or other extraneous material.

E. Low Strength Mortar Backfill: As defined in ODOT Section 613.

2.02 Bedding and Backfill Materials

Reference the Standard Details in the Drawings for illustrations of bedding and backfill materials required for each pipe material. For the purpose of these Specifications, the "pavement zone" shall be defined as that area within five (5) feet of any edge of existing or new pavement on the project site. Bedding and backfill required for pipe materials are as follows:

A. Plastic Pipe and Conduit

1. Bedding and Initial Backfill Zones
   a. Type 1 or Type 3 material is required for PVC pipe and conduits. Shovel slice or otherwise carefully place and "walk" or hand tamp into place from four (4) to eight (8) inches (based upon pipe diameter) below the pipe barrel, to a minimum of twelve (12) inches above the crown of the pipe.
   b. Hand place bedding and initial backfill material around the haunch and sides of the plastic pipe to ensure proper compaction filling of all voids. Place bedding and initial backfill in 6" to 12" balanced lifts.
2. Backfill Zone
   a. Backfill plastic pipe and conduits located within the pavement zone from twelve (12) inches above the crown of the pipe with Type 1 or 3 material compacted to 95-percent Modified Proctor Density.
   b. Backfill plastic pipes located outside of the applicable pavement zone from twelve (12) inches above the crown of the pipe with clean excavated material as shown on the Standard Details on the Drawings.

B. Ductile Iron Pipe

1. Bedding Zone
   a. Ductile Iron Pipe (DI) bedding shall be Structural Backfill – Type 1 or 3. Shovel slice or otherwise carefully place and "walk" or hand tamp into place from three (3) to six (6) inches (based upon pipe diameter) below the pipe barrel, to 1/6th the outside pipe diameter (Bc). Type 1 or Type 3 material is required in the pavement zone and compacted to 95-percent Modified Proctor Density as a minimum.
2. Initial Backfill and Backfill Zones
   a. Backfill ductile iron pipe located within the pavement zone from the haunch area with Type 1 or 3 material compacted to 95-percent Modified Proctor Density.
   b. Backfill ductile iron pipe located outside of the pavement zone from the haunch area with clean, excavated material.

PART 3 - EXECUTION

3.01 Site Preparation

A. Before any excavation is started, provide adequate protection for all lawns, trees, landscape work, shrubs, fences, hydrants, sidewalks and other objects that are to remain in place. Maintain such protection for as long as necessary to prevent damage from the Work.

B. Movable items such as mail boxes and roadway signs may be temporarily relocated during construction. Place movable items in their original location immediately after backfilling is complete. Replace movable items damaged during construction with new items at the Contractor's expense.

C. Strip topsoil and vegetation from the excavated areas. Clean topsoil may be stockpiled for re-use as the upper 6-inches of the area to be seeded. Do not intermix grass, weeds, roots, brush, and stones larger than 1/2-inch with stockpiled topsoil. Dispose of root contaminated topsoil.

D. Clear and remove logs, stumps, brush, vegetation, rubbish and other perishable matter from the job site. Do not remove or damage trees that do not interfere with the work. Completely remove trees including stumps and roots that are required to be removed. Replace trees removed unnecessarily and properly treat damaged trees that can be saved, unless otherwise noted.

E. Remove existing pavement and walks from the excavated areas. Remove asphaltic and concrete materials from the job site as these materials are excavated. Use methods to remove pavement and walks that will assure the breaking or cutting along straight and vertical lines. Remove walks completely where excavation is along the length of a walk. Remove walks to existing joints where excavation crosses walks. The width of pavement to be removed shall not exceed the width of the trench by more than 12-inches on each side of the trench.

3.02 Excavating

A. Store excavated materials suitable and necessary for backfilling in a neat pile adjacent to the excavation in a manner to interfere as little as possible with traffic. Do not place such materials with sufficient height or proximity to the excavation to endanger such openings due to earth slides or cave-ins.

B. Remove excavated material not suitable for backfilling and excess suitable material from the job site and dispose of in accordance with all local, state, and federal regulations.

C. Provide and maintain adequate dewatering equipment to remove and dispose of surface and ground water entering excavations. Use diversion ditches, dikes or other suitable means to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Water from dewatering operations shall be filtered of sediment before discharge and meet the requirements of Section 02101.

3.03 Trenching

A. Excavate trenches to a depth and width shown on the Drawings and as required for the proper installation of the pipe and appurtenances. Fill excavations below the required grade with compacted bedding material.

B. Trenches shall be made as narrow as possible and to the straight lines shown on Drawings. Keep sides of trenches as near vertical as possible and properly sheeted and/or braced, as required. Excavation shall be open cut except where noted on Drawings. The width of the trench shall provide a clearance of not less than 8-inches nor more than 10-inches on each side of the pipe.

C. Provide a continuous, uniform bearing support for the pipe on solid undisturbed soil or compacted Granular Fill (as applicable to the pipe material) with trench dished to provide circumferential support to the lower third of each pipe. Dig out holes to receive pipe bells.

D. Rock excavation encountered in the trench and soft material which, in the opinion of the Engineer is incapable of providing adequate bearing to support the pipe, shall be removed to a depth of 4-inches below the required elevation and filled with compacted Granular Fill. These locations where additional Granular Fill is required are to be field measured with the Engineer prior to backfilling.

E. Do not open more than 50 feet of trench in advance of the installed pipe, unless otherwise directed or permitted by the Engineer. Excavate the trench within 6-inches of full depth for a distance of at least 30 feet in advance of the pipe installation, unless otherwise directed or permitted.

F. Refer to Section 01550 for maintaining use of plant drives during construction.

G. Any Underground Facilities crossing the trench shall be supported without damage and without interrupting service. The manner of supporting such pipes or conduits

is the responsibility of the Contractor and shall be subject to the favorable review of the Engineer, Owner, and/or the representative of the Utility involved.

H. Provide adequate sheeting and bracing in open cut trenches to protect life, property and the work.

I. All sheeting, planking, timbering, shoring, bracing, and bridging shall be placed, renewed and maintained, and shall not be removed until sufficient backfill has been placed to protect the pipe. Sheeting, shoring and/or bracing is not an additional pay item.

J. Where rock is encountered during trenching operations, remove the rock by mechanical means. The use of a rock trencher which produces excavated material commensurate to acceptable Structural Backfill is preferred. Materials suitable for Structural Backfill excavated by a rock trencher may be used as bedding for pipe in areas of rock excavation. The removal of rock using explosives is prohibited.

3.04 Backfilling

A. Do not backfill trenches until all existing utilities and Underground Facilities have been inspected, and until the piping system as installed conforms to the requirements as shown on the Drawings.

B. Place and tamp bedding of Structural Backfill in rock excavations and in the pavement zone requiring full Structural Backfill in a manner which will not damage pipe or alignment. Place Granular Fill bedding in 8-inch loose depth layers the full width of the trench and compact to 95% Modified Proctor. Place Granular Fill bedding from trench subgrade to 12" above top of pipe.

C. Backfill trenches under existing or proposed pavement zones with Granular Fill material placed in 8-inch layers and compacted to 95% Modified Proctor. Compaction shall be by hand tamping or approved mechanical tamping device. Prepare upper portion of trench for surface restoration or pavement replacement.

D. Backfill trenches under existing or proposed sidewalks outside the pavement zone with suitable excavated material placed in 8-inch layers and compacted to 95% Modified Proctor.

E. Backfill trenches in areas not requiring Granular Fill with suitable excavated material. Place backfill in 8-inch layers and compact to 90% Modified Proctor. The top four inches of backfill shall consist of clean topsoil and not contain stones or other objects larger than 1/2-inch in maximum dimension. Mound backfill above finish grade to allow for settlement. Grade area to be restored 6-inches below finish grade after settlement and immediately before restoration. Place 6-inches of clean topsoil over the area to be seeded.

F. Maintain backfilled trenches in a smooth and uniform condition until paving or seeding operations are completed. Refill and restore to the original grade any settlement in the backfill which takes place within the one-year warranty period at no additional cost to the Owner.

G. Perform compaction tests at all paved areas and at locations of the trench backfill as directed by the Engineer. Contractor shall be responsible for payment of all compaction tests.

-END-

SECTION 02535 - PAVEMENT REPAIR AND RESURFACING

PART 1 - GENERAL

1.01 Summary

A. Section Includes:

1. Furnishing all labor, tools, equipment and materials necessary to restore all streets, roads and sidewalks to as good or better condition than existed prior to construction.
2. Preparation for and resurfacing of existing paved areas including streets, drives, parking lots, etc.
3. Cleaning areas to be paved or surfaced. Removing temporary pavement materials such as cold mix asphalt which are not a part of the permanent pavement, and all deleterious and unsuitable materials.

B. Related Sections

1. Section 02220 – Trenching, Backfilling and Compaction for Utilities
2. Section 03300 – Cast-in-Place Concrete

1.02 References

A. American Society for Testing and Materials (ASTM), latest editions

1. ASTM C94 – Standard Specification for Ready-Mixed Concrete

B. Ohio Department of Transportation (ODOT) Standard Specifications, latest edition

1. Section 203 – Excavation and Embankment
2. Section 204 – Subgrade Compaction and Proof Rolling
3. Section 403 – Hot Mix Asphalt, HMA, Pavement
4. Section 407 – Tack Coat
5. Section 401 – Equipment
6. Section 702 – Asphalt Materials

1.03 Project Conditions

A. Do not place asphalt pavement when the air temperature is less than 40 degrees Fahrenheit, nor when the surface on which pavement is to be placed is wet, nor when other conditions are deemed unsuitable.

B. Do not apply Tack Coat to a wet surface, during wet weather, nor after sunset.

PART 2 - PRODUCTS

2.01 General

A. Perform work and provide materials in accordance with ODOT Standard Specifications Sections 402, 406, and 409.

B. The Mixing Plant shall be a plant approved by the Engineer.

C. Obtain materials from the same source throughout.

2.02 Asphaltic Concrete Paving

A. Materials

1. Tack Coat: Asphalt Emulsion, Tack AE-T, in accordance with ODOT Standard Specifications Section 407.
2. Asphalt Cement: PG asphalt binder, Grade 64-22, in accordance with ODOT Specifications Section 702 and 402 for the hot mix asphalt type specified.
3. Aggregate Base – Compacted No. 53 aggregate, in accordance with ODOT Standard Specification Section 304.
4. Hot Mix Asphalt (HMA) Mixture: As shown on the Drawings

B. Asphalt Paving Mix

1. Binder content and aggregate mix shall meet the requirements of ODOT Standard Specification Section 401.

2.03 Portland Cement Concrete

A. Provide ready-mixed concrete meeting the requirements of ASTM C94 and Section 03300.

PART 3 - EXECUTION

3.01 General

A. Clean areas to be paved or surfaced. Remove temporary pavement materials such as cold mix which are not part of the permanent pavement, and all deleterious and unsuitable materials.

B. Replace in kind all pavement encountered with respect to base courses, surface courses and thicknesses or as shown on the Drawings, using whichever pavement section is greater. Finish elevations, lines and grades of replacement pavement shall match original elevations, lines and grades.

C. Pavement cuts shall have neat parallel cut lines. No uneven, jagged cuts will be allowed. Repair all roadway surfaces damage by construction equipment outside of this limit for no additional payment.

D. Any existing pavement surfaces or walks which are not broken or cut along straight lines shall be saw cut along straight lines prior to pavement or walk replacement.

3.02 Asphalt Pavement Replacement

A. Inspection

1. The subgrade or aggregate base shall be dry. Compact all Compacted Aggregate Base, No. 53 to 100 percent Standard Proctor Dry Density. Proof-roll in accordance with ODOT Standard Specifications Section 304 prior to application of asphalt materials.
2. Verify the gradients and elevations of base or subgrade prior to placing asphalt pavement.

B. Preparation

1. Prepare the aggregate base for the application of asphalt pavement in accordance with ODOT Standard Specifications Section 304.
2. Place Tack Coat on existing paved surfaces and between lifts in accordance with ODOT Standard Specifications Section 407 with a specified application rate of 0.05 gallons per square yard.
3. Materials shall be dry to eliminate foaming. Thoroughly mix the materials.

C. Placement

1. Place HMA course on previously placed course after pavement has cooled sufficiently to prevent distortions and withstand compaction.
2. Spread and compact pavement in accordance with ODOT Standard Specifications Sections 401.
3. Place each course to the compacted thickness as shown on the Drawings. The application rate of 110 pounds per square yard is equivalent to 1 inch of asphalt pavement, in place.
4. Restore pavement markings to emulate existing pavement markings, as specified in Section 640 – Pavement Markings.

D. Tolerances: The maximum tolerance shall be as defined in ODOT Standard Specifications Section 403.

3.03 Restoration of Concrete Sidewalk, Curb, and Driveways Disturbed by Construction

A. Replace in kind all removed and damaged sidewalks, curbs, and driveways with respect to material type and dimension. Construct sidewalks, curbs and driveways to the section as shown on the Drawings. Finish elevations, lines, and grades of replacement work shall match original elevations, lines, and grades. Sidewalks shall have a light broom finish with edges and joints tooled with 1/4-inch radius. Install sidewalk, curb, and driveway joints to match the existing type and spacing.

B. Pavement, sidewalks and curbs shall be removed and replaced to the nearest construction or expansion joint.

C. Replace all curbs damaged under this contract.

3.04 Protection

A. General: Remove and replace any and all pavement, curb, and sidewalk damaged by rain or low temperatures for no additional payment.

B. Asphalt Pavement

1. Protect asphalt courses in accordance with ODOT Standard Specifications Section 403.
2. Protect new asphalt pavement from traffic until the mixture has cooled sufficiently to prevent distortion.

C. Concrete Sidewalk and Curb Ramps: Protect new concrete from traffic for curing for a minimum of 5 calendar days or until the minimum design compressive strength is attained, whichever is lesser.

D. Concrete Curb and Gutter: Protect new concrete from traffic for curing for a minimum of 14 calendar days or until the minimum design compressive strength is attained, whichever is lesser.

E. Concrete Pavement: Protect new concrete pavement from traffic for curing for a minimum of 7 calendar days.

-END-

SECTION 02730 – GRAVITY SANITARY SEWER SYSTEMS

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Furnishing and installing gravity sanitary sewers, services, manholes and appurtenances.

B. Related Sections

1. Section 02220 - Trenching, Backfilling and Compacting for Utilities

1.02 References

A. American Association of State Highway and Transportation Officials (AASHTO), latest editions

1. AASHTO M198 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
2. AASHTO M199 - Standard Specification for Precast Reinforced Concrete Manhole Sections

B. American National Standards Institute (ANSI), latest editions

1. ANSI A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
2. ANSI A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
3. ANSI A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water

C. American Society for Testing and Materials (ASTM), latest editions

1. ASTM A48 - Standard Specification for Gray Iron Castings
2. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
3. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe
4. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
5. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections
6. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
7. ASTM C928 - Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs
8. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
9. ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
10. ASTM D4101 - Standard Specification for Polypropylene Injection and Extrusion Materials

11. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
12. ASTM F679 - Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
13. ASTM F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
14. ASTM F894 - Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
15. ASTM F949 - Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
16. ASTM F1055 - Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing
17. ASTM F1803 - Standard Specification for Poly(Vinyl Chloride) (PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
18. ASTM F2648 - Standard Specification for 2- to 60-inch Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications

D. American Water Works Association (AWWA) Standards, latest editions

1. AWWA C104 - Cement Mortar Lining for Ductile Iron Pipe and Fittings
2. AWWA C110 - Ductile Iron and Gray Pipe Fittings
3. AWWA C151 - Ductile Iron Pipe, Centrifugally Cast

E. Ohio Department of Transportation (ODOT) Construction and Material Specifications, latest edition

1. Section 701 – Cementitious Materials
2. Section 705 – Concrete Incidentals
3. Section 706 – Concrete and Clay Pipe
4. Section 707 – Steel, Aluminum, and Plastic Pipe
5. Section 711 – Structural Steel and Structural Incidentals

1.03 Submittals

A. Shop Drawings, as applicable

1. Pipe
2. Fittings
3. Structures
4. Castings

1.04 Delivery, Storage, and Handling

A. Acceptance at Site

1. Pipe possessing defects including, but not limited to the following, will be rejected for installation:
   a. Variations from straight centerline
   b. Elliptical shape in round pipe

c. Lack of rigidity
d. Illegible markings as required herein
e. Bruised, broken, or otherwise damaged metallic or bituminous coating or liner, as applicable
f. Deep or excessive gouges, dents, bends, or scratches on the pipe wall
g. Fractures, punctures, or cracks passing through the pipe wall
h. Damaged or cracked ends where such damage would prevent making a satisfactory joint

2. Concrete structures possessing defects including, but not limited to the following, will be rejected for installation:
a. Fractures or cracks passing through the wall
b. Honeycombed or open texture which would adversely affect the function of the box sections
c. Ends of sections are not normal to the walls and centerline of the section

B. Storage and Protection

1. Protect plastic pipes from extreme temperatures and ultraviolet radiation.

PART 2 - PRODUCTS

2.01 Manhole and Accessories

A. General

1. Provide precast concrete sections with no more than 3 holes cast or drilled in the section for handling.
2. Provide rapid setting patch material in accordance with ASTM C928 or precast concrete plugs for filling all holes used for handling.

B. Precast Concrete Manholes

1. Adjusting rings:
a. Supply a minimum of 1 adjusting ring for each manhole.
b. Minimum of 4 inches and maximum of 8 inches in height for new manholes.
c. Supply precast concrete riser sections for adjustment greater than 12 inches in height.
2. Provide precast concrete eccentric cone section which conforms to ASTM C478. Flat top sections require preapproved by Engineer. Provide a 24-inch opening.
3. Provide precast concrete manhole risers/barrels which conform to ASTM C478, AASHTO M199, and ODOT Standard Specification Section 706.13.
4. Manhole bases:
a. Provide precast concrete manhole bases which conforms to ASTM C478 and AASHTO M199.
5. Manhole benchwalls: precast or constructed using a concrete mixture with a low cure time and the ability to be troweled to a smooth finish.
a. 28-day compressive strength of no less than 4,000 psi.

6. Provide 1/2-inch diameter flexible butyl rubber joint gaskets conforming to ASTM C443 and AASHTO M198 for all manhole section joints as shown on the Drawings. Provide Kent seal or approved equal.
7. Sumps are not permitted in manhole structures.

C. Castings

1. Provide cast iron frames and covers in accordance with ASTM A48 Class 35B, ASTM A 536, and ODOT Standard Specification Section 711.
2. Supply all frames and covers from one manufacturer.
3. Furnish frames and covers which are rated for traffic, of non-rocking design, and have machined horizontal and vertical bearing surfaces. Frames and lids shall be watertight and have a grooved rubber gasket with concealed pick holes.
4. Provide manhole frame and cover as shown in casting schedule below, or approved equal. Sanitary manhole lids shall have the words “SANITARY SEWER” cast in raised letters.
5. Sanitary Manhole Casting Schedule:

Type	Neenah Model	EJIW Model
Frame	R-1772-C	1022Z1
Cover	R-1772-C	1020AGS

D. Pipe to Structure Connections

1. Pipe penetration holes shall be either pre-formed by manufacturer or core drilled in the field.
2. Provide flexible neoprene molded boot or resilient seal which conforms to ASTM C923.
   a. Provide Kor-N-Seal boot as manufactured by National Pollution Control Systems, Inc. or approved equal.
   b. Provide resilient seal as manufactured by A-Lok or approved equal.
3. Grout watertight, the annular space between the pipe and hole cored in the manhole.

PART 3 - EXECUTION

3.01 General

A. Do not install pipe when, in the opinion of the Owner or Engineer, trench conditions are unsuitable.

B. Follow manufacturer's installation procedures when installing pipe, fittings, structures, and appurtenances.

3.02 Examination

A. Verification of Conditions

1. Before installing piping, verify location, depth, type of joint needed, and size of pipe to which connection is proposed.
2. Verify lines can be run as proposed. Refer any necessary deviation to the Engineer for final approval before lines are run.

3.03 Installation

A. Standard Manholes

1. Keep structure excavations free from water during construction.
2. Fill areas excavated below the depth required for the structure's base with No. 8 crushed stone at Contractor's expense.
3. Set top of casting at elevation to prevent surface water infiltration in areas of flooding or ponding.
   a. Install precast concrete risers and adjusting rings in such combination that the manhole frame will be at the proper elevation.
   b. Structures shall be completely constructed to proper finished grade before curbs, asphalt, or other pavement may be installed.
   c. Patching and filling under frames will not be permitted.
4. Install manhole frame to grade and centered.
5. Install precast concrete base, risers, cone, and flat top sections so that the axis of the manhole is vertical.
6. Install gaskets for joints in accordance with the manufacturer's recommendations.
7. Apply a trowelable grade butyl rubber base exterior backplaster material 1/4-inch minimum thickness (when dry) on the exterior of the manhole at each joint, extending 6 inches above and 6 inches below the joint. Wrap joints with 80 gauge stretch wrap.
8. Prior to backfilling, fill all holes used for handling with rapid setting patch material or with precast concrete plugs secured with Portland cement mortar.
9. Unless otherwise indicated, set castings for all structures at finish grade level. Adjust castings to the satisfaction of the Owner.
10. Benchwalls: minimum 1/2-inch per foot slope starting at the manhole wall/benchwall interface and then slope towards the top of the trough.
11. Trough; minimum depth equal to the diameter of the incoming and exiting sewers.
12. Wrap manhole frames located in pavement in minimum 3/8" preformed joint filler extending from the top to the bottom of the frame.

B. Pipe to Structure Connections

1. Core drill new pipe penetration into existing structure at the proper location where the pipe enters the structure.
2. Install flexible neoprene molded boot or resilient seal to secure the pipe in the structure wall as noted in Article 2.01D.2 of this Section.

3.04 Field Quality Control

A. Tests

1. Test all sanitary sewer systems installed in accordance with Section 02732.

3.05 Cleaning

A. Provide all necessary equipment required for proper completion of the flushing of manholes and piping systems.

B. Remove all debris and excess soil from manhole after construction and prior to flushing the sewer pipes.

C. Remove all debris and excess soil from all pipe installed by flushing with clean water. If flushing is not adequate to clean the pipes, clean the pipes by jetting and to the satisfaction of the Owner.

-END-

SECTION 02732 - SANITARY SEWER CLEANING AND TELEVISING

PART 1 - GENERAL

1.01 Scope of Work

A. Contractor shall furnish all labor, materials and equipment required to clean and televise the sanitary sewer system as shown on the Drawings. The work shall include, but not be limited to, all mobilization, demobilization, bypass pumping/flow control, traffic control, televising, root removal, debris removal and disposal, site restoration, sewer line cleaning, video recording and field logs, and all incidentals necessary to complete the work as described in these Specifications and as shown on the Drawings. Water and debris disposal location will not be provided by the Owner.

PART 2 - PRODUCTS

2.01 Equipment for Sewer Segment Cleaning

A. High-Velocity Jet Equipment: All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps and powered hose reel.

B. Accuracy of equipment and operating method for cleaning shall be judged by the results obtained. There are no restrictions on types and use of machines involved.

C. When high-velocity cleaning equipment is used, a suitable sand trap, weir, dam, or other measures shall be employed in the downstream manhole in such a manner that all solids and debris are trapped and removed, thereby preventing such material from passing into the next sewer reach.

D. When Contractor encounters an obstruction that normally cannot be cleaned with equipment indicated above, Contractor shall indicate the location in his field log. Acceptability shall be based on Engineer's review of the video recording. It is the intent of these Specifications that pipe walls be clean enough for the camera to discern structural defects, misalignment and points of infiltration. A minimum of ninety-five percent (95%) of the debris shall be removed.

PART 3 - EXECUTION

3.01 Buried Structures

A. If a manhole or cleanout is found to be inaccessible (i.e., manhole located under an existing building), Contractor shall record such information on Drawings, and Contractor shall inform Engineer.

3.02 Sewer Cleaning

A. Selection of cleaning equipment and the method for cleaning shall be determined by the Contractor and shall be based on the condition and/or pipe material of the sewer segment at the time work commences.

B. Satisfactory precautions shall be taken to protect the sewer segments and appurtenances from damage that might be inflicted upon them by the improper use of cleaning equipment. Any damage inflicted upon a sewer segment or other public or private property which is caused by the improper use of the cleaning equipment, regardless of the cleaning method used, shall be repaired by Contractor at no additional cost to Owner.

C. Payment for Sewer Cleaning shall only be made for segments authorized for cleaning by the OWNER prior to cleaning work. Payment shall be made per linear foot of sewer cleaned.

3.03 Pipe Damage Prevention During Cleaning Operation

A. Contractor shall recognize that there are some conditions such as broken pipe and major blockages that prevent cleaning from being accomplished or where damage would result if cleaning were attempted or continued. Should such conditions be encountered, Contractor shall immediately notify Engineer. If, in the course of cleaning operations, damage does result from preexisting and unforeseen conditions such as broken pipe, Contractor will not be held responsible unless he fails to promptly notify Engineer. Engineer shall be notified by the Contractor of any conditions which warrant termination of cleaning activities.

3.04 Debris Removal and Disposal

A. Contractor shall remove all sludge, dirt, sand, rocks, grease and other solid or semisolid material resulting from the cleaning operation from the sewer segment being cleaned. Cleaning equipment shall be capable of adequately cleaning sewers 4-inches in diameter and larger. Passing material from sewer segment to sewer segment shall not be permitted.

B. In the event that sludge, dirt, sand, rocks, grease and other solid or semisolid material resulting from the cleaning operation are observed and/or detected by Engineer as passing to downstream sewer segment(s), Contractor shall clean such sewer segment(s) at no additional cost to Owner upon written notice from the Engineer.

C. Contractor shall be responsible for the disposal of all debris, silt, and accumulated solids removed from the sewer. All debris, silt and solids removed by Contractor shall be disposed of by Contractor in accordance with all appropriate codes, rules and regulations for the handling and disposal of such materials and shall be removed from the sewer prior to beginning the televising inspection. Under no circumstances shall the removed sewage or solids be dumped onto streets or into ditches, catch basins, storm drains, sanitary sewers, combined sewer manholes or otherwise improperly disposed.

3.05 Protection During Inspection/Cleaning Operations

A. Contractor shall not enter into any sewer segment where hazardous conditions may exist until such times as the source of those conditions is identified and eliminated by Contractor. Contractor shall perform all work in accordance with the latest OSHA confined space entry regulations. Contractor shall coordinate his work with local fire/police rescue units.

B. Satisfactory precautions shall be taken to protect the sewer segments and sewer manholes from damage that might be inflicted by the improper use of cleaning equipment. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force, or any tools which retard the flow of water in the sewer segment are used, precautions shall be taken to ensure that the water pressure created does not cause any damage or flooding to public or private property being served by the sewer segment involved. The Contractor is fully responsible for any and all damage incurred to public and private property as a result of Contractor's operations and must make full restitution with any and all affected property owners.

3.06 Root Removal

A. Contractor shall remove and dispose of roots within sewers when they protrude into the sewer more than 25% of the pipe diameter. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.

3.07 Sewer Segment Television Inspection

A. Contractor shall internally inspect, via closed circuit television inspection, the sewer segments as set forth by Engineer. Contractor shall record these inspections on color digital video disk (DVD). The electronic video file format shall be capable of playing on standard software, such as Windows Media Player and indexed to permit fast forwarding of the videos. If the electronic file format requires special software for viewing, this software package shall be provided to the Owner and to the Engineer at no cost. The DVD shall include a narrative noting:

1. Date, time of day and depth of flow
2. Sewer segment number "from manhole to manhole"
3. Depth of upstream and downstream manholes
4. Sewer material and diameter

5. Closest street address and street name on which sewer is located
6. Direction of camera movement (upstream or downstream)
7. Surface above sewer (i.e. paved road, gravel alley, grass field, etc.)
8. Locations of service connections into sewer
9. Locations of obstructions, structural defects, joint deterioration, leakage or evidence thereof, and other abnormalities with respect to the sewer condition and distance in feet from the upstream manhole centerline.

B. DVD shall visually display date, pipe section number (manhole number) and distance from the center of upstream manhole to center of downstream manhole, to accuracy of 2 feet±. Where a manhole or cleanout is encountered that does not have a number, the Contractor shall contact Engineer for assignment of a new manhole number. Where an obstruction is encountered and a reverse set up is required, the distance shall be written and verbally noted on the video as to from which manhole measurements are being made. No additional cost will be paid for reverse set ups. DVD case shall display the same information as indicated above as well as date and crew ID number. DVDs of all segments shall be provided to Engineer along with the respective television inspection field logs at the completion of the job. TV field logs shall legibly show the location of each point of significance in relation to an identified manhole.

C. Points of significance include, but are not limited to the following: service connections, visible infiltration, unusual conditions, roots, storm sewer connections, broken pipe, presence of scale and corrosion, mineral deposits, hardened sewer debris, structural failures and other discernible features.

D. Contractor shall present on DVD a continuous image of not less than ninety percent (90%) of the internal pipe surface at all times for sewers 4" through 18" in diameter. Maximum acceptable speed of camera through sewer shall be thirty (30) feet per minute. Lighting system shall be adequate for quality pictures. A reflection in front of the camera may be required to enhance lighting.

E. Contractor shall take all necessary measures to televise the internal surface of each sewer segment in its entirety. Engineer shall reserve the right to deduct that total footage deemed to be non-acceptable from the total footage televised that has been submitted to Engineer for payment.

F. If any obstruction in the sewer segment such as a protruding building lateral prohibits the passage of the television camera, Contractor shall attempt to inspect the remainder of the sewer segments by making a reverse set up at the next down stream manhole.

G. All obstructions in the sewer segment that prohibit passage of the television camera shall be immediately reported to the Engineer by Contractor referencing location and nature of the obstruction.

H. Contractor shall perform a closed-circuit television (CCTV) inspection of sewer segments that are 4 inches or greater in diameter. The camera shall be equipped with remote control devices to adjust the light intensity, and a minimum one thousand (1,000) feet of continuous cable shall be provided. The camera shall be

able to transmit a continuous image to the television monitor as it is being pulled through the sewer segments. The camera shall be of the motorized variety; “push” type cameras are not permitted.

I. Contractor shall be responsible for any and all damage to public or private property resulting from his/her televising activities and shall repair or otherwise make whole such damage at no cost to Owner.

J. Contractor shall submit the DVDs, along with corresponding written televising log sheets to Engineer for review at the conclusion of the project.

3.08 Sewage Flow Control

A. Contractor shall be responsible for controlling and/or maintaining all sanitary and storm flows within the sewer system during the work in accordance with the Specifications. Contractor shall submit his plan for flow control to Engineer for approval prior to beginning the work. Contractor may consider bypass pumping to a sewer system separate from the project. It shall be Contractor's responsibility to verify capacity of sewers existing within the proposed sewer system prior to commencement of bypass pumping.

B. Contractor shall provide adequate pumping equipment, pneumatic plugs, couplings, suction pipe, discharge pipe, etc., and other facilities to dewater the sewer segment during the work.

C. If bypass pumping is utilized by Contractor to control flows to achieve television inspection performance requirements, Contractor shall be responsible for monitoring the bypass pumping operation at all times until work is complete. The location of pump(s), force main, discharge point, etc. shall be approved by Engineer.

D. Contractor shall furnish all necessary labor and supervision to set up and operate the dewatering system. Precautions shall be taken to ensure that flow control and dewatering operations will not cause flooding or damage to public or private properties. In the event flooding or damage occurs, Contractor shall make provisions to correct such damage at no additional cost to Owner.

E. The cost for sewage flow control shall be included in the contract unit bid prices for sewer televising of the various sizes contained in Contractor's Proposal.

3.09 Traffic Control

A. Contractor shall maintain vehicular and/or pedestrian traffic during the work at all times.

B. Contractor's work plan shall include measures to minimize traffic interruption. The cost for traffic control shall be included in the unit bid prices for sewer televising contained in Contractor's Proposal.

3.10 Site Restoration

A. Contractor shall replace all lawn and grass areas disturbed or damaged during the work to original or better condition.

B. Contractor shall deposit and spread topsoil to a minimum finished depth of six (6) inches; finely raked, ready for seeding.

C. Contractor shall repair all damage to paved surfaces caused by his/her cleaning and/or televising activities in accordance with all applicable state and local requirements, including damage to privately owned paved surfaces.

D. The cost for site restoration shall be included in unit bid prices for sewer televising of the various sizes contained in Contractor's Proposal.

3.11 Submittals

A. Contractor shall submit two (2) copies of the following deliverables to Engineer for review at the end of each week of CCTV work:

1. Weekly Televising Summary
2. Properly labeled video inspections in DVD format
3. Televising log sheets.
4. Collection System Map highlighting the segments televised during each week of work. Operator shall update the map prior to submittal to accurately display collection system layout and labels as determined in the field.
5. Copy of operators' field notes.

B. The Weekly Televising Summary shall include a brief description of the prior week's work including the length of sewer televised for each pipe diameter, the number of protruding taps removed, noteworthy field observations (manholes found or missing, blind sewer connections, etc.), and sewer defects in need of immediate repair (such as pipe collapse). The summary should be addressed to the Engineer and submitted along with televising videos and log sheets at the end of each week.

C. Contractor shall submit the following deliverables to Engineer for review at the end of the project:

1. "Red Line" drawings of sewer/project route highlighting sewers and portions of sewers televised, highlighting sewers and portions of sewers cleaned, exact televised lengths, locations of protruding laterals removed, and changes to the assumed existing conditions.

-END-

SECTION 02733 - TESTING SANITARY SEWERS

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Furnishing all equipment, instrumentation and Work necessary for flushing and testing manholes installed.

B. Related Sections

1. Section 02730 - Gravity Sanitary Sewer Systems

1.02 References

A. American Society for Testing and Materials (ASTM), latest editions

1. ASTM F1417 - Standard Practice for Installation Acceptance of Plastic Non-Pressure Sewer Lines Using Low Pressure Air

1.03 Submittals

A. Test Results

1. Gravity pipe air test
2. Manhole vacuum test

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 General

A. Conduct all tests in the presence of the Engineer. Preliminary tests made by the Contractor without being observed by the Engineer will not be accepted. Notify the Engineer at least 36 hours (not including holidays or weekends) before any work is to be inspected or tested.

B. Repair and/or replaced all defects in piping systems and retest until acceptable to the Engineer. Make repairs to the standard of quality specified for the entire system.

C. Sections of the system may be tested separately, but any defect which may develop in a section previously tested and accepted shall be promptly corrected and retested at no additional cost to the Engineer or Owner.

D. Test all manholes and piping systems in accordance with these specifications in addition to any test required by Ohio Environmental Protection Agency (OEPA), Ohio Department of Natural Resources (ODNR), State or Local plumbing codes and building authorities.

3.02 Gravity Sewer Testing

A. Flush new piping systems with water to remove any debris prior to testing.

B. All underground sewer piping for gravity flow shall be subjected to an air test rather than an infiltration or exfiltration tests; however, infiltration and exfiltration test methods may be requested by the Engineer during construction. No extra compensation will be allowed if such tests are required.

C. When leakage occurs in excess of the specified limits, locate and repair defective pipe and joints. Remove, reconstruct, and retest as much of the original work as necessary to obtain a sewer test within the allowable leakage limits.

D. Air Test

1. Furnish all equipment and personnel required to make tests including pipe stoppers, air compressor, air storage tank, pressure regulating valves, pressure gauges, stopwatch, etc.
2. Take precautions necessary, including blocking of stoppers or plugs, to protect the safety of property and personnel.
3. Test the sanitary sewer line in increments between manholes or structures in accordance with ASTM F1417.
   a. Seal the line at each end. The seal at one end shall have an orifice through which to pass air into the pipe. Connect an air supply line that contains an on-off gas valve and a pressure gauge having a range of 0 to 5 psi, with minimum divisions of 0.10 psi, and an accuracy of ± 0.04 psi.
   b. Pressurize the pipe line under test to 4 psig. Allow the line to stabilize between 4 psig and 3.5 psig for a period of no less than 5 minutes. If necessary, add air to the line to maintain the pressure above 3.5 psig.
   c. After the stabilization period, close the gas valve. When the line pressure stabilizes above 3.5 psig, commence timing with a stop watch. Allow the stop watch to run until the line pressure drops 1.0 psig or the allowable time in Table 1 is exceeded.
   d. If the pipe line to be tested is beneath the ground water level, increase the test pressure 0.433 psi for each foot the ground water level is above the crown of the pipe.
   e. Allowable time shall be as shown in Table 1. If the time lapse is greater than that specified, the section undergoing testing will have passed. If the time lapse is less than that specified, the line has not passed the test and the Contractor shall be required to make all repairs and retest.

Table 1: Minimum Specified Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated, Q=0.0015 cu. ft. per min. per sq. ft.

Pipe Dia., In.	Minimum Time, min:s	Length for Minimum Time, ft.	Time for Longer Length, s	Specification Time for Length(L) Shown, min:s							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	0.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.864 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	189	3.418 L	11:20	11:20	11:20	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	66:22	79:45	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106.50	124:38	142:26	60:15
33	31:10	72	26.852 L	43:06	64:38	86:10	107:48	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

E. Infiltration Tests (If required)

a. When the groundwater level is at or above 4 feet above the top of the sewer, the infiltration test will consist of sealing off a length of sewer and measuring the depth of flow over a measuring weir, or by pumping the infiltrated water into containers for measurement.
b. Conduct test for a minimum of 4 hours.
c. Infiltration leakage shall not exceed 200 gallons per 24 hours per inch diameter per mile of sewer.

F. Exfiltration Tests (If required)

a. When the groundwater level is less than 4 feet above the top of the sewer, the exfiltration test will consist of isolating the particular section and filling with water to a point 4 feet above the ground water level in the upper manhole and allowing it to stand at least 4 hours.
b. The section shall then be refilled with water up to the original point and after 2 hours measure the drop in the water surface level.
c. The computed leakage shall not exceed 200 gallons per 24 hours per inch diameter per mile of sewer.

3.03 Manhole Vacuum Testing

A. Conduct a vacuum test on all manholes to ensure water tightness and manhole integrity.

B. The equipment required to conduct a vacuum test on manholes includes inflatable pipe plugs, test head, vacuum pump, flexible air hose and a vacuum gage.

1. Provide test equipment designed specifically for the purpose of testing manholes and capable of drawing a vacuum of 10 inches of mercury (in-Hg).
2. Manufacturer: P.A. Glazier, Inc., Worchester, Massachusetts, 10002, or as approved by the Town.

C. Procedure for conducting an air test on manholes:

1. Test each manhole immediately after assembly and prior to setting the casting or backfilling around the structure. If a test must be performed after backfilling, Contractor is responsible for all re-excavation required to locate and correct all leaks that have been identified.
2. All pipes entering the manhole shall be securely plugged and adequately braced against the inside of the manhole to prevent being drawn out of the manhole.
3. Place the test head on the inside of the cone section and seal with an inflatable seal.
4. Draw a vacuum of 10 in-Hg and shut the vacuum pump off. With the valves closed, measure the time for the vacuum to drop to 9 in-Hg. The manhole shall pass if the time is greater than the following:

Depth (ft)	Diameter (in)				
	48	54	60	66	72
	Time (s)				
8	20	23	26	29	33
10	25	29	33	36	41
12	30	35	39	43	49
14	35	41	46	51	57
16	40	46	52	58	67
18	45	52	59	65	73
20	50	53	65	72	81
22	55	64	72	79	89
24	59	69	78	87	97
26	64	75	85	94	105
28	69	81	91	101	113
30	74	87	96	106	121

-END-

SECTION 02734 – BYPASS PUMPING/SEWAGE FLOW CONTROL

PART 1 - GENERAL

1.01 Intent

A. It is the intent of this Specification to provide the minimum requirements for bypass pumping/sewage flow control necessary to facilitate sewer line inspection and/or sewer line rehabilitation and construction activities included in this Contract.

1.02 Scope of Work

A. Contractor shall be responsible for controlling and/or maintaining all sanitary flows within the sewer system during the work in accordance with the Specifications. It shall be the Contractor's responsibility to verify capacity of sewers existing within the proposed sewer system prior to commencement of bypass pumping.

B. Contractor shall provide all labor, equipment, supervision and materials necessary to reduce/control flows via sewage flow control mechanisms or eliminate flows via bypass pumping through a section or sections of pipe designated for inspection and/or rehabilitation and construction activities. Contractor shall be responsible for controlling and maintaining all sanitary within the sewer system during the Work. Contractor may drain flows by pipes, chases, fluming, bypass pumping, or other appropriate methods approved by Owner. Plugging of any sewer line shall not be permitted without bypassing.

1.03 Protection of Private and Public Property

A. Precautions shall be taken to ensure that flow control and dewatering operations shall not cause flooding or damage to public or private properties. In the event flooding or damage occurs, Contractor shall make provisions to correct such damage at no additional cost to Owner. Contractor shall be responsible for any and all damages to public or private property, overflows from the sewer system and violations resulting in fines as a result of the dewatering/bypass operation.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 Bypass Pumping

A. When required by the Contract Documents or when required to facilitate sewer line inspection and/or sewer line rehabilitation and construction activities included in the Contract, Contractor shall provide all labor, equipment and materials necessary for the transfer of flow around the section or sections of pipe designated. The bypass shall be made by diversion of the flow from an existing upstream location,

around the section(s) to be taken from service for inspection or rehabilitation and construction, to an existing downstream location. The bypass system shall be of adequate capacity to handle all flows including wet weather related flows. If bypass pumping is utilized by Contractor to control flows, Contractor shall be responsible for monitoring the bypass pumping operation at all times until work is complete. The location of pump(s), force main, discharge point, pumping rates, etc., shall be the responsibility of the Contractor to ensure all flow is bypassed and to not create an overflow or back-up.

B. Where the flow control mechanism is not sufficient to handle a wet weather event, the flow control/diversion or pumping system shall be capable of quick removal so as not to create an overflow to surface waters, overflow to ground, or back-up in buildings.

C. Bypass Pumping/Sewage Flow Control shall not be considered as a separate pay item.

-END-

SECTION 02738 – COMPOSITE MANHOLE LINING

PART 1 - GENERAL

1.01 Scope

A. This specification shall govern all work, materials, and equipment for manhole rehabilitation for the purpose of eliminating infiltration, providing corrosion protection, repairing of voids, and restoration of the structural integrity of the manhole as a result of applying a cementitious lining with epoxy top-coat to the wall and bench surfaces of brick, concrete, or any other masonry construction material.

1.02 References

A. ASTM C78/C78M – Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

B. ASTM C109/C109M – Compressive Strength of Hydraulic Cement Mortars

C. ASTM C496 – Standard Test Method for Splitting Tensile Strength of Cylinderical Concrete Specimens

D. ASTM C596 – Drying Shrinkage of Mortar Containing Hydraulic Cement

E. ASTM C876 - Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete

F. ASTM D4138 – Measurement of Dry Film Thickness of Protective Coating Systems by Destructive Means

G. ACI 305R – Hot Weather Concreting

H. ACI 503R – Use of Epoxy Compounds for Coating Concrete

I. International Concrete Repair Institute (ICRI) Technical Guideline No. 03730 – Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting From Reinforcing Steel Corrosion

J. ASTM - The published standards of the American Society for Testing and Materials, West Conshohocken, PA.

K. NACE - The published standards of National Association of Corrosion Engineers (NACE International), Houston, TX.

L. SSPC - The published standards of the Society of Protective Coatings, Pittsburgh, PA.

1.03 Submittals

A. Submit the following items:

1. Technical data sheet on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
2. Material Safety Data Sheets (MSDS) for each product used.
3. Product Data – physical properties, surface preparation, application instructions, and curing instructions.
4. Project specific guidelines and recommendations.
5. Contractor Qualifications:
   a. Manufacturer certification that Contractor has been trained and approved in the handling, mixing and application of the products to be used.
   b. Certification that the equipment to be used for applying the products has been manufactured or approved by the protective coating manufacturer and Contractor personnel have been trained and certified for proper use of the equipment.
   c. Five (5) recent references of Contractor (projects similar size and scope) indicating successful application of composite manhole lining system.
   d. Proof of any necessary federal, state or local permits or licenses necessary for the project.
6. Design details for any additional ancillary systems and equipment to be used in site and surface preparation, application and testing.

1.04 Quality Assurance

A. Contractor shall initiate and enforce quality control procedures consistent with applicable ASTM, NACE and SSPC standards and the protective coating manufacturer's recommendations.

1.05 Delivery, Storage, and Handling

A. Store materials in accordance with manufacturer’s recommendations.

B. Protective coating materials shall be handled according to their material safety data sheets.

1.06 Site Conditions

A. Contractor shall conform with all local, state and federal regulations including those set forth by OSHA, RCRA, OEPA, the EPA and any and all other applicable authorities.

1.07 Warranty

A. As outlined in the General Conditions for this Project.

B. In addition to the warranty and guarantee requirements as outlined in the General Conditions, the Certified Applicator shall warrant and guarantee all work against

defects in materials and workmanship for a period of two (2) years beyond the one year anniversary of the date of substantial completion. Certified Applicator shall, within 60 days after receipt of written notice thereof, make arrangements for the repair of defects in materials and/or workmanship which may develop during the said period, and any damage to other work caused by such defects or the repairing of the same, at his own expense and without cost to the Owner.

If defects in the liner equal or exceed 10% of the surface area of the protective coating, the Contractor shall be responsible for the application of an additional epoxy liner matching the thickness specified herein with no additional charge to the Owner. Defects will be deemed to have occurred if the liner fails to A) prevent active infiltration into the structure, B) prevent the internal damage or corrosion of the structure, or C) protect the substrate and environment from contamination by effluent.

PART 2 - PRODUCTS

2.01 Existing Products

A. Standard Portland cement or new concrete (not quick setting high strength cement) must be well cured prior to application of the protective coating. Generally, 28 days is adequate cure time for standard Portland cement. If earlier application is desired, compressive and tensile strengths of the concrete can be tested to determine if acceptable cure has occurred.

B. Remove existing coatings prior to application of the composite manhole lining system. Applicator shall maintain strict adherence to applicable NACE and SSPC recommendations with regard to proper surface preparation and compatibility with existing coatings.

2.02 Manufacturers

A. Composite manhole lining system shall be provided by a single manufacturer.

B. Products shall be:

1. AP/M Permaform, P.O. Box 555, Johnston, IA 50131. Phone: 515-276-9610
2. BASF MasterEmaco, 889 Valley Park Dr., Shakopee, MN 55379. Phone 800-433-9517
3. Mainstay Composite Liner System by Madewell Products Corporation, 7561 Industrial Court, Alpharetta, Georgia 30004. Phone: 770-475-8199
4. Raven Lining Systems, 13105 E. 61st St., Suite A, Broken Arrow, OK 74012. Phone: 800-324-2810
5. Sauereisen, 160 Gamma Dr., Pittsburgh, PA 15238. Phone: 412-963-0303
6. Sherwin-Williams, www.sherwin-williams.com/protective
7. The Strong Company, Inc., 4505 Emmett Sanders Rd., Pine Bluff, AR 71601. Phone: 870-535-7617
8. Or, Engineer approved equal.

2.03 Lining Materials – Composite Manhole Lining System

A. Hydraulic Cement Mortar – Fast-setting mortar used to stop leaks through cracks and holes. Mainstay ML-10; Strong-Seal Strong Plug/QSR, or approved equal.

1. Composition: Blend of hydraulic cements and fillers
2. Compressive Strength, ASTM C109/C109M
   a. 1 Day: 3,500 psi
   b. 7 Day: 4,900 psi
   c. 28 Day: 5,500 psi
3. Tensile Strength, ASTM C496
   a. 7 Day: 290 psi
   b. 28 Day: 575 psi
4. Working Time: 45 to 90 seconds at 77 °F
5. Color: Dark gray

B. Restoration Mortar – Sprayable Microsilica Cement Mortar. Low shrinkage, high strength, sprayable microsilica mortar. Mainstay ML-72; Permaform Permacast MS-10,000; BASF MasterEmaco S 488CI; Strong-Seal MS-2A; Raven 755; or approved equal.

1. Composition: Blend of cements, microsilica, thermoplastic fibers, densifiers, and modifiers. Mortar shall not contain calcium aluminate cements or aggregates.
2. Thickness: Apply a minimum thickness of 3 inches above peaks of existing profile after surface preparation.
3. Compressive Strength, ASTM C109/C109M:
   a. 1 Day: 3,000 psi
   b. 28 Days: 9,000 psi
4. Flexural Strength, ASTM C293:
   a. 1 Day: 535 psi
   b. 28 Days: 1,300 psi
5. Tensile Strength, ASTM C496:
   a. 1 Day: 330 psi
   b. 28 Days: 600 psi
6. Shrinkage, ASTM C596:
   a. 28 Days @ 90%; 0.01 percent
7. Uniaxial Tensile Bond Strength, ACI 503R, Appendix A:
   a. 28 Day: Greater than 500 psi over high strength concrete (5,000 psi compression strength concrete – bond strength governed by substrate tensile strength). Minimum acceptable bond = 145 psi.
8. Color: Dark gray

C. Corrosion Barrier Coating – Mainstay DS-5 Ultra High Build Epoxy Coating; Permaform Cor+Gard 301 Epoxy; Raven Lining Systems, Raven 405; Sherwin Williams Dura-Plate 6100 High Performance Epoxy; or Engineer approved equal.

1. Composition: 100 percent solids, modified epoxy coating
2. Thickness: Minimum of 100 mils in 1 or 2 coats.
3. Number of Components: 2

4. Finish: Gloss
5. Color: Shall be chosen by the Owner (White, Light Grey, or Light Blue)

D. Manhole Frame Seal – Madewell 806 Flexible Epoxy, Sherwin-Williams Sherflex, or Engineer approved equal.

1. Composition: 100 percent solids, flexible epoxy trowel-grade mastic
2. Thickness: minimum of ¼"
3. Number of Components: 2
4. Finish: Semigloss
5. Color: Light gray

2.04 Protective Coating Application Equipment

A. As recommended by manufacturer.

PART 3 - EXECUTION

3.01 Acceptable Applicators

A. Protective coating must be applied by a Certified Applicator of the protective coating manufacturer and according to manufacturer specifications.

3.02 Examination

A. Appropriate actions shall be taken to comply with local, state and federal regulatory and other applicable agencies with regard to environment, health and safety.

B. Contractor shall bear all costs and responsibilities associated with bypass pumping and flow control as needed. Any active flows shall be dammed, plugged or diverted as required to ensure that the liquid flow is maintained below the surfaces to be coated. Flows should be totally plugged and/or diverted when coating the invert. All extraneous flows into the manhole at or above the area coated shall be plugged and/or diverted until the epoxy has set hard to the touch. As an option, the Contractor may add hot air to the manhole to accelerate set time of the coating.

C. Installation of the protective coating shall not commence until the concrete substrate has properly cured in accordance with these specifications.

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

E. Provide the Engineer with a minimum of three (3) days advance notice of completion of surface preparation and start of application.

F. Before application of each material, surfaces to be lined shall be inspected by the Engineer, Owner or their designated representative. Any deficiencies identified by those listed above shall be corrected by the Contractor prior to the application of subsequent material.

G. Inspection by the Engineer, Owner or their representative or the waiver of inspection of any portion of the work shall not relieve the Contractor of responsibility to perform the work as specified.

3.03 Surface Preparation

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

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

1. Remove all steps.

C. Inspection:

1. Inspect cleaned surfaces to identify and mark corroded reinforcing steel and to locate cracks, leaks, and joints.
2. If indicated, perform electrical potential testing in accordance with ASTM C876.

D. Replace or treat corroded reinforcing steel, repair cracks and leaks, and treat joints in accordance with manufacturer's instructions and as approved by the Engineer.

E. Refer to ICRI Technical Guideline No. 03730 - Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting From Reinforcing Steel Corrosion.

F. Apply Madewell 1312P epoxy putty, BASF MasterProtect P 8100 AP, or approved equal after cleaning reinforcing steel to protect the steel from contamination and re-rusting.

G. Prepare surfaces to have a minimum profile of 1/16 inch, with aggregate exposed.

H. Inspect surfaces for soundness.

I. Saturate all surfaces thoroughly with clean water.

J. Apply restoration mortar as soon as water sheen is no longer visible (saturated surface dry).

K. Hydrostatic Leak Correction:

1. Stop visible hydrostatic leaks by application of Hydraulic Cement Mortar, after completion of surface preparation. If indicated, perform electrical potential testing in accordance with ASTM C 876.
   a. Mix only 1 to 2 pounds of Hydraulic Cement Mortar at a time.
   b. Add water to form a viscous mass with consistency of modeling clay.
   c. Apply by hand or trowel.
   d. Press mixed material firmly into place, starting at top of leak and working downward.

2. Inject flowing leaks or cracks using a suitable polymer gel or foam approved by the Engineer. Remove excess or spilled material from concrete surface before application of restoration mortar.

3.04 Application of Restoration Mortar

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

B. Apply by one of the following methods:

1. Low pressure, low volume spray equipment (rotor/stator or piston pumps such as those manufactured by Putzmeister).
2. Wet mix shotcrete equipment.
3. Hand trowel into place.
4. Centrifugal application by use of the Manufacturer approved applicator.

C. Apply uniformly to substrate to the specified thickness. Do not apply to manhole frame.

D. Do not trap air in corners, behind exposed reinforcing steel, or between lifts.

E. Finish surface with wood float, sponge float, broom, or brush to produce a textured surface upon which to apply Corrosion Barrier Coating.

F. Hot Weather Application:

1. Follow manufacturer's instructions to reduce evaporation rate of surface moisture until Corrosion Barrier Coating can be applied.
2. If applying mortar under conditions such as high temperatures of mortar, substrate, or air; high winds; and low humidity; alone or in combination; rapid evaporation of surface moisture can occur and cause plastic shrinkage cracking. Apply Mainstay DS-5 Epoxy Corrosion Barrier Coating, Madewell 927 primer/ sealer, or manufacturer approved equal, a maximum of 1 hour after placing Restoration Mortar.
3. If conditions prevent application of Epoxy Corrosion Barrier Coating or primer, refer to ACI 305R-91, Figure 2.1.5 to estimate the evaporation rate of surface moisture from the mortar, based on temperatures, relative humidity, and wind velocity. Cover with plastic film or wet burlap to limit evaporation rate to a maximum of 0.1 pounds per square foot per hour.

G. Cold Weather Application:

1. Follow manufacturer's instructions for minimum application temperature and minimum number of days to protect from freezing.
2. During cold weather (a period when for more than three (3) successive days the average daily outdoor temperature drops below 40°F) place Restoration Mortar at a minimum temperature of 55°F and protect mortar from freezing for a minimum period of three (3) days at a temperature between 55°F and 75°F, or as otherwise recommended by the mortar manufacturer. Gradually reduce

mortar temperature during the protection period so that the final 24 hours is held as close to 55°F as practical.

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

3.05 Application of Corrosion Barrier Coating

A. Apply Corrosion Barrier Coating in accordance with manufacturer's instructions. Do not apply to manhole frame.

B. Apply Corrosion Barrier Coating as soon as possible after finishing of restoration mortar, but before it is allowed to cure for more than four (4) hours. If the Corrosion Barrier Coating cannot be applied within this time frame, the surface of the Restoration Mortar shall be primed within that time frame with Madewell 927 Penetrating Primer, or approved equal, to hold the surface for up to 72 hours.

C. Do not allow surface contamination to the finished restoration mortar before application of Epoxy Corrosion Barrier Coating. Remove any contamination of primed mortar before application of Corrosion Barrier Coating by means of high pressure (min. 3,500 psi) water blast.

3.06 Curing of Corrosion Barrier Coating

A. Foot Traffic: Allow a minimum cure time of 24 hours at 70°F..

B. Chemical Sercie: Allow a minimum cure time as directed by the manufacturer.

C. Curing Conditions:

1. Continue to protect Composite Manhole Lining from freezing throughout protection periods specified for cold weather application.
2. Shelter Composite Manhole Lining from direct impingement of water until one (1) to three (3) hours after application of Corrosion Barrier Coating, depending on substrate temperatures, after which cure sufficiently to be undamaged by water impingement or immersion at ordinary velocities.
3. Sanitary Sewer Systems: It may be necessary to plug services or main lines temporarily in order to achieve these environmental conditions, but bypass pumping should seldom be required.

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

3.07 Application of Manhole Frame Seal

A. Surface Preparation

1. Corrosion Barrier Coating: Clean/decontaminate corrosion barrier coating if required. If within recoat window of corrosion barrier coating (72 hours), no further surface preparation is necessary. If recoat window has been exceeded,

sand, sandblast, or wire brush, followed by a solvent wipe of, the epoxy corrosion barrier coating surface after cleaning/decontamination.

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

B. Apply Manhole Frame Seal, to a minimum thickness of ¼ inch to manhole, grade rings and manhole frame. Height of application depends on overall height of chimney, but minimum height will be four (4) inches (two (2) inches above and below joint). Apply material with a putty knife to a uniform thickness and texture.

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

D. Remove all drips, splatter, and related from the bench and channel.

3.08 Surfaces for Protective Coating

A. Structures to be coated are those indicated on the Drawings. The interior manhole surfaces to be coated shall include the bench and walls and shall be coated from the bench/channel point of union to approximately two (2) inches above the bottom of the manhole frame. The channel shall be repaired where infiltration or visual damage is evident. The channel surface shall be troweled smooth and free of ridges and must not affect the free-flow of liquid through the structure or otherwise modify the existing grade from inlet to outlet.

3.09 Testing and Inspection

A. All testing equipment shall be provided by the Contractor. All tests shall be performed by the Contractor in the presence of the Engineer and/or Owner.

B. During application of the Restoration Mortar a Depth Gauge such as those manufactured by Hydra-Cone, Inc., shall be used to ensure a monolithic coating and uniform thickness during application.

C. During application of the Corrosion Barrier Coating a wet film thickness gage, such as those available through Paul N. Gardner Company, Inc. meeting ASTM D4414 – Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages, shall be used to ensure a monolithic coating and uniform thickness during application.

D. A visual post-rehabilitation inspection shall be made by the Engineer and/or Owner and Contractor at the conclusion of said work. A visual inspection shall be made by the Engineer and/or Owner and manufacturer's representative prior to the date of substantial completion for the project. On a date not before eleven (11) months from the date of substantial completion, a final 1-year visual inspection shall be made by the Engineer and/or Owner, Contractor and manufacturer’s representative. Any deficiencies in the finished coating shall be marked and

repaired by the Contractor according to the procedures set forth herein at no additonal cost to the Owner

E. Engineer and Owner shall conduct a final inspection of sealed manholes beginning prior the expiration of the 3-year maintenance bond.

F. The municipal sewer system may be put back into non-severe operational service as soon as the post-construction inspection has taken place. However, for severe corrosion duty such as high concentrations of acids, bases or solvents, 3 to 7 days and/or force cure by heat induction to the coated surfaces may be necessary prior to returning to service. Consult coating manufacturer for further details.

G. If the inspections indicate a failure of 10% or greater surface area of the protective coating, the Contractor shall be responsible for the application of an additional protective coating layer matching the thickness specified herein with no additional charge to the Owner. Failure will be deemed to have occurred if the protective coating fails to A) prevent active infiltration into the structure, B) prevent the internal damage or corrosion of the structure, or C) protect the substrate and environment from contamination by effluent.

-END-

SECTION 02742 – SEPTIC TANK SYSTEMS

PART 1 - GENERAL

1.01 Summary

A. Section Includes: Furnishing and installing septic tanks, riser systems, and related accessories.

B. Tank capacity shall be as listed in Appendix C: Schedule of Septic Tank Work.

C. Related Sections

1. Section 02220 – Trenching, Backfilling, and Compacting for Utilities

1.02 References

A. American National Standards Institute (ANSI)

1. ANSI Z1000 Material Property Standard

B. American Association of State Highway Transportation Officials (AASHTO)

1. AASHTO Standard Specification for Highway Bridges

C. International Association of Plumbing and Mechanical Officials (IAPMO)

1. IAPMO PS 1-98 Material and Property Standard for Prefabricated Septic Tanks

D. Ohio Revised Code (ORC)

1. Chapter 6111 – Water Pollution Control
2. Chapter 3718 – Sewage Treatment Systems

E. Ohio Administrative Code (OAC)

1. Chapter 3745-42 – Permits to Install and Plan Approvals for Water Pollution Control
2. Chapter 3701-29 – Household Sewage Disposal Systems

F. Ohio Department of Health (ODH) Pre-Approved Manufactured Septic Tanks list

G. Ohio Department of Transportation (ODOT) Standard Specifications, 2016 edition

a. Section 200 – Earthwork
b. Section 500 – Structures
c. Section 700 – Materials Details

H. The following standards shall apply to plastic materials:

1. American Society for Testing and Materials (ASTM)
   a. ASTM D 638 – Standard Test Method for Tensile Properties of Plastics
   b. ASTM D 790 – Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
   c. ASTM D 1248 – Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
   d. ASTM D 1693 – Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics

I. The following standards shall apply to concrete materials:

1. American Society for Testing and Materials (ASTM)
   a. ASTM C 890 – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures
   b. ASTM C 891 – Standard Practice for Installation of Underground Precast Concrete Utility Structures
   c. ASTM C 1227 – Standard Specification for Precast Concrete Septic Tanks
   d. ASTM C 1644 – Standard Specification for Resilient Connectors Between Reinforced Concrete On-Site Wastewater Tank and Pipes

1.03 Submittals

A. Product Data

1. Septic Tanks, Risers/Access Openings, Effluent Filters, Sewer Disconnects

B. Shop Drawings, as applicable

1. Septic Tanks
2. Risers/Access Openings
3. Effluent Filters
4. Buoyancy control
5. Sewer Disconnects

C. Field quality-control test reports

1.04 Delivery, Storage, and Handling

A. Acceptance at Site

1. Upon arrival, inspect all products including, but not limited to: septic tanks, risers/access openings, effluent filters, buoyancy control, sewer disconnect, for defects during handling or transportation. Any damages including, but not limited to the following, will be rejected for installation:
   a. Deep or excessive gouges, dents, bends, or scratches on the inside or outside walls
   b. Cracks passing through the wall
   c. Damaged or cracked ends that would prevent making a satisfactory joint

B. Storage and Protection

1. Any damaged or rejected materials shall be removed from site.
2. Store tanks on flat surface and secure against movement
3. Protect plastic materials from extreme temperatures and ultraviolet radiation
4. Prevent damage to all products during installation

1.05 Project Conditions

A. Environmental: Contractor shall comply with all federal, state, and local environmental requirements and setbacks.

B. Safety: The contractor shall keep the site and excavations in a safe and satisfactory condition during the progress of the work.

PART 2 - PRODUCTS

2.01 Polyethylene Septic Tanks

A. Septic tanks used in a sewage treatment system shall be labeled in accordance with IAPMO/ANSI Z1000 and shall comply with the following requirements and specifications:

1. All tanks shall be of monolithic construction and be blow molded using high molecular weight (HMW) high density polyethylene (HDPE) resin. No metal parts shall be molded in polyethylene tanks. Field assembly or modification of tanks is strictly prohibited.
2. Minimum tank wall thickness is 0.25”
3. Labeling shall include: manufacturer name, liquid capacity, date, maximum burial depth, and model number.
4. Tanks shall have sufficient structural integrity to withstand being pumped dry without incurring structural deformation (i.e. rib collapse).
5. Tanks shall include an inlet and outlet Polyvinyl Chloride (PVC) tees for baffles, watertight access ports at tank inlet and outlet.
6. Polyethylene used in plastic septic tanks shall comply with ASTM Standard D 1248, and any raw materials must meet the following requirements:
   a. ASTM D 1248 Class B – requiring ultraviolet stabilizer ***or***
   b. ASTM D 1248 Class C – requiring a minimum 1 % carbon black ***and***
   c. ASTM D 638 – Tensile strength of 2,400 pounds or greater
   d. ASTM D 1693 – Environmental stress crack resistance of 150 hours or more
   e. ASTM D 790 – Flexural modulus of elasticity of 85,000 pounds or greater
7. Design: For pedestrian traffic loading
8. Pipe Supports: Required if tank is buried more than 36 inches of cover or as required for buoyancy control.
9. Inlet and Outlet Access Openings: 24-inch diameter openings with watertight gasketed risers to grade and watertight lockable access plug covers.
10. Capacity: Per Appendix C: Schedule of Septic Tank Work
11. Inlet and Outlet Size: 4-inch NPS

12. Tanks shall include a compartment wall with the hole openings complying with Ohio regulations
13. Tanks shall be provided with buoyancy control in accordance with the manufacturer recommendations.
14. Manufacturers:
    a. Roth Global Plastics
    b. Engineer approved equal from ODH Pre-Approved Manufactured Septic Tanks list

2.02 Concrete Septic Tanks

A. Precast Concrete Septic Tanks: ASTM C 1227, two-compartment, precast, reinforced-concrete tank with internal baffle and covers.

1. Design: Tanks shall be designed pedestrian traffic loading according to ASTM C 890, unless otherwise designed as AASHTO “H-20” load rated per Appendix C: Schedule of Septic Tank Work.
2. Inlet and Outlet access openings: 24-inch diameter openings with watertight tank adapters sealed to the tank openings with butyl mastic rope and secured to the tank using stainless steel threaded fasteners appropriate for the tank material. The tank adapters shall have the ability to attach to watertight gasketed risers to grade and watertight lockable access plug covers.
3. Boot connectors shall comply to ASTM C 1644 (of size required for piping, fitted into inlet and outlet openings.)
4. Capacity: Per Appendix C: Schedule of Septic Tank Work
5. Inlet and Outlet Size: 4-inch NPS
6. Manufacturers:
    a. Norwalk Concrete Industries, Stiger Precast
    b. Engineer approved equal from ODH Pre-Approved Manufactured Septic Tanks list

2.03 Riser Systems

A. All riser connections shall be as indicated on the Drawings and be available in 6” and 12” increments and be able to extend to grade from the maximum burial depth. Riser systems shall be authorized by the tank manufacturer to ensure compatibility.

1. Size: 24-inch diameter
2. Provide watertight connection with riser gasket and joint sealant
3. Plastic riser covers shall be lockable; H-20 tanks shall include H-20 rated risers and covers
4. Cast iron frame and covers shall match the same model used for manholes rehabilitated as part of this project.
5. A secondary safety lid shall be included with plastic riser and lid components.
6. Manufacturers:
    a. Roth Global Plastics
    b. SIM/TECH Filter, Inc.
    c. Tuf-Tite, Inc.
    d. Engineer approved equal

2.04 Effluent Filters

A. Removable, septic-tank-outlet filter that restricts discharge solids to 1/16”

1. Effluent filter devices shall be certified to ANSI/NSF Standard 46
2. Effluent filter devices shall be sized to meet the estimated daily design flow for the system that the septic tank is used in.
3. Housing: PVC
4. Outlet Size: Min. 4-inch NPS
5. Manufacturers:
   a. Tuf-Tite, Inc.
   b. Engineer approved equal complying with OAC 3701-29-12 requirements.

2.05 Sewer Disconnects

A. An inline thermoplastic sewer disconnect valve shall be installed upstream of each septic tank as indicated on the Drawings.

1. Housing: PVC
2. Cap shall be threaded and watertight. Cap nut shall be recessed.
3. Inlet and Outlet Size: 4-inch SCH-35 PVC
4. Provide five (5) complete plunger assemblies (SDCP-040, or approved equal)
5. Manufacturers:
   a. Spears, SDC-040
   b. Engineer approved equal

PART 3 - EXECUTION

3.01 General

A. Do not install products when, in the opinion of the Engineer, conditions unsuitable.

B. New septic tanks shall be installed at the same location as the existing septic tanks unless authorized, in writing, by the Engineer and Property Owner.

C. Follow manufacturer’s installation procedures when installing all products

D. Review safety procedures with all employees

3.02 Examination

A. Examine areas and conditions for compliance with requirements and other conditions affecting performance of septic tank systems.

B. Verify compatibility with and suitability of soil structure and materials, and buoyancy requirements.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Before doing any earthwork or installing, verify location, depth, type of product needed, and size of product.

3.03 Earthwork

A. Excavating, trenching and backfilling for piping:

1. Stockpile topsoil for reuse in finish grading without intermixing with other excavated material. Stockpile materials away from edge of excavation and do not store within drip line of remaining trees.
2. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

B. Excavating and Backfilling for Septic Tanks:

1. Excavate sufficient width and length for tanks to depth determined by tank inlet elevation. Tank should be buried no greater than 36 inches below grade. Over excavate to a minimum of 6 inches below bottom of tank. Excavate to provide 12-18 inches of horizontal clearance between outer surface of structure and trench wall to allow for proper backfilling.
2. Place a minimum of 6 inches of well-graded clean stone (ODOT #6 or #8, or Pea Gravel) as base material over subgrade and compact.
3. Where rock is encountered such that the structure would bear on rock, remove the rock to a minimum of 8 inches below the structure and place an 8-inch cushion of clean stone over the exposed rock.
4. When backfilling, verify height of risers and modify/adjust as required. Mark the riser locations on a drawing using permanent landmark features as reference. A minimum of 2 and preferably 3 ties per riser are recommended.
5. Backfill aggregate to a minimum of 4” above tank in 6-8” compacted lifts.
6. Final backfill, 4-inches or greater above the top of tank, may be native soils (excavated material) provided soil is free of clods, debris, clayey soils, organic matter, sharp stones, and stones greater than 2 inches in diameter. The use of excavated material as initial backfill around the tank is prohibited.
7. Care shall be taken to prevent any disturbance to the structure or newly made joints. The filling of the trench shall be carried on simultaneously on both sides of the tank in such a manner that injurious side pressures do not occur such that the tank could be displaced or dislodged. Tank installer may place water in the tank to stabilize tank during backfilling.
8. Do not backfill with muddy or frozen soil.

3.04 Installation

A. Polyethylene Septic Tank

1. Identify the inlet and outlet ends of the tanks. Inlet and outlet may be located in the end of either side ports (per local code requirements). Identify drill location based on liquid level. Drill the inlet and outlet holes using a 5-inch diameter hole saw.
2. Install rubber grommet in inlet and outlet ports.
3. Install the inlet and outlet tees.

4. Install effluent filter in septic tank outlet and secure filter to septic tank wall.
5. Install compartment wall.
6. Install the riser system and secondary safety lid if applicable.
7. Lower the tank into the excavation. Level the tank and verify outlet is lower than the inlet. Install remaining inlet and outlet plumbing.
8. Install anti-buoyancy system per manufacturer's recommendations.
9. Perform required water tightness, plumbing, and/or tank inspections as applicable.

B. Concrete Septic Tanks

1. Identify the inlet and outlet ends of the tanks. Inlet and outlet shall be located in the end of either side ports (per local code requirements).
2. Install boot connectors in inlet and outlet ports.
3. Install the inlet and outlet tees.
4. Install effluent filter in septic tank outlet and secure filter to septic tank wall.
5. Install the riser system and secondary safety lid if applicable
6. Install precast concrete septic tanks level according to ASTM C 891
7. Install remaining inlet and outlet plumbing.
8. Perform required water tightness, plumbing, and/or tank inspections as applicable.

C. Fastening of Fittings

1. Fastening of internal walls or partitions shall be done using a stainless-steel fastening system. Under no circumstances shall any fastening system penetrate the interior tank walls.

D. Pipe Connections

1. All pipe connections shall be watertight. Tanks shall be capable of accommodating pipe penetrations on each end and on either side where allowed by local codes.
2. Install distribution piping according to "PVC Sewer Pipe and Fittings"; ASTM D 2321

3.05 Field Quality Control

A. Testing & Structural Strength Testing

1. Coordinate with property owner to fill all newly installed tanks to a minimum of half full within a minimum of 72 hours following installation, or sooner if heavy rains or saturated ground conditions are forecasted. For tank sites that do not have an active well, Contractor shall provide water for the purposes of filling the tank completely full.

3.06 Cleaning

A. Complete backfilling and grade the area such that surface water will drain away from tank.

B. After backfilling is completed, the contractor shall dispose of all surplus material, dirt and rubbish from site, and shall keep the site free of mud and dust to the satisfaction of the owner.

C. Finish grade and seed once the site has settled in accordance with the Drawings and Specifications.

D. Provide all necessary equipment required for proper completion of the flushing of septic tank and piping systems.

E. Clear interior of piping and structures of dirt and other superfluous material as work progresses.

F. Remove all debris and excess soil from structures after construction and prior to flushing pipes.

G. After all work is completed, the contractor shall remove all tools and other equipment, leaving the site free, clean, and in good condition.

-END-

SECTION 02902 - LANDSCAPING FOR UTILITIES

PART 1 - GENERAL

1.01 Description

A. Furnish and install topsoil, fertilizer, seed, mulch, sod, trees, bushes, ornamental plants, fencing, mail boxes, planters, and related items as applicable, that are necessary to complete work shown or specified.

B. The Contractor shall repair or replace lawn areas, trees, and ornamental plants damaged or destroyed during construction of the work included in this Contract, unless otherwise shown on the Drawings. The Contractor shall repair or replace fences, mail boxes, planters, and other items damaged or destroyed during construction of the work included in this Contract, unless otherwise shown on the Drawings.

C. Lawn areas include grassed areas which are cut and maintained on a routine basis. Lawn areas include lawns at homes and businesses and grass shoulders of streets, roads, and highways.

D. Replacement of underbrush in fields and woods, along farm fences and roads, and in similar areas is not required, unless otherwise shown on the Drawings.

1.02 Job Conditions

A. Seed in accordance with the Seasonal Soil Protection Chart detail. Do not sow seed during adverse weather conditions. Do not broadcast seed during high wind. Do not sow seed when the moisture content of the soil is too low or too high for seed germination.

B. Plant trees and ornamental plants during the proper time and under the proper conditions for the particular tree or plant as determined by local practice.

1.03 Related Work Specified Elsewhere

A. Section 02101 - Storm Water Pollution Prevention and Erosion Control

PART 2 - PRODUCTS

2.01 Lawn Products

A. Limestone shall be as specified in Section 02101 - Storm Water Pollution Prevention and Erosion Control.

B. Fertilizer shall be as specified in Section 02101 - Storm Water Pollution Prevention and Erosion Control.

C. Grass shall be as specified in Section 02101 - Storm Water Pollution Prevention and Erosion Control for permanent seed or sod as applicable.

D. Mulch shall be as specified in Section 02101 - Storm Water Pollution Prevention and Erosion Control.

E. Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate visual metering during application. Composition on air-dry weight basis shall be: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

F. Asphalt adhesive shall be emulsified asphalt. Adhesive shall meet the requirements of ASTM D977 for Grade SS- 1.

2.02 Fence and Other Products

A. For those items damaged or destroyed: replacement fence, mail boxes, planters, and other items shall be new and unused. Fence, mail boxes, planters, and other items shall be the same type as the items removed. Fence, mail boxes, planters, and other items shall be of equal quality to the items removed when the items removed were new.

B. Contractor shall remove and relocate undamaged fence, mail boxes, planters, and other items when possible. Coordinate locations with property owner.

2.03 Erosion Control Blanket

A. Erosion control blanket shall be as specified in Section 02101 - Storm Water Pollution Prevention and Erosion Control.

PART 3 - EXECUTION

3.01 Grading

A. Fine grade all non-paved areas disturbed during construction. Areas shall be smooth and uniform. Finish elevations and grades shall be the same as elevations and grades prior to construction, unless otherwise shown on the Drawings.

3.02 Grass

A. Apply grass seed or install sod as specified in Section 02101 - Storm Water Pollution Prevention and Erosion Control.

3.03 Hydroseeding

A. Hydroseeding may be incorporated to seed areas steeper than a ratio of horizontal to vertical of 3 to 1. Seed and fertilizer shall be added to water and thoroughly mixed at the rates specified by professional landscape contractor. Wood cellulose fiber mulch shall be added at the rates recommended by the manufacturer after the seed, fertilizer and water have been thoroughly mixed, to produce a

homogeneous slurry. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled.

3.04 Fencing and Other Restoration

A. Locate fences, mailboxes, planters, and other items in the same location that the item had been prior to construction. Erect wire and board fences plumb and on straight lines. Set mail boxes, posts, poles, and similar items plumb. Restore planters and similar items to the same shape the items had been prior to construction.

B. Wire fences shall have the proper tension for the type of wire fence restored. Other fences and items shall be properly erected or constructed.

3.05 Erosion Control Blanket Installation

A. Erosion control blanket specified in Article 2.03 of this section shall be used in areas where construction activities have disrupted vegetation in drainage ditch bottoms, and other areas where steep grade prohibits revegetation by standard seeding methods. In the case of drainage ditches, the erosion blanket must extend up the sides of the ditch to above a water level of one foot if hydraulic conditions dictate.

3.06 Clean-Up

A. Clean up the job site following landscaping. Remove rubbish, excess materials, temporary structures, and equipment. Leave the work in a neat and presentable condition.

3.07 Warranty

A. Contractor shall regrade/reseed/restraw when requested to satisfaction of Engineer and Owner during one-year warranty period.

-END-

DIVISION 3 – CONCRETE

SECTION 03100 - CONCRETE FORMWORK

PART 1 - GENERAL

1.01 Summary

A. Section Includes:

1. All labor, equipment, materials and services (including the design and detailing) required to form all cast-in-place concrete indicated on the Drawings and subsequent removal of all such work.

B. Related Sections

1. Section 03200 - Concrete Reinforcement
2. Section 03300 - Cast-In-Place Concrete

1.02 References

A. Work on this project shall conform to all requirements of the latest version of the specifications listed below adopted by the current building codes except as modified by these Contract Documents.

B. ASTM specifications apply in their entirety where specifically referenced in the body of this section.

C. Refer to specific portions of other guides, guidelines, and manuals where referenced in the body of this specification section.

1. ACI 117 Specification for Tolerances for Concrete Construction and Materials
2. ACI 350 Code Requirements for Environmental Engineering Concrete Structures
3. ACI 350.5 Specifications for Environmental Concrete Structures

1.03 Performance Requirements

A. All formwork, including shoring and reshoring, shall be designed by the formwork contractor who shall be solely responsible for this work.

B. Formwork for post-tensioned concrete shall be designed taking into account the possibility of the member lifting off the formwork during the stressing operation.

1.04 Submittals

A. Shop Drawings for review:

1. Submit under the provisions of Division 1 and prior to starting fieldwork.
2. Submit location and detail of construction joints in elevated slabs.
3. Submit product information for forming products.

1.05 Quality Assurance

A. Qualifications of workers:

1. Provide at least one experienced person to be present at all times during execution of this portion of the Work and who shall be familiar with the materials being installed, the referenced standards, and the requirements of this Work, and who shall direct all work performed under this Section.

PART 2 - PRODUCTS

2.01 Form Materials & Accessories

A. Form Lumber:

1. Unless otherwise indicated on the Drawings, provide formed concrete surfaces utilizing the following materials:
   a. Rough Form Finish: Forms for as-cast concrete surfaces not exposed to view and not required to contain fluids – Category ESF-1.0 (ACI 350.5):
      1) Face Forms: Rough sawn lumber, CDX plywood, particle board BBOES plywood, MDO plywood
   b. Smooth Form Finish: Forms for as-cast and rubbed concrete surfaces exposed to view or required to contain fluids – Category ESF-2.0 (ACI 350.5):
      1) Face Forms: BBOES plywood, MDO plywood
   c. Architectural Smooth Form Finish: Forms for surfaces noted on the Drawings as as-cast architecturally exposed concrete, with formwork arranged to provide the form and tie pattern indicated on the Drawings - Category ESF-3.0 (ACI 350.5):
      1) Face Forms: Unless noted otherwise, High Density Overlaid Plyform Class I or II, exterior, bearing APA grade stamp on each piece. Minimum thickness: 3/4".
      2) Phenolic surface film, plastic, or steel material where specifically noted.
2. Surfaces and lines for ESF category shall comply with ACI 117 tolerances and ACI 350.5. Surfaces produced shall require only minor dressing to arrive at true surfaces.
3. All form lumber in contact with exposed concrete shall be new or of sufficient quality to ensure an unblemished texture.

B. Steel Beam Forms:

1. Steel is an acceptable material for beam formwork.
2. Steel forms shall be "like new" producing a clean, smooth, unblemished, texture for concrete exposed in the finished structure.

C. Column Forms:

1. Forms for columns to remain concealed may be made of any material adequate to withstand the hydraulic pressure of the concrete being placed.
2. For square and rectangular columns with ESF-2.0, provide MDO plywood.
3. For square and rectangular columns with ESF-3.0, provide HDO plywood unless noted otherwise.
4. Forms for round columns to remain architecturally exposed shall be:
   a. Fiberglass where exposed vertical seams are acceptable.
   b. For seamless columns: Sonotube finish free concrete forms with strip cord stripping element, or approved equivalent.

D. Form Ties:

1. Factory fabricated, adjustable length, snap-off metal form tie, designed to prevent form deflection and to prevent spalling of concrete upon removal.
   a. The metal after breaking should be at least 1 1/2" from the face of the wall.
   b. Snap-off ties through concrete elements exposed to earth or fluid shall be provided as an assembly, with an integral waterstop and cone-shaped depression at each concrete surface, 1” minimum diameter and 1 1/2” minimum depth, to allow for filling and patching.
2. Taper ties, designed to be completely removed from the concrete element. Provide a waterstopping mechanical plug to seal hole, and fill and patch at each concrete face.
   a. Approved mechanical plug product: X-Plug, by Greenstreek.

E. Form Release Agent:

1. Non-staining, neutral, barrier type which will not cause softening or impede curing. When concrete surfaces are in contact with potable water, formwork release agents shall comply with NSF/ANSI Standard 61: Drinking Water System Components – Health Effects.
2. Standards:
   a. DUO guard Chemical Release Agent – WR Meadows
   b. Magic Kote E Symons Manufacturing Company
   c. Clean Strip J1EF Form Release by Dayton Superior.

F. Falsework

1. The Contractor is responsible for the design, safety, and serviceability of falsework.

2.02 Other Materials

A. All other materials, not specifically described but required for proper completion of concrete formwork, shall be as selected by the Contractor subject to the advance approval of the Architect/Engineer.

B. See “Products Installed but not Furnished” in PART 1 of the Cast-in-Place Concrete specification section for additional embedded items to be coordinated with formwork installation.

PART 3 - EXECUTION

3.01 Surface Conditions

A. Inspection:

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is completed to the point where this installation may properly commence.
2. Verify that forms are constructed in accordance with all pertinent codes and regulations, the referenced standards, and the original design.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Engineer.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved and reviewed by the Engineer.

3.02 Construction of Forms

A. Provide substantial form construction, sufficiently tight to prevent leakage of concrete, and able to prevent excessive deflection when filled with wet concrete.

B. Layout:

1. Form all required cast-in-place concrete to the shapes, sizes, lines and dimensions indicated on the Drawings. Provide 3/4" chamfers on all exposed corners of concrete except those abutting or aligning with masonry.
2. Layout formwork to eliminate need for cutting of concrete after it is in place.
3. Make proper provisions for all openings, offsets, recesses, anchorage, blocking, and other features of the Work as shown, or required.
4. Perform all forming required for Work of other trades and do all cutting and repairing of forms required to permit such installation.
5. Carefully examine the Drawings and Specifications and consult with other trades as required relative to provisions for openings, reglets, chases and other items in the forms.

C. Bracing:

1. Properly brace and tie the formwork together to maintain position and shape and to ensure safety of workers.

D. Construct all formwork straight, true, plumb, level and square within tolerances as specified in ACI 117, unless modified below. Use a reference point on the ground to check plumbness and elevations. Do not use a previous floor as the reference.

E. Keep formwork sufficiently wetted to prevent joints opening up before concrete is placed.

F. Provide holes at bottom of formwork for cleaning and inspection. Close prior to placing concrete.

3.03 Form Removal

A. Remove formwork in an approved manner under competent supervision to avoid damage to the concrete. Use sufficient care to prevent spalling.

B. The Contractor shall bear full responsibility for form removal. Concrete damaged by too early removal of supports shall be repaired to the satisfaction of the Engineer, or replaced.

C. Do not remove shores and other supports until concrete has attained sufficient strength to support, without objectionable deflections, its own weight plus all anticipated construction loads.

1. For non-post-tensioned concrete, the concrete shall have attained, as indicated by the field-cured cylinders, at least 70 percent of its specified 28-day strength before falsework is removed.
2. For post-tensioned concrete, remove forms in accordance with Post-tensioned Concrete Tanks specification.

D. Do not remove formwork for vertical elements (walls and columns) until the day after casting of the concrete. Do not damage concrete surface during form removal.

E. Plug tie holes flush with the surface as specified in Cast-In-Place Concrete specification.

3.04 Maintenance

A. Clean and recondition formwork before each use. Repair damage to formwork during placing, removal, or storage. Do not use formwork with repairs or patches which would result in adverse effects to the concrete finish.

B. Store formwork and form materials in a manner to prevent damage or distortion.

-END-

SECTION 03310 - SITE WORK CONCRETE

PART 1 - GENERAL

1.01 Scope

Contractor shall provide all labor, tools and equipment necessary to construct concrete structures as shown on the Drawings.

1.02 Related work specified elsewhere:

A. Section 03100 - Concrete Formwork

1.03 Quality Assurance

A. Allowable Tolerances

1. ±1/8 inch in 10 ft. from a flat surface for smooth troweled slab finish.
2. ±1/4 inch in 10 ft. from a flat surface for other finishes.
3. ±1/4 inch maximum deviation from required elevations.

B. Quality Control

1. Compression Tests: by an approved testing laboratory, paid for by Contractor, approved by Engineer.
2. Cement: only one brand by an American manufacturer.

C. Reference Standards

1. American Society for Testing and Materials Standards (ASTM).
2. American Concrete Institute "Building Code Requirements for Reinforced Concrete" (ACI 318 - Latest Edition).

1.04 Submittals

A. Submit concrete compression test results to Engineer.

B. Submit concrete delivery tickets in accordance with ASTM C94 for each batch of ready mixed concrete delivered, indicating total water content on each ticket.

1.05 Product Delivery, Storage and Handling

A. Store and handle material to prevent deterioration or intrusion of foreign matter.

B. Immediately and completely remove deteriorated or damaged material from the work and replace with new material.

C. Deliver ready mix concrete in accordance with ASTM C-94.

1.06 Alternatives

A. Construction joints may be substituted for control or contraction joints at indicated joint locations in slabs on grade and other locations approved by the Engineer.

PART 2 - PRODUCTS

2.01 Materials

A. Portland Cement: ASTM C-150.

B. Air-entrained Portland Cement: ASTM C-175.

C. Air-entrained Agent: ASTM C-260.

D. Fine Aggregate

1. ASTM C-33.
2. Natural sand composed of clean, sound, hard, durable particles.

E. Coarse Aggregate

1. ASTM C-33.
2. Clean, hard, durable, screened, crushed stone or gravel.
3. #5, graded from a maximum of 1 1/2 inches for footing.
4. #7, graded from a maximum of 1 inch for slabs.

F. Mixing Water: free from oil, acid, vegetable matter, alkalis and other impurities and clean, suitable for drinking.

G. Admixture other than air-entraining agent: Not to be used unless written approval is obtained from Engineer.

H. Joint Filler

1. Premolded, resilient, compressible, pre-expanded, non-extruding and non-staining.
2. 3/8 inch thick unless otherwise indicated.
3. Polyethylene foam, polyurethane foam, neoprene sponge or polyvinyl chloride sponge.
4. Closed-cell type with 25% compressibility when subject to 10 to 15 psi distributed pressure.

2.02 Approved Concrete Curing and Sealing Compound for Interior

A. ASTM C-309

B. Impervious, non-bituminous, liquid, compatible with floor finish.

C. Manufactured by: Sonneborn - "Kure-N-Seal", Toch Bros. - "Sealkure", Grace - "Horn Clear Seal" or approved equal.

2.03 Approved Concrete Curing and Sealing Compound for Exterior.

A. ASTM C-309.

B. White pigmented, wax resin base membrane type.

C. Manufactured by: Grace - "Horncue 40W", Toch Bros. - "Torkure", Sonneborn - "Hydrocide Curing Compound" or approved equal.

2.04 Concrete Design Criteria

A. Minimum ultimate compressive strength: 3,000 psi at 28 days, unless otherwise noted.

B. Maximum slump shall be 3 inches.

2.05 Concrete Mix

A. ACI 318-83 and ASTM C-94.

B. Proportioned by water-cement ratio method based on requirements for a plastic and workable mix with not less than 6 bags of cement per cu. yd. and not more than 6 gallons of water per 94 lb. bag of cement.

C. Ready mixed or job mixed at Contractor's option.

D. Air entrained with 5 to 7% by volume for concrete exposed to weather with not more than 5 gallons of water per bag of cement.

PART 3 - EXECUTION

3.01 Inspection

A. Inspect piping, conduits, drains and similar items for proper placement and condition prior to placing concrete.

B. Do not place concrete until bearing surfaces have been inspected, approved and authorization to proceed is received from Engineer.

3.02 Concrete Placement: ACI 301-66 and ASTM C-94.

A. Place in final position as soon as possible after mixing in an approved manner to prevent segregation. Handle rapidly from mixer to forms. Spade, work by hand, and vibrate to assure close contact with forms and reinforcement.

B. Place on clean, damp surfaces, free of water. Place in final position within 90 minutes after mixing water with dry material. No water shall be added to the

concrete after initial mixing. Do not use concrete which has been retempered, has partially hardened or been contaminated by foreign material.

C. Remove unsuitable materials from the project site immediately. Do not deposit concrete when temperature of materials is below 50°F or above 85°F. Form concrete slabs to thicknesses shown on Drawings but not less than 4 inches and strike off at proper levels to receive finish.

D. Winter Concreting

1. Shall meet the requirements of ACI 306.
2. Provide for maintaining concrete at a temperature not lower than 70°F. for 3 days or 50°F. for 5 days after placing.
3. Approved by the Engineer for methods of heating materials and protecting concrete. The use of salts, chemicals or other foreign materials shall not be mixed with concrete for the purpose of preventing freezing.

E. Hot Weather Concreting

1. Shall meet the requirements of ACI 305.
2. Do not exceed 90°F. maximum concrete temperature.
3. Protect concrete from rapid moisture evaporation by covering with polyethylene sheeting or spraying.
4. Provide wind breaks as necessary.

F. Install perimeter insulation before placing concrete for slab.

G. Form concrete slabs to thicknesses shown on Drawings but not less than 4 inches and strike off at proper levels to receive finish. Screed and tamp to eliminate voids in surfaces.

H. Form floor slabs to pitch evenly to drains. Form exterior slabs to drain away from building.

I. Inserts and Fastening Devices of Other Work

1. Provide for installation of inserts, anchors, dowels, bolts, thimbles and other fastening devices required for attachment of other work.
2. Properly locate and secure in position before placing concrete.

J. Joints

1. Construct all joints indicated on Drawings.
2. Control Joints
   a. Depth: 1/4 thickness of slab.
   b. Width: 3/16 inch maximum.
   c. Walks and ramps: 5 ft. on center.
   d. After placing concrete make interior concrete joints by inserting plastic control joint former or sawing.

e. Sawing of joints shall start not less than 8 hours after and be completed not more than 30 hours after placing concrete.
f. Flush joints with water immediately after sawing to remove residue.
g. Fill joints with sealant.

3. Expansion Joints
   a. Install premolded joint filler where concrete slabs on grade abut structure and elsewhere indicated.
   b. Install premolded joint filler full depth of slab except for joints permanently exposed, allow 3/8 inch at top and fill with joint sealant.
4. Construction Joints
   a. Provide keyed joints between cast sections of slabs on grade.

3.03 Curing and Protection

A. Do not use dry sand or cement to take up excess free surface water.

B. Cure concrete immediately after placing, finishing, and free water has disappeared.

C. Protect concrete from moisture loss by water curing or application of membrane curing compound.

1. Water Curing: By sprinkling or ponding to keep concrete continuously wet or by moisture retention covers.
2. Compound Curing: By pressure spraying membrane curing as recommended by manufacturer in sufficient thickness to form an effective water seal.

D. Cure concrete minimum of 7 days after placement.

E. Protect fresh concrete from heavy rain, mechanical injury and injurious action of sun.

F. Provide protection and cover concrete until project is completed to prevent construction work damage.

3.04 Field Quality Control Tests

A. Compression Tests

1. Provide for test purposes one set of three cylinders taken for each day's concrete placement.
2. Make test cylinders and cure in accordance with ASTM C-31 and C-39.
3. Test one cylinder 7 days, and one cylinder 28 days after concrete is placed. If the cylinders fail to meet the compression strength specified, the third cylinder shall be tested. Should all cylinders tested fail to meet the compression strength specified, all concrete in place as represented by the test cylinders shall be removed.
4. Contractor shall be responsible for payment of tests.

B. Slump Tests

1. Furnish slump cone and rod for use by the Inspector when concrete is being placed. Make tests at the place of deposit and in accordance with ASTM C-143.
2. Make tests periodically where cylinders are made and as often in the opinion of the Engineer when a change in consistency of the concrete mix is noted.

3.05 Concrete Finishes

A. Interior concrete floors: ACI 301 using steel trowel finish using circular power finishing machine and steel hand trowel to produce a true, hard, uniform surface.

B. Exterior concrete slabs: ACI 301 with a light broom finish to texture approved by Engineer, edges and joints tooled, and slabs scored.

-END-

DIVISION 5 – METALS

SECTION 05532 - ALUMINUM HATCHES

PART 1 - GENERAL

1.01 Description

A. Furnish and install aluminum hatches and appurtenances necessary to complete work shown or specified.

1.02 Domestic Product Requirements

A. All Steel and foundry products provided for in this project, including ferrous and non-ferrous metals, piping, fittings, and piping-related products, shall be manufactured in the United States.

1.03 Submittals

A. Submittals shall be as specified in the General Conditions.

B. Submit shop drawings with physical characteristics of aluminum hatches.

1.04 Product Delivery, Storage, and Handling

A. The Contractor shall be responsible for the delivery, storage, and handling of products.

B. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.

PART 2 - PRODUCTS

2.01 Flush-Mounted Hatches

A. Door leaves shall be 1/4-inch aluminum diamond pattern plate capable of withstanding a live load of 300 pounds per square foot. Channel frame shall be 1/4-inch aluminum with an anchor flange around the perimeter. Hatches for buildings, casements, or over occupied rooms shall have a drainage lip, shall have an anchor flange with a minimum cross-sectional area of 7.5 sq. in. to allow for adequate drainage and a 1-1/2-inch drainage coupling shall be located in the front right corner of each channel frame. Doors shall be equipped with a minimum of two heavy stainless steel hinges with stainless steel pins, spring operators to afford easy operation, and an automatic hold-open arm with release handle. A snap lock with removable handle shall be provided on each door. Each door leaf shall have tubular compression spring operators and a positive hold-open arm that engages automatically when the leaf reaches its fully open position. When closed, doors shall not protrude above the operating surface in which they are installed. Factory

finish shall be mill finish. Surfaces contacting concrete shall have bituminous coating.

B. Flush mounted hatches with drainage lips shall be Bilco Type J or JD, Dur-Red Products Type SLG, or equal. Hatches without drainage lips shall be Bilco Type K or KD, or equal.

2.02 Wrenches

A. When flush mounted hatches and doors are furnished, provide two wrenches for opening hatches.

PART 3 - EXECUTION

3.01 Installation

A. Install hatches in accordance with manufacturer's recommendations and as specified in this Section.

B. Cast flush mounted hatches into concrete slabs.

C. Hatches shall be uniformly supported. Lids shall operate smoothly without binding.

D. Flush mounted hatch and door covers, when closed, shall not protrude above the operating surface in which they are installed, unless otherwise indicated.

3.02 Cleaning and Adjusting

A. All equipment installed under this Section shall be cleaned and adjusted for proper operation to the satisfaction of the Engineer.

3.03 Hatch Schedule

A. Hatches are tabulated giving location, type, size, and number of leaves.

No.	Location	Type	Size	Leaves
1.	Valve Vault @ Wayne Street Lift Station	Flush-mounted with drainage lip	36" x 36"	1

Note: Hatches with flush-mounted drainage lips shall have one-inch PVC piping installed from the lip drain to connect to the nearest gravity drain line, wet well, or other structure as approved by the Engineer.

-END-

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07900 - JOINT SEALERS

PART 1 - GENERAL

1.01 Summary

A. Extent of each form and type of joint sealer is indicated on drawings and schedules.

B. This Section includes joint sealers for the following locations:

1. Exterior joints in vertical surfaces and non-traffic horizontal surface.
2. Exterior joints in horizontal traffic surfaces.
3. Interior joints in vertical surfaces and horizontal non-traffic surfaces.
4. Interior joints in horizontal traffic surfaces
5. Joints in water immersion
6. Joints in pavement

C. Sealing joints related to flashing and sheet metal for roofing is specified in Section 07600 - Flashing and Sheet Metal. Sealant for roofing is specified in Section 07530.

D. Sealants for glazing purposes are specified in Division 8 section “Glass and Glazing.”

1.02 System Performances

Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals

1.03 Submittals

A. Product Data from manufacturers for each joint sealer product required, including instructions for joint preparation and joint sealer application

B. Samples for Initial Selection Purposes. Manufacturer’s standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.

C. Samples for verification purposes of each type and color of joint sealer required. Install joint sealer samples in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealers.

D. Certificates from manufacturers of joint sealers attesting that their products comply with specification requirements and are suitable for the use indicated.

1.04 Quality Assurance

A. Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years at least 3 joint sealer applications similar in type and size to that of this Project.

B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

C. Field-Constructed Mock-Ups: Prior to installation of joint sealers, apply elastomeric sealants to the following selected building joints as indicated below for further verification of colors selected from sample submittals and to represent completed work for qualities of appearance, materials, and application.

1. Joints in field-constructed mock-ups of assemblies specified in other sections which are indicated to receive elastomeric joint sealants specified in this section.
2. Retain mock-ups during construction as standard for judging completed construction.

1.05 Delivery, Storage, and Handling

A. Deliver materials to Project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.06 Project Conditions

A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.
2. When joint substrates are wet due to rain, frost, condensation, or other causes.

B. Joint Width Conditions: Do not proceed with installation of joint sealers where joint widths are less than allowed by joint sealer manufacturer for application indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.01 Materials, General

A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Provide color of exposed joint sealers as selected by Engineer from manufacturer's standard colors.

2.02 Elastomeric Joint Sealants

A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those referenced for Type, Grade, Class, and Uses.

B. Type 1 - Two-Part Non-Sag Polysulfide Sealant: Type M; Grade NS; Class 12-1/2; Uses NT, M, G, A, and, as applicable to joint substrates indicated, O.

1. Products:
   a. "CM-60"; W.R. Meadows, Inc.
   b. "Synthacalk GC2+"; Pecora Corp.
   c. "Sonolastic Two-Part"; Sonneborn Building Products Div., Rexnord Chemical Products Inc.

C. Type 2 - Two-Part Pourable Polysulfide Sealant: Type M; Grade P; Class 12-1/2; Uses T, M, G, A, and, as applicable to joint substrates indicated, O.

1. Products:

D. Type 3 - Two-Part Water Immersion Polysulfide Sealant: Type M; Grade NS; Class 12-1/2; Uses T, M, G, A, and, as applicable to joint substrates indicated, O; with a history of successful test results, per ASTM C 719, and field experience in the sealing of joints immersed intermittently or continuously in water of the same composition as that to which sealant will be exposed after installation.

1. Products:
   a. "Synthacalk GC2+"; Pecora Corp.
   b. "Sonolastic Two-Part"; Sonneborn Building Products Div., Rexnord Chemical Products Inc.

E. Type 4 - Multi-Part Non-Acid-Curing Silicone Sealant: Type M; Grade NS; Class 25; Uses T, NT, M, G, A, and, as applicable to joint substrates indicated, O; and complying with the following requirements for additional joint movement capability:

1. Additional capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage

changes in joint width as measured at time of application and remain in compliance with other requirements of ASTM C 920 for Uses indicated:
   a. 50 percent movement in both extension and compression for a total of 100 percent movement.
2. Products: "Dow Corning 695"; Dow Corning Corp.

F. Type 5 - One-Part Non-Acid-Curing Silicone Sealant: Type S, Grade NS, Class 25, and complying with the following requirements for Uses and additional joint movement capability:

1. Uses NT, M, G, A, and, as applicable to joint substrates indicated, O.
2. Additional capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of application and remain in compliance with other requirements of ASTM C 920 for Uses indicated:
   a. 40 percent movement in both extension and compression for a total of 80 percent movement.
3. Products:
   a. "Dow Coming 790"; Dow Corning Corp.
   b. "Silpruf SCS 2000"; Momentive Performance Materials, Inc.
   c. "864 NST"; Pecora Corp.
   d. "Dow Coming 795"; Dow Coming Corp.
   e. "Omniseal"; Sonneborn Building Products Div., Rexnord Chemical Products Inc.
   f. "Sikasil WS-290"; Sika Corp.

G. Type 6 - One-Part High-Modulus Non-Acid-Curing Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, M, G, A, and, as applicable to joint substrates indicated, O.

1. Products
   a. "Dow Corning 784"; Dow Coming Corp.
   b. "Dow Coming 799"; Dow Coming Corp.
   c. "Ultraglaze SSG 4000"; General Electric Co.

H. Type 7 - One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to non-porous joint substrates indicated, O; formulated with fungicide; intended for sealing interior joints with non-porous substrates and subject to in-service exposure to conditions of high humidity and temperature extremes.

1. Products
   a. "Dow Coming 786"; Dow Coming Corp.
   b. "SCS 1702 Sanitary"; General Electric Co.
   c. "898 NST"; Pecora Corp.
   d. "OmniPlus"; Sonneborn Building Products Div., Rexnord Chemical Products Inc.
   e. "Sikasil-N Plus"; Sika Corp.
   f. "Sikasil-GP"; Sika Corp.

I. Type 8 - Multi-Part Non-Sag Urethane Sealant: Type M, Grade NS, Class 25, and complying with the following requirements for Uses:

1. Uses NT, M, G, A, and, as applicable to joint substrates indicated, O.
2. Products:
   a. “Bostik 505”; Bostik, Inc.
   b. “Dualthane”; W.R. Meadows
   c. “Dynatrol II”; Pecora Corp.
   d. “Permapol RC-2”; Products Research & Chemical Corp.
   e. “Sikaflex-2c NS EZ Mix”; Sika Corp.
   f. “Sonolastic NP 2”; Sonneborn Building Products Div., Rexnord Chemical Products Inc.

J. Type 9 - Multi-Part Pourable Urethane Sealant: Type M, Grade P, Class 25, and complying with the following requirements for Uses:

1. Uses T, M, and, as applicable to joint substrates indicated, O.
2. Products:
   a. “Bostik 555-SL”; Bostik, Inc.
   b. “Pourthane”; W.R. Meadows, Inc.
   c. “Urexpan NR-200”; Pecora Corp.
   d. “PRC 280”; Products Research & Chemical Corp.
   e. “Sikaflex 2c SL”; Sika Corp.
   f. “Sonolastic Paving Joint Sealant”; Sonneborn Building Products Div., Rexnord Chemical Products Inc.
   g. “THC 900”; Tremco Sealant/Weatherproofing Division of RPM International, Inc.
   h. “THC 901”; Tremco Sealant/Weatherproofing Division of RPM International, Inc. (for up to 10% slope)

K. Type 10 - One-Part Non-Sag Urethane Sealant: Type S; Grade NS; Class 25; Uses NT, M, A and, as applicable to joint substrates indicated, O.

1. Products:
   a. “Bostik 900”; Bostik, Inc.
   b. “Bostik 915”; Bostik, Inc.
   c. “Bostik 916”; Bostik, Inc. (textured)
   d. “Dynatrol I-XL”; Pecora Corp.
   e. “Permapol RC-1”; Products Research & Chemical Corp.
   f. “Sikaflex-la”; Sika Corp.
   g. “Sikaflex-15LM”; Sika Corp.
   h. “Sonolastic NP 1”; Sonneborn Building Products Div., Rexnord Chemical Products Inc.
   i. “Dymonic”; Tremco Sealant/Weatherproofing Division of RPM International, Inc.
   j. “"Vulkem 116”; Tremco Sealant/Weatherproofing Division of RPM International, Inc.

L. Type 11 - One-Part Pourable Urethane Sealant: Type S, Grade P, Class 25, and complying with the following requirements for Uses:

1. Uses T, M and, as applicable to joint substrates indicated, O.
2. Products:
   a. “Bostik 955-SL”; Bostik, Inc.
   b. “Urexpan NR-201”; Pecora Corp.
   c. “Sonolastic SL-1 “; Sonneborn Building Products Div., Rexnord Chemical Products Inc.
   d. “Sikaflex-1c SL”; Sika Corp.
   e. “"Vulkem 45SSL”; Tremco Sealant/Weatherproofing Division of RPM International, Inc.

2.03 Solvent-Release-Curing Joint Sealants

A. Type 12 - Acrylic Sealant: Manufacturer’s standard one-part, non-sag, solvent-release curing, acrylic terpolymer sealant complying with ASTM C 920 for Type S; Grade NS; Uses NT, M, G, A, and, as applicable to joint substrates indicated, O; except for selected test properties which are revised as follows:

1. Heat-Aged Hardness: 40-50
2. Weight Loss: 5%
3. Max. Cyclic Movement Capability: Plus or Minus 12-1/2%
4. Products:
   a. “PTI 738”; Protective Treatments Inc.
   b. “PTI 767”; Protective Treatments Inc.

2.04 Latex Joint Sealants

A. Type 13 - Acrylic-Emulsion Sealant: Manufacturer’s standard, one part, non-sag, mildew-resistant, acrylic-emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior and on protected exterior locations involving joint movement of not more than plus or minus 5 percent.

1. Products:
   a. “Chem-Calk 600”; Bostik Construction Products Div.
   b. “AC-20 +Silicone”; Pecora Corp.
   c. “Sonolac”; Sonneborn Building Products Div.; Rexnord Chemical Products, Inc.

B. Type 14 - Silicone Emulsion Sealant: Manufacturer’s standard one part, non-sag, mildew-resistant, silicone-emulsion sealant complying with ASTM C 834 and ASTM C 920, formulated to be paintable and recommended for exposed applications on interior and on protected exterior locations involving joint movement of not more than plus or minus 12-1/2 percent.

1. Products
   a. “Performance Plus Silicone Sealant”; Dow Corning Corp.

2.05 Joint Sealants for Paving

A. Type 15 - Two-Part Jet-Fuel-Resistant Cold-Applied Sealant: Manufacturer's standard, pourable, chemically curing, elastomeric sealant complying with FS SS-S-200 and of the following formulation for base polymer.

1. Urethane formulation complying with FS TT-S-00227, with maximum movement capability of plus or minus 12-1/2 percent.
2. Polymer formulation complying with ASTM C 920 for Type M, Grade P, Class 25, Uses T and O as applicable to joint substrates indicated.
3. Products:
   a. "Gardox"; W.R. Meadows, Inc.
   b. "Urexpan NR-300"; Pecora Corp.
   c. "Sonomeric CT 2"; Sonneborn Building Products Div., Rexnord Chemical Products Inc.
   d. "Sikaflex-2c SL"; Sika Corp.

B. Type 16 - One-Part Jet-Fuel-Resistant Cold-Applied Urethane Sealant: Manufacturer's standard, pourable, coal-tar modified urethane formulation complying with performance requirements of FS SS-S-200, Type H.

1. Products:
   a. "Sonomeric CT 1"; Sonneborn Building Products Div., Rexnord Chemical Products Inc.
   b. "Sikaflex-1c SL"; Sika Corp.

C. Type 17 - One-Part Jet-Fuel-Resistant Silicone Sealant: Manufacturer's standard, pumpable, low-modulus non-acid-curing silicone sealant complying with ASTM C 920 for Type S; Grade NS; Class 25; Uses T, M and, as applicable to joint substrates of concrete highways and concrete runways of airports subject to jet fuel exposure, O; and complying with the following requirements:

1. Additional capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of application and remain in compliance with other requirements of ASTM C 920 for Uses indicated:
   a. 50 percent movement in extension of 50 percent movement in compression for a total of 100 percent movement.
2. Accepted for use in concrete highway and airport runway joints per FAA Engineering Brief No. 36, May 21, 1986.
3. Products:
   a. "Dow Corning 888"; Dow Corning Corp.
   b. "Sikasil-728 NS"; Sika Corp.
   c. "301 NS"; Pecora Corp.

2.06 Butyl Joint Sealants

A. Type 18 - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.

1. Applications: Use for:
   a. Concealed sealant bead in sheet metal work.
   b. Concealed sealant bead in siding overlaps.
2. Products:
   a. “SikaLastomer-511”; Sika Corp.
   b. “"Butyl Sealant”; Tremco Sealant/Weatherproofing Division of RPM International, Inc.
   c. “BA-98”; Pecora Corp.

2.07 Joint Sealant Backing

A. General: Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing per ASTM C 1330.

B. Plastic Foam Joint Fillers: Performed, compressible, resilient, non-waxing, non-extruding strips of flexible, non-gassing plastic foam of material indicated below; non-absorbent to water and gas; and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

1. Closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer, for cold-applied sealants only.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filter materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.08 Miscellaneous Materials

A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer-substrate tests and field tests.

B. Cleaners for Non-Porous Surfaces: Provide non-staining, chemical cleaners of type which are acceptable to manufacturers of sealants and sealant backing materials, which are not harmful to substrates and adjacent non-porous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.

C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

2.09 Joint Fillers for Concrete Paving

A. Provide joint fillers of thickness and widths indicated which are compatible with sealant system used.

PART 3 - EXECUTION

3.01 Examination

A. Examine joints indicated to receive joint sealers, with Installer present, for compliance with requirements for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

3.02 Preparation

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements.

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; old joint sealers; oil; grease; waterproofing; water repellents; water; surface dirt and frost.
2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile; and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.

B. Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on pre-construction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer’s recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

1. Prime all concrete, masonry, stone, and similar porous surfaces.

C. Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 Installation of Joint Sealers

A. General: Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealants as applicable to materials, applications and conditions indicated.

C. Solvent-Release-Curing Sealant Installation Standard: Comply with requirements of ASTM C 804 for use of solvent-release-curing sealants.

D. Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.

E. Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
   a. Do not leave gaps between ends of joint fillers.
   b. Do not stretch, twist, puncture, or tear joint filters.
   c. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.
2. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.

F. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

G. Tooling of Non-Sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.
2. Provide flush joint configuration per Figure 6B in ASTM C 962 at horizontal joints.

3.04 Cleaning

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

3.05 Protection

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

JOINT SEALER SCHEDULE

A. Exterior Joints

1. Vertical and Non-Traffic Horizontal Surfaces

    a. Sealants: Type 4 (Silicone) or Type 8 (Polyurethane)
    b. Applications:
        i. Control & expansion joints in cast-in-place concrete
        ii. Joints between different surfaces listed above

2. Horizontal Traffic Surfaces

    a. Sealants: Type 9 (Polyurethane)
    b. Applications:
        i. Control, expansion, and isolation joints in cast-in-place concrete slabs

3. Other Exterior Surfaces

    a. Sealants: Type 12 (Acrylic)
    b. Applications:
        i. Perimeter joints of exterior openings and other locations where indicated on the drawings not listed above

4. Sheet Metal and Siding

    a. Sealants: Type 18 (Butyl)
    b. Applications:
        i. Concealed sealant bead in sheet metal work.

B. Water Immersion

1. Sealants: Type 3 (Polysulfide)
2. Applications:

    a. Control and construction joints, interior side of tanks walls and slabs
    b. Joints and gaps in weirs, baffles, and other submerged items

D. Paving, Petroleum, and Solvents

1. Sealants: Type 15 or 16 (Urethane) or Type 17 (Silicone)
2. Applications:
    a. Joints in concrete pavements
    b. Joints between concrete and bituminous pavements
    c. Joints between new and existing bituminous pavement
    d. Joints susceptible to contact with petroleum, fuels, and solvents.

-END-

DIVISION 9 – FINISHES

SECTION 09900 – PROTECTIVE COATINGS

PART 1 - GENERAL

1.01 Description

A. Scope: Furnish and apply coatings and do related work necessary to complete work shown or specified.

B. Work Specified Elsewhere: Pipe identification markers for piping are specified in Division 10 and 15.

C. Codes, Specifications, and Standards: Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the references thereto. Latest revisions shall apply, unless otherwise shown or specified.

D. Definitions

1. Abbreviations
   a. ASTM - American Standard Testing Materials
   b. OSHA - Occupational Safety & Health Administration
   c. SSPC - Steel Structures Painting Council
   d. SW - The Sherwin Williams Paint Company
   e. DFT - Dry film thickness
   f. DMT - Dry mill thickness
   g. NFPA - National Fire Protection Association
   h. NACE - National Association of Corrosion Engineers
2. Coating: The term coating includes emulsions, enamels, paints, stains, varnishes, sealers, emulsion filler, and other coating materials whether used as prime, intermediate, or finish coats.
3. Spatter: Drops and droplets of coating and spilled or splashed coatings on surfaces not specified to be coated or surfaces previously finish coated.

1.02 Quality Assurance

A. All coating and surface preparation shall be completed by a qualified painting contractor who shall have a minimum of five (5) years experience in applying protective coatings to industrial and municipal water and wastewater treatment facilities.

B. All coating shall be done strictly in accordance with the most recent manufacturer’s printed instructions and shall be performed in a manner satisfactory to the Engineer.

C. Minimum requirements for materials are included in this Section. These requirements are intended to establish standards of quality. Products of

manufacturers which meet all minimum requirements as herein established shall be acceptable. Written acceptance of the materials to be used shall be obtained prior to surface preparation or application.

D. No request for substitution will be considered which decreases the film thickness designated, or which offers a change from the generic type of coating specified. Requests for substitution shall contain the full name of each product, descriptive literature, directions for use, generic type, nonvolatile content by volume.

E. All materials shall be brought to the job site in the original sealed and labeled containers of the manufacturer and shall be subject to inspection by the resident representative of the job.

F. All materials shall be the product of or recommended by the coating manufacturer.

G. All materials shall be compatible with the service intended. No products shall be used that may have ingredients which might react detrimentally with adjacent fluids or gases.

1.03 Submittals

A. Submittals shall be as specified in the General Conditions.

B. Submit the following:

1. Technical product data sheets for all products used.
2. Color charts and samples.
3. Samples of slip-resistant adhesive tape, if used.
4. List of surfaces indicating coating system and colors.
5. Manufacturer’s application instructions.

1.04 Product Delivery, Storage, and Handling

A. Be responsible for the delivery, storage, and handling of products.

B. Promptly remove damaged or deteriorated products from the job site, including products which have exceeded their shelf life. Replace damaged products with undamaged and undeteriorated products.

C. All coating materials stored on the job site shall be stored in a location consistent to the manufacturer’s storage requirements. Take all safety precautions accordance with NFPA Bulletin No. 101.

1.05 Job Conditions

A. Environmental Requirements

1. Perform coating work in strict conformance with manufacturer’s printed recommendations as to environmental conditions under which coating and coating systems can be applied.

2. Do not apply finish in areas where dust is being generated.
3. During the course of the coating work, adequately ventilate the coated spaces to ensure there will be no concentration of noxious odors, hazardous fumes, or flammable vapors.
4. Unless otherwise noted, do not apply coatings in damp weather or when the temperature is below 50°F or above 95°F.
5. Provide heating and enclosure when necessary to maintain specified temperature during application and curing of coatings.
6. Provide forced air circulation in enclosed areas during the application and curing period.
7.Bear all costs associated with providing and maintaining the required environmental conditions.

B. Protection

1. Protect all finish work of other trades and surfaces not being coated. Furnish suitable coverings as required. Remove coating spatter from all finished surfaces, and restore finishes of affected items to their original conditions at no additional cost to the Owner.
2. Post “Wet Paint” notices, as required, to protect newly coated surfaces.
3. Keep oily rags and waste in Underwriters’ Laboratories labeled metal containers. Do not allow oily rags and waste to accumulate in buildings.
4. Protection of Adjacent Surfaces – Cover or otherwise protect all finished work or other trades and surfaces not being painted. Remove finish hardware, accessories, light fixtures and cover plates, factory finished work, and similar items. Replace upon completion of coating.

C. Job Site Conference: The Contractor shall arrange and conduct a job site conference between the coating manufacturer’s representative, the Owner’s representative, and the personnel assigned this work prior to any field surface preparation or coating application.

PART 2 - PRODUCTS

2.01 Manufacturers

A. Except as otherwise specified, materials shall be the products of the following manufacturers, or equal:

1. The Sherwin Williams Company (SW)

B. Equivalent materials of other manufacturers may be substituted on written approval of the Engineer. Requests for substitution shall include manufacturer’s literature for each product giving the name, generic type, and descriptive information. Submittals shall include the following performance data as certified by a qualified testing laboratory:

1. ASTM D 4541 Adhesion
2. ASTM B 117 Salt Spray
3. ASTM D 1653 Permeability

4. ASTM D 4060 Abrasion
5. ASTMD4585 Humidity
6. Galvanic Protection Conductivity

C. Materials selected for coating systems for each type surface shall be the product of a single manufacturer, unless otherwise acceptable to the Owner.

2.02 Materials

A. All field applied primers and undercoats shall be provided to ensure compatibility of total coating systems and of the same manufacturer as the finish coats for each system as specified hereafter. Provide barrier coats over incompatible primers or remove and reprime as required. No thinner or solvents other than those approved by the Coating Manufacturer shall be used.

B. All materials shall herein be assigned a designation number for ease of reference. The minimum material requirements shall be as listed.

2.03 Coating Systems

All surfaces to be coated shall be cleaned of all dirt, oil, grease, salts, mill scale and other foreign matter prior to the surface preparation and coating applications described below.

A. SYSTEM 1 - Non-Submerged Interior or Exterior Metals, Piping, & Machinery

1. Surface preparation: Commercial blast, per SSPC-SP6, achieve 1.0-2.0 mil profile
2. Prime Coat (shop coated or field coated): Organic Zinc-Rich Primer, 1 coat, 2.5-3.5 mils DFT
   a. SW: Corothane I Galvapak, B65 Series
3. Finish Coat: Aliphatic Acrylic Polyurethane, 2 coats, 2.0-5.0 mils DFT
   a. SW: Acrolon 218 HS, B65 W600 Series
4. Minimum of 3 coats and a minimum total finished DMT of 6.5

B. SYSTEM 2 - Submerged Metals, Piping, & Machinery (see Note 2)

1. Surface preparation: Near-white metal blast, per SSPC-SP-10, achieve 1.0-2.0 mil profile
2. Prime Coat (Shop Coated or Field Coated): Modified Epoxy, 1 coat, 6.0-8.0 mils DFT per coat
   a. Non-Potable, Wastewater, and Sludge Service:
      (1) SW: SherGlass FF, B62 Series
3. Finish Coat: Modified Epoxy, 2 coats, 6.0-8.0 mils DFT per coat
   a. Non-Potable, Wastewater, and Sludge Service:
      (1) SW: SherGlass FF, B62 Series
4. Minimum of 3 coats and a minimum total finished DMT of 18.0

C. SYSTEM 3 - Interior or Exterior PVC piping and surfaces

1. Surface Preparation: Cleaner/detergent per SSPC-SP1, lightly abrade with sandpaper - surface to resemble medium-grit sandpaper
2. Prime Coat: Epoxy, 1 coat, 2.5-4.0 mils DFT
   a. SW: Macropoxy 646 FC, B58 Series
3. Finish Coat (Interior): Epoxy, 1 coat, 2.5-4.0 mils DFT
   a. SW: Macropoxy 646 FC, B58 Series
4. Finish Coat (Exterior): Aliphatic Polyurethane, 1 coat, 2.5-4.0 mils DFT
   a. SW: Acrolon 218HS or HiSolids Polyurethane, B65 Series
5. Minimum of 2 coats and a minimum total finished DMT of 5.0

D. SYSTEM 4 - Manhole Frames and Covers and Valve Box Covers

1. Surface preparation: Commercial blast, SSPC-SP6, achieve 1.0-2.0 mils profile
2. Prime Coat: Organic Zinc-Rich Urethane,1 coat, 2.5-3.5 mils DFT
   a. SW: Corothane I, B65 Series
3. Finish Coat: Aliphatic Acrylic Polyurethane, 2 coats, 2.0-5.0 mils DFT per coat
   a. SW: Acrolon 218 HS, B65 W600 Series
4. Minimum of 3 coats and a minimum total finished DMT of 6.5

E. SYSTEM 5 - Submerged Concrete Slabs, Walls, and Ceilings

1. Surface preparation: Abrade per ASTM D4259, achieve profile of 80 grit sandpaper. Fill in voids, pits, bugholes, and cracks per manufacturer's instructions.
2. Prime and Finish Coats:
   a. Non-Potable, Wastewater, and Sludge Service:
      1) SW:
         a) Parge Coat – DuraPlate 2300, B58A320 Series
         b) Body Coat – DuraPlate 5900, B62 Series, 1 coat, 30-40.0 mils DFT
         c) Finish Coat – DuraPlate 5900, B62 Series, 1 coat, 30-40 mils DFT
         d) Minimum of 2 coats and a minimum total finished DMT of 60

F. SYSTEM 6 - Equipment Pads - New (finish as noted on Coating List)

1. Surface preparation: Prepare per ASTM D4259, achieve profile of 80 grit sandpaper, or per manufacturers instructions
2. SYSTEM 6A – Clear or Colored Sealer (gloss orange peel finish, skid-resistant)
   a. Prime Coat: Epoxy, 1 coat
      1) SW: GP 3579, 10.0-12.0 mils DFT, 10.0-12.0 mils DFT

O. Notes:

1. The total finish dry mil thickness shall be in accordance with the manufacturer's coating system's requirements.

2. The term submerged applies to water and wastewater. Special consideration shall be given to applications where acids or other highly corrosive materials will be present.
3. Minimum total dry film thickness excludes the primer.

2.04 Colors

A. Comply with OSHA requirements concerning color coding and safety marking.

B. Color code exposed piping. Color code equipment associated with piping, unless otherwise shown or specified. Whenever banding is listed for color coding, bands shall be 6-inches wide spaced along the pipe at 5-foot intervals.

C. Color coding shall be generally as follows. Specific colors for each type of service will be selected by the Owner after submittal of color charts:

Application	Color
Dangerous Machine Parts & Energized Equipment	Safety Orange
Digested Sludge Lines	Dark Brown
Sewer (Sanitary or Other)	Dark Gray
Chemical Lines Polymer	Unpainted PVC
Non-Potable Water Lines	Purple
Other Items	To Be Determined in Field

2.05 Mixing and Tinting

A. Coatings, except two part epoxies, shall be delivered to the job site premixed.

B. Job tinting will not be acceptable, except as approved by the Engineer.

C. All mixing shall be done in mixing pails placed in suitably sized non-ferrous or oxide resistant metal pans.

PART 3 - EXECUTION

3.01 Inspection

A. Inspect all surfaces on which paint is to be applied and notify the Owner of any defects considered detrimental to the application of materials specified.

B. If dirty, rusty, scaly, greasy, damp, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film are painted over, remove paint and repaint the affected area without additional cost to the Owner.

C. Provide all scaffolding, staging, and other temporary facilities required for the proper execution of the work. Place scaffolding so as not to interfere with the work of others. Should it be necessary for the progress of the Work in general, if so directed and without extra cost to the Owner, move, relocate, or arrange scaffolds, ladders, or coverings to permit the Owner or other crafts to proceed with their work without delay.

D. Furnish the following for the Engineer's use during the project for both metal and concrete substrates, as applicable:

1. A low voltage wet sponge instrument for checking film continuity.
2. A dry mil thickness gauge for checking film thickness.

3.02 Surface Preparation

A. General

1. All surfaces to be coated shall be prepared in a workman-like manner with the objective of obtaining a clean and dry surface. No coating shall be applied before the prepared surfaces are approved by the Engineer.
2. All preparation and cleaning procedures shall be in strict accordance with the coating manufacturer's printed instructions and as specified in this Section for each particular substrate condition.
3. Remove or otherwise protect hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be painted prior to surface preparation and painting operations. Remove items, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space, reinstall removed items. Such removal and reinstalling shall be done by workmen skilled in the trades involved.
4. Clean surfaces to be coated before applying coating or surface treatments. Remove oil and grease with clean cloths and cleaning solvents in accordance with SSPC SP-1 prior to mechanical cleaning. Clean surfaces of galvanized metals, fiberglass and PVC with water soluble detergents prior to etching. Cleaning solvents shall be low toxicity and shall have a flash point in excess of 115°F. Program cleaning and painting so dust and other contaminants from the cleaning process do not fall in wet, newly coated surfaces.

B. Metals

1. All ferrous metal to be primed in the shop shall have all rust, dust, and scale, as well as all other foreign substances, removed by sandblasting in accordance with SSPC SP-6 or SP-10 and achieve a profile ranging from 1.0 to 3.0 mils DFT as recommended by manufacturer. Immersion (submerged metals) exposure shall receive surface preparation SSPC SP10 near-white blast. Non-immersion (non-submerged metals) exposure shall receive surface preparation SSPC SP-6 commercial blast. Cleaned metal shall be

primed or pretreated immediately after cleaning to prevent new rusting. Abraded or corroded spots on shop coated surfaces shall be wire brushed and touched up with primer specified in this Section. Remove all surface imperfections that will induce premature coating system failure. Chip or scrape off weld splatter and weld slag. Grind down sharp and rough edges of weld seams to create a smooth transition. Surface cleanliness shall be verified in accordance with SSPC-VIS1.

2. Store shop coated ferrous surfaces out of contact with the ground in such manner and location as will minimize the formation of water-holding pockets, soiling, contamination, and deterioration of the coating film.
3. All ferrous metals not primed in the shop shall be sand-blasted in the field prior to application of the primer pretreatment in accordance with criteria specified above.
4. All non-ferrous metals and galvanized surfaces, whether to be shop or field primed, shall be solvent cleaned per SSPC SP-1 prior to the application of a vinyl-phosphoric wash and/or primer.
5. Piping scheduled for a coating which is supplied with a bituminous coating shall receive two coats of titanium pigmented alcohol-soluble resin before applying primer and colored finished coat.
6. All new exterior and interior metal electrical conduits will be coated per specification.
7. All existing coated metals and previously shop coated metals shall be free of all foreign substances and cleaned according to manufacturer's recommendations prior to application of primer and finish coats.
8. All non-submerged existing pipe, pipe supports, metal structural members, and miscellaneous metal items to remain which are to be recoated shall have SSPC SP-6 (commercial blast cleaning) surface preparation. All submerged existing metal items to remain and to be recoated shall have SSPC SP-10 (near white blast cleaning) or SP-11 (near white power tool cleaning) surface preparation to remove existing coating to bare metal. All rust, dust scale, and other foreign substances shall be removed. Bare metal exposed after cleaning shall be immediately primed to prevent new rusting. Prior to applying new coating, clean existing metals and piping with water-soluble degreasers or solvent per SSPC SP-1.

C. Concrete and Masonry

1. All new concrete surfaces shall be allowed to cure a minimum of 28 days before coatings may be applied.
2. All new or existing uncoated concrete surfaces to be coated shall receive a brush-off blast per ASTM D4259 to achieve a profile equal to 80-grit sandpaper as recommended by the manufacturer to remove laitance, efflorescence, chalk, dust, dirt, grease, oil, asphalt, tar, excessive mortar and mortar droppings: Surface deposits of free iron shall be removed prior to painting. At no time shall the underlying aggregate be exposed. Fill holes and imperfections in finish surfaces with surface/fill as recommended by manufacturer. Do not coat over surfaces where the moisture content exceeds that permitted in the coating manufacturer's written instructions.
3. Masonry surfaces to be coated shall be free of laitance, efflorescence, dust, dirt, grease, oil, excessive mortar and mortar droppings. Fill holes and

imperfections in finish surfaces with surface/filler as recommended by manufacturer.

4. Walls, ceilings, and floors to be coated shall have all specified coats applied prior to the installation of equipment or items such as panels which will result in a portion of the wall, ceilings, or floor being inaccessible and preventing them from receiving the specified number of coats.

E. Polyvinyl Chloride (PVC) Pipe and Fittings: PVC pipe and fittings to be coated shall be cleaned of all dirt, oil, excess glue, and other foreign substances with water-soluble cleaners/detergents per SSPC SP-1, scrapers, and sandpaper as required. Surfaces to receive coating shall be lightly abraded with sandpaper to resemble medium grit sandpaper and made free of dust prior to applying coating.

3.03 Application

A. Coating Thickness

1. Each coat of material shall be applied at the rate specified by the manufacturer to achieve the minimum dry mil thickness specified. Dry film thickness shall be verified in accordance with SSPC-PA2. If material has thickened or must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material. One gallon of unthinned material as originally furnished by the manufacturer must not cover a greater square foot area when applied by spray gun than when applied unthinned by brush. Coatings in submersible applications shall be pinhole-free.
2. Deficiencies or excesses in film thickness shall be corrected by the application or removal of an additional coat(s) of material.

B. Drying Time: Drying time shall be construed to mean “under normal conditions.” Where conditions are other than normal because of the weather or because coating must be done in confined spaces, longer drying times will be necessary. Additional coats of material shall not be applied, nor shall units be returned to service until coatings are thoroughly dry.

3.04 Protective Coating of Non-Ferrous and Galvanized Metals

A. Where non-ferrous metals such as aluminum, copper, and galvanized metal comes in contact with concrete or dissimilar metals, a protective coating must be applied. In the case of galvanize, obtain recommendation from coating supplier.

B. A vinyl gasket may be used in lieu of the protective coating.

C. The bottom of aluminum railing posts and aluminum clip angles shall be coated with an aluminum impregnated caulking compound (Alumilastic, or equal) prior to erection.

D. After erection and alignment, openings between non-ferrous metal surfaces and the concrete shall be sealed in a watertight manner with the proper caulking compound, relative to and in accordance with the opening width demand.

3.05 Cleaning

A. Touch-up coatings and restore finish where damaged or defaced by construction activities.

B. Remove coating spatter from all finished surfaces and restore affected finishes.

C. Remove excess materials, scaffolding, staging, drop cloths, equipment, and rubbish from the job site.

3.06 Coating List

A. Areas and items to receive coatings may be indicated on the Drawings and/or on the Coating List. Colors are to be selected by the Owner and Engineer after submittal of the color chart. Color schemes and coding are to match existing facilities on the project site unless otherwise indicated by the Engineer.

B. The coating list is not a guaranteed complete listing of all items requiring coating. Any new items of the Work requiring coating for corrosion protection, aesthetics, or for color coding that are not listed shall be coated based upon the specific application of that item.

COATING LIST

(miscellaneous steel surfaces do not include stainless or galvanized steel)

A. For All New Work

1. Exposed piping, fittings, valves, and appurtenances
2. Miscellaneous steel surfaces not specifically listed
3. Steel or cast iron components of equipment
4. Valve operating levers and handwheels [safety yellow]

B. General Yard/Site

1. New yard hydrants
2. New bollards (safety yellow)
3. Faces and 4-inches on top of all stoops and sidewalk steps [safety yellow]

C. Existing Sludge Dewatering and Storage Building

1. Sludge Dewatering Pump concrete equipment base
2. New sludge piping (not including static mixer)
3. New and Existing non-potable water piping

-END-

DIVISION 10 – SPECIALTIES EDITED

SECTION 10400 – SIGNS AND LABELING

PART 1 - GENERAL

1.01 Description

A. Scope: Furnish and install signs, labels, and appurtenances necessary to complete work shown or specified.

B. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the references thereto. Latest revisions shall apply in all cases.

1.02 Submittals

A. Submittals shall be as specified in the General Conditions and Section 01300-Submittals.

B. Submit the following:

1. Shop drawings with physical characteristics of signs, plaques and labels.
2. Installation data describing appurtenant items, installation requirements, and installation information.
3. One sample each of the following:
   a. Valve identification disc
   b. Equipment identification labels
   c. Pipe markers

1.03 Product Delivery, Storage and Handling

A. The Contractor shall be responsible for the delivery, storage, and handling of products.

B. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.

PART 2 - PRODUCTS

2.01 Signs

A. Non-Potable Water Signs: Signs shall be 10 inch by 14 inch. Each sign shall be fabricated from 1/16-inch thick Fiber-Shield fiberglass, 0.040 gauge aluminum, or semi-rigid butyrate material.

1. Sign wording shall be "DANGER – Do Not Drink", red lettering on black and white background.

2. Fasteners shall be corrosion proof as recommended by sign manufacturer.

B. Miscellaneous Signs: Provide the following signs of size, wording, quantity, and colors indicated at locations designated by the Engineer. Indoor signs shall be 1/6-inch fiberglass, 0.040 gauge aluminum, or semi-rigid butyrate. Outdoor signs shall be aluminum 0.040 gauge aluminum.

1. "Sampling Location →" (12" x 6"), black lettering on white background.
2. See Division 16 for electrical signs and labeling.

C. Valve identification discs shall be 1-1/2 inch diameter 19 gauge brass discs with 1/2 inch black-filled engraved numbers and mounting rings. Numbering system shall correspond to numbers as listed elsewhere in these specifications or as otherwise directed by the Engineer. Valve discs shall be by Seton Identification Products, or equal.

1. Brass discs shall have a 3/16 inch hole to accommodate mounting hardware.
   a. Discs for exposed valves shall be mechanically attached to the valve bodies or attached to the valves by a brass jack chain and S-hooks.
   b. Discs for buried valves shall be attached to the valve box concrete collars.
2. Fasteners for valve identification discs shall be brass. Fastener size shall be as recommended by the disc manufacturer.

D. Pipe Markers: Provide on all new piping and existing piping which is recoated. Pipe labels shall be painted-on stencil labels. Paint shall be weather proof suitable for moist areas or outdoor environments and compatible with pipe coatings. Pipe labeling shall be done for all new and recoated existing piping unless otherwise indicated by the Engineer.

1. Pipe label colors shall be as directed by the Engineer. A minimum of five (5) different colors shall be used.
2. The sizing for band and markers shall have minimum sizing as follows:

Outside Diameter of Pipe or Covering	Length of Label	Size of Label Letters
3/4" to 1 1/4"	8"	1/2"
1 1/2" to 2"	8"	3/4"
2 1/2" to 6"	12"	1-1/4"
8" to 14"	24"	2"
16" and over		3"

E. Sign Manufacturers: valve identification discs, and pipe markers shall be products of Brady Facilities Identification Products, Milwaukee, Wis.; Seton Name Plate Corp., New Haven, Conn.; Safety Sign Co., Cleveland, Oh.; or equal.

PART 3 - EXECUTION

3.01 General

A. Install signs and plaques in accordance with manufacturer's recommendations and as specified in this Section.

3.02 Non-Potable Water Signs

A. Each new yard hydrant, hose bib, sillcock, spigot, and sample cock connected to a non-potable water source shall be identified by a Non-potable Water Sign.

B. Mount signs on posts for yard hydrants or on wall for wall hydrants. Provide treated wooden 4 x 4 mounting posts, buried a min. of 48", and stainless steel hardware for yard hydrants. Signs shall be level and plumb.

3.03 Valve Identification Discs

A. All new valves shall be identified by a numbered valve disc. Operating stands and valve boxes shall be similarly labeled as the valves served.

B. The brass valve tags shall be fastened either by drilling and using a brass screw or by attachment using a brass jack chain. Drilling and tapping methods shall be such that the valve body is not structurally weakened or the pressure rating reduced.

C. Valve identification discs to be mounted on valve box concrete collars shall be mechanically attached in such a manner that the discs will not be loosened by freezing and thawing. Discs shall be imbedded in the concrete collars so that the disc faces are flush with the concrete finish surface. Each disc shall be oriented so that the top of the lettering is toward its respective valve box.

3.04 Pipe Markers

A. After the final finishing coating of pipe work has been completed, the Contractor shall label each line with identification stencil labeling showing the name, direction of flow, destination of flow, and/or other identification of the pipe line as directed by the Engineer. Such identification labeling shall appear every 15-20 feet and after changes in direction, or as necessary in the judgment of the Engineer, but generally not less than two places. A complete detail listing of pipe markers indicating wording and locations will be provided in the field by the Engineer during construction. A typical example of pipe marking is as follows:

"→ Polymer Feed →"

3.05 Cleaning

A. Clean grease, oil, dirt, paint, or any other contaminants from the exterior surfaces of signs, plaques, fasteners, and parts after installation.

-END-

DIVISION 11 – EQUIPMENT

SECTION 11261 - ULTRAVIOLET DISINFECTION EQUIPMENT

PART 1 - GENERAL

1.01 Description

A. Scope:

1. Furnish all labor, materials, equipment and appurtenances required to provide an open channel gravity flow ultraviolet (UV) disinfection system, complete and operational with all control equipment and accessories as shown and specified.

B. Related Work (Specified Elsewhere):

1. Section 03300 - Cast-in-Place Concrete.
2. Division 16 - Electrical

1.02 Quality Assurance

A. Standardization – All equipment shall be of the latest and most modern design. All similar components shall be manufactured and furnished by one manufacturer unless specifically otherwise allowed in writing by the Engineer.

1.03 General Requirements

A. All of the mechanical, tankage, and electrical equipment shall be an integral package supplied by the manufacturer with local representation as to provide undivided responsibility.

1.04 Design Criteria

A. Provide equipment that will disinfect an effluent with the following characteristics:

1. Peak Flow GPD: 280,000 GPD
2. Total Suspended solids mg/L: 30 mg/L, 30 day average
3. Ultraviolet Transmittance @253.7 nm: 65%
4. Annual Effluent Temperature Range: 33° F. to 85° F.
5. Effluent standards to be achieved: 125 E-coli/100 mL, based on a 30 geometric mean of daily samples.

B. The UV equipment shall be installed in a precast concrete tank and channel furnished as part of this system, and having dimensions as shown on the drawings.

C. The system supplied shall be arranged in the following manner:

1. Number of Lamps in each UV Lamp Module: 2
2. Number of UV Lamp Modules: 4

3. Number of UV Banks: 2

D. The lamp array configuration shall be evenly spaced in both horizontal and vertical rows with all lamps parallel to each other and to the effluent flow.

E. The UV dose produced by the system shall not be less that 31,023 µWatt.secs/cm2 after one year (8750 hours) of lamp operation, as measured in an effluent with a 65% UV transmission at 253.7 nm. Lamp output shall be a minimum of 80% of its initial level after one year of operation, and there shall be no fouling on the lamp sleeves. The basis for evaluating the UV dose delivered by the UV system will be the manufacturer's bioassay as carried out by an independent third party. Bioassay validation methodology to follow protocols described in US EPA Design Manual - Municipal Wastewater Disinfection (EPA/625/1-86/021), without exception.

F. The UV system will produce an effluent conforming to the following discharge permit: 125 fecal coliform/100 ml, based on a 30 Geometric Mean fecal coliform. Grab samples will be taken in accordance with the Microbiology Sampling Techniques found in Standard Methods for the Examination of Water and Wastewater, 19th Ed.

1.05 Submittals

A. The Contractor shall submit Shop Drawings and Operation & Maintenance manuals in accordance with Section 01300 for the equipment and systems furnished herein.

1.06 Spare Parts and Special Tools

A. The manufacturer shall furnish one set of any special tools necessary for normal operation, maintenance and calibration.

B. Provide all manufacturers recommended spare parts for each unit, in addition to, or including the following.

1. Four (4) UV lamps
2. Four (4) Quartz sleeves
3. Four (4) Lamp holder seals
4. One (1) Spare Module
5. One (1) Operators Kit (UV protected face shield and gloves)
6. One (1) gallon of Cleaning Solution. Lime-A-Way or approved equal.

1.07 Product Delivery, Storage and Handling

A. The contractor shall be responsible for the delivery, storage and handling of products. Store products in accordance with the manufacturer's recommended procedures.

B. Load and unload all equipment by hoists or skidding. Do not drop products. Do not skid or roll products on or against other products. Attach slings and hooks in such a manner to prevent damage to products.

C. The equipment furnished shall be packaged in such a manner as to provide ample protection from damage during handling, shipment and outdoor storage at the station site. All openings shall be capped with dustproof closures and all edges sealed or taped to provide a dust-tight closure.

D. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.

PART 2 - PRODUCTS

2.01 Manufacturer

A. The UV Equipment shall be as manufactured by Trojan Technologies, Inc., or approved equal.

2.02 General Requirements

A. Provide a UV disinfection system complete with UV lamp modules, precast concrete tank and channel, and level control weir as shown on the Contract Drawings and as herein specified.

B. The Contractor shall be responsible for supplying electrical power to each module and providing sufficient electrical power distribution receptacles. The receptacles shall be rated for continuous operation of the UV lamp modules. The contractor is also to provide Ground fault interrupter protection from the power source.

2.03 Design, Construction and Materials

A. General

1. All material in contact with effluent shall be concrete, stainless steel or quartz.
2. All wiring exposed to UV light shall be teflon coated.
3. All material exposed to UV light shall be stainless steel, anodized aluminum, quartz 214, or teflon.
4. UV system shall be designed for complete outdoor installation, without shelter or supplemental cooling or heating required.

B. UV Module (UVM)

1. Each UV lamp module shall consist of 2 lamps and their corresponding electronic ballast. Each lamp shall be enclosed in its individual quartz sleeve, one end of which shall be closed and the other end sealed by a lamp end seal and holder.
2. The electrical wires connecting the lamps and electronic ballasts shall be enclosed in the stainless steel frame and not exposed to the effluent.
3. Each UV module shall be provided with a standard 120 volt plug and weatherproof cable for connection to a power distribution receptacle. The cable shall be no longer than 10 feet. A total of four (4) active UV modules shall be supplied, one (1) spare module shall be provided for redundancy.

Lamp status shall be displayed on top of each UV module by watertight LED indicator lights.

4. Modules shall be approximately 68 inches long 20 inches high and 2.8 inches wide, weighing approximately 38 lbs. Materials of construction shall be stainless steel type 316, anodized aluminum, quartz 214, and Teflon™.

C. UV Lamps

1. Low pressure mercury slimline lamps of the hot cathode, instant start design. The coiled filamentary cathodes to be heated by the current.
2. 90% of UV output shall be within the wavelengths of 233.7 to 273.7 nm.
3. The operating life of the lamp shall be guaranteed for 12,000 hours, non-prorated.
4. Independent validation of lamps aging factor is required.

D. Lamp End Seal and Lamp Holder

1. The open end of the lamp sleeve shall be sealed by means of a sleeve nut which threads onto a sleeve cup and compresses the sleeve `O' ring.
2. The sleeve nut shall have a knurled surface to allow a positive hand grip for tightening. The sleeve nut shall not require any tools for removal.

E. UV Lamp Sleeves

1. Type 214 clear fused quartz circular tubing as manufactured by General Electric or equal.
2. Rated for UV transmission of 89% and shall not be subject to solarization.
3. The nominal wall thickness shall be 1.0 to 2.0 mm.

F. Effluent Channel

1. Each unit shall be provided with one (1) stainless steel 304, 14 gauge effluent channel complete with drain module, UV support rack and downstream level control serpentine weir.
2. Each effluent channel shall be as determined by the manufacturer.

G. Level Control Weir

1. Weir shall be placed downstream of the UV module in the channel so as to maintain an average water depth of five (5) inches.
2. Maximum effluent level variance from zero to peak flow shall be no greater than 1.5 inches.
3. Weir shall be welded watertight.
4. Minimum crest length shall be as recommended by the manufacturer and fit within the channel dimensions shown on the drawings.

H. Electrical

1. The UV disinfection system shall be divided into 4 UV modules.
2. Interconnecting Cables shall be standard 120 volt, weatherproof, 10 feet long and shall be suitable for outdoor installation.

3. Power Distribution Receptacles
    a. 120 volt receptacles rated for continuous outdoor use shall be used. Receptacles shall be of the duplex type complete with ground fault interrupter circuitry.
    b. Receptacles provided by Manufacturer and installed by Contractor.
4. Power Consumption
    a. Maximum power draw to UV System shall be 1500 watts, 12.8 amps.
    b. All electrical supplies shall be 120 volt, 60 Hz.

I. Cleaning Procedure

1. The UV lamp modules shall be manually cleaned by removing from the effluent channel and hand wiping the sleeves with and acid solution, using a non-abrasive cloth.

J. Power Distribution Receptacle (PDR)

1. Duplex ground fault interrupter receptacle(s) shall be provided by the UV Manufacturer.
2. Receptacles shall be mounted in an individual, painted cast aluminum junction box complete with a Type 3R rain shield for outdoor installation.

K. Transition Connections

1. Transition boxes shall be incorporated into the precast concrete structure in accordance with UV manufacturer recommendations.

2.04 Miscellaneous

A. Cleaning System

1. Maintenance Rack – A maintenance rack of Type 304 stainless steel shall be supplied. The rack shall be designed to facilitate the servicing operation of the UV modules.

PART 3 - EXECUTION

3.01 Installation

A. All equipment shall be installed in accordance with the manufacturer's published instructions, and in accordance with all state and local codes, ordinances and regulations.

B. The Contractor shall adjust and leave the system in proper working condition.

3.02 Service

A. The Contractor shall include with his bid the services of the Equipment Manufacturer's field service technician for a minimum period of one (1) trip of one (1) day.

B. This service shall be for the purpose of check-out, initial start-up, acceptance testing, certification, and instruction of plant personnel.

C. A written report covering the technician's findings and installation approval shall be submitted to the Engineer covering all inspections and outlining in detail any deficiencies noted.

3.03 Manufacturer's Service and Start-Up Report

A. The Contractor shall provide the services of a representative of the manufacturer for a minimum of one trip of one (1) day to perform the following tasks:

1. Inspect the installation of the equipment.
2. Place the equipment and system in operation and make any necessary adjustments.
3. Perform tests specified in this Section and recommended by the equipment manufacturer;
4. Instruct Owner's personnel in the proper operation and maintenance (O & M) of the equipment training.

B. If equipment is not completed for proper start-up and training procedures, the representative shall reschedule another visit at no additional cost to the Owner. Training shall be performed separate and distinct from start-up and testing tasks. An abstract or outline of the start-up, testing, and training procedures shall be provided to the Engineer at least five days prior to the scheduled visit. Manufacturer's operation and maintenance manuals and materials shall be incorporated in the training procedures, with emphasis on items or materials of greatest importance.

C. A typed, bound report covering the manufacturer's representative's findings shall be submitted to the Engineer for review and approval. The report shall (1) describe the start-up procedures taken; (2) include any inspections performed; (3) outline in detail any deficiencies observed along with the corrective measures taken; and (4) include the results of all field tests, including necessary graphs, charts, tables, etc., specified in this Section or required by the reference standards. The report shall certify that the equipment is properly installed and functioning for the purpose intended.

D. The Contractor shall bear all expenses associated with the start-up, testing, and training procedures and report described above, including labor, transportation, lodging, and material costs.

3.04 Warranty

A. The Contractor shall guarantee the equipment to be free from defective material and workmanship for a period of one year from the date of acceptance of the equipment by the Owner. The Contractor shall replace any defective materials, components, or workmanship during this time, including but not limited to all materials, labor, shipping, and transportation, at no additional cost to the Owner. Any repair work performed during this one year period shall also be guaranteed to

be free from defective material or workmanship for a period of one year from the date the work is complete and shall be addressed in the same manner at no additional cost to the Owner.

3.05 Acceptance by Owner

A. Refer to Section 01650, Starting of Systems, for acceptance of the equipment by the Owner.

-END-

SECTION 11325 – DIAPHRAGM PUMP

PART 1 - GENERAL

1.01 General

A. The equipment to be furnished and installed by the contractor under this section shall be a complete pump unit consisting of diaphragm pump and motor, air chamber, starter control panel (NEMA 4) with disconnect and 15’ cables, pressure sensor, and spare parts (comprehensive) kit. Diaphragm pump is to be mounted on a fabricated steel subbase.

1.02 Related work specified elsewhere includes but is not limited to the following:

A. Site Work – Division 2

B. Mechanical – Division 15

C. Electrical – Division 16

1.03 Quality Assurance

A. It is the intent of these specifications to procure a quality product by an established manufacturer, incorporating the latest design. The cost of the equipment shall include all royalties and costs arising from patents and licenses associated with furnishing the specified equipment.

B. The manufacturer must have 10 years of experience manufacturing and marketing Diaphragm Pumps in North America and a minimum of 10 installations in similar duty that have each been in operation for 10 years in North America. If requested, the manufacturer shall provide the following information.

1. Project name, location and equipment description
2. Owner's name, address and telephone number
3. Engineer's name, address and telephone number
4. Evidence of 10 years of experience
5. Evidence of 10 similar installations at the design requirements herein

C. All materials shall be designed to withstand the stresses encountered in fabrication, erection and operation. All equipment shall be of corrosion resistant materials or shall be suitably protected by the supplier with corrosion resistant industrial coatings approved by the Engineer.

1.04 Submittals

A. Submittals shall be as specified in Specification 01300.

B. Submit the following:

1. Manufacturer's Certificate of Compliance certifying compliance with the referenced specifications and standards.
2. Copy of manufacturer's standard warranty for each type of equipment provided.
3. Shop drawings with performance, descriptive literature, weights and dimensions, and other physical characteristics verifying compliance with this section, including pump curves showing specified design points, motor starting and full-load amps, motor horsepower, and motor data. When numerous options and sizes are shown, the shop drawings shall be marked to clearly indicate the size and type specific to this section and project.
4. Manufacturer's installation instructions and recommended testing procedures.
5. Manufacturer's operation and maintenance (O&M) manuals and materials per Section 01300. When numerous types and sizes are shown, the manuals shall be marked to clearly indicate the sizes and types specific to this project.
6. Provide Start-Up Certification Report specified in this section.
7. Electrical:
   a. Submit all electrical requirements for each piece of equipment including voltage, phase, and load data.
   b. Provide wiring diagrams for each piece of equipment. For example, submitting one diagram for all metering pumps is not acceptable.
   c. "Typical" diagrams are not acceptable. Manufacturer's standard diagrams may be submitted if they are made specific for this project by:
      1) Showing all included options, special items, etc.
      2) Unused options or features shall be crossed out or deleted.
      3) Identify the drawing with project name, equipment name, and tag number, e.g., "Grover Hill WWTP, Sludge Dewatering Pump, Tag No. SDP-1".

1.05 Warranty

A. Equipment and installation warranties shall comply with the warranty requirements specified in the General Conditions.

B. The manufacturer shall warrant the equipment furnished under this Section for a period of one (1) year from the date of acceptance by the Owner against defects in workmanship and materials under normal use, operation, and service. If the equipment should fail during this warranty period due to a defective part, it shall be replaced, and the units restored at no expense to the Owner.

C. The Contractor shall guarantee the equipment to be free from defective material and workmanship for a period of one year from the date of acceptance of the equipment by the Owner. The Contractor shall replace any defective materials, components, or workmanship during this time, including but not limited to all materials, labor, shipping, and transportation, at no additional cost to the Owner. Any repair work performed during this one year period shall also be guaranteed to be free from defective material or workmanship for a period of one year from the

date the work is complete and shall be addressed in the same manner at no additional cost to the Owner.

1.06 Product Delivery, Storage and Handling

A. The Contractor shall be responsible for the delivery, storage, and handling of products. Store products in accordance with the manufacturer's recommended procedures.

B. Load and unload all pumps, motors, and appurtenances by hoists or skidding. Do no drop products. Do not skid or roll products on or against other products. Attach slings and hooks in such a manner to prevent damage to products.

C. The pumps furnished shall be packaged in such a manner as to provide ample protection from damage during handling, shipment, and outdoor storage at the station site. All openings shall be capped with dustproof closures and all edges sealed or taped to provide a dust-tight closure.

D. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.

PART 2 - PRODUCTS

2.01 Description

A. Pump shall be three-inch (3”) heavy duty, diaphragm, positive displacement type, with Cast Iron Housings, contain an emergency pressure relief valve, and have a solids handling of 2.25-inch or 50% by volume. The mounting of the pump shall be a stationary mount setup. Duplex pumping arrangements are not acceptable. The pump shall consist of a single diaphragm contained inside a contoured velocity channel that enables fluid to pass below the pump rod and diaphragm material and reduces the amount of fluid that contacts the diaphragm. The suction and discharge housings shall contain EPDM material flapper valves that are to be easily serviceable.

B. The pumping action shall be achieved by one (1) thirteen-inch (13”) diaphragm attached to a AISI 12L14 carbon steel pump rod driven by a heavy duty AISI 1045 HR steel crankarm. The diaphragm shall be of neoprene with reinforcement for high dimensional stability, tensile strength, abrasion resistance, and durability. The reciprocating action of the diaphragm shall perform the duty of the flapper valves. Pumps that require internal check valves for operation shall not be acceptable.

C. The pump shall be driven by a 3 phase, 3 Hp, TEFC motor with a Siemens or SEW Eurodrive gear reducer and have a pump operating speed of 60 rpm. The use of v-belts and pulleys to control pump speed shall not be acceptable.

D. Pump shall be of the end suction - discharge with standard MNPT connection type. The pump suction and discharge shall be three-inch (3") diameter.

E. The pump manufacture shall provide an air chamber to mount on the discharge line for pulsation dampening. The air chamber shall be pressure tested to 60 psi for leaks. The air chamber shall be provided with a ½-inch NPT coupling located at the top. This connection shall be suitable for a pressure switch assembly or the ball valve/quick disconnect assembly should a switch not be specified.

F. The pump manufacturer shall provide a pressure sensor and switch assembly to mount on top of the provided air chamber. The sensor shall be able to protect against discharge dead head or plugged pipe situation that can damage pump.

2.02 Subbase

A. Pump shall be mounted on a coated steel subbase. Base design shall have two (2) raised cross-members underneath the contoured velocity channel. The suction and discharge ends shall allow for complete wash-out and draining without trapping liquid. Base shall be sufficient gusseted, reinforced and braced to withstand all shock loads and resist all wearing and buckling during pump operation.

2.03 Drive Motor

A. Motor shall contain a Siemens or SEW Eurodrive gear reducer.

B. Motor shall be premium efficiency type that meets EPACT and NEMA MG1 standards. Motor shall be wound with copper wire, shall be Code G or less, and shall have a 1.15 service factor.

C. Motor shall be TEFC, 3 Hp, 60 rpm, horizontal, solid shaft, 460 volt, 3 phase, 60 hertz.

2.04 Finish

A. All cast iron and carbon steel components shall be finished with manufacturers standard industrial grade primer 2 – 3 mils DFT suitable for multiple top coat finishes. The top coat shall be industrial enamel 2 – 3 mils DFT.

B. All stainless steel and aluminum surfaces will remain unpainted. All weld splatter shall be removed and all welds ground smooth for a neat appearance.

2.05 Spare Parts

A. Provide one (1) factory recommended spare parts (comprehensive) kit for the pump. Consisting of diaphragm, flappers, gaskets, weights and hardware.

PART 3 - EXECUTION

3.01 Installation

A. All equipment shall be installed in accordance with the manufacturer's published instructions, and in accordance with all state and local codes, ordinances and regulations.

B. Properly brace and support piping at suction and discharge connections to withstand all shock loads and vibrations.

C. The Contractor shall adjust, lubricate and leave the pumping system in proper working condition.

3.02 Clean Up

A. Up completion of work the Contractor shall remove all construction equipment and temporary materials, and he shall also dispose of all rubbish and other unsightly debris caused by operations and shall leave the premises in as good or better condition than found.

3.03 Field Testing

A. The manufacturer's representative shall perform a pumping test of the new pump as soon as practical after the pumping equipment is installed. The Contractor is responsible for coordinating the testing of the pump. The pumping test shall determine the capacity, discharge pressure, pump speed, and horsepower draw of the pumping unit under actual operating conditions. The duration of the pump test shall be at least ten (10) minutes of continuous operation. Include all as-installed test data and pump curves in Start-Up Certification Report.

B. Flow meter shall be used to determine the pumping rate. The Contractor shall install temporary pressure gauges for pump testing if requested by the Engineer or manufacturer’s representative.

C. Any defects in the new equipment or failure to meet the specified performance shall be corrected by the Contractor. The Owner reserves the right to reject the pump if the Contractor fails or refuses to make the corrections required to meet the specified performance; or the improved pumping units, when tested, fail to meet the specified performance.

3.04 Manufacturer's Service and Start-Up Certification Report

A. The Contractor shall provide the services of a qualified representative of the pump manufacturer for a minimum of one day to perform the following tasks:

1. Inspect the installation of the equipment.
2. Place the equipment in operation and make any necessary adjustments.
3. Perform Field Tests specified above.

4. Perform tests specified in this Section and recommended by the equipment manufacturer.
5. Instruct Owner's personnel in the proper operation and maintenance (O&M) of the equipment (training).

B. If equipment is not completed for proper start-up and training procedures, the representative shall reschedule another visit at no additional cost to the Owner. Training will not be permitted without proper start-up and testing tasks. An abstract or outline of the start-up, testing, and training procedures shall be provided to the Engineer at least five days prior to the scheduled visit. Manufacturer's operation and maintenance manuals and materials, when included under submittal requirements, shall be incorporated in the training procedures, with emphasis on items or materials of greatest importance.

C. A typed, bound report covering the manufacturer's representative's findings shall be submitted to the Engineer for review and approval. The report shall (1) describe the start-up procedures taken; (2) include any inspections performed; (3) outline in detail any deficiencies observed along with the corrective measures taken; and (4) include the results of all field tests, including necessary graphs, charts, tables, etc., specified in this Section or required by the referenced standards. The report shall certify that the equipment is properly installed and functioning for the purpose intended.

D. The Contractor shall bear all expenses associated with the start-up, testing, and training procedures and report described above, including labor, transportation, lodging, and material costs.

3.05 Acceptance of Equipment

A. Refer to Section 01650, Starting of Systems, for acceptance of equipment by the Owner.

DATA SHEET

DIAPHRAGM POSITIVE DISPLACEMENT PUMP

A. Sludge Dewatering Pump No. 1

1. LOCATION: Sludge Dewatering Building

2. QUANTITY: One (1)

3. OPERATING CONDITONS: The pump shall operate within the entire pumping range specified without cavitation and exceeding the vibration limits established by the Hydraulic Institute.

    a. Material to be Pumped: Primary Sludge, 2-4% solids
    b. Pump shall be capable of displacing 1.33 gallons per revolution.
    c. Pump shall be capable of operating dry for an indefinite period of time without damage.
    d. Design Point - A single pump shall pump 80 gpm at 15.0’ TDH.

4. SPECIFICATIONS

    a. Minimum Diaphragm Diameter: 13”
    b. Connections: 3” suction, 3” discharge, MNPT
    c. Drive Type: Electric Siemens or SEW Eurodrive; 3HP/1800RPM/3/60/230-460V 3PH

5. MANUFACTURER: Wastecorp Pumps, Model 3FAC-EC, Part # 64994-10, or approved equal.

- END -

SECTION 11364 – SLUDGE DEWATERING SYSTEM

PART 1 - GENERAL

1.01 Description

A. Scope

1. Furnish and install a sludge dewatering system including polymer feed unit, mixing manifold, roll-off dumpster, geotextile bags, and appurtenances as specified and shown on the drawings. The sludge dewatering system specified in this section shall be provided by a single vendor to insure coordination and compatibility of equipment.
2. The sludge dewatering system shall be provided by Blue River Technologies; New Castle, IN (765) 766-6190, or approved equal.

B. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the references thereto. Latest revisions shall apply unless otherwise shown or specified.

1.02 Quality Assurance

A. Perform field tests and submit reports specified in this Section.

B. UL listed parts shall be used when available.

1.03 Submittals

A. Submittals shall include information and materials specified in this Section, the General Conditions and Section 01300, Submittals.

1.04 Product Delivery, Storage, and Handling

A. The Contractor shall be responsible for the delivery, storage, and handling of products.

B. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.

C. Ship and store materials and equipment in accordance with manufacturer's instructions, with seals and label intact and legible.

PART 2 - PRODUCTS

2.01 General

A. Furnish and install a polymer feed unit, mixing manifold, 20 CY roll-off dumpster, and geotextile bags. The polymer feed unit shall deliver a mixture of emulsion polymer and water solution to a mixing manifold for the purpose of flocculation of

waste activated sludge prior to entering the geotextile bag. The polymer feed unit shall be capable of blending the neat polymer with dilution water at a rate of 12-15 gallons per minute with a solution concentration of up to 0.5%. One 20 CY roll-off dumpster outfitted for sludge dewatering shall be provided. Two (2) geotextile bags shall be furnished by the Contractor and one (1) installed by the Owner. Store geotextile bags in location as directed by Owner.

2.02 Polymer Feed Unit

A. The polymer feed unit (Unit) shall be a fully integrated package to automatically meter, dilute, and activate a neat polymer with clean filtered dilution water. All piping on the Unit shall be Sch 40 316 Stainless Steel or Sch-80 PVC. The Unit shall operate with 110 VAC, 1 phase power. The local control system shall include a power on switch with illuminated indicator light, a run switch with illuminated indicator light, an integrated fuse for protection and a Hand-Off selector switch. In Hand, the Unit shall run. In Off, the Unit shall stop and remain off. The unit shall include an electronic diaphragm metering pump to feed the neat polymer into the dilution water line, a high energy hydraulic mixing head for initial dispersion and dilution of the neat polymer with the dilution water and a secondary static mixer prior to discharge. A stainless-steel check valve with a 10 psi opening pressure shall be installed in the polymer feed line between the metering pump and the water line. This check valve shall be a Swagelok SS-CF4M4-10 check valve and shall be installed at the injection point of the water dilution line. The Unit shall include an electronic solenoid actuated valve to open and close the dilution water supply line. This valve shall be actuated by the run switch on the control box. A 0-100 psi pressure gage shall be included and installed in the water supply line between the electric solenoid valve and the primary mixing head. The water valve shall include a time delay shut off to allow dilution water to flush out the complete system when the run switch is shut off. Framework and base of the Unit shall be manufactured from stainless steel sheet. The Unit shall include a calibration column.

B. A 316 stainless steel floor stand shall be provided for the Unit. The stand shall be mounted to the floor using stainless steel hardware at a height to allow suction from a 55-gallon drum. The Unit shall be mounted to the stand using stainless steel hardware.

C. Electronic Diaphragm Metering Pump

1. The electronic diaphragm metering pump shall be a Walchem High Viscosity metering pump capable of delivering up to 2 gallons per hour of neat polymer to the dilution water line. The pump shall operate on 110 VAC power and shall be capable of 50 psi output. The liquid end of the pump shall be designed for high viscosity materials and shall include check valves on both inlet side and discharge side of the pump. The pump discharge shall include a fitting to allow a syringe to be used to prime the pump for startup or in the event the pump loses prime during operation. The pump shall include a stroke frequency adjustment from 0-240 strokes per minute. The pump stroke length shall be adjustable from 40% to 100% of output. The pump shall be mounted on the framework of the Unit and plugged into the control

for ease of removal and replacement. The dilution water line shall include a 0-100 psi gage to monitor water pressure. The pressure gage shall be located upstream of the primary mixing head between the mixing head and the solenoid valve.

D. Mixing Head

1. The primary polymer mixing head shall be a mixing head that utilizes the hydro-kinetic energy of impinging water streams to activate the neat polymer with the dilution water. The mixer shall be a Blue River Technologies 2-inch mixing head. The mixing chamber shall be manufactured from clear PVC to allow visual verification of the mixing process. The mixer shall have an inlet and discharge connection of at least 3/4 inch FNPT. The mixer body shall be manufactured from Acetal with stainless steel bolts. After the high energy mixing head, the mater shall be introduced into a low energy static mixer. This mixer shall contain a series of chain type mixing elements and shall be constructed with a clear PVC housing to allow visual checks of the mixed solution.

2.03 Mixing Manifold

A. The mixing manifold shall be fabricated from 4 inch Sch 80 PVC and shall provide at least five (5) sets of mixing elements to convert the laminar flow to a turbulent flow at each set. The construction of the manifold shall include a non-clogging design that will pass a 2 inch solid. A 2 inch sampling valve shall be provided to allow sludge samples to be taken from time to time to insure proper flocculation.

2.04 Geotextile Bags

A. The geotexile dewatering bag shall be constructed from polypropylene geotextile fabric. The fabric shall have a wide with tensile strength of 400 lbs/inch in the machine direction and 550 lbs/inch in the cross direction. The apparent opening size shall be a U.S. Sieve #40. The water flow rate shall be 20 gpm/ft^2. The fabric shall have a UV resistance rating of 70% per ASTM 4355. The bag shall be sewn in a bread box shape to the following dimensions: Length 22 ft., Width 88 inches, Height 44 inches. The bag shall include six (6) handling straps located on the top side seams. One strap located at the front and rear of the bag and one strap located near the center of the bag. The straps shall be 1” wide polypropylene straps. The seams of the bag shall be “J” style seams with a minimum of three (3) full length stitches with a polyester thread type STC-1000/5#6.5. The bag shall include one (1) fill port located at the top center of the bag. The fill port shall be constructed from woven polyester fabric and shall be large enough to pass a 6 inch PVC pipe through to the inside of the bag. The fabric shall have a tensile strength of 175 lbs in both directions. The fabric port shall be sewn into a cylindrical shape prior to attaching to the bag. The seam shall be “J” style seam with a minimum of two (2) full length stitches with a polyester thread type of STC-1000/5#6.5. The fabric fill port shall have a minimum length of 48 inches and shall be attached to the bag with a doubt stitch sewn “J” style seam or a mechanical compression flange.

PART 3 - EXECUTION

3.01 Installation

A. Install the sludge dewatering system in accordance with the Drawings and the manufacturer's written instructions.

B. The contractor shall adjust, lubricate, and leave the polymer feed unit in proper working condition.

3.02 Manufacturer’s Service and Start-Up Certification Report

A. The Contractor shall provide the services of a qualified representative of the manufacturer for a minimum of one (1) day to perform the following tasks:

1. Inspect the installation of the equipment. Check to see if the rest of the system, though not his responsibility, is suitable for good operation. Notify Engineer if the system is unsuitable.
2. Assist Owner in selection and rate setting of polymer. Owner will purchase polymer.
3. Place the equipment in operation and make any necessary adjustments.
4. Perform tests specified in this Section and other tests as recommended by the equipment manufacturer.
5. Instruct Owner’s personnel in the proper operation and maintenance (O & M) of the equipment (training).
   a. If equipment is not completed for proper start-up and training procedures, the representative shall reschedule another visit at no additional cost to the Owner. Training will not be permitted without proper start-up and testing tasks. An abstract or outline of the start-up, testing, and training procedures shall be provided to the Engineer at least five days prior to the scheduled visit. Manufacturer’s operation and maintenance manuals and materials and audio-video cassette, when included under submittal requirements, shall be incorporated in the training procedures, with emphasis on items or materials of greatest importance.

B. A typed, bound report covering the manufacturer’s representative’s findings shall be submitted to the Engineer for review and approval. The report shall (1) describe the start-up procedures taken; (2) include any inspections performed; (3) outline in detail any deficiencies observed along with the corrective measures taken; and (4) include the results of all field tests, including necessary graphs, charts, tables, etc., specified in this Section or required by the referenced standards. The report shall certify that the equipment is properly installed and functioning for the purpose intended. The report must be received and reviewed by the Engineer prior to the equipment being put into permanent operation.

C. The Contractor shall bear all expenses associated with the start-up, testing, and training procedures for report described above, including labor, transportation, lodging, and material costs.

3.03 Warranty

A. The Contractor shall guarantee the equipment to be free from defective material and workmanship for a period of one year from the date of acceptance of the equipment by the Owner. The Contractor shall replace any defective materials, components, or workmanship during this time, including but not limited to all materials, labor, shipping, and transportation, at no additional cost to the Owner. Any repair work performed during this one year period shall also be guaranteed to be free from defective material or workmanship for a period of one year from the date the work is complete and shall be addressed in the same manner at no additional cost to the Owner.

3.04 Acceptance of Equipment

A. Refer to Section 01650 – Starting of Systems for acceptance of equipment by the Owner.

-END-

SECTION 11375 – PACKAGE DIFFUSED AERATION EQUIPMENT

PART 1 - GENERAL

1.01 Summary

A. Section includes furnishing and the installation of the following equipment:

1. Diffused aeration equipment for the Existing Polishing Basin (EQ Basin).

1.02 References

A. Reference Standards:

1. ETL – Edison Testing Laboratories (Intertek).
2. UL – Underwriters Laboratory.
3. CSA – Canadian Standards Association.
4. NEC – National Electrical Code.
5. NEMA – National Electrical Manufacturer's Association.

1.03 Submittals

A. Shop Drawings and Product Data: Submit detailed specifications, drawings, unit anchorage details, thrust results, and data covering all materials, parts, devices, equipment, and other accessories forming part of the equipment for the complete operational system. Mark each submittal to show which products and options are applicable to the project.

B. Include the following information, as applicable:

1. Manufacturer catalog cut sheets.
2. Installation, start-up, operation, and maintenance manuals/instructions from the equipment manufacturer.
3. Notation of coordination requirements.
4. Availability and delivery time information.

C. Manufacturer's Instructions: Furnish manufacturer's printed instruction for delivery, handling, storage, assembly, installation, start-up, wiring diagrams, and factory-recommended maintenance schedule, as appropriate.

D. Operations and Maintenance Data: Submit data on all parts, devices, equipment, and other accessories furnished forming the complete operational system.

1.04 Quality Assurance

A. The equipment manufacturer must have at least 50 continuous years' experience in the design, application and manufacture of mechanical agitation, mixing, and aerator assemblies of similar size and capacity. All material and equipment shall be new and of the highest quality.

B. Manufacturer must have a dedicated engineering team including design, mechanical, quality, and electrical qualifications.

C. Manufacturer must have documented quality requirements and procedures which include component sampling and testing, and build instructions.

D. Manufacturer must have dedicated service and repair department in house.

E. Manufacturer must have dedicated customer service team with at least 4 employees.

F. Diffuser systems, complete with compressor, cabinet or mount, diffuser heads, and self-weighted tubing shall be furnished by the diffuser manufacturer to ensure compatibility and integrity of the individual components and provide the specified warranty for all components.

G. In order to assure uniform quality, ease of maintenance, and minimal parts storage, it is the intent of these specifications that all diffuser assemblies and accessories called for under this section shall be supplied by a single manufacturer or authorized sales representative. The authorized sales representative shall, in addition to the Contractor, assume the responsibility for proper installation and functioning of the equipment if contracted for the installation and maintenance of the aerators.

1.05 Factory Testing

A. Each diffused aeration system is tested for:

1. Proper function of compressor
2. Proper orientation and function of cooling fans
3. Proper function of pressure relief valve
4. Proper function of cabinet lock.

1.06 Third Party Testing

A. Diffuser heads shall be independently tested at an accredited testing facility to move no less than 927 GPM with 1.5 CFM of air being delivered to the diffuser head in 6.5’ of water.

1.07 Delivery, Storage, and Handling

A. Delivered materials shall be stockpiled and stored at locations approved by the Owner until required for installation. Materials shall be stored in accordance with manufacturer’s instructions.

B. Contractor shall inspect materials upon delivery for loss or damage in transit. Contractor shall be responsible for the replacement of damaged materials. All damaged materials shall be removed from the Site.

C. Delivery and start-up shall be supplied by a factory trained and authorized equipment distributor representative.

PART 2 - PRODUCTS

2.01 Acceptable Manufacturer

A. Approved Manufacturers:

1. Kasco Marine, Inc. of Prescott, Wisconsin (Contact factory at 715-262-4488).
2. Or pre-approved equal by the Engineer. To offer equipment as a pre-approved equivalent, a written application from the alternative supplier shall be submitted to the Engineer a minimum of TEN (10) days prior to the scheduled bid opening. Provide a list of at least five (5) installations of the proposed equipment in a similar application for review by the Engineer. The list shall include the contact name and phone number for each installation. Alternates must meet or exceed the oxygen transfer.

2.02 Performance

A. Diffuser units shall be designed for the following operating, performance, and design requirements:

Quantity	Model Number	Compressor Horsepower	Voltage/ Phase/ Frequency	# of Diffuser Heads	Amount of 3/8” Tubing	Amount of 5/8” Tubing	Cabinet Option
1	RA1-PM	¼	115V,1P, 60 Hz	1	100’	0’	Post Mount

2.03 General

A. Each diffuser system shall be complete with a rocking piston, oil-less compressor, enclosed cabinet or mounting bracket, diffuser heads, and self-weighted tubing.

B. Provide each diffuser system complete with all accessories and appurtenances, as required, for a complete operational system.

C. The power source for the diffuser system shall be 120VAC or 208/240VAC single phase grid power to allow the unit to operate continuously, (24 hours per day, 7 days per week, 365 days per year), where necessary.

2.04 Features

Each diffuser system shall consist of the following components regardless of the power source selected:

A. Compressor(s):

1. Compressors shall be ¼ HP, 120Vac or 208-240Vac.
2. Compressors shall be rocking piston style, oil-less and continuous duty rated.
3. Compressors shall include intake air filter assembly, 40 PSI pressure relief valve, and ramped reed valve.
4. Compressor shall be serviceable.
5. Compressor shall be able to operate in up to 50’ of water depth.

B. Post Mount Cabinet:

1. Shall be coated aluminum construction with integral mounting openings to attach to a 4”x4” post or exterior wall.
2. Shall be weather resistant, lockable, and include sound dampening foam.
3. Shall have a hinged top and front cover to open out and down for easy access to internal parts.
4. Shall include a 110 CFM cooling fan with guard.
5. Shall accommodate one ¼ or one ½ HP compressor.
6. Shall be available in 120Vac or 208-240Vac options.
7. Shall allow for a sound of 65dB at 5’ distance when compressor is operating.

C. Diffuser Head:

1. Shall be self-weighted, stainless steel construction with integral strain relief for weighted tubing and rope tie-offs.
2. Shall include molded plastic edge guards.
3. Shall be tumbled during manufacture to remove sharp edges.
4. Shall include two oval diffuser sections made from a proprietary linear low-density polyethylene and rubber hose material.
5. Diffuser material shall sit 6” above bottom of stainless steel substrate.
6. Shall include a polypropylene check valve with viton seals and Hastelloy spring.

D. Weighted Tubing:

1. Shall be self weighted, PVC tubing 3/8” ID.
2. Tubing shall include all fitting kits.
3. Air line shall be insulated/protected from the cabinet to 3-ft. below the waterline in accordance with manufacturer’s directions.

PART 3 - EXECUTION

3.01 Examination and Preparation

A. Contractor shall inspect all equipment immediately upon receipt.

B. The equipment shall not be installed, if damaged, until repairs have been made in accordance with the manufacturer’s written instructions.

3.02 Installation

A. Contractor shall furnish the unit(s) and install per manufacturer’s recommendations. Coordinate work with the Electrical Contractor for all wiring and controls work to make a complete and operational system. Installation, start-up, and on-site water testing of all equipment shall be per the manufacturer's recommendations. Contractor shall:

1. Ensure proper machine spatial placement in the reservoir.

2. Ensure proper intake depth setting.
3. Diffused aeration system shall be installed complete with all necessary connections.
4. Ensure airline slopes downhill from the compressor to the diffuser.

B. Coordinate locations of each diffuser with Owner and Engineer prior to installation.

C. The diffuser system shall be installed in accordance with manufacturer's procedures, including outlined "slow start procedure", unless otherwise approved in writing from the manufacturer.

D. Contractor shall be responsible for providing and installing a complete and functional system.

3.03 Field Service

A. Contractor (or a representative of the manufacturer) shall check and inspect the diffuser system(s) after installation, place the diffuser unit(s) in operation, and make necessary adjustments.

B. The diffuser system manufacturer (or their representative) shall instruct designated Owner personnel in the safe and proper operation of the diffuser system. This training shall reference the operations manual provided and demonstrate proper function of the equipment.

3.04 Spare Parts

A. Contractor shall provide spare parts as recommended or supplied with this diffuser assembly by the equipment manufacturer.

3.05 Warranty Requirements

A. Warranty: A written manufacturer's warranty shall be provided for the equipment specified in this Section. The Product shall be warranted to be substantially free from defects in material and workmanship for: two (2) years for compressors, five (5) years for diffuser heads and cabinets, and ten (10) years for weighted tubing; from the date of delivery. This equipment warranty shall be directly from the manufacturer of the equipment to the Owner. Such warranty shall cover all defects or failures of materials or workmanship that occur as the result of normal operation and service.

-END-

DIVISION 12 – FURNISHINGS

SECTION 12346 - LABORATORY EQUIPMENT

PART 1 - GENERAL

1.01 Summary

A. Work included in the Section includes the following:

1. Wastewater laboratory equipment.

1.02 Submittals

A. Product Data: Submit manufacturer's catalog for reference. Identify features and options to be provided.

1.03 Delivery, Storage, and Handling

A. Delivery: Coordinate with Owner to allow for inside storage immediately upon delivery.

PART 2 - PRODUCTS

2.01 Wastewater Process Centrifuge

A. Model F-10300, 120 volt, as manufactured by Raven Environmental Products, or approved equal.

1. 1 package of plastic centrifuge tubes, B-10101 as manufactured by Raven Environmental Products, or approved equal.

2.02 Handheld Optical Dissolved Oxygen Meter

A. YSI ProSolo ODO Optical Dissolved Oxygen Meter, or approved equal.

1. ODO/T Probe Assembly, 4m (SKU: 627200-4) by YSI, or approved equal.

2.03 Multi-parameter Colorimeter

A. Hach DR 900 Multiparameter Colorimeter, Handheld, or approved equal

1. Hard-sided case (GH-99573-53), or equal
2. Reagents (Hach, or approved equal)
   a. Ammonia (Product #: 2668000)
   b. Nitrate (Product #: 2605345)
   c. pH 4-7-10 (Product #: 2507200)

3. Hach Tensette Pipet, 1.0-10 mL (Product #: 1970010), or approved equal
    a. Hach Tensette tips for pipets, sterile (Product #: 2558996)
4. 16 oz. Economy Dipper (USA Bluebook: 46894)

PART 3 - EXECUTION

Not used.

-END-

DIVISION 15 – MECHANICAL

SECTION 15060 – PROCESS AND YARD PIPING

PART 1 - GENERAL

1.01 Description

A. Scope: Furnish and install all pipe, fittings and appurtenances necessary to complete work shown or specified.

B. Codes, specifications and standards referred to by title or number in this specification shall be adhered to, and latest revisions shall apply in all cases.

C. Definitions

1. Abbreviations
   a. AASHTO - American Association of State Highway and Transportation Officials
   b. ANSI - American National Standards Institute
   c. ASTM - American Society for Testing & Materials
   d. AWWA - American Water Works Association
   e. PFI - Pipe Fabricators Institute
2. All pipe, fittings and references to pipe diameter on the drawings or in specifications are intended to be nominal size or diameter and shall be interpreted as such.

D. References

1. Specification 02220 – Trenching, Backfilling, and Compaction

1.02 Quality Assurance

A. Mark pipe and fittings according to the applicable specification or standard.

B. Perform factory and field tests in accordance with the applicable specification or standard.

C. Disinfect potable water piping constructed under this Contract. Collect samples of water from the potable water piping after the piping has been disinfected and submit the samples to the applicable regulatory agency for bacteriological analysis. Collection and submittal of these samples shall meet the requirements of the Ohio Environmental Protection Agency.

1.03 Submittals

A. Submittals shall be as specified in the General Conditions.

B. Submit shop drawings with performance data, physical characteristics, data on accessories, and dimensioned layouts of piping and valves.

1.04 Product Delivery, Storage and Handling

A. The Contractor shall be responsible for the delivery, storage and handling of products.

B. Load and unload all pipe, fittings and appurtenances by hoists or skidding, and do not drop, skid or roll products. Pad slings, hooks and pipe tongs, and use in such a manner to prevent damage to the products

C. Keep stored products safe from damage or deterioration. Keep the interior of pipe, fittings and appurtenances free from dirt or foreign matter. Store gaskets, plastic pipe and fittings, and other products, which deteriorate by sunlight, in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products.

D. Do not stack ductile iron pipe higher than the limits shown in ANSI/AWWA C600. Stacking of cast iron, clay, concrete, copper, plastic and steel pipe shall meet the requirements of the pipe manufacturer. Do not stack fittings.

E. Promptly remove damaged products from the job site and replace with undamaged products at no cost to the owner.

PART 2 - PRODUCTS

2.01 General

A. All pipe, fittings and appurtenances shall be as shown on the drawings or as required by the manufacturer and ANSI/AWWA specifications. All pipe, fittings and appurtenances shall be new and unused.

B. Public Work Projects – steel or foundry products used or supplied in performance of the contract shall be U.S. manufactured steel products in accordance with United States House of Representatives, 113th Congress, H.R. 3547-Section 436, commonly referred to as “American Iron and Steel” provisions.

2.02 Buried Yard Piping and Fittings

A. Ductile Iron Pipe and Fittings

1. Pipe
   a. Ductile iron pipe shall meet the requirements of ANSI/AWWA C151/A21.51-91. Design and manufacture pipe for a working pressure of 150 psi plus a 100 psi surge pressure. Additionally, a safety factor of 2.0 and a depth of cover, indicated on the drawings or as required by manufacturer and ANSI/AWWA specification, shall be included. Minimum pressure class shall be as follows:

Size Range	Minimum Pressure Class
All Sizes	150 psi

b. Pipe joints shall be push-on type meeting the requirements of ANSI/AWWA C110/A21.11. Restrained joints shall be Mega-Lug, Lok-Ring, Lok-Fast, Lok-Tyte or as approved by the Engineer. Field-Lok, Fast-Grip, or similar push-on joint restraining gasket may be used for straight run pipe joints.

2. Fittings
   a. Fittings shall be ductile iron. Fittings for standard size pipe shall meet the requirements of ANSI/AWWA C110/A21.10. Compact or short body fittings, 3 inches through 24 inches shall meet the requirements of ANSI/AWWA C153/A21.53. Design and manufacture fittings for a pressure rating of at least 150 psi.
   b. Fitting joints shall be mechanical joints meeting the requirements of ANSI/AWWA C110 /A21.11. Fittings on pumped pressure lines or force mains shall be wedge-action type restrained mechanical joints by Mega-Flange, Uni-Flange, or equal. Restrained joints shall be used instead of thrust blocking. Pipes connecting to restrained joint fittings shall be restrained for the length indicated on the detail in the drawings or as required by manufacturer and ANSI/AWWA specifications. Restrained joints for all piping prior to or beyond the fitting itself may be FieldLok, Fast-Grip, or other push-on joint restraining gasket acceptable to the Engineer
3. Adapters
   a. Adapters from push-on or mechanical joint ductile iron pipe to flange joint valves or fittings shall be ductile iron. Adapters shall meet the requirements of ANSI/AWWA C110. Design and manufacture adapters for a pressure rating of 150 psi.
   b. Adapter ends connecting to ductile iron pipe shall be one of the following: plain-end-push-on joint; mechanical joint; or restrained push-on joint. Adapters with plain-end-push-on joints or mechanical joints may be used when restrained joints are not required. Adapters shall have restrained joints when the distance to a valve or fitting falls within the length shown on the restrained joint detail in the Drawings. Mechanical joints and push-on joints shall meet the requirements of ANSI/AWWA C111/A21.11.
   c. Adapter ends connecting to flange joint valves or fittings shall have joints complying with the specifications for the applicable valves or fittings.
4. Line the inside surfaces of all pipe, fittings and adapters for liquid service with a single cement mortar lining and bituminous seal coat. Cement mortar lining and seal coat shall meet the requirements of ANSI/AWWA C104. Pipe, fittings and adaptors for air and gas lines shall be unlined. Coat the outside surfaces of all pipe, fittings and adapters with coating complying with ANSI/AWWA C151.
5. Gaskets for mechanical joints and push-on joints for water and wastewater service shall meet the requirements of ANSI/AWWA C111/A21.11.
6. Gaskets for air service shall be EPDM, Viton, or equal suitable for temperature of at least 250°F. These gaskets shall be specially marked in the field.
7. Nuts and Bolts
   a. Nuts and bolts for mechanical joints shall be high strength, heat treated, alloy steel. Nuts shall be hexagon nuts, and bolts shall be tee head bolts. Nuts and bolts shall meet the requirements of ANSI/AWWA C111/A21.11.
   b. Nuts and bolts for restrained push-on joints shall meet the requirements of the joint manufacturer.

B. Polyvinyl Chloride Pressure Pipe and Fittings, 4 inches & Larger

1. Pipe
   a. Polyvinyl chloride pipe, 4 inches or larger, shall meet the requirements of ANSI/AWWA C900, Class 150/DR18. Design and manufacture pipe for a working pressure of 150 psi plus a 100 psi surge pressure. Additionally, a safety factor of 2.0 and a depth of cover, indicated on the drawings or as required by the manufacturer's and ANSI/AWWA specifications, shall be included.
   b. Polyvinyl chloride pipe shall have ductile-iron-pipe-equivalent outside diameter.
   c. Pipe joints shall be push-on type and meet the requirements of ANSI/AWWA C900. Do not use solvent-cement joints.
2. Fittings and Adaptors
   a. Fittings and adaptors shall be as specified under Ductile Iron Pipe and Fittings, Article 2.02.A.2.
3. Gaskets
   a. Gaskets for polyvinyl chloride push-on joints shall meet the requirements of ANSI/AWWA C900.
   b. Gaskets for mechanical joints shall meet the requirements of ANSI/AWWA C111/A21.11.
4. Nuts and bolts for mechanical joints shall be high strength, heat treated, alloy steel. Nuts shall be hexagon nuts, and bolts shall be tee head bolts. Nuts and bolts shall meet the requirements of ANSI/AWWA C111/A21.11.

C. Polyvinyl Chloride Pipe and Fittings, Smaller than 4 inches

1. Pipe and Fittings
   a. Pipe and fittings shall be manufactured from unplasticized, Class 12454 polyvinyl chloride meeting the requirements of ASTM D1784.
   b. Polyvinyl chloride pipe shall conform to ASTM D2241.
   c. Polyvinyl chloride fittings shall meet the requirements of ASTM D2466.
   d. Pipe and fittings shall be Schedule 80 or SDR21 and obtained from one manufacturer. SDR21 pipe and fittings shall be rated for 200 psi and be bell and socket gasket joints meeting ASTM D3139, with elastomeric gaskets meeting ASTM F477. Schedule 80 pipe and fitting joints shall be socket, solvent weld type.
2. Welding rods shall be of the same material as pipe and fittings.
3. Primer shall be stabilized tetrahydroftiran, or a primer approved by the Engineer and supplied by the pipe and fitting manufacturer, for hot, windy conditions.
4. Solvent joint cement shall meet the requirements of ASTM D2564. Cement containers shall be no larger than 1 pint and have a dauber secured to the container lid.

D. Polyethylene Pipe:

1. Pipe: Polyethylene, ASTM D2513.
   a. Designation: PE2306 or PE3408 and DOT Title 49, Part 192.
   b. Standard Dimension Ratio (SDR): Not greater than SDR-11 for sizes through 12-inch.

c. Markings: Mark in accordance with ASTM 2513 at spacing not to exceed 24 inches.

2. Fittings: Polyethylene, socket fusion or saddle fusion, ASTM D2683.
   a. Materials: Match pipe.
   b. Provide fittings and adapters as recommended by pipe manufacturer to join HDPE pipe and fittings to other pipe materials.

2.03 Exposed Pipe and Fittings

A. Ductile Iron Pipe and Fittings

1. Pipe
   a. Pipe shall meet the requirements of ANSI/AWWA C151/A21 51.
   b. Thickness of pipe shall be as shown in Table 15.1 of ANSI/AWWA C115/A21.15 for 250 psi working pressure.
   c. Flange joints shall be screwed on ductile iron and shall meet the requirements of ANSI/AWWA C115/A21.15. Field made-up flanges will not be allowed unless approved in writing by the Engineer - if allowed, field made-up flanges shall comply with ANSI/AWWA C115/A21.15 with facing done after turning pipe through flange.
   d. Grooved ductile iron pipe shall conform to AWWA C606 “Grooved and Shouldered Joints”.
2. Fittings
   a. Fittings shall meet ANSI/AWWA C110 and be designed and manufactured for a pressure rating of 150 psi.
   b. Fittings with flange joints and shall meet the requirements of ANSI/AWWA C110.
   c. Grooved fittings shall conform to AWWA C606 “Grooved and Shouldered Joints”.
3. Coat the exterior surfaces of ductile iron pipe and fittings in accordance with Section 09900.
   a. Surface preparation of all surfaces to be coated shall be per NAPF-500-03-04 abrasive blast cleaning for submerged piping, and a minimum of NAPF-500-03-03 power tool cleaning for exposed non-submerged piping.
   b. All piping shall be shop prime coated with an organic zinc-rich primer, Tnemec Tneme-Zinc Series 90-97 or Sherwin Williams Corothane I, B65 Series, 1 coat, 2.5-3.5 mils DFT. Damaged areas of prime coating shall be touched-up in the field with the identical prime coating prior to finish coating to be done in the field.
   c. If a prime coating differs from that specified above, a certification shall be provided by the piping manufacturer and their coating manufacturer stating the alternate prime coat is compatible with the finish coat specified in Section 09900, with the actual finish coat to be used by the Contractor in the field being specifically listed in the certification. The Engineer will then make the final determination as to whether the alternate prime coating is acceptable.
   d. Finish coats shall be applied after installation.
4. Flange Joint Accessories
   a. Gaskets for flange joints for water and wastewater service shall meet the requirements of ANSI/AWWA C110, be full face rubber, or another material as approved by the Engineer, and be 1/8-inch thickness.

b. Gaskets for air piping shall be EPDM, Viton, or equal suitable for temperatures of at least 250°F. These gaskets shall be specially marked in the field.
c. Nuts and bolts shall conform to ANSI/AWWA C110 and shall be zinc-coated alloy steel.

B. Polyvinyl Chloride Pipe and Fittings

1. Pipe and Fittings
   a. Pipe and fittings shall be manufactured from unplasticized, Class 12454-B polyvinyl chloride, corresponding to ASTM D1784.
   b. Polyvinyl chloride pipe shall correlate with ASTM D1785.
   c. Pipe and fittings shall be Schedule 80 Pipe and fitting joints shall be threaded, flanged or socket, solvent weld.
   d. Socket, solvent weld fittings shall follow ASTM D2467.
   e. Threaded fittings shall conform to ASTM D2464.
   f. Flanges shall be polyvinyl chloride, 150 pounds and flat face, with ANSI Drilling.
   g. Pipe and fittings shall be obtained from one manufacturer.
2. Primer shall be stabilized tetrahydrofuran, or a primer approved by the Engineer and supplied by the pipe and fitting manufacturer, for hot, windy conditions.
3. Solvent joint cement shall comply with ASTM D2564 Cement containers shall be no larger than 1 pint and shall have a dauber secured to the container lid.
4. Threaded joint sealant shall be teflon tape, 1/2-inch wide, and the thickness shall be recommended by manufacturer of threaded fittings.
5. Gaskets
   a. Gaskets for flange joints shall be ethylenepropylene terpolymer rubber, 1/8-inch thick and full face with a Durometer hardness of 80.
   b. Gaskets in polyvinyl chloride unions and strainers shall be viton.
6. Nuts and bolts used in water piping shall be as follows:
   a. Nuts shall be semi-finished, regular, hex-head, nuts, type 303 stainless steel, ASTM A194, Grade 3F, NC threads.
   b. Bolts shall be semi-finished, regular, hex-head, cap screws, type 304 stainless steel, ASTM A193, Grade B8, NC threads.
7. Nuts and bolts used in chemical piping shall be monel metal, hex head or NC threads.

C. PVC Tubing

1. Flexible tubing for chemical lines shall be braid-reinforced, standard wall PVC tubing. Tubing shall be chemical resistant and have molded-in polyester reinforcement to handle higher pressures Tubing shall have a temperature range of +25° to +150° F and a durometer of Shore A 70±5. Characteristics of tubing shall be as follows:

I.D.	O.D.	Max. PSI @ 70°F
3/16"	0.375"	250
1/4"	0.438"	250
3/8"	0.594"	225
1/2"	0.750"	200
5/8"	0.891"	200
3/4"	1.031"	150
1"	1.300"	125
1-1/4"	1.62"	100
1-1/2"	1.438"	100
2"	2.490"	75

PVC tubing shall be installed using stainless steel clamps and fittings to adapt to hard-piped systems

2.04 Flanged Joint Adapters

A. Flanged joint adapters shall have restrained joints designed for a pressure rating of 150. The use of flange adapters and union flanges, such as Mega-Flange and Uni-Flange, are discouraged and their use shall be limited. The use of flange adapters will be reviewed by the Engineer on a case-by-case basis.

B. For adapting grooved and shouldered joints to flange joints, adapters shall be Victaulic Style 341 Vic-Flange Adapters.

PART 3 - EXECUTION

3.01 Inspection

A. General

1. The quality of all materials, the process of manufacture and the finished products shall be subject to inspection and approval by the Engineer. Such inspection may be made at the place of manufacture, after delivery to the site or at both places; and the products shall be subject to rejection at any time for failure to meet any of the specifications' requirements, even though sample products may have been previously accepted as satisfactory at the place of manufacture.
2. Prior to being installed, each pipe and fitting shall be carefully inspected. Those not meeting the specifications shall be rejected and removed immediately from the work.

B. Ductile Iron Pipe

1. In any pipe showing a distinct crack and which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portion, if so approved by the Engineer, may be cut off. Therefore, this portion may be removed before the pipe is installed, at the expense of the Contractor. This

shall ensure that the pipe used is perfectly sound. The cut shall be made in the sound barrel at a point at least 12 inches from the visible limits of the crack.
2. All cutting shall be done with a machine having steel cutters or knives adapted to the purpose and all cut ends shall be examined for possible cracks caused by cutting.

3.02 Installation of Buried Piping

A. Laying Piping

1. All excavation shall be in accordance with federal, state and local OSHA requirements. Proper tools and facilities shall be provided and used by the Contractor for safe working conditions.
2. All pipe and fitting shall be cleaned of all debris, dirt and other foreign material before being laid, and it shall be kept clean until accepted in the completed work.
3. Lay and maintain pipe to the lines and grade shown on the drawings, to maintain the minimum depth specified. Install fittings in the locations shown on the drawings or as directed by the Engineer.
4. When the exact location of buried utilities is unknown and piping is to be constructed parallel and close to said utilities, adjust the alignment of the piping to least interfere with these utilities. This applies unless otherwise shown on the drawings or specified by the Engineer.
5. Potable water piping shall be laid at least 10 feet horizontally from any existing sanitary sewer or sewage force main. The distance shall be measured from edge to edge of the pipe. Potable water piping crossing sanitary sewer or sewage force mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the potable water piping and the outside of the sewer or force main. The 18-inch separation shall apply whether the potable water piping is over or under the sewer or force main. Lay potable water piping at crossings of sewers and force mains so a full length of pipe is centered on the sewer or force main whenever possible. No potable water piping shall pass through or come in contact with any part of a sanitary sewer manhole.
6. For pipe 10 inches and smaller, pressure piping shall be laid at a depth that provides at least 4 feet of cover. These depths of cover apply unless otherwise depicted on the drawings or specified by the Engineer. Furthermore, cover shall be measured as the vertical distance from the top of the pipe to the finish grade elevation.
7. Do not lay pipe in water or when the trench or weather conditions are unsuitable for proper installation.
8. Polyethylene Pipe and Fittings: Install in accordance with the pipe manufacturer's installation recommendations.
9. Lower pipe and fittings into the trench by hand, hoists or ropes or other suitable tools or equipment which will not damage products, coatings or linings. Do not drop or dump pipe or fittings into the trench.
10. Pipe laying shall proceed upgrade, beginning at the lower end of the pipe line.
11. The Contractor shall use laser beam equipment, surveying instruments or other proven techniques to maintain accurate alignment and grade, when required.
12. Deflection of pressure pipe from a straight line or grade shall not exceed the limits specified in this Section. If the alignment requires joint deflections in

excess of the allowable deflection per joint, furnish and install fittings or a sufficient number of shorter lengths of pipe.

13. For pressure and process piping, provide mechanical restraint at horizontal and vertical deflection fittings, tees, plugs, tapping sleeves and tapping saddles.
14. Laying of ductile iron piping shall meet the requirements of ANSI/AWWA C600, unless otherwise specified in this Section or as approved by the Engineer.
15. Open excavation shall be satisfactorily protected at all times. At the end of each day's work, the open ends of all pipes shall be protected against the entrance of animals, children, earth or debris by bulkheads or stoppers. The bulkheads or stoppers shall be perforated to allow passage of water into the installed pipe line, thereby preventing flotation of the pipe line. Any earth or other material that may find entrance into the main sewer or into any lateral sewer must be removed at the Contractor's expense. The cost of all such plugs, and the labor connected therewith, must be included in the regular bid for the sewers.

B. Pipe Bedding, Haunching and Initial Backfill

1. Provide bedding, haunching, and backfill per Specification 02220.

C. Backfill trenches not requiring granular backfill with suitable excavated material. Fill and restore any settlement of the backfill. In unpaved areas, backfill shall be mounded above finish grade to allow for settlement. Grade unpaved area to be restored 6 inches below finish grade after settlement of backfill and immediately before restoration of vegetated areas. Place 6 inches of topsoil over area to be restored.

D. Concrete cradles shall be constructed of Class "B" concrete and of the design shown on the detailed drawings. When so ordered in writing, concrete cradles not shown on the drawings will be paid for at an additional price per linear foot of pipe.

E. Jointing

1. Clean the ends of the pipe satisfactorily just before laying. Subsequently, the joint shall be made in a satisfactory manner according to the manufacturer's recommendations for that specific joint and as approved by the Engineer. All joint work shall be done by experienced workmen.
2. Joints shall be as specified in this Section.
3. Each length of pipe shall be installed in accordance with the manufacturer's recommendations and ANSI/AWWA C600.
4. Piping shall be tested as specified in this Section.

F. Install polyethylene encasement only when indicated on the drawings or specified by the Engineer.

3.03 Installation of Exposed Piping (4-Inch and Larger)

A. All pipe shall be installed to accurate lines and grades with fittings, valves and appurtenances at the required locations. Wherever possible, piping shall be parallel to walls and floors.

B. Installation

1. All piping shall be cleared of debris, dirt, etc., before being installed and be kept clean until accepted at completion of work.
2. Piping shall be installed in a neat workmanlike manner. Proper tools and facilities shall be provided and used by the Contractor for safe working conditions. All piping shall be carefully installed in such a manner as to prevent damage to piping materials, protective coatings and liners.
3. The pipe, fittings and appurtenances shall be inspected for defects prior to installation
4. Piping shall be installed so no undue strain is placed upon piping joints, equipment or structures.

C. Supports

1. The Contractor shall provide all necessary supports to keep the pipe and appurtenances stable at the lines and grades shown on drawings or as directed by the Engineer, and without strain upon the piping and connected equipment.
2. Piping shall be supported from the floor by suitable saddle stands or concrete piers. Piping along walls shall be supported by suitable wall brackets with attached roll or saddle, or by wall brackets with hanger rods. For piping supported from the ceiling, approved rod anchors of a type capable of supporting the pipe shall be used.
3. Supports located in tanks (supported from floor, wall or cantilevered walkway, submerged, or non-submerged) shall be stainless steel or fiberglass, including any all-thread rods used with hanging supports.
4. Supports shall be located wherever necessary and not exceed 8 feet on centers, unless otherwise required by the manufacturer or code
5. Bases of supports mounted on the floor shall be installed on a minimum 2-inch grout pad. Supports in troughs or channels shall have a minimum 4-inch grout pad under the base.
6. Support suction and discharge piping connecting to pumps, blowers, and other equipment in a manner that the piping does not transmit any load to the pump or equipment.
7. Supports shall be anchored using stainless steel hardware.

D. Piping cast in concrete or masonry shall be accurately set with bolt holes carefully aligned so that connecting piping can be installed without undue strain and at the lines and grades required.

3.04 Installation of Small Pipe and Fittings (3-Inch and Smaller)

A. Piping shall be installed in a neat and workmanlike manner. Exposed piping shall **be installed vertically or horizontally parallel to the walls and ceiling wherever** possible and supported where necessary not exceeding 8 feet on centers for rigid piping and 4 feet on center for non-rigid piping (PVC, polyethylene, and other plastic piping).

B. Install piping free of sags and bends.

C. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.

D. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

E. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

F. After cutting to final lengths, all pipe ends shall be reamed, threads cleaned and screwed joints made up with Teflon tape on a thickness recommended by the manufacturer of threaded fittings.

G. All joints showing evidence of leaking shall be reworked.

H. Any system of small piping shall incorporate sufficient unions to permit ready disassembly and reassembly as may be required

I. Supports

1. The Contractor shall provide all necessary supports to keep the pipe and appurtenances stable at the lines and grades shown on drawings or as directed by the Engineer, and without strain upon the piping and connected equipment.
2. Piping shall be supported from the floor by suitable saddle stands or concrete piers. Piping along walls shall be supported by suitable wall brackets with attached roll or saddle, or by wall brackets with hanger rods. For piping supported from the ceiling, approved rod anchors of a type capable of supporting the pipe shall be used.
3. Supports shall be located wherever necessary and not exceed 4 feet on center unless otherwise required by the manufacturer.
4. Supports shall be anchored using stainless steel hardware.

3.05 Setting Appurtenances

A. Install all fittings and appurtenances in the lines as indicated on the Drawings or as specified by the Engineer.

3.06 Joints

A. Ductile Iron Push-on Joints

1. Pipe must be cleaned and installed as specified by the manufacturer and ANSI/AWWA C600 requirements. Additionally, all lumps, blisters, excess bituminous coating and foreign material must be removed from the bell and spigot end of each pipe.
2. Deflect pipe after jointing, if deflection is required. The amount of deflection shall not exceed the limits shown in the following table:

Pipe Size	Maximum Deflection Angle	Maximum Deflection Based Upon 18-Foot Pipe Length
4"	5º	18-1/2"
6"	5º	18-1/2"
8"	5º	18-1/2"

3. For restrained push-on joints, pull the nuts to a uniform tightness by hand or with a short wrench. Do not pull the spigot of the pipe being installed against the back of the bell of the receiving pipe. Engage at least a full nut on each bolt when joint deflection is required.

B. Mechanical Joints

1. Pipe must be cleaned and installed as specified by the manufacturer and ANSI/AWWA C600 requirements. Additionally, all lumps, blisters, excess bituminous coating and foreign material must be removed from the bell and spigot end of each pipe.
2. Evenly tighten the nuts using a torque wrench. The torque shall be within the range listed in the following table:

Pipe Size	Bolt Size	Torque Range
4" thru 24"	3/4"	75 to 90 ft.-lb.

3. Deflect pipe, fittings or valves after jointing, if deflection is required. The amount of deflection shall not exceed the limits shown in the following table:

Pipe Size	Maximum Deflection Angle	Maximum Deflection Based Upon 18-Foot Pipe Length
4"	8º -18’	31"
6"	7º -7’	27"
8"	5º -21’	20"

C. Flange Joints

1. Pipe must be cleaned and installed as specified by the manufacturer and ANSI/AWWA C60 requirements. Additionally, all lumps, blisters, excess bituminous coating and foreign material must be removed from the bell and spigot end of each pipe.
2. Do not overtorque nuts and bolts.

D. Threaded Joints

1. Threading of steel pipe shall be done after bending, forging, heat treating or welding operations.

2. Threads shall be concentric with the outside of the pipe and shall conform to ANSI 82.1.
3. Do not seal weld threaded joints; instead make leaktight using Teflon tap on all but the first two threads of the pipe.
4. When threading chemically cleaned pipe, use inhibited trichloroethane (methyl chloroform) as the cutting fluid.
5. Avoid overtightening of threaded joints damaging the piping exterior with the pipe wrench.
6. Backing off of made-up threaded joints to facilitate fit-up or alignment will not be permitted.

3.07 Wall Penetrations, Wall Pipes, and Wall Sleeves

A. Details for the installation of wall penetrations, wall pipes, and wall sleeves are shown on the Drawings.

B. All submerged or exterior wall penetrations, wall pipes, and wall sleeves which leak shall be replaced at no extra cost to the Owner.

C. Exterior walls refer to walls which are on the exterior of a building or structure, either buried or exposed. Interior walls refer to a wall between two interior rooms in a building or structure.

D. Wall pipe shall be used on new concrete structures where process piping is in a submerged application to allow connection of process piping directly to the wall pipe joints. Lay lengths and sizes of wall pipes vary depending on the wall width and connecting pipe size shown on the Drawings for each specific application.

3.08 Restraining and Supports

A. Mechanical Joint Rod Restraint

1. Mechanical joint rod restraint may be used in lieu of restraining glands and shall be form fitting or fitting to valve.
2. The number of rods shall conform to the following table:

Pipe Size	Rod Size	Minimum No. of Rods
4"	3/4"	2
6"	3/4"	2
8"	3/4"	4

B. Restrained Joint Piping: Restrained joint piping shall be as specified in this Section. Distance from restrained fittings or valves to end of piping requirement restraint shall not be less than that indicated on the detail in the Drawings. Thrust blocking is not permitted. All restrained joints for buried piping shall be of a mechanical type restraint method.

C. Pipe Supports

1. Furnish and install supports required to hold pipe, fittings and valves at the lines and grades indicated on the Drawings, without causing strain upon pipe, fittings, and valves.
2. Support piping by suitable saddle stands, concrete piers or hangers.
3. Locate supports where necessary, but not more than 8 feet on center.

3.09 Air Test

A. Air testing shall be performed on all gravity sewer lines, drain lines, and low pressure small piping.

B. The ends of the pipe section being tested shall be sealed and properly blocked. The seal at one end shall have an orifice through which to pass air into the pipe. An air supply shall be connected to the orifice at one end of the section. The air supply line will contain an off-on gas valve and a pressure gauge having a range from 0 to 25 psi. The gauge shall have minimum divisions of 0.10 psi and shall have an accuracy of the nearest +0 1 psi. The seals at each manhole shall be properly blocked to prevent displacement while the line is under pressure.

C. Procedure for Conducting a Low Pressure Air Test

1. Clean pipe to be tested by propelling a snug fitting inflated ball through the pipe by water pressure or other adequate method. This step is important because it not only flushes out construction debris, but the water used to flush the ball through the pipe dampens the pipe wall. The rate of air loss through pipe wall permeation can be significant on dry pipes.
2. Plug all pipe outlets with pneumatic plugs having a sealing length equal to or greater than the diameter of the pipe to be tested. The pneumatic plug shall be able to resist internal testing pressures without requiring external bracing.
3. Once the pipe outlet plugs are securely in place, pressurized air is introduced to the system. The air shall be fed through a single control panel with three individual hose connections as follows:
   a. From control panel to pneumatic plugs for inflation in sewer pipe,
   b. From control panel to sealed line for introducing the pressurized air;
   c. From sealed line to control panel. This line will enable continuous monitoring of the air pressure rise in the sealed line.
4. The air shall be introduced slowly to the section of pipe under evaluation until the internal air pressure is raised to 4.0 psig greater than the hydrostatic pressure head created by the existence of groundwater that is over the pipe section.
5. A minimum of two minutes shall be provided for the air pressure to stabilize to conditions within the pipe. (This stabilization period is necessary for variations in temperature to adjust to the interior pipe conditions) Air may be added slowly to maintain a pressure to 3.5 to 4.0 psig for at least two minutes.
6. After the stabilization period, when the pressure reaches exactly 3 5 psig, the stopwatch shall be started; and when the pressure reaches 2.5 psig, it is stopped. The portion of the line being tested shall be acceptable if the time in minutes for the air pressure to decrease from 3.5 psig to 2.5 psig is greater than the time shown in the following table.

Pipe Diameter (Inches)	Time (Minutes)
4	2.0
6	3.0
8	4.0
10	5.0
12	5.5
15	7.5
18	8.5
21	10.0
24	11.5

a. In areas where the groundwater is above the top of the pipe, the test pressures shall be increased by 0.433 per foot of groundwater (e.g., if the groundwater is 11-1/2 feet above the top of the pipe, the 3.5 to 2 5 pressure drop will be increased by 5 psi and the time then will be measured for a pressure drop from 8 5 psi to 7.5 psi.).

D. Safety Precautions During Air Test

1. The air test may be dangerous if, because of ignorance or carelessness, a line is improperly prepared. It is extremely important that the various plugs be installed and braced in such a way as to prevent blowouts. Inasmuch as a force of 250 pounds is exerted on an 8-inch plug by an internal pipe pressure of 5 psi, it should be realized that sudden expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be dangerous.
2. As a safety precaution, pressurizing equipment should include a regulator set at perhaps 10 psi to avoid over-pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing.

E. For piping 30 inches and greater in diameter, joint testing is an acceptable method of testing. Joint testing shall be accomplished by isolating each joint and applying low pressure air The line shall be acceptable if each joint passes the air test. The joint will be considered acceptable if the air pressure being applied to the joint drops less than 1 psi in three minutes. The air pressure applied will vary depending on the line being tested, but shall be a minimum pressure over and above the groundwater back pressure. Groundwater shall be compensated by increasing the test pressure by 0 433 for each foot of groundwater. It is the Contractor's responsibility to determine the groundwater level and the appropriate test pressure. The testing pressure for each line are to be reviewed by the Engineer prior to testing.

3.10 Hydrostatic Test

A. Hydrostatic test shall be performed on all process piping, pressure piping, plant water piping, and chemical piping. Test procedures shall meet the requirements of ANSI/AWWA C600.

B. The piping shall be complete and shall have been in place for not less than 10 days prior to being tested.

C. Test closed-end pressure piping and plant water lines as follows:

1. Expel all air from the piping prior to the application of test pressure. Tap the piping at high points, if necessary, to release all air from the piping. Plug taps after the test is successfully completed. Plugs shall be watertight.
2. Test piping at a static pressure of 150 pounds per square inch over a period of not less than eight consecutive hours. The test will be considered successful when the pressure drop over the test period is 5 pounds per square inch or less. If the pressure drop exceeds 5 pounds per square inch, repair the leaks and repeat the test. Repair leaks and repeat the test until the pressure drop over the test period is 5 pounds per square inch or less.

D. Test open-end pressure piping, process piping, and ductile iron sewer piping as follows:

1. The ends of piping being tested shall have test plugs or caps adapted with a tap of adequate diameter to fill and pressurize the system with water.
2. When a section is terminated at a manhole with a plain end (spigot), the pipe must extend into the manhole of sufficient length to accommodate a restraining cap. The bench-wall shall be formed in the manhole after the test section has been approved.
3. Water shall be introduced into the section to be tested at the lower end. The upper end shall have an orifice at the top of the plug or cap to expel air when filling the system with water All air shall be expelled from the pipe.
4. The test plugs or caps shall be capable of withstanding an internal pressure of 175 psi.
5. Process piping and gravity flow systems shall be tested in conformance with Section 13 of ANSI/AWWA C600, at 50 pounds per square inch over a period of not less than four hours. The system will not be acceptable until all leaks have been repaired.
6. Pumped flow systems shall be subjected to an internal pressure equal to 50% more than the maximum operating pressure, but in no case less than 50 psig or greater than 120 psig.
7. Hydrostatic test may be dangerous if, because of ignorance or carelessness, a line is improperly prepared. It is extremely important that the various plugs be installed in such as way as to prevent blowouts. Inasmuch as a force of 2,500 pounds is exerted on an 8-inch plug by an internal pipe pressure of 50 psi, it should be realized that sudden expulsion of a poorly installed plug or cap can be dangerous. As a safety precaution, no one shall be allowed in the manholes when the pipe is pressurized.

3.11 Flushing

A. Water, Wastewater and Sludge Piping

Flush piping with a flushing velocity of at least 2.5 feet per second. Following are flows required to provide a flushing velocity of 2.5 feet per second:

Pipe Size	Inside Diameter	Flow at a Velocity of 2.5 Feet per Second
4"	4"	98 gpm
6"	6"	220 gpm
8"	8"	390 gpm

1. Flush piping and hydrants until the water discharged is clear
2. Flush potable water piping prior to disinfection.

3.12 Valve Field Testing

A. Operate manual valves through 10 full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. If valves stick or bind, repair or replace the valve and repeat the tests.

B. Gear operators shall operate valves from full open to full close through 10 cycles without binding or sticking. The torque required to operate valves having 2-inch AWWA nuts shall not exceed 150-ft-lbs. If operators stick or bind or if pulling forces and torques exceed the values stated previously, repair or replace the operators and repeat the tests. Operators shall be fully lubricated in accordance with the manufacturer's recommendations prior to operating.

-END-

SECTION 15080 - PROCESS VALVES

PART 1 - GENERAL

1.01 Description

A. Scope

1. This section includes valves and appurtenances applicable to process, chemical, and site piping. Valves pertaining to plumbing, and other mechanical non-process or domestic systems are included in other Division 15 sections. Furnish and install valves and appurtenances necessary to complete work shown or specified.
2. All valves of a single type shall be provided by a single manufacturer.
3. Valve size and all references to pipe diameter on the drawings or specifications are intended to be nominal size or diameter and shall be interpreted as such.

1.02 Codes and Abbreviations

A. Codes, specifications and standards referred to by title or number in this specification shall be adhered to, and latest revisions shall apply in all cases.

B. Definitions

1. ANSI - American National Standards Institute
2. ASTM - American Society for Testing & Materials
3. AWWA - American Water Works Association
4. PFI - Pipe Fabricators Institute

1.03 Quality Assurance

A. Mark valves according to the applicable specification or standard.

B. Perform factory and field tests in accordance with the applicable specification or standard.

1.04 Submittals

A. Submittals shall include information and materials specified in this Section, the General Conditions, and Section 01300, Submittals.

B. Submit the following for the Engineer’s review and approval:

1. Manufacturer’s Certificate of Compliance with the referenced specifications and applicable standards.
2. Certified copies of factory tests and reports, if specified in this Section or required by the referenced standards.
3. Copy of manufacturer’s standard warranty for each type of equipment provided.

4. Shop drawings with performance data, descriptive literature, weights and dimensions, and other physical characteristics verifying compliance with this Section. When numerous options and sizes are shown, the shop drawings shall be marked to clearly indicate the sizes and types specific to this Section and project.
5. For air release valves, submit calculations used to determine sizing of all valves.
6. Manufacturer's installation instructions and recommended testing procedures.
7. Manufacturer's operation and maintenance (O&M) manuals and materials. When numerous types and sizes are shown, the manuals shall be marked to clearly indicate the sizes and types specific to this project.
8. Electrical
    a. Submit all electrical requirements for each piece of equipment including voltage, phase, and load data.
    b. Provide wiring diagrams for each piece of equipment. For example, submitting one diagram for all metering pumps is not acceptable.
    c. "Typical" diagrams are not acceptable. Manufacturer's standard diagrams may be submitted if they are made specific for this project by:
        1) Showing all included options, special items, etc.
        2) Unused options or features shall be crossed out or deleted.
        3) Identify the drawing with project name, equipment name, and tag number, i.e. "Grover Hill WWTP, FCV-01, Tag No. xx-xxxx."

1.05 Product Delivery, Storage and Handling

A. The Contractor shall be responsible for the delivery, storage and handling of products.

B. Load and unload all valves and appurtenances by hoists or skidding. Do not drop products. Do not skid or roll products on or against other products. Use sling, hooks and pipe tongs in such a manner to prevent damage to products.

C. Keep stored products safe from damage or deterioration. Keep the interior of valves and appurtenances free from dirt or foreign matter. Drain and store valves in a manner that will protect valves from damage by freezing. Store gaskets and other products which will deteriorate from sunlight in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products

D. Store valves and appurtenances in accordance with manufacturer's recommendations.

E. Do not stack valves, valve boxes or valve stands.

F. Promptly remove damaged products from the job site and replace with undamaged.

PART 2 - PRODUCTS

2.01 General

A. All valves and appurtenances shall be new, unused and as shown on the drawings and specified in this Section. Valve opening direction shall be determined by the Engineer.

2.02 Valves

A. Plug Valves

1. Eccentric Plug Valves for water and wastewater service shall be non-lubricated with a resilient sealing surface. Valves shall have screwed, flanged or mechanical joint ends conforming to ANSI/AWWA C110 requirements. Port areas shall be at least 80% of full pipe area. Valves shall have permanently lubricated stainless steel slave-type bearings, or other lubricated type bearings, in the upper and lower stem journals. Valve seats shall be corrosion resistant, having a high nickel content.
2. Bonnet shaft seals shall be capable of being replaced while line and valve remain in service, thereby eliminating the need to take process treatment units out of service. All exposed nuts, bolts, springs and washers shall be zinc-coated steel. Means of actuation shall be by hand lever, chain lever, worm gear actuator, tee wrench, extension stem, floor stand with handwheel, pneumatic or electric motor actuators, as indicated on the valve schedule.
3. The valves shall be capable of providing drop-tight shutoff with flow in either direction up to the specified maximum line pressure differential. Flanged valves shall be faced and drilled to ANSI B.16.1, Class 125 standard. Flanges of valves through 12 inches shall have face-to-face dimensions of ANSI/AWWA standard gate valves.
4. The plug face material for water/sewage/sludge service shall be nitrile-butadiene, Neoprene or as approved by the Engineer.
5. Valves and actuators for buried and submerged services shall have seals on all shafts and gaskets on valve and actuator covers to prevent the entry of fluid. Actuator mounting brackets for submerged service shall be totally enclosed and have gasket seals.
6. All valves in buried and submerged service shall have totally enclosed and sealed operators with a 2-inch square AWWA operating nut. Additional operator parts – stem extensions, floorstands, guide stems, extension bonnets, etc., shall be provided as described in the Drawings or further described in the Specifications.
7. Each operator shall be capable of seating and unseating the valve and have a maximum torque to the valve shaft of 50 foot-pounds on operating nuts.
8. Non-buried valves shall be prime coated and finish coated in accordance with Article 2.08 of this Section.
9. Valves shall be DeZurik, Series 100; Val-Matic, Cam-Centric; or equal.

B. Check Valves

1. Rubber Flapper Check Valves
   a. Rubber flapper check valves for wastewater service shall be of the Swing Flex full body flange type, with domed access cover and only one moving part, the valve disc.
   b. The valve body shall have full flow equal to nominal pipe diameter at any point through the valve. The seating surface shall be on a 45 degree angle to minimize disc travel. The top access port shall be full size, allowing removal of the disc without removing the valve from the pipeline.
   c. Valve body and cover shall be ASTM A126, Class B cast iron. The disc shall be Buna-N (NBR) ASTM D2000-BG. The exterior shall be coated with a universal primer.
   d. A screw-type backflow actuator shall be provided. The actuator shall be field installable without modification to the valve, a need for special tools, or removal of the valve from line.
   e. The disc shall be of one-piece construction, precision-molded with an integral o-ring sealing surface and contain steel and nylon reinforcements in both the flexible and central disc areas. The flexible portion of the disc shall be warranted for 25 years. Non-slam closing characteristics shall be provided through a short 35° disc stroke and memory flex disc return action.
   f. The valve shall be cycle tested 1,000,000 times with no signs of wear or distribution to the valve disc or seat and shall remain drop-tight at both high and low pressures. The test results shall be independently certified.
   g. Valves shall be prime coated and finish coated in accordance with Article 2.08 of this Section.
   h. Rubber flapper check valves shall be suitable for sewage and sludge service and be manufactured by Val-Matic, Series 500; APCO; Crispin; or equal.

C. Yard Hydrants

1. Type YH-1: Yard hydrants shall be exposed, non-freeze post type with 1-inch inlet and 1-inch male hose connection. Hydrants shall have cast iron head with lockable lift handle. Hydrant shall have bronze interior parts and galvanized steel casing with bronze valve housing and 1/8-inch drain port in housing. Provide 1" x 3/4" reducer for male hose connection for each hydrant. Type YH-1 hydrants shall be Model Y1 by Woodford, or equal.
2. Buried hydrants shall be installed 36-inches above ground and 4-feet of bury with 1/3 cubic yard of No. 8 stone around valve housing for drainage.

D. PVC ball valves 2" and smaller shall be manufactured of ASTM D-1784 Type 1, Grade 1, polyvinyl chloride and have teflon seats and viton seals. Valves shall be 150 pound working pressure at 75°F and have double union screwed or flanged

E. Buried valves 2 inches and smaller in water lines shall be curb stops. Curb stops shall meet the applicable requirements of ANSI/AWWA C800 and ASTM B-62. Curb stops shall be Mueller H-10283 or as approved by the Engineer.

2.03 Manual Valve Operators

A. Manual operators shall conform to AWWA C504. Gate and butterfly valves with the valve centerline less than 6 feet above floor or platform shall be provided with manual operators and handwheels. Manual operators shall be of the traveling nut, self-locking type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Operators shall be equipped with mechanical stop-limiting devices to prevent over-travel of the disc/plug in the open and closed positions. Valves shall close with a clockwise rotation. Operators shall be fully enclosed and designed to produce the specified torque with a maximum pull of 80 lbs. on the handwheel. Operator components shall withstand an input of 300 lbs. at extreme operator position without damage. Handwheels, levers, and tee wrenches shall be painted yellow.

2.04 Valve Boxes

A. Valve boxes shall be cast or ductile iron and either the two or three-piece type. Each two-piece box shall be complete with bottom section, top section and cover. Each three-piece box shall be complete with base, center section, top section and cover. Valve boxes shall be extension type with slide or screw type adjustment. Each base and bottom section shall be the proper size for the valve served. Each valve box assembly shall be the proper length for the valve served. The minimum thickness of metal shall be 3/16-inch. Cast the word “SEWER” in each process valve box cover.

B. Underground valves, 3 inches and larger, provided with valve boxes shall also be provided with compatible extension stems of sufficient length to place operating nut within approximately 9 inches of the finished ground surface. Extension stem shall be furnished by the valve manufacturer.

C. Valve boxes for curb stops shall be cast or ductile iron. Curb boxes shall be extension type. Each curb box shall be complete with foot piece, curb box and lid.

2.05 Valve Tools

A. Furnish one tee wrench, for every 10 valves, to operate buried valves with 2-inch operating nuts. Wrench shall have an overall length of 4’-0”. The wrench shall consist of a socket and tee. The socket shall be specifically designed to fit a 2-inch operating nut and shall be 1-3/4 inches deep. Tee shall have a 1-1/2-inch pipe shaft and a 1-1/4-inch pipe handle. The tee handle shall be 36 inches long.

B. Furnish all special tools required to operate and maintain valves in a container labeled “Valve Tools”.

2.06 Coating

A. Coat the exterior surfaces of valves, hydrants and appurtenances as specified in Section 09900.

1. Surface preparation of all surfaces to be coated shall be per SSPC-SP10, near-white metal blast for submerged items, and a minimum of SSPC-SP6, commercial blast, for non-submerged items.
2. Surfaces shall be shop prime coated with an organic zinc-rich primer, Tnemec Tneme-Zinc Series 90-97 or Sherwin Williams Corothane I, B65 Series, 1 coat, 2.5-3.5 mils DFT. Damaged areas of prime coating shall be touched-up in the field with the identical prime coating prior to finish coating to be done in the field.
3. If a prime coating differs from that specified above, a certification shall be provided by the valve manufacturer and their coating manufacturer stating the alternate prime coat is compatible with the finish coat specified in Section 09900, with the actual finish coat to be used by the Contractor in the field being specifically listed in the certification. The Engineer will then make the final determination as to whether the alternate prime coating is acceptable.
4. Finish coating shall be done in the field. Paint color shall be selected by the Engineer.

PART 3 - EXECUTION

3.01 Inspection

A. The quality of all materials, the process of manufacture and the finished products shall be subject to inspection and approval by the Engineer. Such inspection may be made at the place of manufacture, on the work after delivery or at both places. The products shall be subject to rejection at any time on account of failure to meet any of the specifications' requirements even though sample products may have been accepted as satisfactory at the place of manufacture.

1. Prior to being installed, each pipe, fitting, valve and hydrant shall be carefully inspected, and those not meeting the specifications shall be rejected and promptly removed from the work.

3.02 Installation of Buried and Submerged Valves

A. General

1. Installation of valves shall be in conjunction with and in conformance with piping installation as specified in Section 15060, Process and Yard Piping.
2. Proper tools and facilities shall be provided and used by the Contractor for safe working conditions.
3. Each valve shall be cleaned of all debris, dirt and other foreign material before being laid and shall be kept clean until accepted in the completed work.
4. Install valves and hydrants in the locations shown on the drawings.

5. Lower valves into the trench by hand, by means of hoists or ropes or by other suitable tools or equipment which will not damage products, coatings or linings. Do not drop or dump valves into the trench.

B. Setting Valves and Boxes

1. Clean valve interiors of foreign matter before installation. Tighten stuffing boxes. Inspect valves in opened and closed positions to ensure all parts are in working condition.
2. Set buried valves and valve boxes plumb. Center valve boxes on the valves or valve operators. Locate valves outside the area of roads and streets where feasible. Tamp backfill around each valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet.

3.03 Installation of Exposed Valves

A. General

1. Installation of valves shall be in conjunction with and in conformance with piping installation as specified in Sections 15060, Process and Yard Piping.
2. All valves shall be cleared of debris, dirt, etc., before being installed and shall be kept clean until accepted at completion of work. During installation, no debris, tools, clothing, lumber or other materials shall be placed in the valves.
3. Valves shall be installed in a neat workmanlike manner. Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All valves shall be carefully installed in such a manner as to prevent damage to valve materials, protective coatings and liners.
4. The valves and appurtenances shall be inspected for defects prior to installation.
5. Valves shall be installed in such a manner that no undue strain is placed upon piping joints, equipment or structures.

B. Supports

1. The Contractor shall provide all supports necessary to support the valves and appurtenances in a firm, substantial manner at the lines and grades shown on drawings or as directed, and without strain upon the piping and connected equipment.
2. Valves shall be supported from the floor by suitable saddle stands or concrete piers. Valves along walls may be supported by suitable wall brackets. For piping supported from the ceiling, approved rod anchors of a type capable of screw adjustments after erection of the piping and valves and with suitable adjustable concrete inserts or beam clamps shall be used.
3. Provide wall bracket guides for extension stems at intervals recommended by the manufacturer.

3.04 Setting Appurtenances

A. Install all valves and appurtenances in the lines as indicated on the drawings.

3.05 Testing

A. Testing shall be in conjunction with and in conformance with piping testing as specified in Section 15060.

3.06 Valve Leakage Testing

A. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 15060 for pressure testing requirements. Protect or isolate any parts of valves, operators, or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace valves showing leaks and retest.

3.07 Valve Field Testing

A. Operate manual valves through 10 full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. If valves stick or bind, repair or replace the valve and repeat the tests.

B. The torque required to operate valves having 2-inch ANSI/AWWA nuts shall not exceed 150 ft-lbs,. If operators stick or bind or if pulling forces and torques exceed the values stated previously, repair or replace the operators and repeat the tests. Operators shall be fully lubricated in accordance with the manufacturer's recommendations prior to operating.

3.08 Warranty

A. The Contractor shall guarantee the equipment to be free from defective material and workmanship for a period of one year from the date of acceptance of the equipment by the Owner. The Contractor shall replace any defective materials, components, or workmanship during this time, including but not limited to all materials, labor, shipping, and transportation, at no additional cost to the Owner. Any repair work performed during this one year period shall also be guaranteed to be free from defective material or workmanship for a period of one year from the date the work is complete and shall be addressed in the same manner at no additional cost to the Owner.

3.09 Valve Schedule

A. Valve Schedule on the Drawings lists valves 3 inches and larger giving size, type, location and type of joints. Figures on drawings adjacent to valves correspond to valve and/or tag number as listed in the valve schedule.

B. The valve schedule is to be used only as a guide and is not guaranteed. Any valves shown on the drawings and not listed in the valve schedule shall be furnished and installed at no additional cost to the Owner.

-END-

H26 05 01 BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 Special Note

A. All provisions of the Bidding Requirements, General Conditions and Supplementary Conditions, including Division 00 and Division 01, apply to work specified in this Division.

B. The scope of the Division 26 work includes furnishing, installing, testing and warranty of all Division 26 work and complete systems as shown on the Division 26 drawings and as specified in Division 26 and elsewhere in the project documents.

C. Understanding that the contractors for various Divisions are sub-contractors to the Prime Contractor, assignments of work by division are not intended to restrict the Prime Contractor in assignment of work among the contractors to accommodate trade agreements and practices or the normal conduct of the construction work. If there is a conflict of assigned work between Divisions 02 thru 33 and Divisions 00 and 01, Divisions 00 and 01 shall take precedence.

1.2 Permits and Regulations

A. Include payment of all permit and inspection fees applicable to the work in this Division. Furnish for the Owner certificates of approval from the governing inspection agencies, as a condition for final payment.

B. Work must conform to the National Electrical Code, National Electrical Safety Code and other applicable local, state and federal laws, ordinances and regulations. Where drawings or specifications exceed code requirements, the drawings and specifications shall govern. Install no work contrary to minimum legal standards.

C. All electrical work shall be inspected and approved by the local jurisdictional authority.

1.3 Inspection of Site

A. Inspect the project site and the premises of the existing building. Conditions shall be compared with information shown on the drawings. Report immediately to Wessler Engineering any significant discrepancies which may be discovered. After the contract is signed, no allowance will be made for failure to have made a thorough inspection.

1.4 Drawings and Specifications

A. The drawings indicate the general arrangement of the work and are to be followed insofar as possible. The word "provide", as used, shall mean "furnish and install". If significant deviations from the layout are necessitated by field conditions, detailed layouts of the proposed departures shall be submitted to Wessler Engineering for approval before proceeding with the work.

B. Make all necessary field measurements to ensure correct fitting. Coordinate work with all other trades in such a manner as to cause a minimum of conflict or delay.

C. The drawings and specifications shall be carefully studied during the course of bidding and construction. Any errors, omissions or discrepancies encountered shall be referred immediately to Wessler Engineering for interpretation or correction, so that misunderstandings at a later date may be avoided. The contract drawings are not intended to show every vertical

or horizontal offset which may be necessary to complete the systems. Having bus duct, wireways and fittings fabricated and delivered in advance of making actual measurements shall not be sufficient cause to avoid making offsets and minor changes as may be necessary to install bus duct, wireways, fittings and equipment.

D. Wessler Engineering shall reserve the right to make minor adjustment in locations of system runs and components where they consider such adjustments desirable in the interest of protecting and concealing work or presenting a better appearance where exposed. Any such changes shall be anticipated and requested sufficiently in advance as to not cause extra work, or unduly delay the work. Coordinate work in advance with all other trades and report immediately any difficulties which can be anticipated.

E. Equipment, ductwork and piping shall not be installed in the dedicated electrical space above or in the working space required around electrical switchgear, motor control centers or panelboards as identified by NEC 110.26 Spaces about Electrical Equipment – 600 Volts Nominal or Less. For equipment rated over 600 volts nominal – 110.32 Work Space About Equipment – 110.33 Entrance to Enclosures and Access to Work Space – 110.34 Work Space and Guarding. Caution other trades to comply with this stipulation.

F. Where any system runs and components are so placed as to cause or contribute to a conflict, it shall be readjusted at the expense of the contractor causing such conflict. Wessler Engineering's decision shall be final in regard to the arrangement of bus duct, conduit, etc., where conflict arises.

G. Provide offsets in system runs, additional fittings, necessary conduit, pull boxes, conductors, switches and devices required to complete the installation, or for the proper operation of the system. Exercise due and particular caution to determine that all parts of the work are made quickly and easily accessible.

H. Should overlap of work among the trades become evident, this shall be called to the attention of Wessler Engineering. In such event, none of the trades or their suppliers shall assume that they are relieved of the work which is specified under their branch until instructions in writing are received from Wessler Engineering.

1.5 Asbestos Materials

A. Abatement, removal or encapsulation of existing materials containing asbestos is not included in the Division 26 Contract. Necessary work of this nature will be arranged by the Owner to be done outside of this construction and remodeling project by a company regularly engaged in asbestos abatement. Such work will be scheduled and performed in advance of work in the construction and remodeling project.

B. If, in the performance of the work, materials are observed which are suspected to contain asbestos, the Contractor shall immediately inform Wessler Engineering who in turn will notify the Owner. Work that would expose workers to the inhalation of asbestos particles shall be terminated. Work may be resumed only after a determination has been made and unsafe materials have been removed or encapsulated and the area declared safe.

1.6 Inspection

A. All work shall be subject to inspection of Federal, State and local agencies as may be appropriate, and of the Engineer.

B. Obtain final inspection certificates and turn over to the Owner.

1.7 Record Drawings

A. Maintain a separate set of field prints of the contract documents and hand mark all changes or variations, in a manner to be clearly discernible, which are made during construction. Upon completion of the work and within 90 days of system acceptance, these hand marked drawings shall be turned over to Wessler Engineering. This shall apply particularly to underground and concealed work, and to other systems where the installation varies to a degree which would justify recording the change.

1.8 Operating and Maintenance Manuals

A. Assemble two copies each of operating and maintenance manuals for the Electrical work.

B. All “approved” shop drawings and installation, maintenance and operating instruction pamphlets or brochures, wiring diagrams, parts list, and other information, along with warranties, shall be obtained from each manufacturer of the principal items of equipment. In addition, prepare and include a chart listing all items of equipment which are furnished under this contract, indicating the nature of maintenance required, the recommended frequency of checking these points and the type of lubricating media or replacement material required. Name and address of a qualified service agency. A complete narrative of how each system is intended to operate. Major items of equipment shall consist of not less than the following:

1. Emergency generator and load transfer equipment.
2. Motor controllers and motor control centers.
3. Specialty equipment.
4. Lighting equipment and lighting controls.

C. Standard NEMA publications on the operation and care of equipment may be furnished in lieu of manufacturer's data where the manufacturer's instructions are not available.

D. Original purchase order number; date of purchase; name, address, and phone number of the vendor; warranty information.

E. Copy of required test reports.

F. These shall be assembled into three-ring loose leaf binders or other appropriate binding. An index and tabbed sheets to separate the sections shall be included. These shall be submitted to Wessler Engineering for review. Upon approval and within 90 days of system acceptance, manuals shall be turned over to the Owner.

1.9 Final Inspection and Punch List

A. As the time of work completion approaches, survey and inspect Division 26 work and develop a punch list to confirm that it is complete and finished. Then notify Wessler Engineering and request that a final inspection be made. It shall not be considered the Architect's or Engineer's obligation to perform a final inspection until the Contractor has inspected the work and so states at the time of the request for the final inspection.

B. Requests to the Engineer for final inspection may be accompanied by a limited list of known deficiencies in completion, with appropriate explanation and schedule for completing these; this is in the interest of expediting acceptance for beneficial occupancy.

C. The Architect and/or Engineer will inspect the work and prepare a punch list of items requiring correction, completion or verification. Corrective action shall be taken by the Contractor to the satisfaction of Architect and Engineer within 30 days of receipt of the Architect/Engineer's punch list.

1.10 Warranty

A. Warrant all workmanship, equipment and material entering into this contract for a period of one (1) year from date of final acceptance or date of beneficial use, as agreed to between Contractor and Wessler Engineering. Any materials or equipment proving to be defective during the warranty period shall be made good without expense to the Owner. Use of equipment for temporary electric is not the start of the warranty period.

B. This provision is intended specifically to cover deficiencies in contract completion or performance which are not immediately discovered after systems are placed in operation. These items include, but are not limited to, motor controller malfunction, heater element changes required for motor controller, fuse replacement where fuses blow due to abnormal shorts, adjustments and/or replacement of malfunctioning equipment and adjusting special equipment and communication systems to obtain optimum performance.

C. This provision shall not be construed to include maintenance items such as making normally anticipated adjustments or correcting adjustment errors on the part of the Owner's personnel.

D. Provisions of this warranty shall be considered supplementary to warranty provisions under Division 01 General Conditions.

PART 2 - PRODUCTS

2.1 Materials and Equipment

A. Materials and equipment furnished shall be in strict accordance with the specifications and drawings and shall be new and of best grade and quality. When two or more articles of the same material or equipment are required, they shall be of the same manufacturer.

B. All electrical equipment and wiring shall bear the Underwriters Laboratories, Inc. label where UL labeled items are available, and shall comply with NEC (NFPA-70) and NFPA requirements.

2.2 Reference Standards

A. Where standards (NFPA, NEC, ASTM, UL, etc.) are referenced in the specifications or on the drawings, the latest edition is to be used except, however, where the Authority Having Jurisdiction has not yet adopted the latest edition, the edition so recognized shall be used.

2.3 Equipment Selection

A. The selection of materials and equipment to be furnished shall be governed by the following:

1. Where trade names, brands, or manufacturers of equipment or materials are listed in the specification, the exact equipment listed shall be furnished. Where more than one name is used, the Contractor shall have the option of selecting between any one of the several specified. All products shall be first quality line of manufacturers listed.
2. Where the words "or approved equal" appear after a manufacturer's name, specific approval must be obtained from the Engineer during the bidding period in sufficient time to be included in an addendum. The same shall apply for equipment and materials not named in the specifications, where approval is sought.
3. Where the words "equal to" appear, followed by a manufacturer's name and sometimes a model or series designation, such designation is intended to establish quality level and standard features. Equal equipment by other manufacturers will be acceptable, subject to the Engineer's approval.

B. Substitute equipment of equal quality and capacity will only be considered when the listing of such is included as a separate item of the bid. State the deduction or addition in cost to that of the specified product.

C. Before bidding equipment, and again in the preparation of shop drawings, verify that adequate space is available for entry and installation of the item of equipment, including associated accessories. Also verify that adequate space is available for servicing of the equipment and that required NEC clearances are met.

D. If extensive changes in conduit, equipment layout or electrical wiring and equipment are brought about by the use of equipment which is not compatible with the layout shown on the drawings, necessary changes shall be deemed to be included in this contract.

2.4 Shop Drawings

A. Electronic copies of shop drawings and descriptive information of equipment and materials shall be furnished. Submit to the Architect and/or Engineer for review as stated in the General Conditions and Supplementary Conditions. These shall be submitted as soon as practicable and before equipment is installed and before special equipment is manufactured. Submittal information shall clearly identify the manufacturer, specific model number, approval labels, performance data, electrical characteristics, features, specified options and additional information sufficient to evidence compliance with the contract documents. Product catalogs, brochures, etc. submitted without project specific items marked as being submitted for review will be rejected and returned without review. Shop drawings for equipment, fixtures, devices and materials shall be labeled and identified same as on the Contract Documents. If compliance with the above criteria is not provided shop drawings will be subject to rejection and returned without review. Samples shall be submitted when requested or as specified here with-in.

B. The review of shop drawings by the Architect or Engineer shall not relieve the Contractor from responsibility for errors in the shop drawings. Deviations from specifications and drawing requirements shall be called to the Engineer's attention in a separate clearly stated notification at the time of submittal for the Engineer's review.

C. Shop drawings of the following equipment and materials shall be submitted:

1. Wireway.
2. Manholes and pull boxes.
3. Miscellaneous cabinets.
4. Wiring devices and coverplates.
5. Surge suppression.
6. Cabinets and enclosures.
7. Fuses.
8. Disconnects.
9. Manual transfer switches.
10. Emergency generator and accessories.
11. Telephone equipment and Telemitry system.

PART 3 - EXECUTION

3.1 Testing

A. As each wiring system is completed, it shall be tested for continuity and freedom from grounds.

B. As each electrically operated system is energized, it shall be tested for function.

C. The Contractor shall perform megger and resistance tests and special tests on any circuits or equipment when an authorized inspection agency suspects the system's integrity or when requested by the Architect or Engineer.

D. All signaling and communications systems shall be inspected and tested by a qualified representative of the manufacturer or equipment vendor. Submit four (4) copies of reports indicating results.

E. Tests shall be witnessed by field representatives of the Architect or Engineer or shall be monitored by a recorder. Furnish a written record of each system test indicating date, system, test conditions, duration and results of tests. Copies of all test reports shall be included in the O&M manuals.

F. Instruments required for tests shall be furnished by the Contractor.

3.2 Equipment Cleaning

A. Before placing each system in operation, the equipment shall be thoroughly cleaned; cleaning shall be performed in accordance with equipment manufacturer's recommendations.

B. Refer to appropriate Sections for cleaning of other equipment and systems for normal operation.

3.3 Operation and Adjustment of Equipment

A. As each system is put into operation, all items of equipment included therein shall be adjusted to proper working order. This shall include balancing and adjusting voltages and currents; verifying phase rotation; setting breakers, ground fault and other relays, controllers, meters and timers; and adjusting all operating equipment.

B. Caution: Verify that all bearings of equipment furnished are lubricated, all motors are operating in the right direction, and correct drive settings and overload heater elements are provided on all motors. Do not depend wholly on the other trades judgment in these matters. Follow specific instructions in regard to lubrication of equipment furnished under this Contract.

3.4 Operating Demonstration and Instructions

A. Set the various systems into operation and demonstrate to the Owner and Wessler Engineering that the systems function properly and that the requirements of the Contract are fulfilled.

B. Provide the Owner's representatives with detailed explanations of operation and maintenance of equipment and systems. A thorough review of the operating and maintenance manuals shall be included in these instructional meetings.

C. A minimum of 48 hours continuous trouble-free operating time shall be acceptable to prove that the systems function properly.

END OF SECTION

H26 05 04 BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 Temporary Electric Services

A. The temporary service and temporary lighting for construction is provided by the Contractor. Refer to Division 01 - General Requirements.

B. The Contractor is cautioned to carefully consider the possible sources of temporary electric service and the probable location of the General Contractor's office.

C. The General Contractor will make application to the local utility company for the temporary electric service and will pay for all electric power used during construction, including electric heating.

D. The Contractor shall furnish, install and pay for all necessary conduit, wire, metering, poles, switches, receptacles, lights and accessories to provide a 400 amp, 120/208 volt, 3 phase, 4 wire temporary electric service with the main disconnect switch, meter, and a 42 circuit load center at a location specified by the General Contractor.

E. Consult the utility company for fees required and include same in Electrical Contract.

F. Labor, receptacles, boxes, fixtures, wire, etc. required by the various Contractors inside their offices shall be paid for by the respective Contractors.

G. Lighting fixtures shall be placed every 40 ft. along each corridor or, where corridors do not occur, along the long axis of all rooms and areas greater than 25 ft. in length. Provide a 200 watt (or LED equivalent) lamp in a rubber coated socket with wire guard, spliced into branch feeder conductor at every 20 ft. The branch circuit wiring may be 3 wire type "NMC" and the wire guard shall be bonded to the ground conductor. Receptacle circuits shall consist of 1 gang handy box with grounded duplex receptacles a maximum of 50 ft. on center with a maximum of 4 per circuit. All receptacle circuits shall be protected by its own overcurrent device in a panelboard. Install wiring and equipment above 6 feet 6 inches and below the finished ceiling. Extend circuits as required and protect in an appropriate panelboard on each floor level. Provide GFCI protected receptacles and circuits as required by NEC and OSHA.

H. Contractors requiring extension cords shall provide their own cords and plugs up to capacity of 20 amperes. For services to larger items of equipment and welders, this Contractor shall extend proper feeders as requested at the expense of the Contractors requiring the service.

I. The Contractor shall maintain the temporary light and power system for the duration of the work and shall remove it from the site when directed or no longer required as coordinated with the construction team.. Temporary wiring and equipment shall remain the property of the Contractor.

J. The use of the permanent electrical system for temporary services during the latter stages of construction shall be allowed. Expedite completion of system as practicable to this end. Maintain the system during this period.

K. Warranty periods on equipment, materials and systems shall commence upon Owner acceptance of the building or systems. Temporary use shall not jeopardize or alter warranty requirements.

L. The complete temporary service shall comply with Power Company, OSHA, and all Code requirements.

1.2 Continuity of Service

A. Work shall be so planned and executed as to provide reasonable continuous service of existing systems throughout the construction period. Where necessary to disrupt services for short periods of time for connection, alteration or switch over, Wessler Engineering shall be notified in advance and outages scheduled at the Owner's reasonable convenience.

B. Submit, on request, a written step-by-step sequence of operations proposed to accomplish the work. The outline must include tentative dates, times of day for disruption, downtime and restoration of services. Submit the outline sufficiently in advance of the proposed work to allow the Architect or Engineer to review the information with the Owner. Upon approval, final planning and the work shall be done in close coordination with the Owner.

C. Shutdown of systems and work undertaken during shutdowns shall be bid as being done during normal working hours. If the Owner should require such work be performed outside of normal working hours, reimbursement shall be made for premium time expenses only, without mark up.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 Workmanship

A. Materials and equipment shall be installed and supported in a first-class and workmanlike manner by mechanics skilled in their particular trades. Workmanship shall be first-class in all respects, and the Architect and Engineer shall have the right to stop the work if highest quality workmanship is not maintained.

B. Electrical work shall be performed by a licensed Contractor in accordance with requirements of the jurisdiction.

3.2 Protection

A. The Contractor shall be entirely responsible for all material and equipment furnished in connection with their work. Special care shall be taken to properly protect all parts thereof from theft, damage or deterioration during the entire construction period in such a manner as may be necessary, or as directed by the Architect.

B. The Owner's property and the property of other contractors shall be scrupulously respected at all times. Provide drop cloths and visqueen or similar barriers where dust and debris is generated, to protect adjacent areas.

3.3 Cutting and Patching

A. Refer to Division 01 - General Requirements for information regarding cutting and patching.

B. Plan the work well ahead of the general construction. Where conduits, cable trays, bus ducts and wireways are to pass thru walls, partitions, floors, roof or ceilings, place sleeves in these elements or arrange with the General Contractor to provide openings where sleeves are not

practical. Where sleeves or openings have not been installed, sawcut or core drill holes and patch as required for the installation of this work, or pay other trades for doing this work when so directed by Wessler Engineering. Any damage caused to the building in this work shall be repaired or rectified.

C. All sleeves and openings not used or partially used shall be closed to prevent passage of smoke and fire.

3.4 Cutting and Patching

A. Refer to Division 01 - General Requirements for information regarding cutting and patching.

B. Plan the work well ahead of the general construction. Where conduits, cable trays, bus ducts and wireways are to pass thru new walls, partitions, floors, roof or ceilings, place sleeves in these elements or arrange with the General Contractor to provide openings where sleeves are not practical. Where sleeves or openings have not been installed, cut holes and patch as required for the installation of this work, or pay other trades for doing this work when so directed by Wessler Engineering. Any damage caused to the building shall be repaired or rectified.

C. Where conduits, cable trays, bus ducts and wireways are to pass thru, above or behind existing walls, partitions, floors, roof or ceiling, cutting, patching, refinishing and painting of same shall be included in this contract. Core drilling and saw cutting shall be utilized where practical. Contractor to examine where floors and walls etc. are to be cut for presence of existing utilities.

D. All sleeves and openings not used or partially used shall be closed to prevent passage of fire or smoke.

E. All materials, methods and procedures used in patching and refinishing shall be in accordance with applicable provisions of specifications governing the various trades and shall be completed by skilled workmen normally engaged in these trades. The final appearance and integrity of the patched and refinished areas must meet the approval of the Architect. Wall, floor and ceiling refinishing must extend to logical termination lines (entire ceiling of the room repainted, for instance), if an acceptable appearance cannot be attained by finishing a partial area.

F. Provide steel angle or channel lintels to span openings which are cut in existing jointed masonry walls where the opening span exceeds 16 inches. Provide framing around roof openings for required support of the roof deck.

3.5 Removals, Alterations and Reuse

A. Refer to the drawings for the scope of remodeling in the existing building.

B. Cooperate with the General Contractor Wessler Engineering regarding all removal and remodeling work. The Contractor shall remove existing work which is associated with their trade, and which will be superfluous when the new system is installed and made operational. Void unused conduit behind walls or below floors as necessary or as directed. No wire or conduit shall be removed which will impair the functioning of the remaining work unless first replaced with a rerouted section of wire or conduit to ensure continuity. Remove inactive wiring back to the last active junction box, panelboard or piece of equipment.

C. Upon completion, no unused conduit or stub shall extend thru floors, walls or ceilings in finished areas. Abandoned conduit where remaining in place shall have any unused wiring removed. All accessible unused conduit shall be removed.

D. When it is necessary to reroute a section of an active circuit, the rerouted section shall be installed before removing the existing in order to minimize system down time. Rerouted sections shall be installed as required for new work.

E. Materials and equipment which are removed shall not be reused within the scope of this project unless specifically noted to be relocated or reused. Turn over to the Owner and place where directed on the premises all removed material and equipment so designated by the Owner. All material and equipment not claimed by the Owner after a reasonable time frame shall become the property of the Contractor responsible for removal and shall be removed from the premises.

F. Remove, store and reinstall lay-in ceiling tile and grid as needed to perform work in areas where such removal and re-installation is not to be done by the General Contractor. Damaged tile and/or grid shall be replaced with new matching tile and/or grid.

G. In areas of minor work where the space is not completely vacated, temporarily move portable equipment and furnishings within the space as required to complete the work. Coordinate this activity with Owner. Protect the Owner's property by providing dust covers and temporary plastic film barriers to contain dust. Remove barriers and return equipment and furniture upon completion of the work.

H. Refinish any surface disturbed under this work to match existing, except where refinishing of that surface is included under the General Contract.

3.6 Painting

A. In addition to any painting specified for various individual items of equipment, the following painting shall be included in Division 26:

1. Ferrous metal which is not factory or shop painted or galvanized and which remains exposed to view in the mechanical rooms, storage rooms, and other unfinished areas shall be given a prime coat of paint and two finish coats of paint.
2. Ferrous metal installed outside the building which is not factory or shop painted or galvanized shall be given a prime coat of paint and two finish coats of paint.
3. Equipment and materials which have been factory or shop coated (prime or finished painted or galvanized), on which the finish has been damaged or has deteriorated, shall be cleaned and refinished equal to its original condition. The entire surface shall be repainted if a uniform appearance cannot be accomplished by touch up.
4. Apply Z.R.C. Galvilite cold galvanizing compound, or approved equal, for touch-up and repair of previously galvanized surfaces.

B. Paint, surface preparation and application shall conform to applicable portions of the Painting section of Division 09 of the Specifications. All rust must be removed before application of paint.

C. Finish painting is included in the General Contract except where otherwise required under remodeling work. Refer to the Cutting and Patching paragraph in this Section for finishing requirements.

END OF SECTION

H26 05 09 EXCAVATION, BACKFILL AND SURFACE RESTORATION

PART 1 - GENERAL

1.1 Excavate for exterior ducts, conductors, conduit, and incidental work which are included in the Electrical contract. Backfill to finish grade or to levels consistent with the General Contractor's and the Site Contractor's activities. Repair or restore exterior surfaces to original condition where such are not affected by Division 31 – Earthwork or Division 32 Exterior Improvements. All work shall comply with requirements set forth in Division 31 and 32.

1.2 Excavation and trench wall supporting, cribbing, sloping and stepping of excavations required for safety shall be done in accordance with OSHA and local requirements. Pumping of water from excavations and trenches which may be required during construction shall be included in the contract.

1.3 Contact the Ohio Utilities Protection Service 8-1-1 or (1 800 362 2764) sufficiently in advance of the start of any excavation so that notification can be made to member utility departments and utility companies (water, sewer, gas, petroleum, electric, telephone, cable, etc.) having underground utilities in or near the project area. Also contact those companies to verify that utility lines have been located and duly marked and identified.

1.4 A utility locator service shall be engaged to locate, mark and identify private lines and other utilities that are not located by the means mentioned above.

1.5 Existing utilities encountered during excavation work shall be protected in a manner acceptable to the utility owner. Any utilities that are damaged shall be repaired or replaced by this Contractor to the full satisfaction of the utility owner.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 Exterior trenches shall be over excavated and the duct, conductor or conduit shall be laid on 4 inches minimum depth sand bed. Where ductbank is concrete encased, excavate to required depth, if fill or backfill needed under ductbank use washed pea gravel or crushed limestone and compactt.

3.2 Backfilling of excavations and trenches inside the building and outside under paved or other hard surfaced areas, shall be with graded pea gravel, graded coarse sand or crushed limestone 0.75 inch maximum size, to prevent undue settlement. Backfill material for non-metallic conduit shall be pea gravel or sand. Other excavations and trenches shall be backfilled with similar materials or with excavated material up to 18 inches above the top of the conduit. The remainder shall be with similar materials or with excavated material having no large clots, stones or rocks.

3.3 Backfill shall be mechanically compacted in layers not over 6 inches deep. Water settling will not be permitted. Where excavations have not been properly filled or where settlement occurs, they shall be refilled, compacted, smoothed off, and finally made to conform to the initial requirements. Excess excavated materials shall be removed from the site or disposed of as directed by the General Contractor. Refer to Division 31 Earthwork for compaction requirements.

3.4 Concrete floor slabs, paving, sidewalks, curbs, sodded and other finished surfaces which have been damaged or removed in order to install the underground work shall be replaced by this Contractor equal to original conditions. This requirement is not applicable in areas where the General Contractor or the Site Contractor is obligated to provide new surfaces.

3.5 Maintain in place adequate barricades, guards, planking, plating, signage, warning lights, etc., at and around excavations.

3.6 All exterior underground conduit, concrete encased ducts, and direct buried conductors shall be protected against future excavation damage by placing a plastic tape warning marker in each trench during backfill. Tape shall be 6 inches wide with black letters identifying the type of service. Tape shall be equal to that manufactured by Seton. Install tape full length of the trench approximately 18 inches above and on the centerline of the conduit, duct or conductor.

END OF SECTION

H26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS

PART 1 - GENERAL

1.1 This section pertains to the use of copper conductors, 600V insulation class.

PART 2 - PRODUCTS

2.1 All conductors shall be copper: conductors shall be insulated for 600 volts.

2.2 Insulation types referenced are those of NEC. All conductors shall be UL labeled and shall be marked for size and type at regular intervals on its length. Conductors #8 and larger shall be stranded; #10 and smaller may be stranded provided approved terminations are used.

2.3 Types of conductor insulation for general use may be any of the following, subject to limitations listed, in addition to those in the NEC:

A. Type THHN - restrictions - do not use for conductors in slab. Do not use in wet locations.

B. Type THWN - no restrictions.

C. Type XHHW - no restrictions.

2.4 Use shielded VFD cables for feeds from VFD to motor where conductor length is longer than 25 feet. VFD cable shall be 3 conductor XHHW low capacitance copper, full size insulated copper ground, 1.5 mil AL foil and 85 percent tinned copper woven braid shield with PVC oil and sunlight resistant jacket. UL TC-ER, 90 degrees C., 600V wet/dry. Manufactured by Belden, AWC, Lutze or equal.

2.5 Use only Type XHHW for isolated ungrounded branch circuit wiring such as monitored wiring in hospital operating and special procedures and X ray rooms. Refer to Section "Hospital Specialty Equipment".

2.6 Use Type THHN or XHHW, (90 degrees C. rated) types for connecting luminaires and for running thru fixture housings.

2.7 Use conductors such as type FEP with high temperature insulation as identified in the NEC for connections to resistance heating elements or in other areas subject to temperature exceeding the rating of THWN, XHHW or THHN.

2.8 Color Coding – The use of colored commercial building wire is encouraged.

A. On 208/120 volt, three phase and 240/120 volt, single phase grounded systems, wires colored black, red and blue shall be used for phase conductors. Neutral wires on these systems shall be white. If conductors No. 4 AWG or larger are not available in white or white stripes, the neutral may be a black wire identified with white tape, minimum size 0.50 inch wrapped twice around at the following points:

1. At each terminal.
2. At each conduit entrance.
3. At intervals not more than 12 inches apart in all accessible enclosures.

B. On 480/277 volt, three phase system, wires colored brown, orange and yellow shall be used for phase conductors. Neutral wires on these systems shall be gray or other NEC acceptable means for distinguishing each system grounded conductor from another. If conductors No. 4

AWG or larger are not available in the proper colors, black wire may be used with 0.50 inch tape bands of the proper color at the following points:

1. At each terminal.
2. At each conduit entrance.
3. At intervals not more than 12 inches apart in all accessible enclosures.

C. Equipment grounding conductors shall be green, or for 4 AWG and larger may be completely taped green, at all accessible points.

D. All control circuits shall be red with individual wire identification on each conductor.

E. Where existing wiring systems (remodel work or building additions) have different color coding, consult the Engineer concerning matching existing wire color coding and phasing.

2.9 Wire size ampacity shall equal or exceed its overload protective device. Where wire sizes shown on the drawings are greater than the apparent ampacity requirements, the size shown shall prevail to compensate for voltage drop. In no instance shall conductors be installed that are less than required by N.E.C. Minimum conductor size shall be No. 12 AWG except No. 14 AWG may be used only for control wiring or where otherwise specifically shown.

2.10 When necessary to use a lubricant for pulling wires, lubricant must be listed by Underwriters' Laboratories, Inc. Only cable lubricants approved for the type of jacket material or insulation shall be used, and must be of such consistency that it will dry completely when exposed to air. Lubricant must leave no obstruction or tackiness that will prevent pulling out old wires or pulling in new wires or additional wires, and, after drying, must leave a film of lubrication which will promote easy movement of the wires. The lubricant shall contain no waxes, greases, silicones, or polyalkylene glycol oils or waxes. Lubricant shall be Ideal "Yellow 190", 3M “WL”” Wire Pulling Lubricant, or approved equal.

2.11 Splices No. 10 AWG and smaller shall be made using the following:

A. Preinsulated spring pressure connectors as follows: ITT Holub "Freespring", with metal grip threads 3M "Scotch-Lok", Ideal "Wingnut", Thomas and Betts Type "PT", or Buchanan "B Cap". Other hard insulated wire connectors which have bakelite or ceramic insulation are prohibited. (Non-metallic thread connectors shall not be used.)

2.12 Splices No. 8 AWG and larger shall be made using the following:

A. Approved crimp type connectors with special crimping tool; T&B, Burndy, Buchanan or approved equal. Joints and free ends shall be covered with tape or approved moistureproof insulating kits. Applied insulation shall exceed 150 percent of conductor insulation voltage rating.

B. For two or more taps use Power Distribution Blocks by Square D, Gould, Taylor, Ilsco or Connectron.

2.13 Wiring in vertical raceways shall be supported with strain relief devices; Kellem's grips or approved equal.

2.14 Connections to equipment shall be made with pressure type terminals. On stranded wire, use spade type terminals or terminals approved for use with stranded wire. Connections shall contain only single conductors unless approved for multiples.

A. For conductors No. 10 AWG and smaller, applied crimp type terminals shall be T&B "Sta Kon" or approved equal.

B. For No. 8 AWG and larger conductors, applied crimp type terminals shall be Burndy, T&B or approved equal.

2.15 Where tape is applied over wires and connectors on 600 volt or lower voltage applications, it shall consist of a minimum of two (2) half lapped layers of Scotch "88" or Plymouth No. 4240 for both indoor and outdoor applications, except Scotch 33 Plus or Plymouth No. 4453 is acceptable for use indoors.

2.16 Where fireproofing of cables is noted on the drawings or required by Code, each cable shall be arc and fireproofed with one (1) half lapped layer of Scotch Brand 77 Electric Arc and Fireproofing Tape. Tape shall be secured with a 2 layer band of Scotch Brand 69 Glass Electrical Tape over the last wrap. Installation shall comply with manufacturer's recommendation.

2.17 Where installed underground, splices and terminations shall be listed and approved for waterproof application. Utilize kits approved for the application.

PART 3 - EXECUTION

3.1 Branch circuit conductor identification means shall be permanently posted at each panelboard and switchboard. This identification shall be installed on the inside of the door and shall identify conductor colors for each voltage system in the building. Provide identification at all new panelboards and existing panelboards utilized within this project.

3.2 Conduit systems shall be clear and clean before pulling wire. Branch circuit conductors shall be pulled without resorting to levers or heavy pulling devices.

3.3 Cable pulling tensions shall not exceed recommended values.

3.4 Group ungrounded and grounded circuit conductors for each multiwire branch circuit by cable ties in panelboards and tap boxes.

3.5 Each branch circuit or multiwire branch circuit shall have its own dedicated neutral. Group neutral conductors with phase conductors by wire ties in each enclosure where multiple neutrals provided.

3.6 Shielded VFD cables shall be provided for VFD to motor conductors length longer than 25 feet. VFD motor feed cables shall be terminated per VFD manufacturer’s direction.

3.7 Control conductors shall not be run in same raceway with branch circuit or motor circuit conductors.

3.8 Unless noted otherwise on the drawings, a maximum of 8 conductors shall be installed in a branch circuit conduit. This maximum is a count of all phase and neutral conductors only, ground conductors are not counted when determining maximum fill for this purpose.

3.9 Wire tags shall be provided on all main and feeder conductors in all pull boxes, wireways and panelboard and switchboard wiring gutters. Tags shall identify wire or cable number and/or equipment served. Tags shall be of flame resisting adhesive material, T&B Type WSL or approved equal.

3.10 Perform meggar tests on all feeders and motor branch circuit conductors prior to energization of circuits. Provide documentation in standard NETA format to the Engineer for review. Do not run meggar check on solid state equipment.

END OF SECTION

H26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 Work includes grounding and bonding of system neutral, equipment and conduit systems to conform to requirements of NEC and as detailed on the plans and in the specifications.

PART 2 - PRODUCTS

2.1 Grounding rods shall be copper clad, molten-welded copper to steel; unless otherwise designated, 0.625 inch diameter x 10 ft. long.

2.2 Clamps and continuity devices shall be non-ferrous material, UL approved. Connections to ground rods and all underground connections shall be "Thermoweld" or "Cadweld".

2.3 Ground conductors shall be insulated, identified by green insulation or by painting or taping green at all accessible locations and shall be connected with approved connectors and terminators to boxes, devices, equipment, etc. and to ground bars in panels.

PART 3 - EXECUTION

3.1 Provide a listed intersystem bonding termination system with capacity for a minimum of 5 - #4 - 4awg and 1 - #6 – 2 awg bonding conductor terminations. Locate external to the service entrance equipment and connect to the grounding electrode system.

3.2 Wiring devices shall be connected with grounding jumper from ground pole on device to grounding screw in the outlet box. Branch circuit to be connected to grounding screw in the outlet box.

3.3 Grounding Bus: Install in electrical service equipment space, telephone equipment rooms, generator room, battery rooms, below raised floors, and elsewhere as indicated.

A. Bus shall be minimum 3/8 inch x 2 inches x 12 inches L. solid copper.

B. Install bus on insulated spacers 1 inch, minimum, from wall 6 inches above finished floor, unless otherwise indicated.

C. The grounding bars shall be bonded to the building grounding electrode system and the building ground ring.

3.4 The complete metal conduit system shall be used for the equipment grounding system. Conduit systems and associated fittings and terminations shall be made mechanically tight to provide a continuous electrical path to ground and shall be safely grounded at all equipment by bonding all metallic conduit to the equipment enclosures with locknuts cutting thru paint or enclosures. Bond all conduits entering emergency generator control panel and main breaker panel, and secondary service entrance switchboard panelboard with a ground wire connecting the grounding type bushings to the equipment ground bar. Conductors shall be sized per NEC Tables 250.66, 250.102 and 250.122. Bond all communications conduit systems to ground.

3.5 In addition to using the conduit system for grounding, a complete auxiliary green wire equipment grounding system shall be installed, continuous from main ground, thru distribution and branch circuit panelboards and paralleling all feeders and branch circuit wiring. Grounding conductor sizes shall comply with NEC Table 250.122, minimum size shall be #12 copper except #14 on control circuits. This shall apply to all circuits rated 100 volts or more above ground potential.

A. Connect ground terminal on wiring devices to auxiliary green wire equipment grounding system.

3.6 Motor frames shall be bonded to the equipment grounding system by an independent green insulated copper wire, sized to match equipment grounding conductor. Motors with VFD shall be bonded with flat braided tinned copper straps in lieu of wire.

3.7 Cord connected appliance frames shall be grounded to the equipment grounding system thru a green wire in the cord.

3.8 Equipment mounted on vibration isolation hanger and supports shall be bonded so bond does not transmit vibration. Size bond to match equipment ground conductor.

3.9 A green grounding conductor shall be installed in each non-metallic conduit and all flexible conduits, including exterior underground conduits.

3.10 System neutral connections shall be insulated from metal enclosures except at the neutral of the service entrance equipment and on the neutral of a separately derived system. Connections to the main switchgear enclosure shall be by means of bonding jumpers.

3.11 The building neutral shall be identified throughout with white conductors. Where there are neutral conductors from a separately derived system (such as 120/208 volt, 3 phase, 4 wire where the main building service is 277/480 volt, 3 phase, 4 wire) the neutrals of the two systems shall be separately identifiable per NEC Article 200.

3.12 Where a 277/480 volt emergency generator is provided on a system having ground fault protection on the normal service and the generator is located in the vicinity of the main electric service equipment, isolate the generator neutral from the generator frame. The generator neutral will be grounded through the main electric service grounding electrode. Bond the generator frame to the equipment grounding conductor. Provide signs at the grounding locations per NEC 700.7 and 701.7.

3.13 Connections to driven ground rods or other such electrodes shall be a minimum of three feet from the foundation wall or beyond the roof drip line, whichever is greater.

3.14 Provide sign at normal service “WARNING – SHOCK HAZARD EXISTS IF GROUNDING ELECTRODE CONDUCTOR OR BONDING JUMPER CONNECTION IN THIS EQUIPMENT IS REMOVED WHILE ALTERNATE SOURCES(S) IS ENERGIZED”.

END OF SECTION

H26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 This specification section covers common conduit systems, boxes, and sleeves. Where other methods are specified under separate sections for specific applications, the specific application requirements shall govern.

1.2 Refer to Section “Communication System Pathways and Support Equipment” for future communication system.

PART 2 - PRODUCTS

2.1 Conduit Type - Application (Use only conduit types listed)

A. Conduit - Rigid or Intermediate Grade Galvanized Threaded.
Application - restrictions - (Not to be used in):

1. Direct buried in corrosive soils.
2. Corrosive atmospheres.

B. Conduit - Thinwall EMT.
Application - restrictions - (Not to be used in):

1. Poured concrete.
2. Exposed to weather.
3. Underground.
4. Exposed in mechanical equipment or other equipment/process rooms below 48 inches.
5. Hazardous or corrosive atmospheres.

C. Conduit - PVC Type 40 (Schedule 40) rigid, conforming to ANSI, NEMA specifications and each length UL labeled.
Application - use limited to:

1. In or under concrete slabs on grade where permitted by electric legend on the drawings.
2. Exterior use when encased in 3 inch concrete.
3. Direct buried, underground when indicated on drawings.

D. Conduit - Flexible Metal (Greenfield type), galvanized steel.
Application - use limited to:

1. Connection to lighting fixtures; not over 6 ft. in length. Note: Metal-Clad Cable: Type MC may be used for fixture whips only; must contain green insulated ground conductor, be limited to 6 ft. in length and must use UL approved connectors.
2. Narrow movable partitions where other raceways are not practicable, when approved by the Architect or Engineer.
3. Connections to transformers, dynamic equipment and for motors only when in air streams or plenums.
4. In existing walls for remodel projects, vertical drops to outlets and switches; no more than 3 ft. out the top of the wall.

E. Conduit - Liquidtight Flexible Metal.
Application - use and limitations:

1. Connections to all motors, except in air stream or plenum.

2. Connections to controls on dynamic equipment, transformers, etc., outdoors and indoors in wet locations.
3. Use not permitted underground or where subject to physical damage.

2.2 Conduit sizes

A. Conduits shall be 0.75 inch minimum size except 0.50 inch size may be used for switch legs and flexible connections to lighting fixtures.

2.3 Conduit Fittings

A. Fittings and workmanship shall ensure electrical continuity. All conduit systems in poured concrete shall be concrete tight.

B. Application of bushings, locknuts and insulated fittings shall comply with NEC requirements.

C. Use conduit fittings as manufactured by Efcor, Steel City, Raco, Midwest, Appleton, ETP / O-Z / Gedney, American Fitting Corporation or T&B, equal to the following catalog numbers:

1. Rigid and intermediate conduit
   - all fittings, couplings and connectors shall be threaded type.
   - grounding bushings, malleable iron; insulated; Steel City BG-801; Midwest Series GLL.
2. EMT
   - fittings shall be all steel, set screw or compression type, concrete tight.
   - set-screw type couplings; Midwest Series 460; Steel City TK 121; Appleton TW 50S.
   - compression type couplings; Midwest series 660S; Steel City TK111; Appleton TWC50CS.
   - set-screw type connectors; Midwest Series 450; Steel City TC 121; Appleton TWC 50S.
   - compression type connectors; Midwest Series 650; Steel City TC111; Appleton TW50CS.
3. Flexible metal conduit
   - malleable iron, "squeeze" type, non-insulated; Midwest series 1708; Steel City XC 901; Appleton 7481V. (For lighting fixture whips only - all steel or die cast screw in connector; Midwest 771; Steel City XC 241; Appleton SGC 50DC).
4. Liquid tight conduit
   - steel or malleable iron; Midwest Series LT; Steel City LT 100; Appleton ST.
5. PVC Type 40 and Type TC-6
   - couplings and fittings socket type solvent weld, coupling and solvent by same manufacturer as conduit.

A. Junction boxes and pull boxes shall be code gauge galvanized steel with multiple screw fasteners and galvanized steel covers.

B. Outlet boxes all steel construction with galvanized or plated finish or otherwise all metal, by Steel City, Appleton, Crouse Hinds, R&S or Raco.
1. Lighting fixture outlet boxes 4 inches square or octagonal, 2.125 inches deep, with 0.375 inch fixture studs. Equal to Steel City Series 54171; Series 52171 with FE 421 stud. Fixtures weighing more than 50 lbs. shall be supported independently of the outlet box.
2. Flush mounted device outlet boxes shall be minimum 4 inches square. Provide extension rings as required. Use Erico Caddy No. H2-3 mounting support plate where metal studs are used.
3. Device rings in finished masonry or tile walls shall be square corner masonry type with no extended ears, to allow flush mounting of plates.

4. Surface mounted device boxes shall be cast "FS" type or special surface mounted boxes for use with surface raceway systems.

C. Floor boxes shall be UL listed for its application as manufactured by Hubbell, Steel City, Walker, Raco or Wiremold. Drawings identify material type.

D. Provide water tight boxes, slip expansions and bonding jumpers where dictated by construction conditions.

E. Terminations at boxes shall be secured by locknuts or approved bushings.

2.4 Surface Metal Raceways

A. Snap on cover types by Mono-Systems, Panduit or Wiremold / Walkermold with prime gray finish (enamel finish coat to match room finishes in remodel areas). Application - permitted only when specifically shown on the drawings.

1. Fittings, boxes and extension rings: Furnish manufacturer's standard accessories; match finish of raceway.

2.5 Sleeves and Openings

A. Sleeves and formed openings shall be placed in walls, partitions, floor slabs and poured concrete roof decks for the passage of conduit, cable, wireway, cable tray and bus duct. Sleeves and formed openings are not required:

1. In floor slabs on grade.
2. Where conduit is installed before the wall, partition or slab is constructed.
3. Openings are cut for conduit passage and patched with equal or comparable material to close the space around the conduit.
4. In stud and gypsum board or plaster walls and partitions which are not fire rated.
5. For conduit passing thru masonry walls and partitions and stud and gypsum board or plaster walls and partitions. Sleeves are required however, for which expansion, contraction and other movement can be expected.
6. In core drilled openings in solid concrete not requiring water protection.
7. In large floor openings for multiple pipe and duct risers which are within a fire rated shaft, unless the opening is to be closed off with concrete or other material after conduits are set.
8. Sleeves for passage of conduit and cables shall be schedule 40 black steel pipe or galvanized rigid conduit. Rectangular sleeves for cables, wireway, cable tray and bus duct shall be 18 gauge galvanized steel in poured concrete floors, walls and roof decks; 26 gauge galvanized sheet steel in other than poured concrete.
9. Sleeves shall be sized to afford 0.25 inch to 0.75 inch clearance space.

2.6 In areas having special membrane waterproofing in or on the floor slab, a Josam 26420, or equal approved by the Architect, riser sleeve with clamping ring and auxiliary conduit sleeve extending 4 inches above finished floor or 8 inches above finished roof shall be used. Waterproofing membrane for roof and floor construction shall be secured by the clamping ring. These are to be used in areas having special membrane water-proofing in or on the floor slab and at roof decks.

2.7 Escutcheon plates shall be split-ring chromium plated pressed steel. Plates shall be sized to cover the surface penetration and sleeve. Plates shall be installed on exposed piping in finished rooms and areas where conduits penetrate walls, floors, ceilings or overhead structure.

2.8 Anchors and Fasteners

A. Anchors and fasteners shall be of a type designed and intended for use in the base material to which the material support is to be attached and shall be capable of supporting the intended load and withstanding any associated stresses and vibrations.

B. In general, screws shall be used in wood, masonry anchors on concrete or brick, toggle bolts in hollow walls, and machine screws, bolts or welded studs on steel.

C. Nails shall not be used except for temporary support or for light loads in wood frame construction.

D. In outdoor locations or other corrosive atmospheres, the anchors and fasteners shall be non-corrosive or have suitable corrosion resisting coatings.

PART 3 - EXECUTION

3.1 Conduit shall be run concealed in all finished areas of new construction and elsewhere unless specifically indicated or upon specific permission by the Architect. All conduit shall parallel building lines.

3.2 Conduit shall be run overhead and shall not be run in or below concrete slabs unless specifically indicated on the drawings and in the legend on the drawings.

3.3 All conduits installed below concrete slab on grade shall have a minimum of 6-inches fill over the conduits in order to prevent accidental damage to conduits should the floor be saw-cut in the future.

3.4 Conduit crossing building expansion joints shall have expansion provisions with grounding continuity; use special expansion fittings or other NEC approved method. Refer to the Architectural and Structural floor plans and details for locations of expansion joints.

3.5 Boxes not otherwise accessible in ceilings and walls shall be made accessible by installation of hinged door access panels. Refer to Section 26 05 04 - Basic Electrical Materials and Methods.

3.6 Work shall be so planned as to:

A. Minimize the number of offsets and junction boxes. For feeder conduits, use all long radius conduit bends or accessibly located large junction boxes with screw covers.

B. Generally run conduit and conductors as high as practicable against underside of floor slab in concrete construction or immediately below the top chord of bar joist construction unless otherwise shown. This high level zone shall be used for running electrical raceways. Running conduits promiscuously at various levels and directions will not be acceptable. Runs at bottom chord level or ceiling grid level will not be acceptable.

C. Coordinate activity in advance to avoid interference with other trades.

D. Provide access to all junction and pull boxes.

E. Maintain 6 inches from conduit to paralleled hot water piping and 4 inches from cross piping and 12 inches from generator exhaust piping.

3.7 Secure feeder conduit to basic structural elements with galvanized strap hangers and clamps; use of trapeze type hangers is encouraged for multiple conduits where space will permit. Galvanized metal clamps and screws may be used for attaching and supporting branch circuit conduit. Non-metallic fasteners shall not be used except plastic inserts may be used in concrete for small conduits. Vertical conduits shall be supported at each floor by clamps.

3.8 Surface mounted horizontal and vertical conduit supports on walls up to a height of 7 feet-0 inches above the floor shall be one or two hole sheet metal pipe straps. Pinch type hangers similar to Minerallac type may only be used at heights greater than 8 feet-0 inches. The use of pinch type hangers similar to Minerallac type are expressly prohibited on ductwork, air handling units and other mechanical equipment below 8 feet-0 inches.

3.9 During construction temporarily cap open ends of conduit. Caution trades to take special care of runs in concrete slabs during pouring.

3.10 Empty conduit installed for communications use or for future systems shall have an insulated pull wire or heavy nylon cord inserted for use in pulling wires.

3.11 Pull mandrel or large swab thru conduit to ensure freedom from debris before pulling wires. Use pulling lubricants sparingly.

3.12 Sleeves for passage of conduit, cables, wireway, cable tray and bus duct shall be placed in the initial stages of construction before concrete, masonry and other general construction activity. Means shall be taken to ensure that the sleeve will not move during or after construction. Beams, columns and other structural members shall not be sleeved except upon approval of the Architect.

3.13 Length of wall sleeves shall be such that the sleeve ends are substantially flush with both sides of the wall or partition. Floor sleeves shall be flush with the bottom and top of the floor slab except, in mechanical rooms and other areas which might have water on the floor, sleeves shall project a minimum of 1 inch above finished floor.

3.14 Where firestopping is not required, the annular space between the sleeve, core drilling or opening and the conduit, cable, cable tray, bus duct and raceway shall be closed with caulking to retard the passage of smoke.

3.15 Where permitted by OBC Section 712 Penetrations, metallic conduits requiring no pipe sleeves in passing thru concrete floors or concrete or masonry walls and partitions, the annular space shall be closed full depth of the penetration with materials and methods compatible with the floor, wall or partition material (concrete, grout or mortar).

3.16 Conduits, wire and cables entering from outside the building shall be sealed water and moisture tight. Seal between conduit and sleeves, conduits and core drilled holes and around conductors inside conduits. Delete paragraph 2.7 and 3.23 if project does not have conduits penetrating the roof deck.

3.17 Conduit, wire and cable, where exposed to different temperatures, shall have raceway or sleeve filled with approved material to prevent circulation of warm air to cold.

3.18 Power actuated fasteners of any type are prohibited in occupied buildings. This includes anchors which are driven into place by any device which produces an impact force by use of a powder charge, compressed air, gas or any other propellant.

3.19 All conduit terminations to be equipped with locknuts and bushings. Conduits 1-1/2 inches and larger shall have insulating bushings, grounding lug and shall have locknuts inside and outside the enclosure.

3.20 Outlet Box Installation

A. Set box square and true with finished building surfaces and trim.

B. Secure boxes firmly to building structure.

C. Verify location of outlets and switches in finished rooms with Architectural Drawings of interior details and finish. In centering outlets and locating boxes, allow for overhead pipes, ducts and mechanical equipment, variations in fireproofing and plastering, window and like, and correct any inaccuracy from failure to do so without expense to the Owner.

D. Maintain symmetry of all outlets as closely as possible contained within Architectural Elevation. For example, the Contractor shall center light fixture over doorway or receptacle in section of masonry wall, if shown in that approximate position. If receptacle is shown in same location as counter or bench, determine countertop height and set receptacle to clear top and trim of counter and render outlet easily accessible.

E. In the event of conflict between locations of electrical outlets as shown on the Electrical Drawings and on the Architectural Drawings, outlets shall be installed in accordance with the latter.

F. Locate light switches on latch side of door and verify door hinge location in field prior to switch outlet installation.

G. The Owner reserves the right to relocate any device as much as 10 feet-0 inches (measured horizontally) from its indicated location at no additional cost, provided the contractor is notified prior to roughing that device in.

3.21 Contractor shall record carefully on a set of "as built" prints the exact location of all feeder conduits.

3.22 Unless noted otherwise on the drawings, a maximum of 8 conductors shall be installed in a branch circuit conduit. This maximum is a count of all phase and neutral conductors only - ground conductors are not counted when determining maximum fill for this purpose.

END OF SECTION

H26 05 43 UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEM

PART 1 - GENERAL

1.1 Work includes underground duct banks complete as shown, including excavation, backfill and accessories.

PART 2 - PRODUCTS

2.1 Duct Banks

A. Duct material, where concrete encased, shall be concrete encasement type PVC with 3 inches envelope of 3,000 psi concrete. Fittings shall be fully compatible for the duct material, assembled with recommended sealants to form a watertight joint. All bends shall be long sweep type; use proper adapters between PVC duct and galvanized rigid steel.

B. Ducts shall be carefully placed, aligned and tied to avoid disruption during pouring using plastic spacers.

C. Duct runs shall pitch slightly toward manholes to provide drainage; pitch away from building entrance.

D. Pull a mandrel or swab through each completed duct run; leave a No. 10 THW copper or equivalent, pull wire in all unused duct runs: plug ends of all unused duct runs.

E. Use rigid galvanized steel conduit at all bends and within five (5) ft. of the building wall.

F. Provide taper end bells at all pull in points.

G. Mark the top of all underground duct runs with one of the following methods:

1. Concentrated red dye or powder on top.
2. 6 inches wide yellow plastic tape, with black letters; place approximately 18 inches above on the centerline of the duct bank.

EXECUTION

3.1 Installation

A. Refer to Section 26 05 09 for excavation and backfill.

B. Ducts shall be placed only on firm soil, carefully graded. Tamped sand or gravel shall be used to compensate for over excavation.

C. Use saw cuts where existing paving, walks or curbs are cut. Replace all surfaces to near original condition as practicable.

D. Coordinate duct bank locations with underground utilities and piping.

E. Duct runs shall be covered only after inspection and approval by the Engineer or the Architect.

F. Where ductbank crosses road place #6 rebars to extend under roadbed and 5 feet beyond.

END OF SECTION

H26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 Equipment Identification

A. Identify all the following items with laminated plates:

1. Every motor, lighting and equipment controller and disconnect switch.
2. Panelboards.
3. Motor control centers and motor controller panelboards and individual motor starters within panelboards.
4. Transformers.
5. Manual transfer switches.

B. Nameplate on motor controllers, disconnect switches, Manual transfer switches, switchgear, switchboards, panelboards and transformers shall indicate source, voltage, disconnect location, and load served.

C. Branch circuit panelboards:

1. Identify panel designation on directory card within the panel.
2. Fill out branch circuit directory indicating circuit number and area served, rooms, group of rooms, lighting, convenience outlets, motors, etc. Card index shall be neatly typed. Provide electronic file for card using Excel.
3. Update or replace branch circuit directory in existing panelboards in areas of alteration.
4. Branch circuit phase conductor color format shall be permanently identified inside each panelboard.

D. Wire identification:

1. Identify communications and signaling system wiring and branch circuit wiring by circuit number in panels and motor control center wiring gutters by means of permanent durable wire markers wrapped around or fastened to conductors. This shall be done concurrently with pulling of conductors.
2. Wiring or fiber cabling installed by Contractor for termination by Owner's vendor such as for telephone or data systems shall be identified at both ends utilizing the alpha/numerical identification schedule established by the system vendor.

PART 2 - PRODUCTS

2.1 Nameplates

A. Nameplates shall be laminated phenolic with black surface (red surface for emergency) and white core. Use 0.0625 inch thick material for plates up to 2 inches x 4 inches and 0.125 inch thick for larger sizes. The lettering shall be Condensed Gothic with space between the lines equal to the width of the letters. Use 0.25 inch minimum height letters on the small plates increasing the size proportionately to plate size.

B. The lettering on the plate shall indicate the name of equipment, the specific unit number, voltage, phases, which panel, switchboard or motor control center the equipment is served from, and any other reference data pertinent to the operation. Names and numbers shall coincide with those listed on the drawings. Sample: Panel 3A; 277/480 V, 3 phase, 4 wire, served from unit substation USI.

PART 3 - EXECUTION

3.1 Nameplates shall be secured with screws, one on each end.

END OF SECTION

H26 28 13 FUSES

PART 1 - GENERAL

1.1 Safety switches and other fusible protective devices provided under this contract shall be complete with fuses properly sized to protect the feeders and equipment served.

1.2 Fuses shall not be shipped installed in switches in electrical equipment nor shall they be shipped to the job site until the equipment is ready to be energized. Fuses shall be of the same manufacturer to retain selectivity as designed.

PART 2 - PRODUCTS

2.1 Manufacturers shall be Bussmann, Mersen, Littelfuse or Edison.

2.2 Fuses shall be current limiting with 200,000 amperes interrupting capacity, all shall be UL labeled.

2.3 Fuses, 601 ampere to 6,000 ampere (bolt type dimensions) shall be UL Class "L" fuses. The size and type is indicated on drawings; Bussmann HI CAP time delay fuse KRP C shall be used.

2.4 Fuses with ampere ratings 1 ampere to 600 ampere (standard dimensions) shall be UL Class RK 1. The size and type is indicated on drawings. Bussmann LOW PEAK Time Delay fuse LPN RK (250 volts) or LPS RK (600 volts).

2.5 H.I.D. ballasts shall be individually fused with type GLR fuses in an HLR fuseholder or Type KTK fuses in HEB waterproof fuse holder sized and installed by the fixture manufacturer, in addition to any internal ballast thermal protection. When ballast primary is phase to phase, both shall be fused.

2.6 Where Bussmann specific fuse types are indicated above or on the drawings, acceptable fuses by cross reference of manufacturers are:

Voltage UL Class	Ratings	Bussmann	Mersen	Littel Fuse	Edison
L	600 V	HI CAP KRP C	AMP TRAP A4BQ( )	POWR-PRO KLPC	LCL
RK 1		Low Peak	AMP TRAP II	POWR-PRO	
	250V	LPN RK	A2D ( ) R	LLN-RK	LEN-RK
	600V	LPS RK	A6D ( ) R	LLS-RK	LES-RK
J (Time Delay)	600V	LPJ ( )	AJT ( )	JTD ( )	JDL ( )

PART 3 - EXECUTION

3.1 Place a fuse identification label showing type and size inside door of each switch. Use fuse reducers where fuse gaps are larger than fuse dimension.

3.2 Verify fuse types before installation for proper application by voltage and ampere ratings; fuses protecting motors shall not exceed 150 percent of motor nameplate amps. (Applies to fuses in sizes 600 amps and below.)

3.3 Furnish the Owner with a minimum of 25 percent of quantity of each size installed, but not less than one complete set of three spare fuses for each size of fuse furnished.

END OF SECTION

H26 28 16 DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 Provide disconnect switches, fused and non-fused, where indicated on the drawings and in the specifications, and where required by the NEC.

PART 2 - PRODUCTS

2.1 Disconnect switches shall be listed by Underwriter's Laboratories and shall be manufactured by Square D, Siemens, G.E. or Eaton. All starters and disconnect switches shall be of the same manufacturer unless otherwise approved.

2.2 Switches shall be Heavy-Duty Type, NEMA 1 enclosures, non-fused except where fuses are specified or required to protect wiring from overload; provide raintight NEMA 3R type enclosures for outdoor applications unless otherwise noted.

2.3 Disconnect switches shall be quick-make, quick-break, externally operated with door interlocked with operating handle. Provide solid neutral and ground bars where indicated or where required by the application.

2.4 Disconnect switches shall have multiple padlock provisions in the off position.

2.5 The fuse holders shall be designed for Class "R" rejection type fuses.

2.6 Refer to "Identification for Electrical Systems" Section for nameplate requirements.

PART 3 - EXECUTION

3.1 Mount top of wall mounted disconnect switch 6 ft.-0 inches above floor where space permits.

3.2 Coordinate location of disconnect switches to avoid interference with other equipment and trades and allow access for safe operation.

END OF SECTION

26 32 13 DIESEL ENGINE DRIVEN GENERATOR SETS – WEATHER PROTECTIVE HOUSING

PART 1 - GENERAL

1.1 Provide a standby power system to supply electrical power in event of failure of normal supply consisting of a liquid cooled engine, an AC alternator with main breaker and complete generator set controls, fuel system including fuel, sub-base tank and piping, exhaust system with muffler and piping and cooling sub system. Refer to the drawings for capacity and electrical characteristics.

1.2 Rating shown on drawings is for standby service with 100 hours or less per year operating time.

1.3 The electric generating system, consisting of a prime mover, generator, governor, coupling and all controls, must have been tested, as a complete unit, on a representative engineering prototype model of the equipment to be sold.

1.4 The generator set must conform to and comply with applicable local code requirements of the authority having jurisdiction and NEC Articles 445 and 702 pertaining to the construction and installation of standby systems. Comply with applicable requirements of NFPA 37, “Installation and Use of Stationary Combustion Engines and Gas Turbines”, NFPA 110 “Standby Power Systems”.

1.5 The package generator set shall be UL 2200 listed and labeled. If the generators are not UL 2200 listed in order to meet NEC 700 and 701 selective coordination requirements, then it will be the contractor and manufacturers responsibility to obtain a UL field listing for the complete generator system.

1.6 Generators shall be certified by the manufacturer at the factory to meet the EPA standards.

37 – 129 m KW Tier 3

Equipment needed, either internal or external, to comply with the certification shall be furnished, installed, tested and warranted to provide a complete operational system.

Certification test can be with operation on Ultra low sulfur fuel. If certified with use of Ultra low sulfur fuel, provide warning label on engine that use of other fuels will result in unit not complying with EPA Standards.

Emission standards to be rated for 10 years in standby operation (operating up to 100 hours per year). Warranties to cover all components and labor whose failure would increase the engine’s emission of any pollutant maintenance of the equipment to maintain the emissions warranty shall be included under the contract and signified by a signed agreement by the generator maintenance company performing the service.

1.7 Equipment supplier shall submit for approval with shop drawings, recommended fuel piping diagram, interconnection diagram showing all controls and alarms and dimensioned drawings of the complete generator assembly including floor pad, isolators, main breaker location and lug size, exhaust connections, required clearances, exhaust assembly, thru-wall thimble, offsets, etc. Shop drawings submitted without complete dimensioned drawings will be rejected. At completion of the project, the drawings shall be included as part of the maintenance manuals. Note: Where engine fuel injectors are required to be cooled by engine fuel, the equipment supplier shall include in their costs all additional necessary equipment and labor to modify the fuel system design including fuel cooler and all other piping and electrical work as needed.

PART 2 - PRODUCTS

2.1 The generator set shall be of standard design with complete factory assembly by Caterpillar, Cummins, Generac, MTU Onsite Energy or Kohler. Custom manufactured or one-of-a-kind units, and units by other suppliers will not be approved.

2.2 The engine shall be diesel fueled, four-cycle for heavy duty industrial application, rated to deliver the specified capacity at an ambient temperature of 100 degrees F., and an elevation of 1000 ft. above sea level. Engine shall develop approximately 1.5 HP for each kW of generator, after deducting the HP required for the unit mounted fan and pump operation. Maximum speed at rating 1800 RPM, ratings shall be those in standard published curves and data. Special test ratings for non-standard products will not be acceptable. Engine shall incorporate all standard equipment including:

A. Liquid cooling radiator, engine mounted, with engine driven fan, duct flange and fan guard; engine driven water pump and closed coolant recovery system providing visual diagnostics means to determine if the system is operating with normal coolant level. The radiator shall be designed for operation with 110/122 degrees F (43/50 degrees C.) ambient air temperature.

B. Engine mounted intake air filter(s) with replaceable element.

C. Full pressure engine lubrication supplied by a positive displacement lube oil pump. Engine shall have a replaceable filter with internal bypass and replaceable elements.

D. Provide engine coolant and oil drain extensions to outside of the mounting base for cleaner and more convenient engine servicing. Each drain line shall have a high-quality valve located near the fluid source.

E. The engine fuel system shall be designed for operation on No. 2 diesel fuel. A secondary fuel filter, water separator, manual fuel priming pump, fuel shutoff solenoid and all fuel lines must be installed at the point of manufacture.

F. Sensing elements shall be located on the engine for low oil pressure shutdown, high coolant temperature shutdown, low coolant level shutdown, over speed shutdown and over crank shutdown. These sensors are to be connected to the control panel using a wiring harness with the following features: wire number labeling on each end of the wire run for easy identification, a molded rubber boot to cover the electrical connection on each sensor to prevent corrosion and all wiring to be run in flexible conduit for protection from the environment and any moving objects.

G. Steel base for engine generator with adjustable spring type vibration isolators.

H. Electronic governor capable of maintaining alternator frequency within 0.5 percent from no load to full load alternator output. Steady state regulation is to be 0.25 percent. (Woodward 2301 Electro-Hydraulic governing system or equal by Barber Coleman or Gen-Set manufacturer.)

I. Electric jacket water (block) heater(s) with 120 or 208-volt power source; each thermostatically controlled and used to aid in quick starting.

2.3 Control instruments and alarms (NFPA 110) shall be microprocessor based and shall be mounted in an engine shock mounted control panel.

A. Oil pressure gauge and alarm light. (Pressure gauge can mount on engine.)

B. Water temperature gauge with high temperature alarm light. (Temperature gauge can mount on engine.)

C. Running time meter.

D. Voltmeter with selector switch, phase to phase, phase to neutral and off.

E. Ammeter with selector switch each line and off.

F. Frequency meter.

G. Battery charging ammeter.

H. Over speed shut down alarm light.

I. Unit control run stop.

J. Voltage level adjustment rheostat. (Can mount on engine control panel.)

K. Safety shut offs for high water temperature, low oil pressure, over speed, low coolant level and engine over crank; fault light and alarm contact for each.

L. Alarm light for belly storage tank low fuel level.

M. Indication of all alarms required by NFPA 110; include provisions for remote annunciation.

N. Relay with normally closed contact for damper control.

O. Stop button with lockout provisions.

P. Manual, off, auto switch; four LED's to indicate 1) not in auto, 2) alarm active, 3) generator running, 4) generator ready.

Q. Provide summary alarm dry contacts (2-N.O.) that closes upon any generator alarm condition for interface with fire alarm panel and/or other building system panel(s).

R. Provide communication port for interface with BAS system panel utilizing MODbus.

S. Main line circuit breaker(s); install in separate floor mounted panel if breaker(s) is too large to be installed in engine mounted control panel.

2.4 Generator features shall include:

A. The AC generator shall be synchronous, four-pole, optimum pitch, revolving field, drip-proof construction, single pre-lubricated sealed bearing, air cooled by a direct drive centrifugal blower fan and directly connected to the engine with flexible drive disc or flexible steel coupling - provide guard.

B. All insulation system components shall meet NEMA MG1, UL 1446 temperature limits for Class H insulation system. Actual temperature rise measured by resistance method at full load shall not exceed **105 degrees centigrade**.

C. The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage not more than 5 percent above or 10 percent below rated voltage.

D. A permanent magnet generator (PMG) shall be included to provide a reliable source of excitation power for optimum motor starting and short circuit performance. The PMG and

controls shall be capable of sustaining and regulating current supplied to a single phase or three-phase fault at approximately 300 percent of rated current for not more than 10 seconds.

E. Design and construction conforming to NEMA, AIEE and ASA standards.

F. PMG excited and static regulated, 12 lead brushless revolving field.

G. Power factor 0.80; 60 hertz-frequency.

H. Voltage regulation plus or minus 1 percent.

I. Steady state frequency regulation plus or minus 0.5 percent.

J. Radio interference suppression.

K. Winding and bearing RTD: with RTD module for remote temperature alarm.

L. Load steps – meet ISO 8528-5:2013 Class G3 transient response parameters for each step.

1. Add load then remove in reverse
   a. 50KW / 62.5KVA
   b. 15KW / 18.75KVA
   c. 15KW / 18.75KVA
2. One step full rating 100KW/125KVA

Provide the test results from factory test with generator delivery.

2.5 The main line breaker shall be molded case thermal magnetic trip 100 percent rated type for load circuit breaking and line protection and rated for minimum 115 to 125 percent full capacity of generator output. Generator exciter field circuit breakers are not acceptable as a substitute for the main breaker.

2.6 Accessories: Furnish and connect the following engine accessories:

A. Heavy duty twelve volt or 24-volt lead acid starting batteries and charger with an adjustable trickle charge rate and a high charge rate. Battery charger shall include a D.C. ammeter and voltmeter, AC circuit breaker and a DC fuse, 0 24-hour equalizing timer, A.C. power failure relay, and low D.C. voltage alarm relay; LaMarche Model A 46 in NEMA 1 enclosure or equal by Charles Industries, Model AE or equal by gen-set manufacturer. The battery shall not be discharged through the battery charger. For battery fluid capacity greater than 50 gallons provide spill containment reservoir and absorbent neutralization pillows.

B. Flexible stainless steel exhaust connection for each exhaust outlet.

C. Critical type exhaust silencer Maxim #M51 or equal by Burgess, EM Products Inc., Universal "ENS", York "Y4" or Cowl. Provide crossover manifold where engine has more than one exhaust outlet. Provide ventilated roof/wall thimble to accommodate exhaust piping;

D. Red mushroom engine stop button with protective lift cover and sign “Emergency Engine Stop”, Single Gang Box Mounting.

E. 5-gallon stainless steel fill spill containment. Provide bracket mounting where fill is located remote from sub-base tank.

F. Extend engine drain line for crankcase oil to outside engine mounting rails to permit easy access.

G. Sub-base mounted fuel oil tank shall be double wall constructed of steel plate of thickness required by applicable standards and shall be UL listed 142 and constructed per NFPA requirements; manufactured by Tramont, Pryco, Victory Industrial Products or approved equal.

1. Tank shall include necessary vents, fill, fuel level gauge, low, high and critical high-level sensors, supply and return openings, piping and accessories. Provide vent lines to outside with approved cast iron screened rain shield; install with proper clearance from all building openings.
2. Provide an intertank leak detector and alarm contact; connect alarm contact to control panel for local and remote annunciation.
3. Base tank shall be fabricated separately from the base; after fabrication, tank shall be bolted to its base to form a complete unit that mates to the generator skid. Base tank shall not interfere with access to engine and generator for maintenance and shall be mounted to allow minimum 2 inches air space between bottom of tank and concrete floor.
4. Complete assembly shall be prime and finish painted to match color of engine generator set.
5. Tank shall be UL listed and labeled.

H. Provide a factory installed weather protective type sound attenuating (75 db at 7 meters and 5 feet above grade) housing around generator for outdoor installation. Standard features associated with housing shall be as follows:

1. Hinged and removable side and rear panels for easy access to generator set.
2. Vertical outlet hoods with 90-degree angles and baffles or turning vanes to redirect air and reduce noise; UL 94 HF1 listed acoustic insulation for flame resistant standards.
3. Louvers on both the generator air intake and radiator air discharge ends for cooling; prevent rain and snow entry.
4. Lockable latches on each removable or hinged panel; all parts of latches and hinges and mounting hardware shall be stainless steel (hinges can be aluminum with SS pins).
5. Rugged Galvanized steel or aluminum construction; painted with accepted manufacturer's painting process. Skid mounted. Color selected by Architect / Engineer special beige, gray, brown, green, blue??
6. Battery rack and battery blanket heater, 120 V thermostatically controlled.
7. Insulated critical rated silencer with tail pipe and rain cap; mount silencer inside generator enclosure.
8. Rodent barriers and insect screens over all openings including louvered openings.

2.7 Batteries shall be designed to fit inside enclosure and alongside the engine and shall be easily removable for service. Batteries under the generator are not acceptable.

2.8 Auxiliary Systems Connections

A. Oil Supply System

1. All tanks and piping systems and installation shall conform to applicable portions of NFPA 31 and shall meet requirements of the State Fire Marshall.
2. Oil and vent piping shall be schedule 40 threaded coated black steel ASTM A-53 with cast iron screwed standard fittings.
3. Provide vent line to outside with approved rain shield on end; must be installed with proper code clearance from all building openings.
4. Diesel fuel shall be provided by this Contractor and shall be type and grade as recommended by engine supplier.

B. Radiator heat transfer plenum and outdoor louver shall be as detailed on the drawings, complete with weatherproof louver and bird screen, automatic damper with engine operation interlock, and flexible duct connection to the engine. Applicable sections of the Division 23 specifications

shall apply to this work however, the work shall be included in this Contract. Intake and exhaust dampers shall be normally closed; when engine operates, dampers shall open. Dampers shall be motor operated for closing with spring opening on power failure. Connect controls to an emergency circuit.

C. Engine exhaust piping system shall be constructed of rigid schedule 40 steel pipe with welded fittings. System shall be complete from exhaust manifold thru flexible connector and muffler and extend thru roof or wall as detailed. Roof sleeve shall consist of an insulated steel curb with 6 inches clearance at roof line beyond insulation, counterflashing and flashing clamp. Cover with 4 inches thickness calcium silicate preformed insulation having a final protective jacket of aluminum or stainless steel. Provide a trapped condensation drain at low point of system and a welded mesh bird screen over open end of exhaust pipe. Cut end of exhaust pipe at 60 degrees to the axis of the pipe to reduce noise.

PART 3 - EXECUTION

3.1 Installation

A. Mount engine generator on steel reinforced concrete base with adjustable spring type vibration dampeners or factory installed isolators between engine and skid. Bolt firmly to foundation.

B. Make external connections to generator and engine thru flexible connections. Provide bushing in raceway to protect wiring from abrasion due to vibration.

C. Connect auxiliary systems all in accordance with manufacturer's specific instructions for automatic and manual operation.

D. Install remote engine stop button at entry to room or outside enclosure. Connect to engine controls for shutdown.

E. Fill radiator and cooling system with the necessary solution of ethylene glycol, additives and water for freeze and engine protection as recommended by manufacturer. Freeze protection down to -32 degrees to -40 degrees F for Ohio and neighboring states.

F. Neutral shall not be bonded to generator. Bonding of neutral and ground is accomplished in main switchgear. Provide signs at service entrance location and at grounding location per NEC 702.7. Provide labeling if bonding is modified in field from the manufacturer standard.

3.2 Testing and Demonstration

A. The supplier shall furnish a certified full-load test certificate verifying that the generator has been tested prior to delivery and found to be in satisfactory working condition under test loads.

B. Adjust, test and demonstrate proper operation of the system after installation. Test shall demonstrate automatic operation, transfer, quick start and a minimum of 2 hours endurance under not less than 50 percent load, then not less than 2 hours at full load. Provide a temporary resistance load bank for the test. Testing shall comply with current JCAHO/NFPA 110 acceptance testing standards. Engineer / Architect may require extended test time if system is suspect.

C. Run step loading per either ISO 8528-5 Class G2 or G3 according to the BMEP of unit.

D. All fuel piping and base mounted fuel tanks shall be tested after installation and before filling with fuel; tests shall comply with Ohio Mechanical Code, Chapter 13 and OFC Chapter 34.

E. Submit test report based on NFPA 110.

F. Provide load bank, associated cables, metering and operation assistance for factory start-up, demonstration test.

G. Include in the demonstration / training documentation the continuing maintenance and testing requirements to comply with the permit-by-rule requirements of the State of Ohio.

H. Personnel training should cover system operation, record-keeping and periodic maintenance. Operator is to be familiar with all power system components alarm conditions, operation and maintenance procedures. Also knowledgeable of subsystems fuel storage and delivery, starting batteries, engine coolant heaters and airflow both in and out.

3.3 The Contractor shall provide fuel for testing and top off the tank after completing all tests and demonstrations.

3.4 Exit and emergency lighting and power distribution wiring shall be run in a separate and independent conduit system.

3.5 Provide sign at the service entrance indicating type and location of on-site power sources per NEC 700.7 / NEC 701.7 / 702.7. Coordinate with Authority Having Jurisdiction.

3.6 Permit

A. Obtain the information and forms to submit for “Permit-by-“Rule” exception of OAC 3745 to the State of Ohio for installation and operation of the standby generator. Coordinate with the owner for their testing and fuel reporting operations. Request shall be submitted sufficiently in advance of generator start-up to receive approval of the permit.

B. Obtain permit for flammable and combustible liquid tanks as required by OFC Section 105. Perform test, coordinate inspections and provide records as required.

3.7 Warranty – Provide a comprehensive 2-year warranty. Warranty shall clearly state what is included.

3.8 Operation Instructions and Maintenance Manual:

A. After completion of work and start-up of the equipment at the jobsite, deliver to the Owner, copies of operating instructions, maintenance manuals and drawings presenting full details for care and maintenance of each item of equipment furnished and/or installed under this contract. Training of Owner’s personnel shall be included but limited to one 4-hour session. Provide video taping of training sessions and turn over to Owner.

B. Each manual shall contain the operating and maintenance information and parts lists furnished by the manufacturer for all equipment provided in the contract. When necessary, provide supplemental drawing to show system operation and servicing and maintenance points. For all electrical components, furnish wiring and connection diagrams. Manuals shall include instructions required to accomplish specified operation and functions. Data shall be neat, clean, legible copies. Drawings shall be accordion folded. Non-applicable information shall not be included. Two (2) sets of manuals shall be furnished to the Owner. In addition, (1) CD containing the same information electronically (i.e. color PDF) shall be provided.

C. Generator drawings and wiring diagrams shall be furnished complete and up to date at the completion of start-up and system acceptance by the Owner. Drawings and wiring diagrams shall include any field modifications or changes to reflect actual as-built conditions.

END OF SECTION

H26 36 13 MANUAL TRANSFER SWITCHES

PART 1 - GENERAL

1.1 Furnish and install non-automatic transfer switches where indicated on the drawings to allow the selection of emergency power sources from the indicated emergency generators.

1.2 Each unit shall be complete with accessories in a NEMA 3R enclosure and shall be UL 1008 listed.

PART 2 - PRODUCTS

2.1 Manufacturer – ASCO Series 300 – 3NTS or equal by Russelectric.

2.2 Non-automatic transfer switch shall have door-mounted selector switch for local, manually initiated electrical control; includes following features:

A. Available from 30 thru 3,000 amps.

B. Rated for all classes of load transfer.

C. 100 percent tungsten load ratings through 400 amps.

D. UL Listed Withstand & Close-On Ratings

UL1008 Withstand and Close-On Ratings for ASCO Series 300 Group G Products [1,2]
(RMS Symmetrical Amps)

Frame	Switch Rating (Amperes)	Current Limiting Fuses				Specific Breaker[5]		
	Transfer Switches	480V Max.	600V Max.	Max Size, A	Class	240V Max.	480V Max.	600V Max.
D	200	200kA	-	200	J	65kA	25kA	10kA

Notes:

1. All WCR values indicated are tested in accordance with the requirements of UL 1008, 7th Edition. See ASCO Pub. 1128 for more WCR information.
2. Application requirements may permit higher WCR for certain switch sizes.
3. Front Connected only.
4. J150, 200, 230 Amp available in 3ADTS and 3NDTS only.
5. Provide appropriate size specific breaker for OCD being provided to acquire listed withstand rating.

E. Key operated selector switch on front face of panel with switch position indicating signal lights. (ASCO feature 6Q)

F. One auxiliary contact closed when transfer switch is connected to normal and one closed contact when connected on emergency.

G. Source availability lights to provide operator with a local indication of power source availability. Normal (Red) and Emergency (Red).

H. Auxiliary contacts to indicate position of main contacts. Two (2) for normal position and two (2) for emergency position. (ASCO 14AA / 14BA).

I. In phase monitor to transfer motor loads between live sources. For both directions.

PART 3 - EXECUTION

3.1 Mount top of wall mounted cabinets 6 feet-0 inches above floor.

3.2 Coordinate location of switches to avoid interference with other equipment and trades.

3.3 Demonstrate operation of transfer switch.

END OF SECTION

APPENDIX A

Schedule of Manhole Rehabilitation

Appendix A: Schedule of Manhole Rehabilitation

Manhole ID	Depth (Feet)	Surface Material	Replace Frame & Cover, Pavement (Each)	Construct Bench & Channel (Each)	Composite Manhole Lining, Seal Full Depth (Vertical Feet)	Install New Manhole (Each)	Comments
SSMH-001	13.4	Pavement	1	1	13.4		
SSMH-002	11.6	Pavement		1	11.6		
SSMH-003	11.4	Pavement	1	1	11.4		
SSMH-004	11.3	Non-Pavement		1	11.3		
SSMH-005	11.5	Pavement		1	11.5		Previously cleaned and prepped
SSMH-006	11.8	Pavement		1	11.8		Previously cleaned and prepped
SSMH-010	5.0	Pavement	1	1	5.0		
SSMH-011	8.6	Pavement	1	1	8.6		
SSMH-014	Unk.	Non-Pavement			Unk.	1	
SSMH-015	Unk.	Non-Pavement			Unk.	1	
Totals	**--**	**--**	**4**	**8**	**85.0**	**2**	

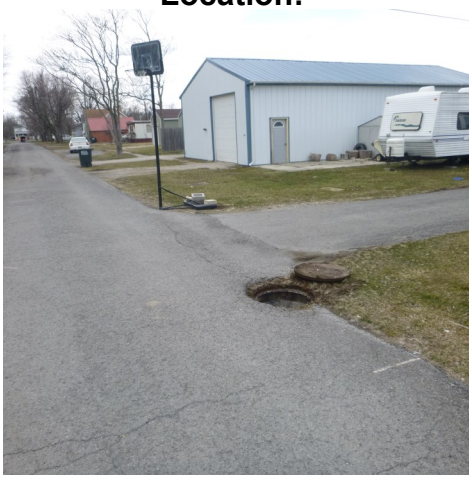
APPENDIX B

Manhole Rehabilitation Log

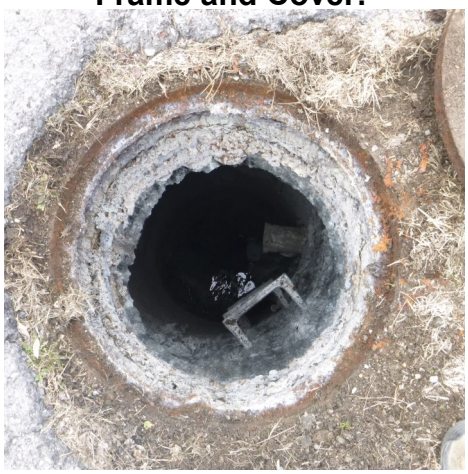
Appendix B: Manhole Rehabilitation Log

Date:	10/15/2020	**Manhole ID:**	SSMH-001
Depth (ft.):	13.4	**Surface Material:**	Pavement
Replace Frame & Cover:		Yes	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

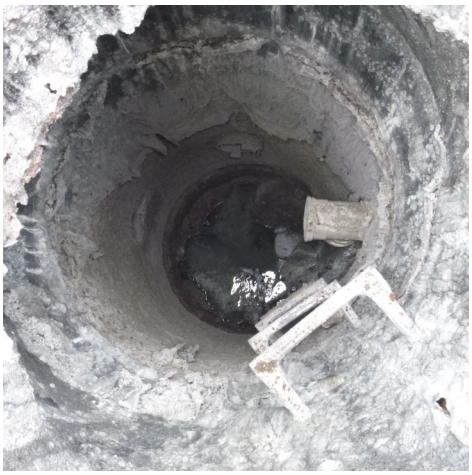
Location:



Frame and Cover:



Internal Photos:

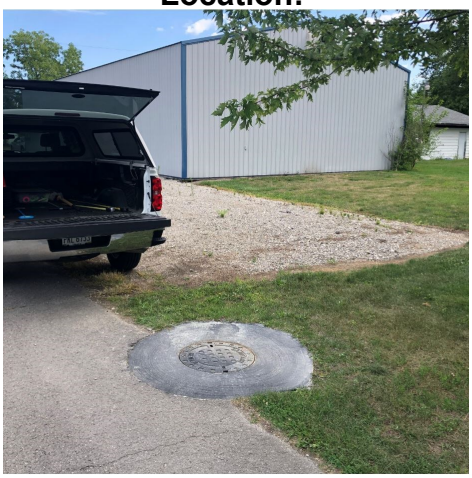


WESSLER ENGINEERING

Appendix B: Manhole Rehabilitation Log

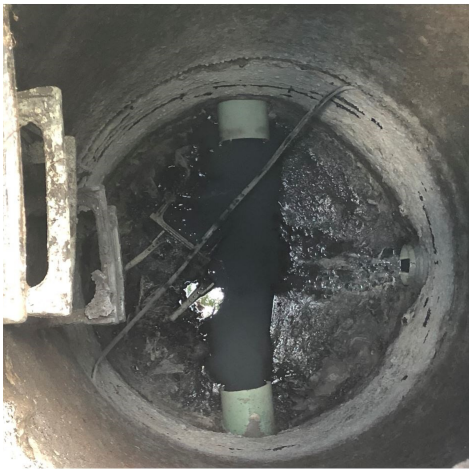
Date:	10/15/2020	**Manhole ID:**	SSMH-002
Depth (ft.):	11.6	**Surface Material:**	Pavement
Replace Frame & Cover:		No	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

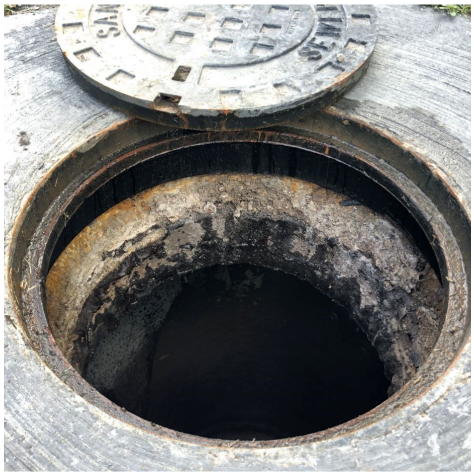
Location:

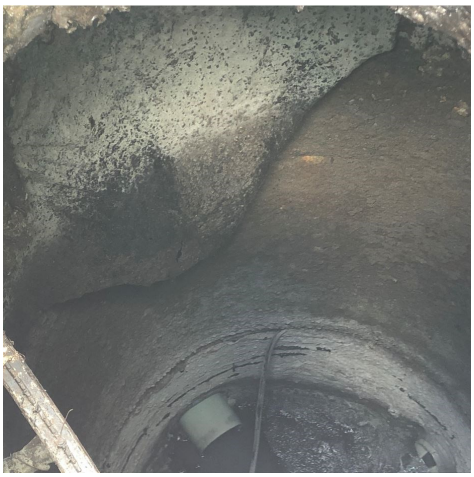


Frame and Cover:

Internal Photos:







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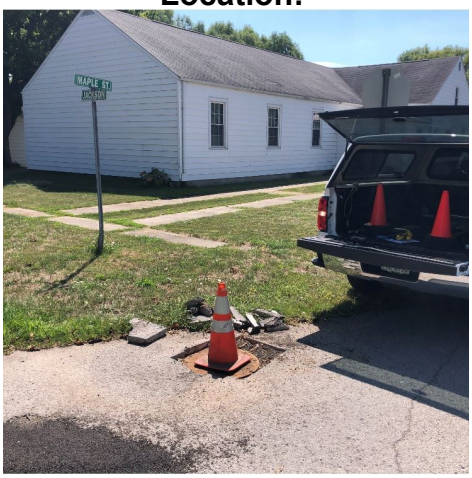
Appendix B: Manhole Rehabilitation Log

Date:	10/15/2020	**Manhole ID:**	SSMH-003
Depth (ft.):	11.4	**Surface Material:**	Pavement
Replace Frame & Cover:		Yes	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

Location:



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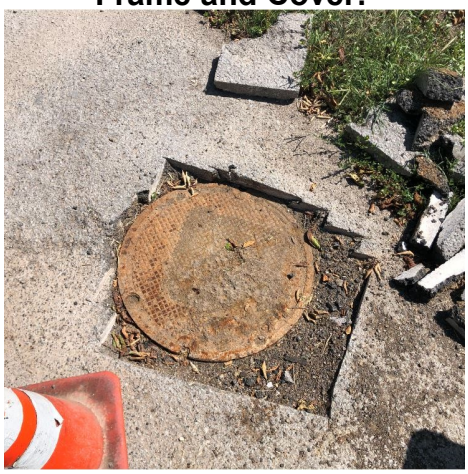

Internal Photos:

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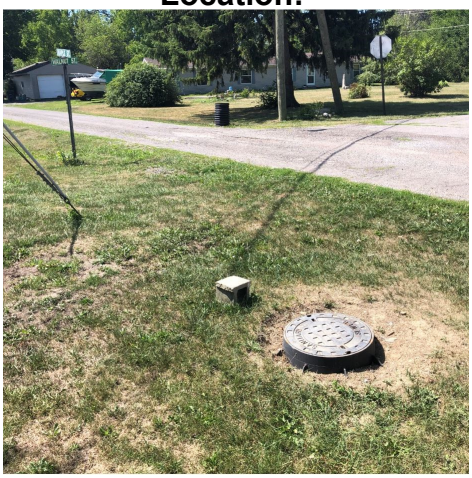
Appendix B: Manhole Rehabilitation Log

Date:	10/15/2020	**Manhole ID:**	SSMH-004
Depth (ft.):	11.3	**Surface Material:**	Non-Pavement
Replace Frame & Cover:		No	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

Location:



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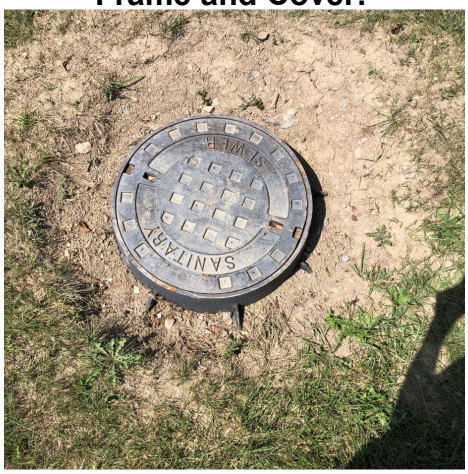
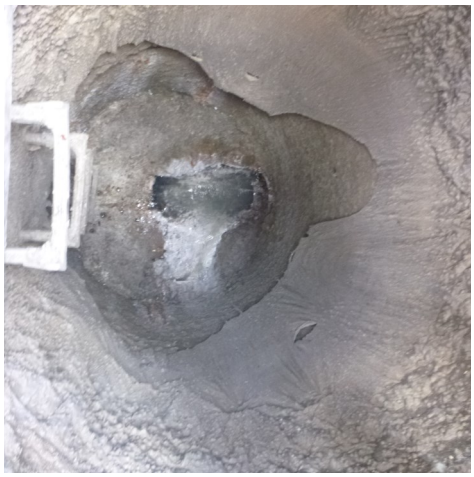
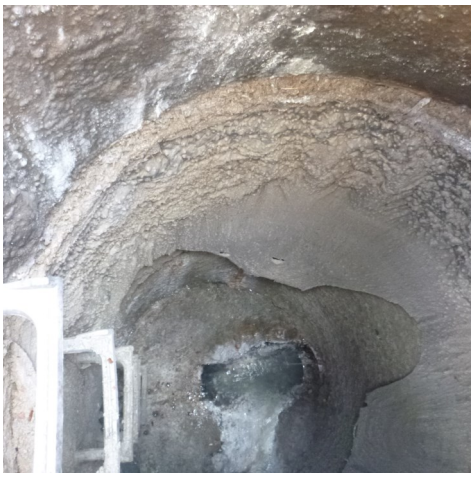
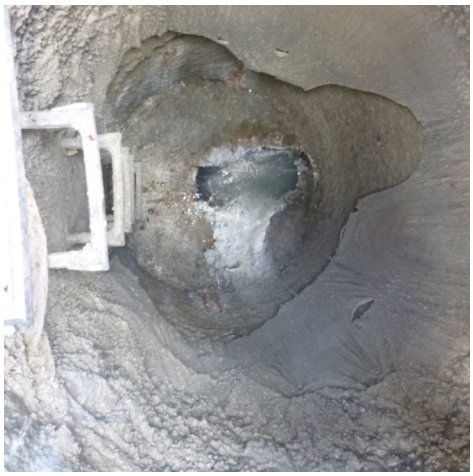


Internal Photos:







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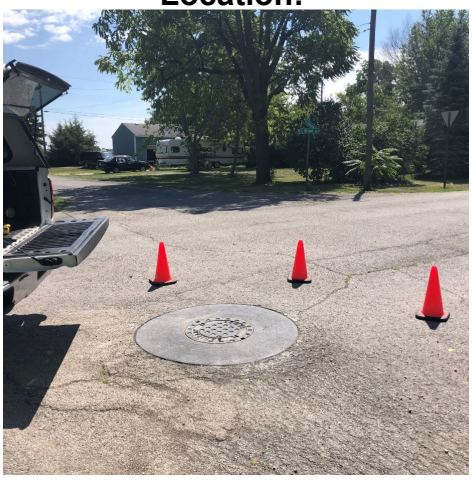
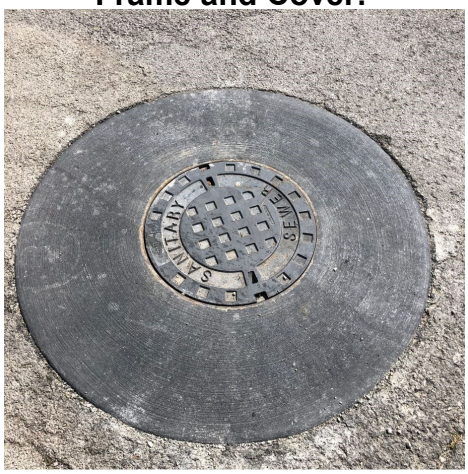
Appendix B: Manhole Rehabilitation Log

Date:	10/15/2020	**Manhole ID:**	SSMH-005
Depth (ft.):	11.5	**Surface Material:**	Pavement
Replace Frame & Cover:		No	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

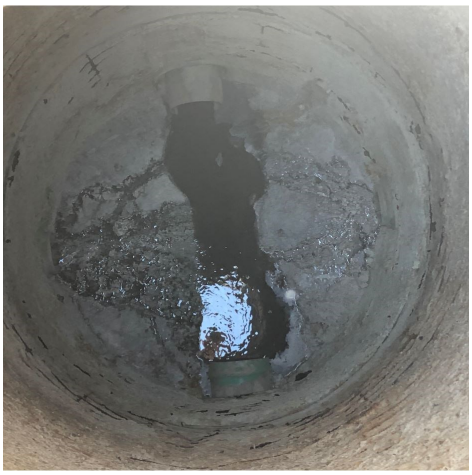
Location:



Frame and Cover:



Internal Photos:



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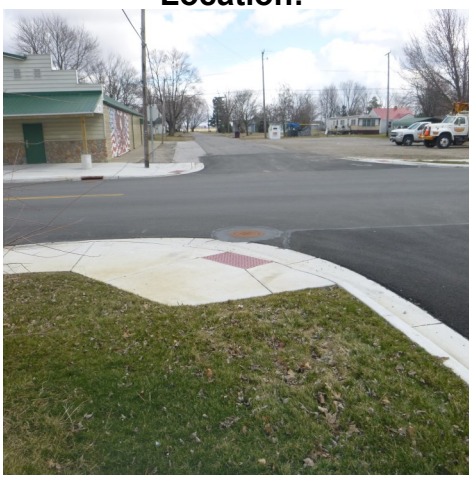
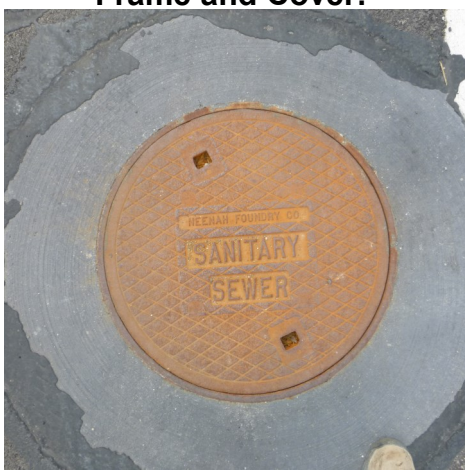
Appendix B: Manhole Rehabilitation Log

Date:	10/15/2020	**Manhole ID:**	SSMH-006
Depth (ft.):	11.8	**Surface Material:**	Pavement
Replace Frame & Cover:		No	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

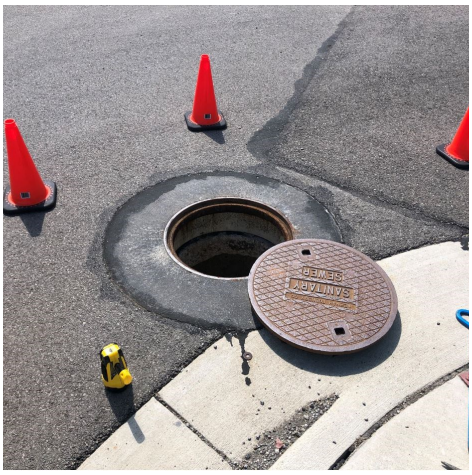
Location:

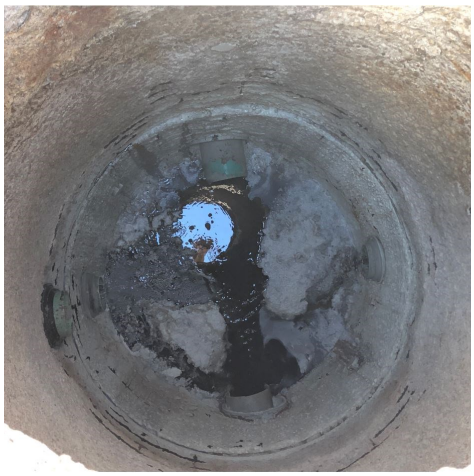


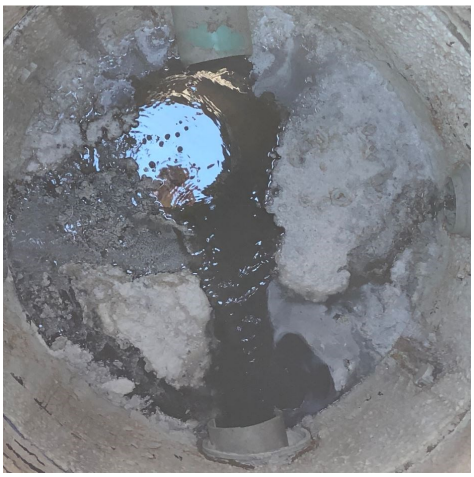
Frame and Cover:

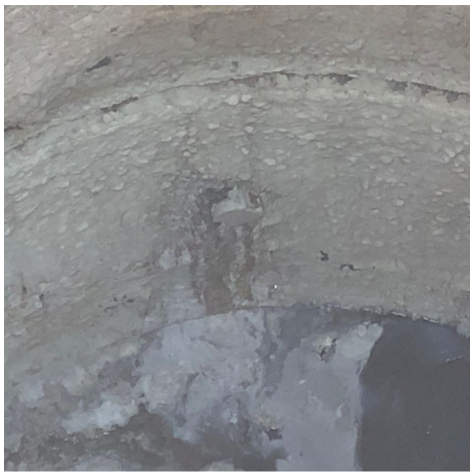


Internal Photos:









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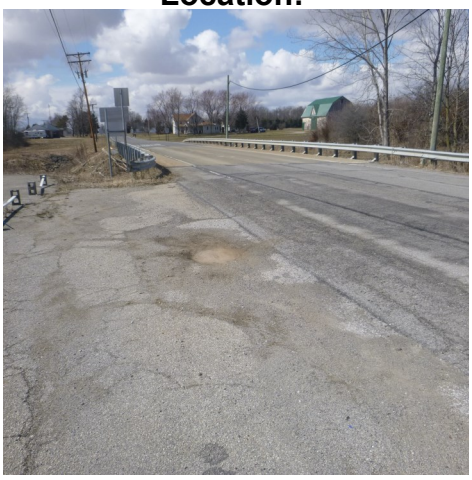
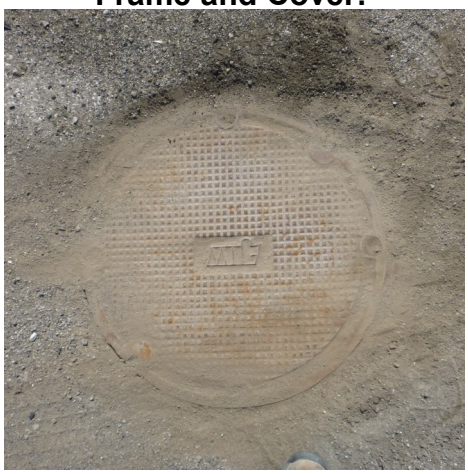
Appendix B: Manhole Rehabilitation Log

Date:	10/15/2020	**Manhole ID:**	SSMH-010
Depth (ft.):	5.0	**Surface Material:**	Pavement
Replace Frame & Cover:		Yes	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

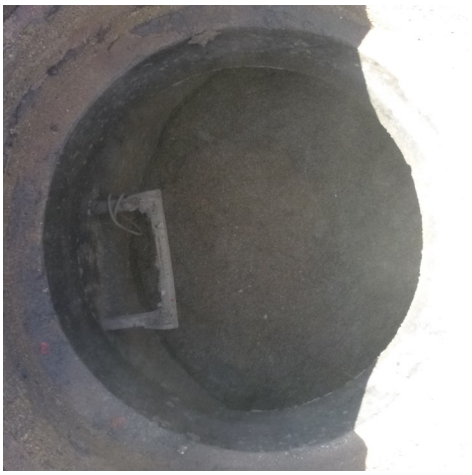
Location:

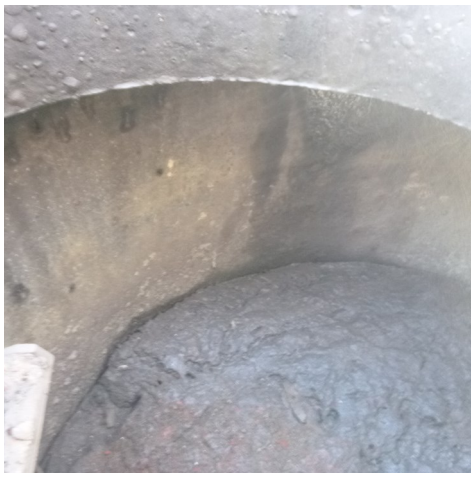


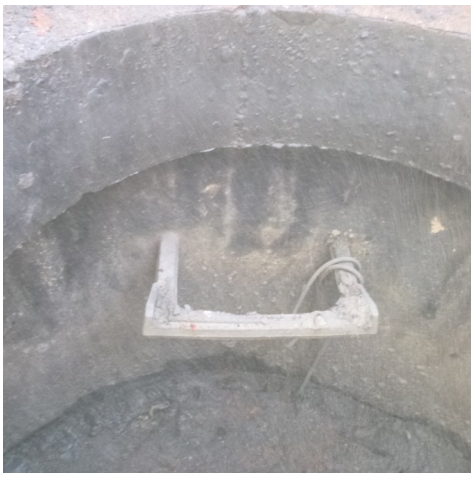
Frame and Cover:

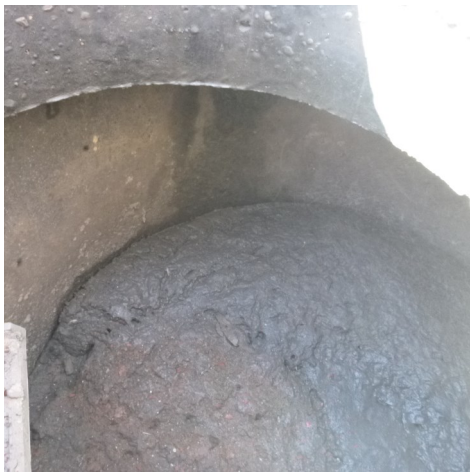


Internal Photos:









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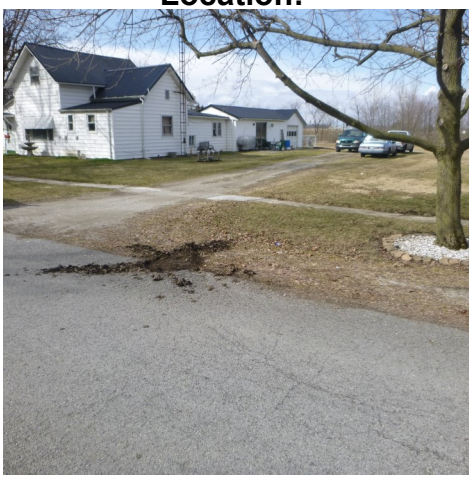
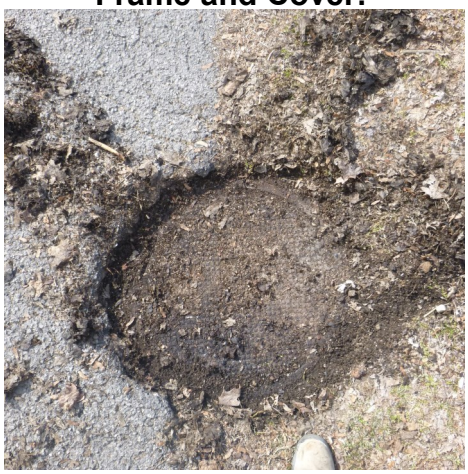
Appendix B: Manhole Rehabilitation Log

Date: 10/15/2020	**Manhole ID:** SSMH-011
Depth (ft.): 8.6	**Surface Material:** Pavement
Replace Frame & Cover:	Yes
Install Bench & Channel:	Yes
Composite Manhole Lining, Seal Full Depth:	Yes

Location:



Frame and Cover:



Internal Photos:

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Appendix B: Manhole Rehabilitation Log

Date:	10/15/2020	**Manhole ID:**	SSMH-014
Depth (ft.):	0.0	**Surface Material:**	Non-Pavement
Replace Frame & Cover:		No	
Install Bench & Channel:		Yes	
Composite Manhole Lining, Seal Full Depth:		Yes	

Location:

Frame and Cover:

Internal Photos:

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Appendix B: Manhole Rehabilitation Log

Date: 10/15/2020	**Manhole ID:** SSMH-015
Depth (ft.): 0.0	**Surface Material:** Non-Pavement
Replace Frame & Cover:	No
Install Bench & Channel:	Yes
Composite Manhole Lining, Seal Full Depth:	Yes

Location:

Frame and Cover:

Internal Photos:

WESSLER ENGINEERING

APPENDIX C

Schedule of Septic Tank Work

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-001	409 W JACKSON	NEW	NEW	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			Tank installation may require fence removal/replacement, asphalt work, and removal of pipe leading to creek. Coordinate with property Owner/Engineer for tank's install location.
STK-002	406 W JACKSON	GPS LOCATED	REPLACE	STANDARD	01948		GRASS/SOIL	HDPE, 1500			
STK-003	405 W JACKSON	GPS LOCATED	REPLACE	STANDARD	96622 & 02623		GRASS/SOIL	HDPE, 1500			
STK-004	403 W JACKSON	GPS LOCATED	REPLACE	STANDARD	02623		GRASS/SOIL	HDPE, 1500			
STK-005	304 W JACKSON	GPS LOCATED	REPLACE	STANDARD	96619		GRASS/SOIL	HDPE, 1500			
STK-006	302 W JACKSON	GPS LOCATED	REPLACE	STANDARD	96618		GRASS/SOIL	HDPE, 1500			
STK-007	300 W JACKSON	GPS LOCATED	REPLACE	STANDARD	96612		GRASS/SOIL	HDPE, 1500			
STK-008	401 W JACKSON	GPS LOCATED	REPLACE	STANDARD	96692	Tank sits on Lot 3 and Lot 46. Easement covers Lot 3, but there is no easement for Lot 46.	GRASS/SOIL	HDPE, 1500			
STK-009	102 S JEFFERSON	GPS LOCATED	REPLACE	STANDARD	96693 & 96694		GRASS/SOIL	HDPE, 1500			
STK-010	403 W WALNUT	GPS LOCATED	REPLACE	STANDARD	99114		GRASS/SOIL	HDPE, 1500			
STK-011	403 W WALNUT	GPS LOCATED	REPLACE	STANDARD	00159 & 99114	Easement 00159 is assumed to be labeled wrong. Says Outlot 6 south half, assumed it should be Kinkade's 1st add. Lot 6 south half.	GRASS/SOIL	HDPE, 1500			May require tree removal, refer to Appendix D.
STK-012	401 W WALNUT	GPS LOCATED	REPLACE	STANDARD	96697		GRASS/SOIL	HDPE, 1500			
STK-013	200 S JEFFERSON	GPS LOCATED	REPLACE	STANDARD	96698		GRASS/SOIL	HDPE, 1500			Tank is close to building below an existing deck, refer to Appendix D. Coordinate with Owner a minimum of 1-month in advance of work to allow for deck removal so tank can be removed. Coordinate new tank location with Owner, include all work necessary to reconnect to new tank.
STK-014	404 W FIRST	GPS LOCATED	REPLACE	STANDARD	01125		GRASS/SOIL	HDPE, 1500			
STK-016	300 W FIRST	GPS LOCATED	REPLACE	STANDARD	96700		GRASS/SOIL	HDPE, 1500			
STK-017	301 W WALNUT	GPS LOCATED	REPLACE	STANDARD	96699		GRASS/SOIL	HDPE, 1500			
STK-018	103 S JEFFERSON	GPS LOCATED	REPLACE	STANDARD	00008		GRASS/SOIL	HDPE, 1500			May require tree removal, refer to Appendix D.
STK-019	-- W JACKSON	AS-BUILT LOCATED	REMOVE	NONE	NO EASEMENT		GRAVEL/STONE	-- --			CCTV from Cleanout at the southeast corner of Jefferson St. and Jackson St. to try and locate lateral to tank.
STK-020	-- W JACKSON	AS-BUILT LOCATED	REMOVE	STANDARD	96691, 96629, & 96816		GRAVEL/STONE	-- --			
STK-021	301 W JACKSON	GPS LOCATED	REPLACE	STANDARD	96816		GRASS/SOIL	HDPE, 1500			May require sidewalk/concrete work, refer to Appendix D.
STK-022	-- S MONROE	GPS LOCATED	REMOVE	STANDARD	03144		GRASS/SOIL	-- --			
STK-023	300 W WALNUT	GPS LOCATED	REPLACE	STANDARD	98941		GRASS/SOIL	HDPE, 1500			
STK-024	200 S MONROE	GPS LOCATED	REPLACE	STANDARD	00005		GRASS/SOIL	HDPE, 1500			
STK-025	204 S MONROE	GPS LOCATED	REPLACE	STANDARD	00160		GRASS/SOIL	HDPE, 1500			
STK-026	203 S MONROE	GPS LOCATED	REPLACE	STANDARD	00155		GRASS/SOIL	H-20 PRECAST, 1500			
STK-027	201 S MONROE	GPS LOCATED	REPLACE	STANDARD	02183		GRASS/SOIL	HDPE, 1500			
STK-028	203 W WALNUT	GPS LOCATED	REPLACE	STANDARD	96821		GRASS/SOIL	HDPE, 1500			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-029	206 W PERRY	GPS LOCATED	REPLACE	STANDARD	99003 & 97163		GRASS/SOIL	HDPE, 1500			
STK-030	206 W PERRY	GPS LOCATED	REMOVE	STANDARD	99003 & 97163		GRASS/SOIL	-- --			Tank is close to building proximity, may require tree removal, refer to Appendix D.
STK-031	205 N HARRISON	GPS LOCATED	REPLACE	STANDARD	98836		GRASS/SOIL	HDPE, 1500			May require tree removal, refer to Appendix D.
STK-032	203 N HARRISON	GPS LOCATED	REPLACE	STANDARD	00158 & 98837		GRASS/SOIL	HDPE, 1500			
STK-033	201 N HARRISON	GPS LOCATED	REPLACE	STANDARD	99108		GRASS/SOIL	HDPE, 1500			
STK-034	200 W PERRY	GPS LOCATED	REPLACE	STANDARD	96637		GRASS/SOIL	HDPE, 1500			
STK-035	107 N HARRISON	GPS LOCATED	REPLACE	STANDARD	00203		GRASS/SOIL	HDPE, 1500			
STK-036	105 N HARRISON	GPS LOCATED	REPLACE	STANDARD	00203		GRASS/SOIL	HDPE, 1500			
STK-038	200 W JACKSON	GPS LOCATED	REMOVE	STANDARD	99110		GRASS/SOIL	-- --			
STK-039	200 W JACKSON	GPS LOCATED	REPLACE	STANDARD	96646		GRASS/SOIL	PRECAST, 2500			
STK-040	104 S HARRISON	GPS LOCATED	REPLACE	STANDARD	00363		GRASS/SOIL	HDPE, 1500			Tank is close to an existing deck, refer to Appendix D. Coordinate with Owner a minimum of 1-month in advance of work to allow for deck removal so tank can be removed. Coordinate new tank location with Owner, include all work necessary to reconnect to new tank.
STK-041	201 W WALNUT	GPS LOCATED	REPLACE	STANDARD	00205		GRASS/SOIL	HDPE, 1500			
STK-042	200 S HARRISON	GPS LOCATED	REPLACE	STANDARD	01949		GRASS/SOIL	HDPE, 1500			
STK-043	202 S HARRISON	GPS LOCATED	REPLACE	STANDARD	00206 & 98937		GRASS/SOIL	HDPE, 1500			
STK-044	204 S HARRISON	GPS LOCATED	REPLACE	STANDARD	98937		GRASS/SOIL	HDPE, 1500			
STK-044A	100 W FIRST ST	GPS LOCATED	REMOVE	STANDARD	98709		GRASS/SOIL	-- --			
STK-045	205 S HARRISON	GPS LOCATED	REPLACE	STANDARD	98937		GRASS/SOIL	HDPE, 1500			
STK-046	-- S HARRISON	GPS LOCATED	REMOVE	STANDARD	02579		GRASS/SOIL	-- --			
STK-047	201 S HARRISON	GPS LOCATED	REPLACE	STANDARD	96653 & 02579		GRASS/SOIL	HDPE, 1500			May require tree removal based on unknown orientation of the existing tank, refer to Appendix D.
STK-048	100 W WALNUT	GPS LOCATED	REMOVE	STANDARD	99113 & 96652		GRASS/SOIL	-- --			
STK-049	103 S HARRISON	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96648 & 96649	96649: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			Tank is in close proximity to building, refer to Appendix D. May want to discuss relocation of tank with property owner if spacing between tank and building is an issue.
STK-050	101 S HARRISON	GPS LOCATED	REPLACE	STANDARD	96623		GRASS/SOIL	HDPE, 1500			
STK-051	-- W JACKSON	AS-BUILT LOCATED	REPLACE	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-052	104 N HARRISON	GPS LOCATED	REPLACE	STANDARD	99001		GRASS/SOIL	HDPE, 1500			Tank is in close proximity to building, refer to Appendix D. May want to discuss relocation of tank with property owner if spacing between tank and building is an issue.
STK-053	106 N HARRISON	GPS LOCATED	REPLACE	STANDARD	03037		GRASS/SOIL	HDPE, 1500			
STK-054	100 W PERRY	GPS LOCATED	REPLACE	STANDARD	00171		GRASS/SOIL	PRECAST, 2500			
STK-055	200 N HARRISON	GPS LOCATED	REPLACE	STANDARD	02989		GRASS/SOIL	HDPE, 1500			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-056	209 N MAIN	GPS LOCATED	REPLACE	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-057	207 N MAIN	GPS LOCATED	REPLACE	STANDARD	96633		GRASS/SOIL	H-20 PRECAST, 1500			Tank is in close proximity to building, refer to Appendix D. May want to discuss relocation of tank with property owner.
STK-058	205 N MAIN	GPS LOCATED	REPLACE	STANDARD	99107, 99180, & 96633		GRASS/SOIL	HDPE, 1500			Tank installation may require fence removal/replacement, refer to Appendix D.
STK-059	203 N MAIN	GPS LOCATED	REPLACE	STANDARD	00480		GRASS/SOIL	HDPE, 1500			
STK-060	201 N MAIN	GPS LOCATED	REPLACE	STANDARD	00480 & 03038		GRASS/SOIL	HDPE, 1500			
STK-061	101 W PERRY	GPS LOCATED	REPLACE	STANDARD	96641		GRASS/SOIL	HDPE, 1500			
STK-061A	-- N MAIN	NEW	NEW	NONE	NO EASEMENT	Easement needed or place in the alley in the Right-of-Way and change tank to H20	GRASS/SOIL	H-20 PRECAST, 1500			Coordinate with property Owner/Engineer for tank's install location.
STK-062	-- N MAIN	GPS LOCATED	REPLACE	RIGHT-OF-WAY	NO EASEMENT		GRAVEL/STONE	H-20 PRECAST, 1500			
STK-063	101 N MAIN	GPS LOCATED	REPLACE	RIGHT-OF-WAY	NO EASEMENT		GRAVEL/STONE	H-20 PRECAST, 1500			
STK-064	199 W JACKSON	GPS LOCATED	REPLACE	STANDARD	02018		CONCRETE	H-20 PRECAST, 1500			Tank removal and installation will require concrete removal/replacement, HVAC removal/replacement, and is in close proximity to building/utility pole/propane tank. Refer to Appendix D.
STK-065	100 S MAIN	GPS LOCATED	REPLACE	STANDARD	99101		GRASS/SOIL	HDPE, 1500			
STK-066	102 S MAIN	GPS LOCATED	REPLACE	STANDARD	96608		GRASS/SOIL	PRECAST, 2500			
STK-067	104 S MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96609, 96610, & 96608	96610: 14 feet in width plus temporary construction easement of 13 feet in width.	GRAVEL/STONE	H-20 PRECAST, 1500			May require the removal/replacement of a propane tank, coordinate with owner and utility. Refer to Appendix D.
STK-068	-- S MAIN	GPS LOCATED	REPLACE	STANDARD	00459		GRASS/SOIL	HDPE, 1500			
STK-070	200 S MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	02376, 02281, & 96655	96655: 14 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	PRECAST, 2500			
STK-071	202 S MAIN	GPS LOCATED	REPLACE	STANDARD	99102 & 03143		GRASS/SOIL	HDPE, 1500			Will require chain link fence removal/replacement, see Appendix D.
STK-072	204 S MAIN	GPS LOCATED	REPLACE	STANDARD	03143 & 99102		GRASS/SOIL	HDPE, 1500			
STK-073	300 S JEFFERSON	GPS LOCATED	REPLACE	RIGHT-OF-WAY	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-074	306 S JEFFERSON	GPS LOCATED	REPLACE	STANDARD	96626		GRASS/SOIL	HDPE, 1500			
STK-075	-- S JEFFERSON	GPS LOCATED	REPLACE	STANDARD	03199		GRASS/SOIL	HDPE, 1500			
STK-076	-- S JEFFERSON	AS-BUILT LOCATED	NEW	NONE	NO EASEMENT		GRASS/SOIL	HDPE,1500			Find and remove existing tank. Coordinate with property Owner/Engineer for tank's install location.
STK-077	305 S JEFFERSON	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	98875 & 98877	98877: 14 feet in width plus temporary easement for construction purposes 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-078	303 W SECOND	GPS LOCATED	REPLACE	STANDARD	96604		GRASS/SOIL	HDPE, 1500			
STK-079	-- S JEFFERSON	GPS LOCATED	REMOVE	RIGHT-OF-WAY	NO EASEMENT		GRASS/SOIL	-- --			
STK-080	301 W FIRST	GPS LOCATED	REMOVE	STANDARD	00452		GRASS/SOIL	-- --			
STK-081	302 S MONROE	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96681 & 96682	96682: 14 feet in width plus temporary easement for construction purposes 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-082	304 S MONROE	GPS LOCATED	REMOVE	STANDARD & NONSTANDARD	00553, 96681, & 96682	96682: 14 feet in width plus temporary easement for construction purposes 13 feet in width.	GRASS/SOIL	-- --			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-083	301 W SECOND	AS-BUILT LOCATED	REMOVE	STANDARD	96687		GRASS/SOIL	-- --			
STK-084	402 S MONROE	GPS LOCATED	REPLACE	STANDARD	00524		GRASS/SOIL	PRECAST, 2500			
STK-085	403 S MONROE	GPS LOCATED	REPLACE	STANDARD	00207		GRASS/SOIL	PRECAST, 2500			
STK-086	201 W SECOND	GPS LOCATED	REPLACE	STANDARD	96687		GRASS/SOIL	H-20 PRECAST, 1500			
STK-088	303 S MONROE	GPS LOCATED	REPLACE	STANDARD	02426		GRAVEL/STONE	H-20 PRECAST, 1500			
STK-089	301 S MONROE	GPS LOCATED	REPLACE	STANDARD	02427 & 02426		GRASS/SOIL	H-20 PRECAST, 1500			May require tree removal, refer to Appendix D.
STK-090	201 W FIRST	GPS LOCATED	REPLACE	STANDARD	96685		GRASS/SOIL	HDPE, 1500			May require sidewalk/concrete work, refer to Appendix D.
STK-091	300 S HARRISON	GPS LOCATED	REPLACE	STANDARD	98940		GRASS/SOIL	HDPE, 1500			May require tree removal, clothesline removal/replacement, and building in close proximity, refer to Appendix D.
STK-092	-- S HARRISON	GPS LOCATED	REPLACE	STANDARD	02943 & 98940		GRAVEL/STONE	H-20 PRECAST, 1500			
STK-093	400 S HARRISON	GPS LOCATED	REPLACE	STANDARD	96686		GRASS/SOIL	HDPE, 1500			
STK-093A	-- S HARRISON	AS-BUILT LOCATED	REPLACE	STANDARD	02374		GRASS/SOIL	HDPE, 1500			
STK-094	405 S HARRISON	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96689, 96690, & 00506	96690: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			May require plastic fence removal/replacement, refer to Appendix D.
STK-095	407 S HARRISON	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	00506, 96689, & 96690	96690: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-096	403 S HARRISON	GPS LOCATED	REPLACE	STANDARD	96688		GRASS/SOIL	HDPE, 1500			May require sidewalk/concrete work, refer to Appendix D. May want to coordinate with property owner and Engineer on tank relocation to avoid the sidewalk, driveway, garage, and tree issues.
STK-097	401 S HARRISON	GPS LOCATED	REPLACE	STANDARD	01943		GRASS/SOIL	HDPE, 1500			
STK-098	103 W SECOND	GPS LOCATED	REMOVE	STANDARD	00207		GRASS/SOIL	-- --			Coordinate with property owner one month in advance for the removal of the vehicles ontop and other items around the tank, refer to Appendix D.
STK-099	101 W FIRST	GPS LOCATED	REPLACE	STANDARD	00010		GRASS/SOIL	HDPE, 1500			
STK-100	302 S MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	99109, 00156, & 00157	00157: 7 feet in width plus temporary easement for construction purposes 13 feet in width.	GRASS/SOIL	PRECAST, 2500			
STK-102	304 S MAIN	GPS LOCATED	REPLACE	STANDARD	99134	Tank is on lot boundary lines. The north lot has an easement (99134), but the south lot does not have an easement.	GRASS/SOIL	HDPE, 1500			
STK-103	400 S MAIN	GPS LOCATED	REPLACE	STANDARD	00405		GRASS/SOIL	HDPE, 1500			
STK-104	402 S MAIN	GPS LOCATED	REPLACE	STANDARD	98942		GRASS/SOIL	HDPE, 1500			
STK-105	404 S MAIN	GPS LOCATED	REPLACE	STANDARD	99112		GRASS/SOIL	HDPE, 1500			
STK-106	408 S MAIN	GPS LOCATED	REPLACE	STANDARD	00506		GRASS/SOIL	HDPE, 1500			Tank is close to building and limited access to septic tank, refer to Appendix D.
STK-107	410 S MAIN	GPS LOCATED	REPLACE	STANDARD	00181		GRASS/SOIL	HDPE, 1500			
STK-107A	-- S MAIN	GPS LOCATED	REMOVE	STANDARD & NONSTANDARD	02374, 00181, 96613, & 96614	96614: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	-- --			
STK-108	414 S MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	00009, 96613, & 96614	96614: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			May require the removal/replacement of a propane tank, coordinate with owner and utility. Refer to Appendix D.
STK-109	-- ST. RT. 637	GPS LOCATED	REPLACE	STANDARD	00348		GRASS/SOIL	HDPE, 1500			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-110	-- ST. RT. 637	AS-BUILT LOCATED	REPLACE	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-111	-- N MAIN	NEW	NEW	STANDARD	96632		GRASS/SOIL	HDPE, 1500			Coordinate with property Owner/Engineer for tank's install location.
STK-112	204 N MAIN	GPS LOCATED	REPLACE	STANDARD	96634 & 96632		GRASS/SOIL	H-20 PRECAST, 1500			
STK-113	202 N MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	99136 & 99135	99135: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			May require chain link and wooden fence removal and replacement to access the location of the tank, refer to Appendix D.
STK-114	200 N MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96638 & 96639	96639: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			May require the removal/replacement of a propane tank, coordinate with owner and utility. Refer to Appendix D.
STK-115	-- N MAIN	GPS LOCATED	REPLACE	STANDARD	98944		GRASS/SOIL	HDPE, 1500			
STK-117	101 S MAIN	GPS LOCATED	REPLACE	STANDARD	96647		GRASS/SOIL	HDPE, 1500			May require sidewalk/concrete work, refer to Appendix D.
STK-118	198 S MAIN	GPS LOCATED	REPLACE	STANDARD	96630		GRASS/SOIL	PRECAST, 2500			
STK-119	-- S MAIN	GPS LOCATED	REMOVE	STANDARD	99000		GRASS/SOIL	-- --			
STK-120	338 S WAYNE	GPS LOCATED	REPLACE	STANDARD	96651		GRASS/SOIL	H-20 PRECAST, 1500			May require the removal/replacement of two propane tanks, coordinate with owner and utility. Refer to Appendix D.
STK-121	101 E WALNUT	GPS LOCATED	REPLACE	STANDARD	02631		GRASS/SOIL	HDPE, 1500			
STK-122	-- S CLEVELAND	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	00163 & 00162	00162: 14 feet in width plus temporary easement for construction purposes 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-124	-- N CLEVELAND	GPS LOCATED	REPLACE	STANDARD	00169		GRASS/SOIL	HDPE, 1500			
STK-125	101 E PERRY	GPS LOCATED	REPLACE	STANDARD	99105		GRASS/SOIL	HDPE, 1500			May require sidewalk/concrete work, refer to Appendix D.
STK-126	201 N CLEVELAND	GPS LOCATED	REPLACE	STANDARD	02019		GRASS/SOIL	HDPE, 1500			
STK-127	203 N CLEVELAND	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	98779 & 98780	98780: 7 feet in width plus temporary easement for construction purposes 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-128	205 N CLEVELAND	GPS LOCATED	REPLACE	NONSTANDARD	01944	7 Feet in width plus a temporary easement for construction purposes of 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-129	103 E WAYNE	GPS LOCATED	REPLACE	STANDARD	00006 & 99103		GRAVEL/STONE	H-20 PRECAST, 1500			
STK-130	-- E WAYNE	GPS LOCATED	REPLACE	STANDARD	00007		GRASS/SOIL	HDPE, 1500			
STK-131	121 E WAYNE	GPS LOCATED	REPLACE	RIGHT-OF-WAY	0006	Tank is outside Lot 20 which has easement 0006, considering this as Right of way.	GRASS/SOIL	HDPE, 1500			
STK-132	201 E WAYNE	GPS LOCATED	REPLACE	STANDARD	96674		GRASS/SOIL	HDPE, 1500			Tank is close to building , refer to Appendix D.
STK-133	203 E WAYNE	GPS LOCATED	REPLACE	STANDARD	96675		GRASS/SOIL	H-20 PRECAST, 1500			
STK-134	204 N CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96631		GRASS/SOIL	HDPE, 1500			
STK-135	200 N CLEVELAND	GPS LOCATED	REPLACE	STANDARD	00161 & 96635		GRASS/SOIL	HDPE, 1500			
STK-136	201 E PERRY	GPS LOCATED	REPLACE	STANDARD	00161	Tank is on lot boundary lines. The north lot (19) has an easement (00161), but the south lot does not have an easement.	GRASS/SOIL	HDPE, 1500			May require sidewalk/concrete work, refer to Appendix D.
STK-137	102 N CLEVELAND	GPS LOCATED	REPLACE	STANDARD	98805 & 96642		GRASS/SOIL	HDPE, 1500			
STK-138	100 N CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96642		GRASS/SOIL	HDPE, 1500			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-139	-- N CLEVELAND	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96644 & 00020	00020: 14 feet in width and temporary construction easement of 13 feet.	GRASS/SOIL	HDPE, 1500			
STK-140	203 E JACKSON	GPS LOCATED	REPLACE	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-140A	204 E JACKSON	AS-BUILT LOCATED	REMOVE	NONE	NO EASEMENT		GRASS/SOIL	-- --			Tank was visually located on 10/16/2020, but has not been GPS Located.
STK-141	103 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	01947		GRASS/SOIL	HDPE, 1500			
STK-142	105 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	00362		GRAVEL/STONE	H-20 PRECAST, 1500			
STK-143	201 E WALNUT	GPS LOCATED	REPLACE	STANDARD	96650		GRASS/SOIL	HDPE, 1500			
STK-144	203 E WALNUT	GPS LOCATED	REPLACE	STANDARD	01946		GRASS/SOIL	HDPE, 1500			
STK-145	100 S MAPLE	GPS LOCATED	REPLACE	STANDARD	02632		GRASS/SOIL	HDPE, 1500			
STK-146	101 N MAPLE	GPS LOCATED	REPLACE	STANDARD	96643		GRASS/SOIL	HDPE, 1500			
STK-147	103 N MAPLE	GPS LOCATED	REPLACE	STANDARD	99002		GRASS/SOIL	HDPE, 1500			
STK-148	-- N MAPLE	GPS LOCATED	REMOVE	STANDARD	99002		GRASS/SOIL	-- --			
STK-149	203 N MAPLE	GPS LOCATED	REPLACE	STANDARD	96640 & 00204		GRASS/SOIL	HDPE, 1500			
STK-150	201 N MAPLE	GPS LOCATED	REPLACE	STANDARD	00204 & 96640		GRASS/SOIL	HDPE, 1500			
STK-151	203 N MAPLE	GPS LOCATED	REPLACE	STANDARD	96636		GRASS/SOIL	HDPE, 1500			
STK-152	205 N MAPLE	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	99003, 99004, & 96636	99004: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			May require chain link fence removal and replacement along with possible tree removal, refer to Appendix D.
STK-153	205 E WAYNE	GPS LOCATED	REPLACE	STANDARD	96676 & 00317		GRASS/SOIL	HDPE, 1500			May require tree removal, wooden fence removal/replacement, and sidewalk/concrete work, refer to Appendix D.
STK-154	205 E WAYNE	GPS LOCATED	REPLACE	STANDARD	96676		GRASS/SOIL	HDPE, 1500			Tank is close to building below an existing deck, refer to Appendix D. Coordinate with Owner a minimum of 1-month in advance of work to allow for deck removal. Coordinate with property Owner/Engineer for tank's install location, include all work necessary to reconnect to new tank.
STK-155	-- N MAPLE	GPS LOCATED	REPLACE	STANDARD	02741		GRASS/SOIL	HDPE, 1500			Will require tree removal, refer to Appendix D.
STK-156	301 E WAYNE	GPS LOCATED	REPLACE	STANDARD	01950		GRASS/SOIL	HDPE, 1500			
STK-157	206 N MAPLE	GPS LOCATED	REPLACE	STANDARD	96673		GRASS/SOIL	HDPE, 1500			
STK-158	200 N MAPLE	GPS LOCATED	REPLACE	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-159	200 N MAPLE	GPS LOCATED	REPLACE	STANDARD	96667 & 96666		GRASS/SOIL	H-20 PRECAST, 1500			
STK-160	303 E PERRY	GPS LOCATED	REPLACE	STANDARD	97034 & 96665		GRASS/SOIL	HDPE, 1500			
STK-161	100 N MAPLE	GPS LOCATED	REPLACE	STANDARD	98943		GRASS/SOIL	HDPE, 1500			
STK-162	303 E JACKSON	GPS LOCATED	REPLACE	STANDARD	98839 & 99098		GRASS/SOIL	HDPE, 1500			
STK-163	302 E JACKSON	GPS LOCATED	REPLACE	STANDARD	98806		GRASS/SOIL	HDPE, 1500			
STK-164	-- S MAPLE	GPS LOCATED	REPLACE	STANDARD	98806		GRASS/SOIL	H-20 PRECAST, 2000			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-165	107 S MAPLE	GPS LOCATED	REMOVE	STANDARD	00402		GRASS/SOIL	-- --			
STK-166	107 S MAPLE	GPS LOCATED	REPLACE	STANDARD	00402		GRASS/SOIL	PRECAST, 2500			
STK-167	107 S MAPLE	GPS LOCATED	REPLACE	STANDARD	00402		GRASS/SOIL	HDPE, 1500			
STK-168	304 E JACKSON	GPS LOCATED	REMOVE	STANDARD	00722		GRASS/SOIL	-- --			
STK-169	306 E JACKSON	GPS LOCATED	REPLACE	STANDARD	96615 & 00331		GRASS/SOIL	HDPE, 1500			
STK-170	308 E JACKSON	GPS LOCATED	REPLACE	STANDARD	00331 & 96615		GRASS/SOIL	HDPE, 1500			
STK-171	305 E JACKSON	GPS LOCATED	REPLACE	STANDARD	01945		GRASS/SOIL	HDPE, 1500			
STK-172	307 E JACKSON	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96663 & 96664	96664: 14 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-173	305 E PERRY	GPS LOCATED	REPLACE	STANDARD	00877		GRASS/SOIL	HDPE, 1500			
STK-174	300 E WAYNE	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96670, 96671, & 96672	96671: 14 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-175	302 E WAYNE	GPS LOCATED	REPLACE	STANDARD	98874 & 96670		GRASS/SOIL	HDPE, 1500			May require the removal/replacement of a propane tank, coordinate with owner and utility. Refer to Appendix D.
STK-176	307 E WAYNE	GPS LOCATED	REPLACE	STANDARD	96678 & 96677		GRASS/SOIL	H-20 PRECAST, 1500			
STK-177	311 E WAYNE	AS-BUILT LOCATED	REPLACE	STANDARD	96680 & 00172		GRASS/SOIL	H-20 PRECAST, 1500			
STK-178	309 E WAYNE	GPS LOCATED	REPLACE	STANDARD	96680 & 96679		GRASS/SOIL	HDPE, 1500			
STK-179	202 N TYLER	GPS LOCATED	REPLACE	STANDARD	99100 & 98999		GRASS/SOIL	HDPE, 1500			
STK-180	202 N TYLER	GPS LOCATED	REPLACE	STANDARD	98999		GRASS/SOIL	HDPE, 1500			
STK-181	401 E JACKSON	GPS LOCATED	REPLACE	STANDARD	96627 & 02184		GRASS/SOIL	HDPE, 1500			
STK-182	405 E JACKSON	GPS LOCATED	REPLACE	STANDARD	02184		GRASS/SOIL	HDPE, 1500			
STK-183	310 E JACKSON	GPS LOCATED	REPLACE	STANDARD	96624		GRASS/SOIL	PRECAST, 2500			
STK-183A	310 E JACKSON	GPS LOCATED	REMOVE	STANDARD	96624		GRASS/SOIL	-- --			
STK-184	312 E JACKSON	GPS LOCATED	REPLACE	STANDARD	99111		GRASS/SOIL	HDPE, 1500			
STK-185	-- ST. RT. 114	GPS LOCATED	REPLACE	STANDARD	00170		GRASS/SOIL	HDPE, 1500			
STK-186	203 S MAIN	GPS LOCATED	REPLACE	STANDARD	97164 & 96659		GRASS/SOIL	HDPE, 1500			
STK-187	207 S MAIN	GPS LOCATED	REPLACE	STANDARD	02643		GRASS/SOIL	HDPE, 1500			
STK-188	102 E FIRST	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96701 & 96702	96702: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-189	303 S MAIN	GPS LOCATED	REPLACE	STANDARD	00453 & 96701		GRASS/SOIL	HDPE, 1500			May require chain link fence removal and replacement, refer to Appendix D.
STK-190	305 S MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	02375, 96707, & 96706	96706: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	PRECAST, 2500			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments
STK-191	309 S MAIN	GPS LOCATED	REPLACE	STANDARD	99104		GRASS/SOIL	HDPE, 1500			May require chain link and wooden fence removal and replacement to access the location of the tank, refer to Appendix D.
STK-192	311 S MAIN	AS-BUILT LOCATED	REPLACE	STANDARD	03040		GRASS/SOIL	HDPE, 1500			
STK-193	313 S MAIN	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96617 & 96616	96616: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			
STK-194	315 S MAIN	GPS LOCATED	REMOVE	STANDARD & NONSTANDARD	96607 & 96606	96606: 7 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	-- --			
STK-195	-- S MAIN	GPS LOCATED	REPLACE	STANDARD	00349		GRASS/SOIL	HDPE, 1500			May require plastic fence removal/replacement. Tank may need to be relocated to owners property. Coordinate with property owner and Engineer. Refer to Appendix D.
STK-196	-- S MAIN	GPS LOCATED	REPLACE	STANDARD	00349		GRASS/SOIL	HDPE, 1500			
STK-197	304 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96708		GRASS/SOIL	HDPE, 1500			May want to coordinate one month in advance with property owner for the removal of above ground pool, refer to Appendix D.
STK-198	302 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD & NONSTANDARD	96704 & 96705	96705: 14 feet in width plus temporary construction easement of 13 feet in width.	GRASS/SOIL	HDPE, 1500			May require tree removal, refer to Appendix D.
STK-199	204 S CLEVELAND	GPS LOCATED	REMOVE	STANDARD	01942		GRASS/SOIL	-- --			Coordinate with property owner one month in advance for the removal of the vehicle in the proximity of the tank, refer to Appendix D.
STK-200	101 E FIRST	GPS LOCATED	REPLACE	STANDARD	01064 & 96660		GRASS/SOIL	HDPE, 1500			
STK-201	202 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96660		GRASS/SOIL	HDPE, 1500			
STK-202	200 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96658 & 98710		GRASS/SOIL	HDPE, 1500			
STK-203	-- E WALNUT	GPS LOCATED	REPLACE	STANDARD	96656		GRASS/SOIL	HDPE, 1500			
STK-204	200 E WALNUT	GPS LOCATED	REPLACE	STANDARD	03039 & 96661		GRASS/SOIL	HDPE, 1500			
STK-205	205 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96661		GRASS/SOIL	HDPE, 1500			
STK-206	201 E FIRST	GPS LOCATED	REPLACE	STANDARD	02578		GRASS/SOIL	HDPE, 1500			
STK-207	-- S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96822		GRASS/SOIL	HDPE, 1500			
STK-208	301 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	03116 & 96822		GRASS/SOIL	HDPE, 1500			
STK-209	303 S CLEVELAND	GPS LOCATED	REPLACE	STANDARD	96703		GRASS/SOIL	HDPE, 1500			May require fence removal and replacement, refer to Appendix D.
STK-210	-- S CLEVELAND	GPS LOCATED	REPLACE	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-211	-- S CLEVELAND	GPS LOCATED	REPLACE	NONE	NO EASEMENT		GRASS/SOIL	HDPE, 1500			
STK-212	202 E FIRST	GPS LOCATED	REPLACE	STANDARD	99106		GRASS/SOIL	HDPE, 1500			
STK-213	202 E FIRST	GPS LOCATED	REMOVE	NONE	NO EASEMENT		GRASS/SOIL	-- --			
STK-213A	-- S Maple	AS-BUILT LOCATED	REPLACE	STANDARD	00350		GRASS/SOIL	HDPE, 1500			
STK-214	203 E FIRST	GPS LOCATED	REPLACE	STANDARD	96662		GRASS/SOIL	HDPE, 1500			
STK-215	204 E WALNUT	GPS LOCATED	REPLACE	RIGHT-OF-WAY	96657	Tank is on lot boundary lines. The north lot (96) has an easement (96657), but the south lot does not have an easement.	GRASS/SOIL	HDPE, 1500			

Appendix C: Schedule of Septic Tank Work

Septic Tank ID	Address	Tank Location	Tank Instructions	Easement Type	Easement Number (s)	Easement Comments/Notes	Surface Material	Tank Material & Capacity (gal.)	Tank Removal Date	Tank Installation Date	Notes/Comments

Notes:

1 "Notes/Comments" may not capture all unique site conditions. Contractor shall review all drawings and appendices and visit sites prior to submitting bid.

2 Standard Easement - Being a perpetual easement covering an area five (5) feet each side and end of the septic tank and to include an area seven (7) feet both sides of the lateral line from the septic tank to the main line. Also, an easement five (5) feet outside of said perpetual easement to be used for construction purposes only.

3 Non-Standard Easement - Easement distances are equal to or greater than "Standard Easement" distances. See "Easement Comments/Notes".

APPENDIX D

Septic Tank Data Sheet

Note: Appendix D is not included in printed / electronic version of this Project Manual. You can find a link to the document at https://www.wesslerengineering.com/wp-content/uploads/2020/12/Appendix-D_Septic-Tank-Data-Sheet_Final-Full-Set.pdf